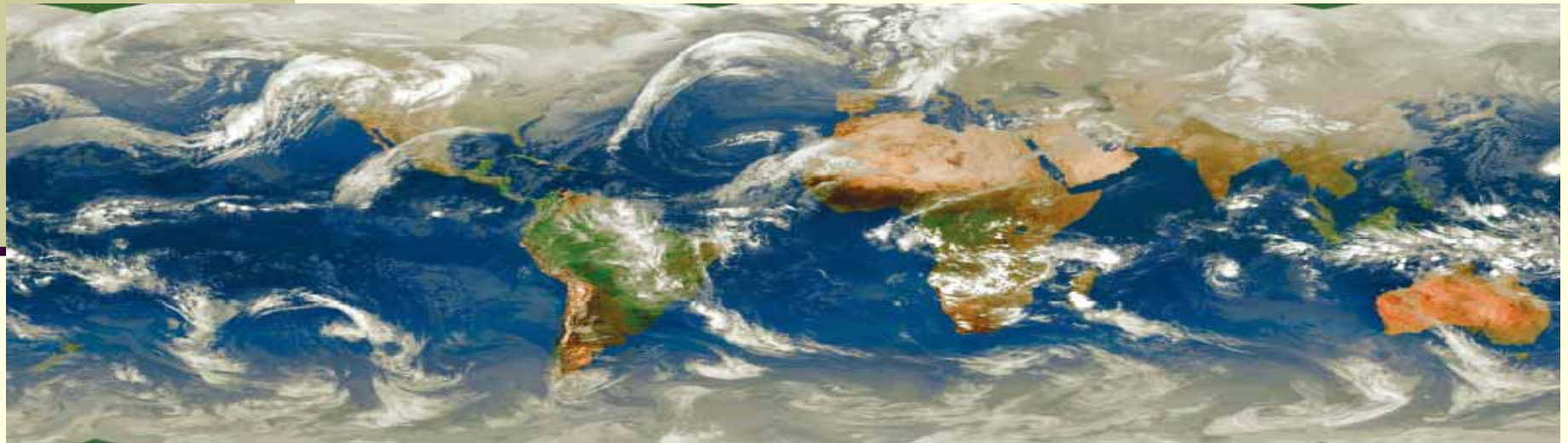


Earth Observation Activities in China

Dr. **Guoguang ZHENG** (GEO Co-Chair)

Dr. **Naimeng LU** and Dr. **Jinlong FAN**
(China Meteorological Administration)



Tokyo, Japan, 11-12 Jan. 2007

Outline

- GEO Activities in China
- GEOSSS Progress in China
- Promote GEO Cooperation in AP



I. GEO Activities in China

National Activities

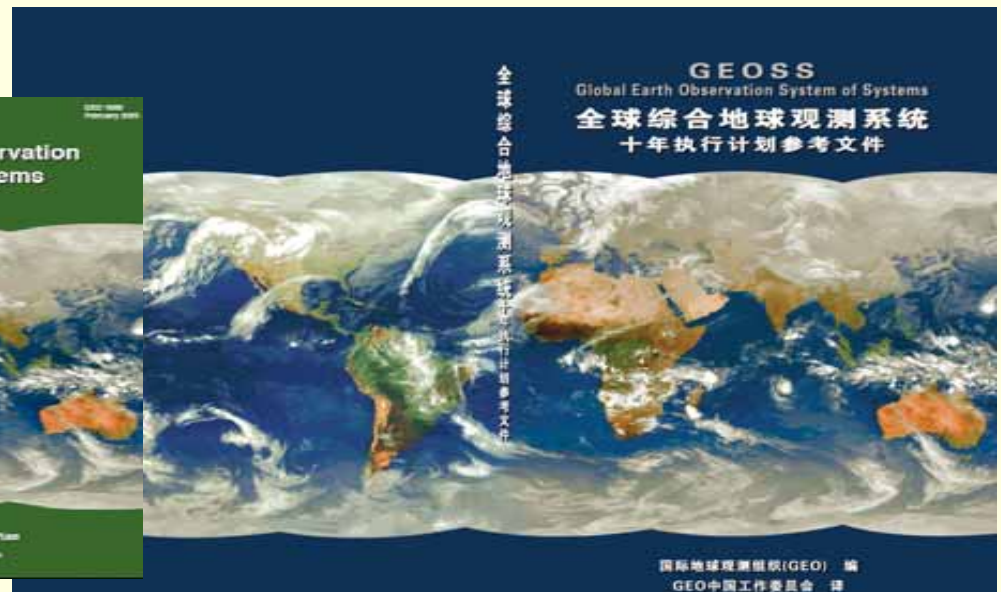
- Set up National Committee of GEO
- An National High-tech R&D Program --Earth Observation formed
- Publish GEOSS Ten-Year Implementation Plan in Chinese version
- National GEOSS Ten-Year Implementation Plan under development
- Set up FENGYUNCast, one important component of GEONETCast

International Activities

- Participate in international activities of GEO and GEOSS including GEO Tasks, Working Group, Workshop,.....
- Data Sharing
- Cooperation between GEO members

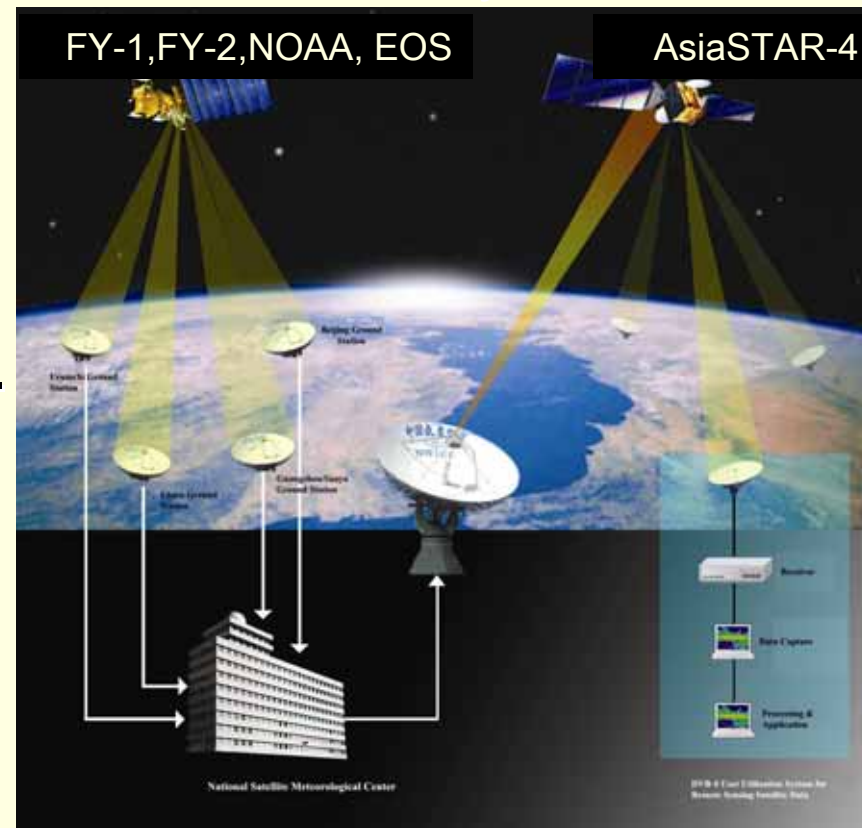
GEO Activities in China (1)

- Set up National Committee of GEO in China
members from CMA, MOST, CNSA, CAS, and others
- Create an National Key High-tech R&D Program
Earth Observations and Navigation in order to promote
Earth Observations System in China and scientific
research related to the GEOSS.
- Publish the GEOSS Ten-Year Implementation Plan in
Chinese version



GEO Activities in China (2)

- Draft GEOSS Ten-Year Implementation Plan in China
- Set up FENGYUNCast, one important component of GEONETCast, which is a data dissemination system based on communication satellite and DVB technology, and allows users in AP to get the Earth observations data at low cost or free and in time.



GEO-China website

地球观测组织 (中国) - Microsoft Internet Explorer
地址: http://127.0.0.1:8088/geo/index.aspx



地球观测组织 (中国)
GROUP ON EARTH OBSERVATIONS



中华人民共和国
科学技术部



中国气象局



国家航天局

ChinaGeo 名单
联合主席 郑国光
结构和数据委员会:
张文建 朱忠礼
能力建设委员会:
李德仁 张运华 杨军
科学技术委员会:
王汶 董晓龙 郭亚曦
用户界面委员会:
龚建雅 陆锋 卢乃猛
海啸工作组:
王邦中 李京

政府部门
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省级气象

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地址: http://127.0.0.1:8088/geo/showNews.aspx?newsID=10



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GROUP ON EARTH OBSERVATIONS



CHINESE ENGLISH

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海啸工作组:
王邦中 李京

主 页 | 新 闻 | 活 动 介 绍 | 研 究 进 展 | 文 档 下 载 | 关 于 我 们 | 联 系 我 们

地球观测组织 (GEO) 第六次执委会成功召开



2006/09/06

地球观测组织 (Group on Earth Observation-GEO) 于2006年9月5-6日在瑞士日内瓦世界气象组织 (WMO) 总部召开了第六次执委会, 来自12个执委会成员国的代表及秘书处成员约40人参加了会议。会议由GEO的当前联合主席美国NOAA罗德里格斯 (C. Leutenbacher) 主持, 中国气象局国家卫星气象中心副主任卢乃猛、董晓龙博士和我国驻日内瓦使团一等秘书赵阳三位同志参加了会议。这次会议主要讨论了6个方面的议题: 批准第五次执委会的总结报告; 听取秘书处第二季度工作报告和经费开支以及外部审计情况; 讨论秘书处修订的接收新参加组织的程序和标准; 讨论执委会成员任期; 听取2006年工作计划的进展情况, 听取和讨论2007-2009年工作计划的修订情况; 讨论确定第三次全会的地点, 讨论第四次全会和GEO 2007年部长级峰会的事宜。

第二季度, GEO秘书处招聘人员已到位, 运行平稳, 经费开支低于预算, 已与英国国家审计事务

GEO Activities in China (3)

- Participate in GEO and GEOSS, including GEO Tasks, Working Group, Workshop,.....

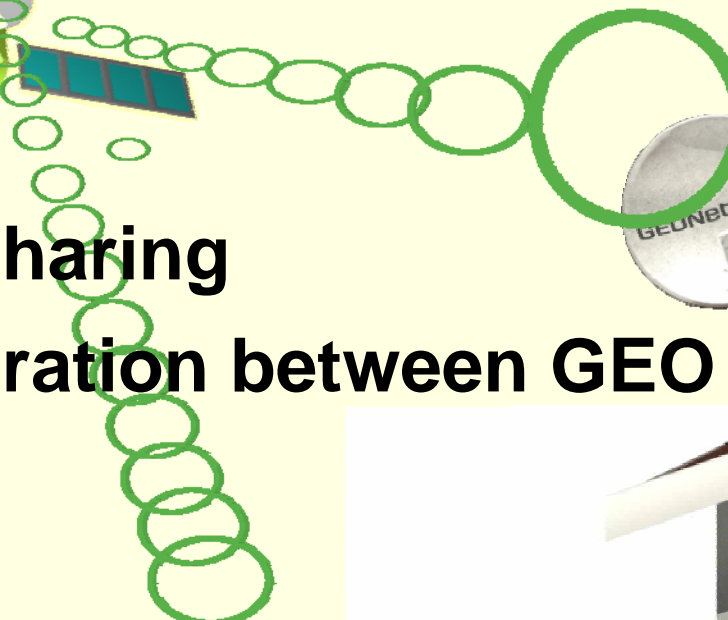
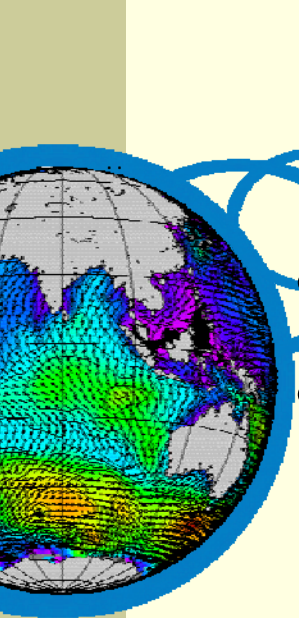
One of Co-Chairs of GEO, involving GEO ExCom Meetings, Plenary Sessions, Working Group Meeting

- Hosted GEO and IEEE Workshops in Beijing, the 36th COSPAR, APN workshops etc.



GEO Activities in China (4)

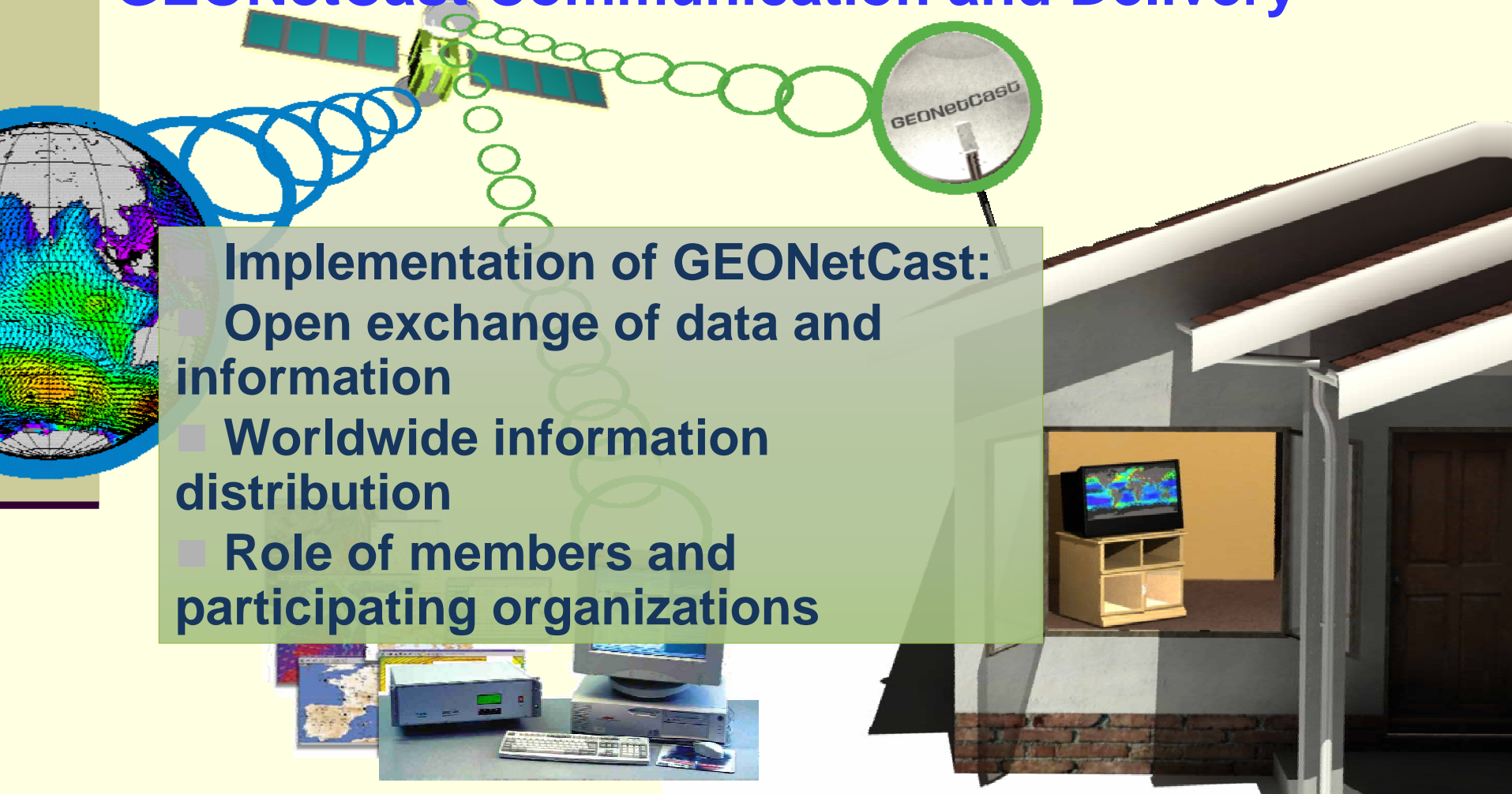
- Data Sharing
- Cooperation between GEO members



Cooperation in field of Earth Observations between U.S. and China

GEONetCast Communication and Delivery

- Implementation of GEONetCast:
- Open exchange of data and information
- Worldwide information distribution
- Role of members and participating organizations



FENGYUNCast

– important member of GEONETCast

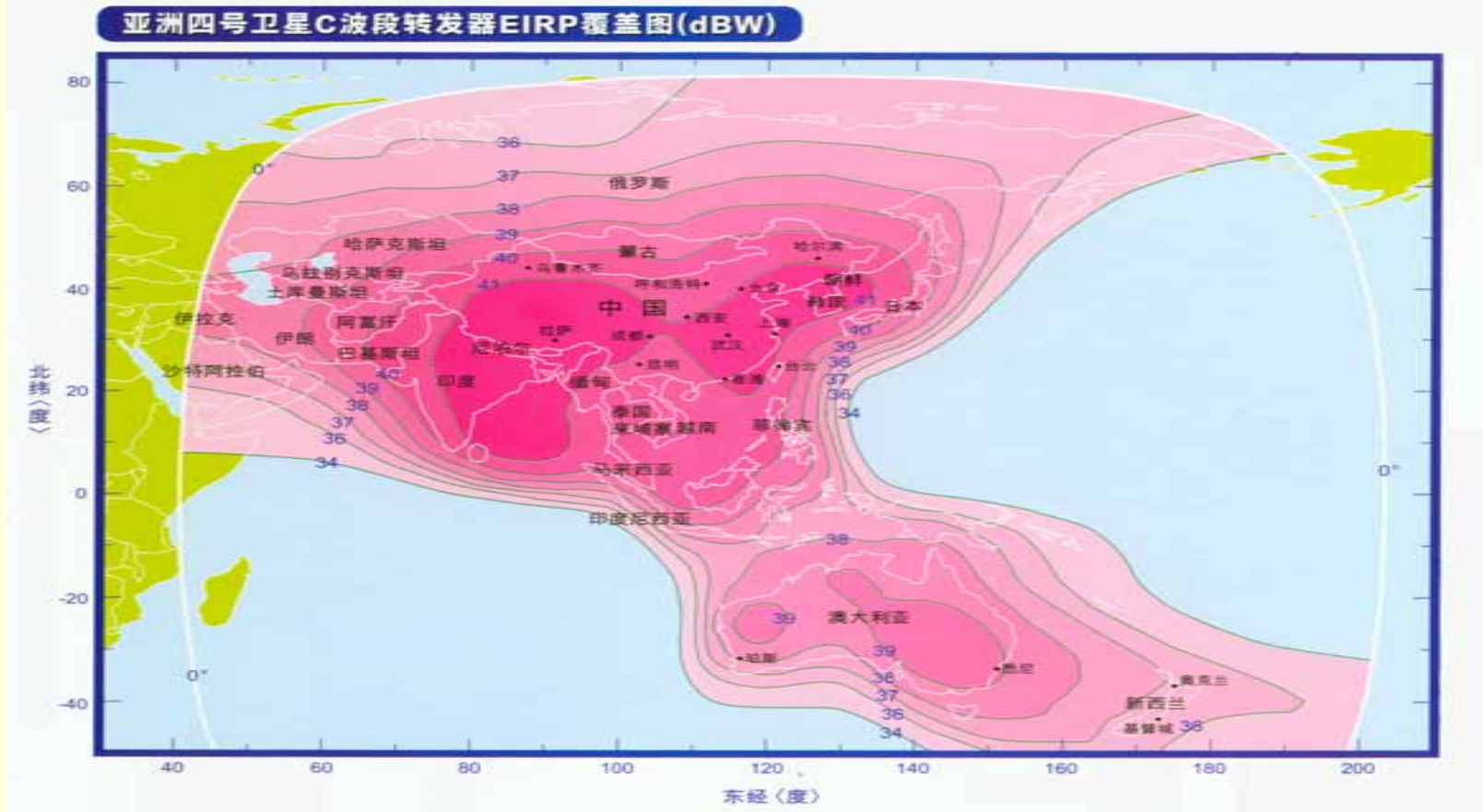
China, NOAA, EUMETSAT and WMO are working together for the development of **GEONETCast**.

China has expanded **FENGYUNCast** data dissemination to cover as far west as Pakistan and as far east as New Zealand in 2006.

FENGYUNCast would meet a major regional need and move **GEONETCast** much closer to global coverage.

FENGYUNCast

Wider Coverage for AP region Countries.



Asiasat-4 C-band EIRP Coverage

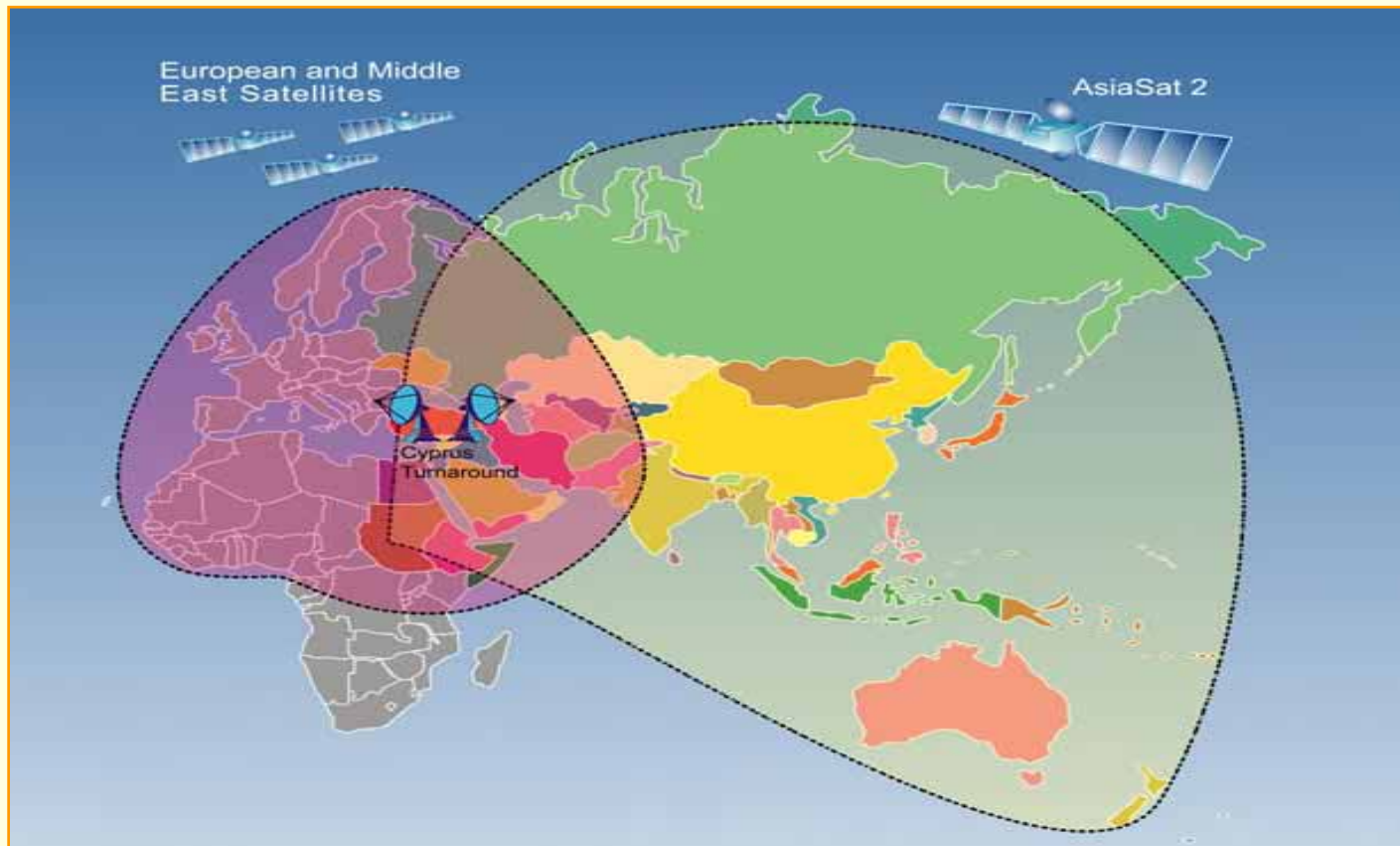
FENGYUNCast

- In June 2006, CMA set up a user reception of EUMETCast in Kashi, Xinjiang.
- In Nov. 2006, a FENGYUNCast demo took place successfully at 34th CGMS Meeting in Shanghai, and at GEO-III in Bonn, Germany.



FENGYUNCast

AP Countries are now able to get global Earth observation data through FENGYUNCast.



FENGYUNCast

- In March 2006, China government donated seven user reception systems of FENGYUNCast to seven countries (Bangladesh, Indonesia, Iran, Mongolia, Pakistan, Thailand, Peru).
- In July 2006, a FENGYUNCast user training workshop was held in CMA.



GEO Activities in China (5)

Set up Asia-Pacific Space Cooperation Organization

■ Motives of APSCO

Multilateral space cooperation not only enables the Asia-Pacific countries to benefit from each other's strengths, but also helps to address the technology and financial challenges to their space causes.

■ Achievements

The small Multi-Mission Satellite program, participated by China, Iran, Mongolia, Pakistan, Republic of Korea, Thailand and Bangladesh, has entered the development stage and is expected to be launched in 2007.

■ Prospect

The APSCO, headquartered in Beijing, will commit itself to further expansion of cooperation among countries in the Asia-Pacific region in space technology and its applications and contribute significantly to the social and economic development as well as common prosperity in this region.

II. GEOSS Progress in China

1. Earth Observations Satellite Series

- ❑ **Meteorological Satellite**, Polar Orbiting satellites FY-1 A,B,C,D and Geostationary satellites FY-2A,B,C,D
- ❑ **Oceanic Satellite**: HY-1A, HY-1B
- ❑ **Earth Resource Satellites**: CBERS-1, CBERS-2
- ❑ **Environment and Disaster Reduction Satellite** (2 Optic and 1 SAS)
- ❑ **Small Satellites**: Beijing No.1 Satellite (Launched in Oct. 2005)

Meteorological Satellite Program

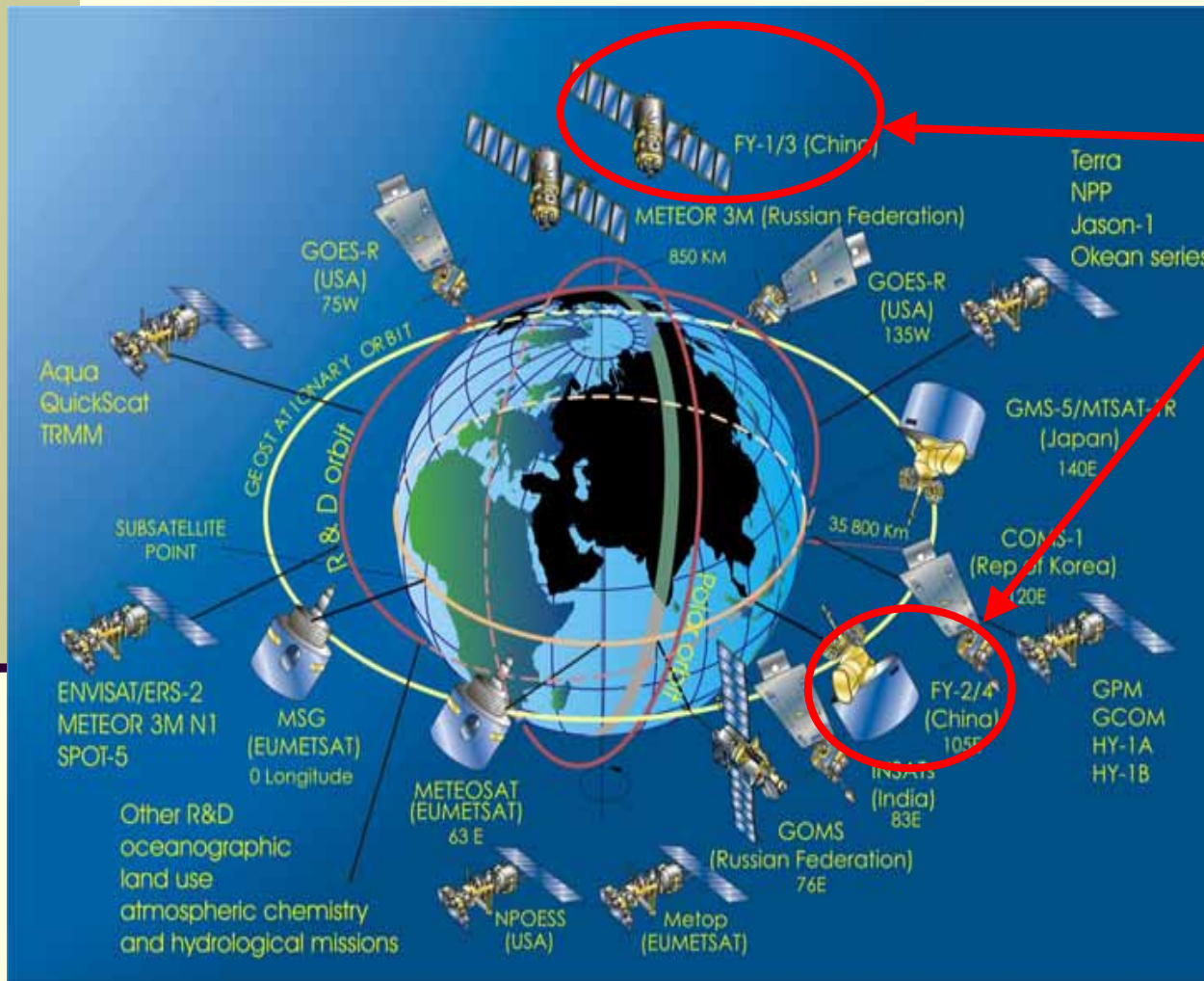
- On 8 Dec. 2006, a geostationary meteorological satellite **FY-2D** was launched successfully.
- In late of 2007, a new generation polar-orbiting meteorological satellite **FY-3A** will be launched.

2006年12月8日8时53分 风云二号D星在西昌卫星发射中心发射升空



World Weather Watch

- Global Observing System (Space Component)



FY-1

FY-2

**China
Contribution to
GEOSS**

Future of Polar-Orbiting Meteor. Sat.

- FY-3, second generation of polar satellite
 - With both Imaging and Sounding Missions (microwave sensor)
 - Enhanced global observation capability
 - Will be launched in 2007

Future of Geostationary. Meteor. Sat.

- Development of **FY-4** (Second generation of Geostationary Meteorological Satellite Series)
 - More powerful imagers
 - Sounding capability
 - Data Collection Platforms

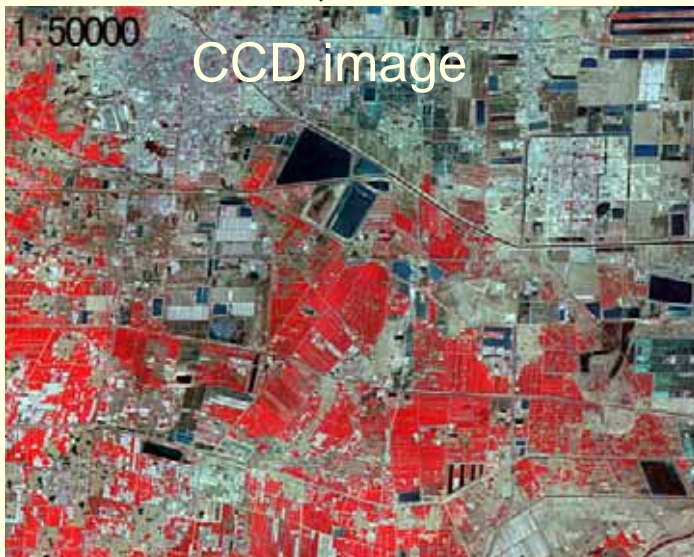
Oceanic Satellites in China

- HY-1A satellite was used for the detection of ocean color and temperature scanner with 10 bands and CCD imaging apparatus.
- HY-1B satellite will be launched in 2007.
- HY-2 satellite onboard microwave sensors is in the stage of development.
- HY-3 satellite will carry both optical and microwave sensors.
- HY-1, HY-2 and HY-3 will form space-based China ocean observations system.

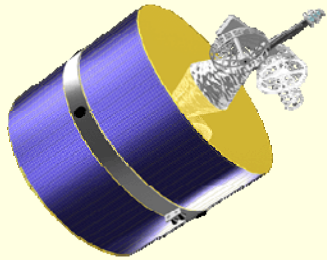


Earth Resources Satellites in China

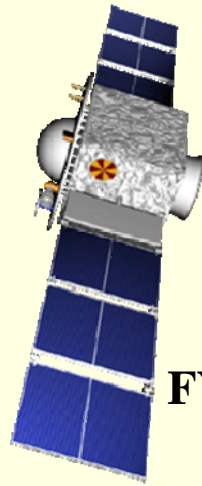
- China-Brazil Earth Resource Satellite (CBERS) was jointly developed by China and Brazil, which initiated the first space high-tech cooperation between two developing countries.
- CBERS 01 was successfully launched in Oct. 1999.
- CBERS 02 was successfully launched in Oct. 2003.
- CBERS 02B, 03 and 04 are developed.



Space-based observations system



FY-2



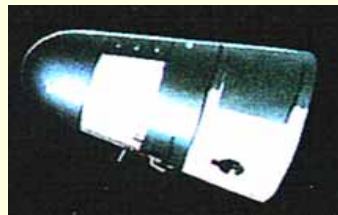
FY-1



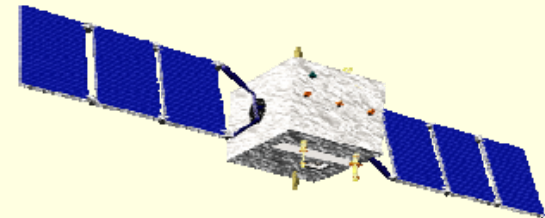
Resource-1



Resource-2



Returning Sat.



HY-1

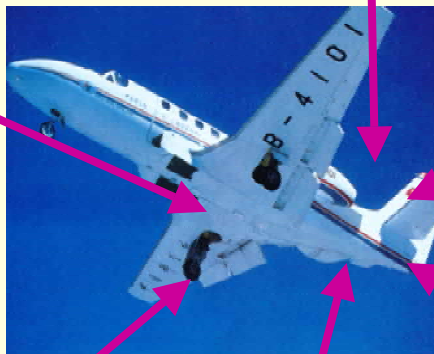
GEOSS Progress in China (2)

OMIS imaging Spectrometer



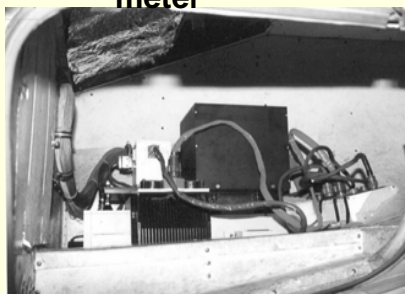
CCD

CCD Camera



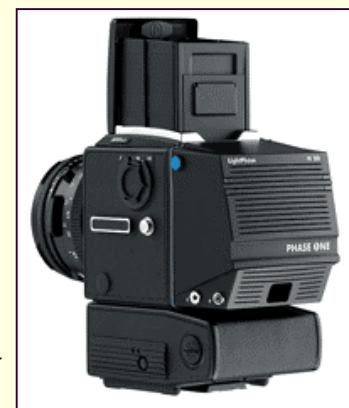
Airborne system

Imaging Spectrometer



RC30

Camera



GEOSS Progress in China (3)

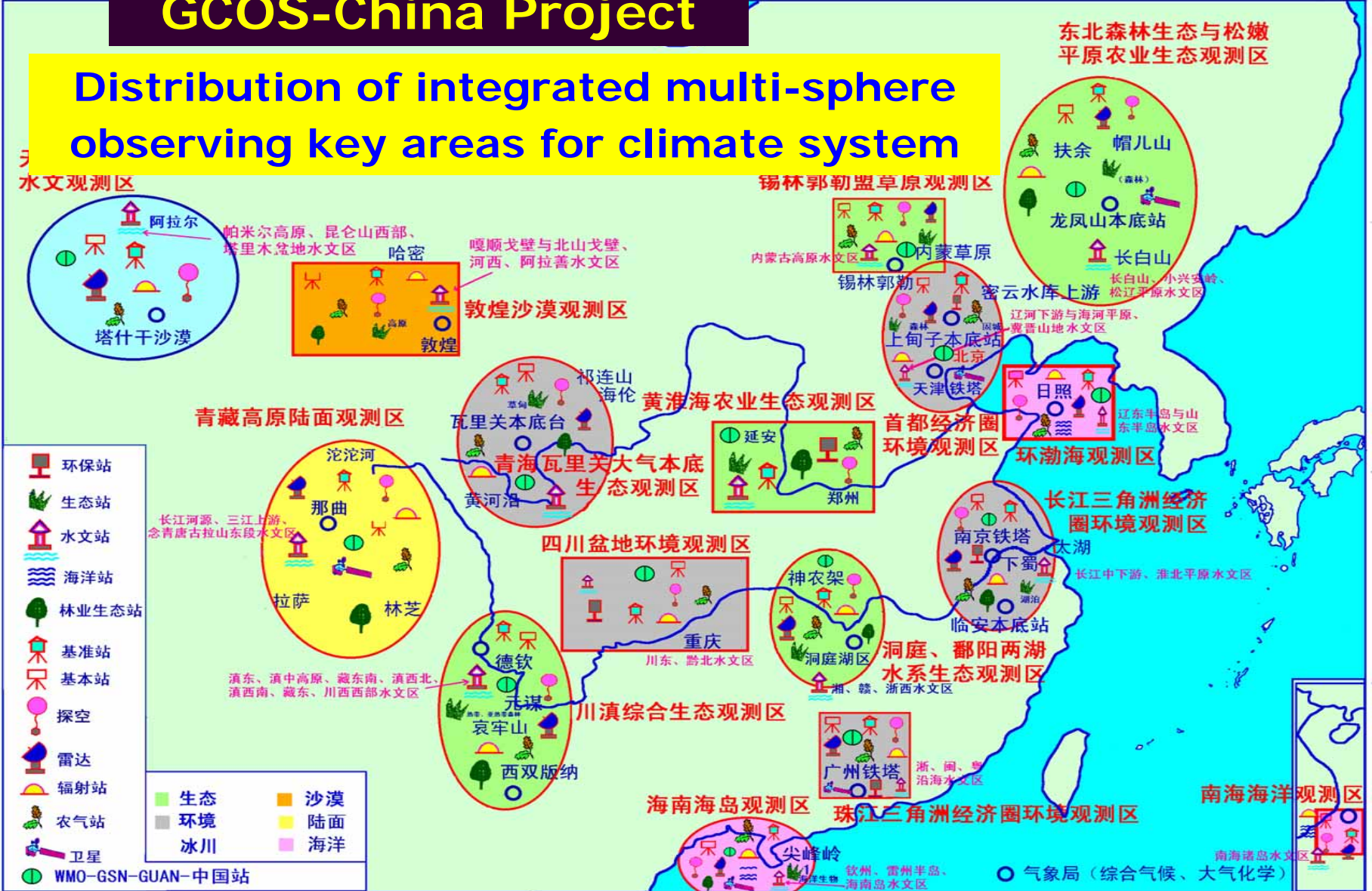
2. Network for in-situ Observations

- National Meteorological Observation Network
- Digital Earthquake Observations Network
- National Ocean Observations Network
- CERN (China Ecology Research Network)
- CFERN (China Forest Ecology Research Network)
-

In-situ Observation Network in China

GCOS-China Project

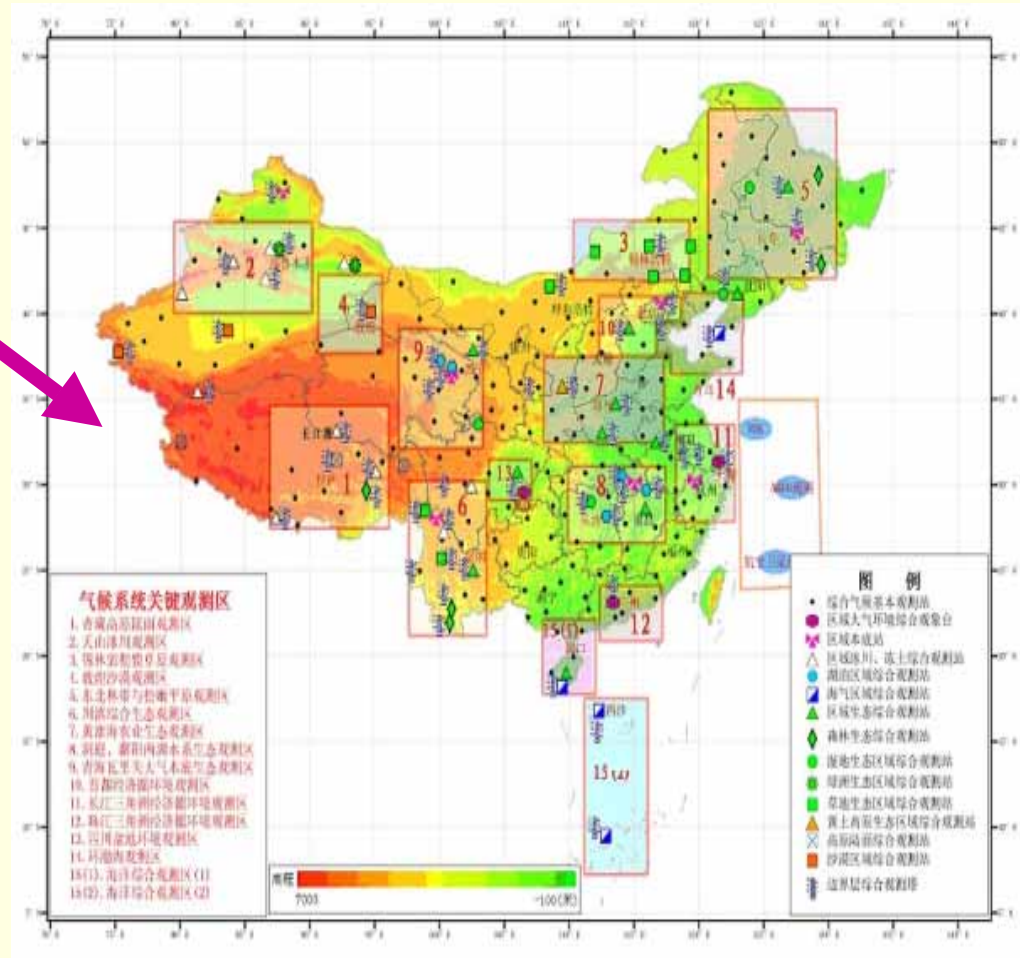
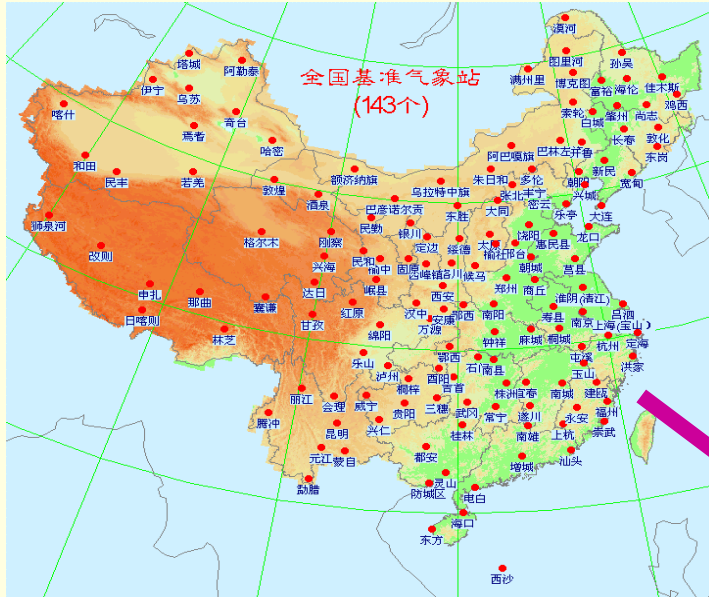
Distribution of integrated multi-sphere observing key areas for climate system



Meteorological Observation system

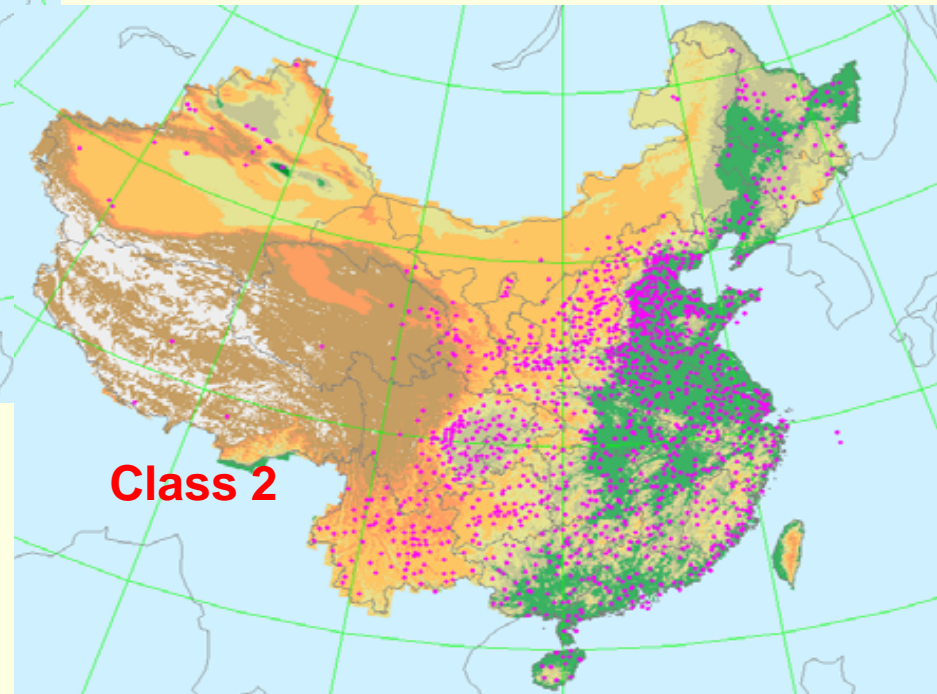
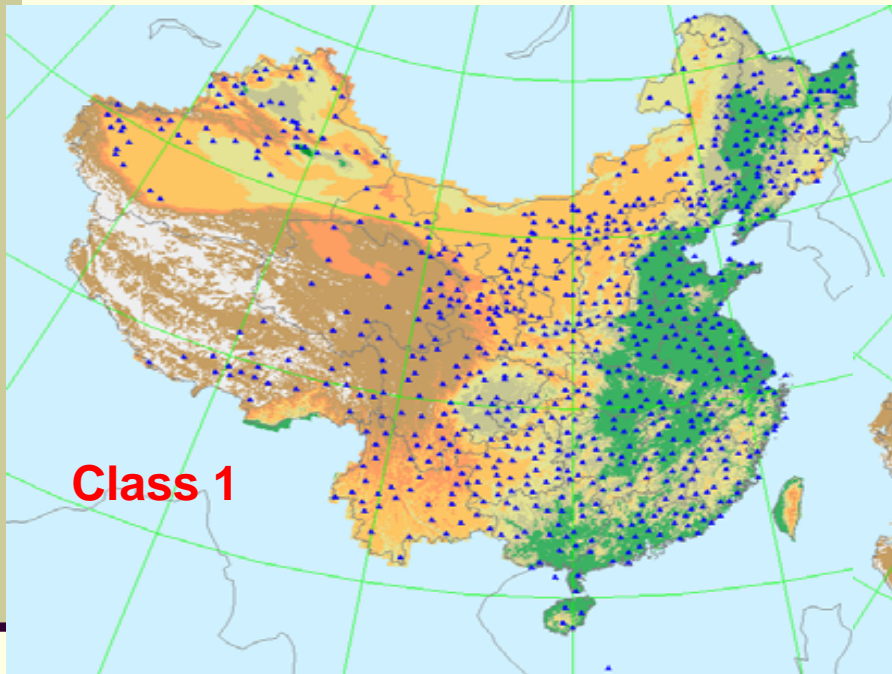
- **National Climate Monitoring Network**
- **National Synoptic Observation Network**
- **National Specialized Meteorological Observation Network**
- **Regional Meteorological Observation Network.**

National Climatological Observatories: 260



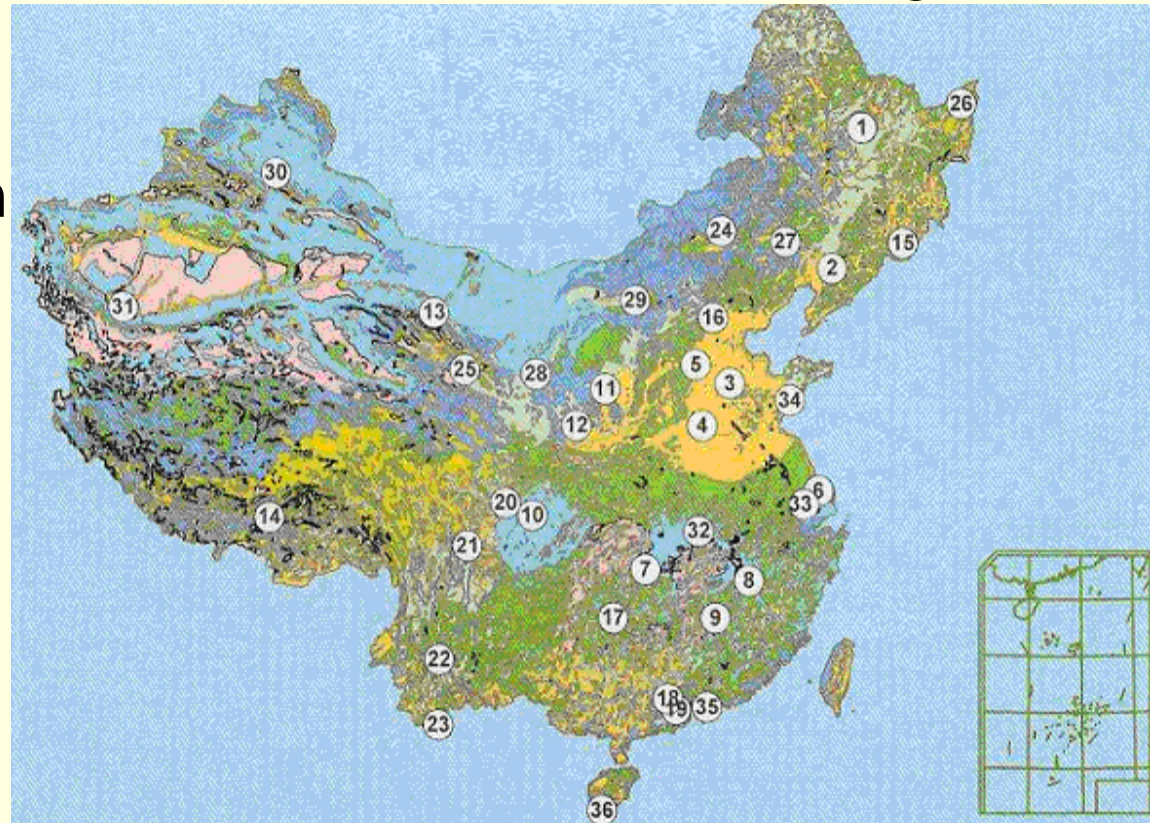
National Meteorological Observation Stations: 2400

Average space resolutions is about 60 km.



CERN (China Ecology Research Network)

- CERN has been operating by Chinese Academy of Sciences since 1988.
- CERN included **36** in-situ stations which are focusing on the agriculture, forest, grassland, wetland, desert, lake and ocean observations.



Integrated Observation Systems over several sectors

- **China Climate Observations System**
- **China Atmospheric Chemistry Observations System**
- **China Oceanic Observations System**
- **China Water Cycle Observations System**
- **China Carbon Cycle Observations System**

Radiometric calibration site for satellite sensors in China (land and water body)

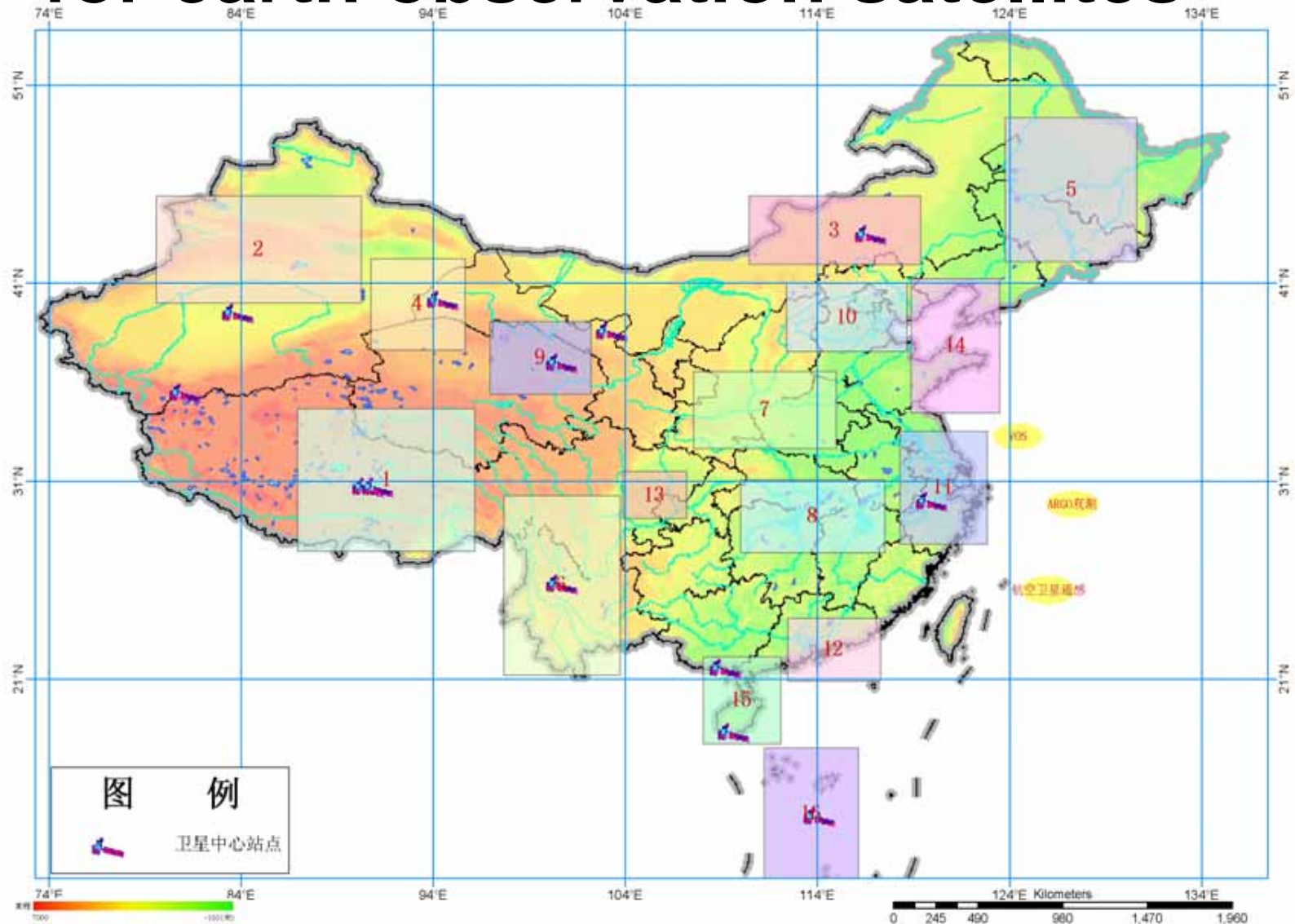


Dunhuang Gobi Desert

Lake Qinghai



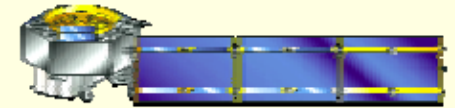
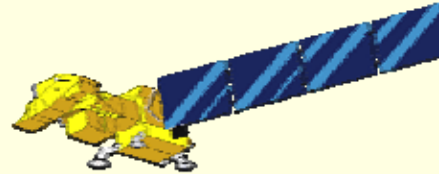
Future of ground calibration sites for earth observation satellites



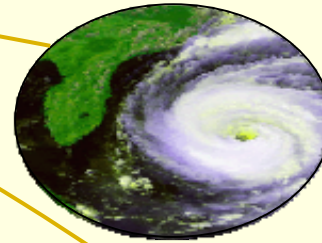
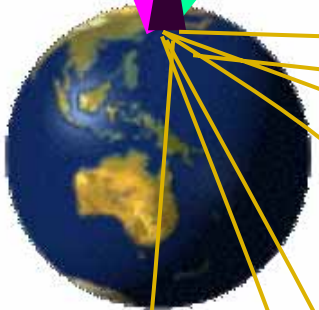
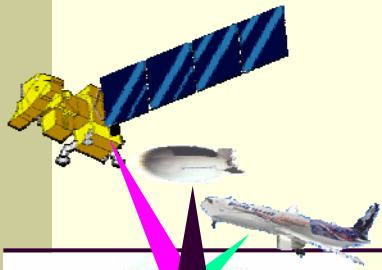
Future GEOSS in China

Objective

By 2020, China will build up an advanced earth observation system, which are composed of space-base, airborne and in-situ platform, to monitor the land, atmosphere and ocean with global coverage.



Meets the needs of the economic and social development of China

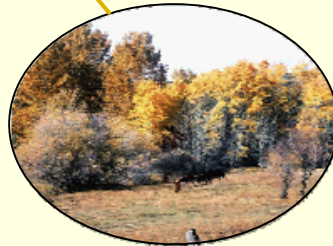


Climate and Disaster



Decision making Support

Inspection of major Eco-projects



Environment and Public Health



Agriculture and Food



Interdiscipline and Innovation



Population and Citizen

GEOSS Progress in China (4)

- China has made a great efforts to promote the cooperation with the international communities in Earth observation and signed **13** cooperation agreements and memoranda with a lot of nations, space agencies and international organizations.
- Two earth resource satellites have been successfully launched with the collaboration of China and Brazil.



Pseudo-color Image of Yellow River Delta from CCD of CBERS-1



III. Promote GEO Cooperation in AP

1. GEO Liaison in AP

Each GEO member in AP designates a person who are responsible for contacting with other countries' GEO.

One GEO ExCom member serves as the focus liaison of AP for one year in turn.

III. Promote GEO Cooperation in AP

2. More roles of GEO ExCom members in AP

GEO ExCom members in AP are responsible for collecting suggestions and comments on GEO ExCom activities before meeting, and providing progresses of GEO ExCom activities to each GEO member in AP.

III. Promote GEO Cooperation in AP

3. Promote cooperation among GEO members in AP

GEO members in AP cooperate for the development of filling the gaps of GEOSS and undertake the GEO tasks together, and getting earth observation data via GEONETCast and FENGYUNCast.

China will continue to support the developing countries in AP with providing FENGYUNCast user reception equipments.



Thank You for Your Attention !