Progress on Earth Observation in China, 2007
Outline

- Important Role of China in GEO
- GEO Activities in China
- GEOSS Progress in China
I. Important role of China in GEO

China renewed Co-Chair of GEO in Nov. 2007, which is contributed from AP members.
II. GEO Activities in China

- Release China’s National Climate Change Programme, Jun. 2007
- Host Asia-Pacific Regional Workshop on GEOSS Information Access, Oct. 2007
- Donation of FENGYUNCast User receptions to Asia Pacific developing countries, Oct. 2007
- Preparation for Providing the Meteorological Service in Support to the Beijing Olympic Games 2008
- Participate in international activities of GEO and GEOSS including GEO Tasks, Working Group, Workshop, 2007
- Preparation for the GEO-V plenary session in Beijing, Nov. 2008
GEO Activities in China (1)

- Publish the GEOSS Ten-Year Implementation Plan in Chinese version
GEO Activities in China (2)

Release China’s National Climate Change Programme.

China’s National Climate Change Programme

Prepared under the Auspices of National Development and Reform Commission People's Republic of China

Printed in June 2007

CONTENTS

Foreword ........................................................................................................... 2
Part 1 Climate Change and Corresponding Efforts in China ......................... 4
  1.1 Observations and Trend of Climate Change in China ............................... 4
  1.2 Current GHG Emissions in China .............................................................. 6
  1.3 China’s Efforts and Achievements in Mitigating Climate Change ......... 7
Part 2 Impacts and Challenges of Climate Change on China .................... 14
  2.1 China’s Basic National Circumstances of Climate Change ................. 14
  2.2 Impact of Climate Change on China ...................................................... 16
  2.3 Challenges Facing China in Dealing with Climate Change ................. 19
Part 3 Guidelines, Principles and Objectives of China to Address Climate Change ...................................................... 23
  3.1 Guidelines .............................................................................................. 23
  3.2 Principles ................................................................................................ 24
  3.3 Objectives ............................................................................................... 26
Part 4 China’s Policies and Measures to Address Climate Change .......... 30
  4.1 Key Areas for GHG Mitigation ............................................................... 30
  4.2 Key Areas for Adaptation to Climate Change ....................................... 47
  4.3 Climate Change Science and Technology .............................................. 52
  4.4 Public Awareness on Climate Change ..................................................... 54
  4.5 Institutions and Mechanisms ................................................................ 56
Part 5 China’s Position on Key Climate Change Issues and Needs for International Cooperation ............................................ 58
  5.1 China’s Position on Key Climate Change Issues ................................. 58
  5.2 Needs for International Cooperation on Climate Change ................. 60
GEO Activities in China (3)

- Hosted Asia-Pacific Regional Workshop on GEOSS Information Access in Beijing.
- GEO Press Conference in Beijing
In Oct. 2007, another eleven user reception systems of FENGYUNCast donated to eleven countries (Burma, DPRK North Korea, Kirghizia, Laos, Malaysia, Nepal, Philippines, Sri Lanka, Tajikstan, Uzbekistan, and Viet Nam)

A FENGYUNCast user training workshop was held in CMA in Oct. 2007.
Wider Coverage for AP region Countries.

Asiastar-4 C-band EIRP Coverage
AP Countries are now able to get global Earth observation data through FENGYUN Cast.
As a regional system under GEONETCast, now the total 17 countries in AP are benefit from FENGYUNCast.

FENGYUNCast now constitutes the Asia Pacific region hub of GEONETCast, a near real-time, global delivery system for environmental information. The system obtains Earth observations from the numerous land-, sea-, air- and space-based systems that together constitute GEOSS.

We sincerely hope users’ feedback us with valuable comments and suggestions for a better system tomorrow.
The 2008 Beijing Olympics Task team, led by China and WMO, has organized a workshop to draw the lessons from the second system-trial for the Forecast Demonstration Project of the (B08FDP).

The FY-2D & FY-2C dual-satellite observations have been implemented, which increases the frequency of earth observation from once every 30 minutes to once every 15 minutes.

The Beijing Olympic Meteorological Service Centre carries out 3-dimensional variational data assimilation, it has set up such operational systems as nowcasting, short-time & short-term weather forecasting with a spatial resolution of 3 kilometers.

Two tests of international weather forecast demonstration project (FDP/RDP) were accomplished in 2006 and 2007 respectively.
GEO Activities in China (6)

Participate in GEO and GEOSS activities

- GEO Tasks, ExCom Meetings, Plenary Sessions, Working Group, Workshop, ……
GEO Activities in China (7)

• Preparation for the coming the Fifth GEO Plenary Session, which will be held in Beijing Nikko New Century Hotel, Nov., 2008.
III. GEOSS Progress in China

1. Earth Observations Satellite Series

- **Meteorological Satellite**, Polar Orbiting satellites FY-1 A, B, C, D, FY-3A and Geostationary satellites FY-2A, B, C, D
- **Oceanic Satellite**: HY-1A, HY-1B
- **Earth Resource Satellites**: CBERS-1, CBERS-2, CBERS-2B
- **Environment and Disaster Reduction Satellite** (2 Optic and 1 SAS)
- **Small Satellites**: Beijing No.1 Satellite (Launched in Oct. 2005)
Meteorological Satellite Program

Polar System

FY
1A
1B
1C
1D

First Generation

FY
3A
3B
3C
3H

Second Generation

Geostationary System

FY
2A
2B
2C
2D
2E

First Generation

FY
4

Second Generation
World Weather Watch
- Global Observing System (Space Component)

China Contribution to GEOSS
On 8 Dec. 2006, a geostationary meteorological satellite FY-2D was launched successfully.

The FY-2D & FY-2C dual-satellite observations have been implemented, which increases the frequency of earth observation from once every 30 minutes to once every 15 minutes.

- FY-3, second generation of polar satellite
  - With both Imaging and Sounding Missions (microwave sensor)
  - Enhanced global observation capability
- Will be launched in May, 2008
FY-3A is the first satellite of new generation of polar system. The important improvement from the old is 11 payloads onboard. Among those, only the VIRR are inherited from the formal platform. The three sensors in green shadow group together as ATOVS-like for atmospheric sounding; and MERSI is MODIS-like, which can provide aerosol information; and SBUS and TOU are SBUV and TOMS-like, which can provide ozone profile and total ozone amount separately.

<table>
<thead>
<tr>
<th><strong>Abbreviation</strong></th>
<th><strong>Instrument Full Name</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>VIRR</td>
<td>Visible and InfraRed Radiometer</td>
</tr>
<tr>
<td>IRAS</td>
<td>InfraRed Atmospheric Sounder</td>
</tr>
<tr>
<td>MWTS</td>
<td>MicroWave Temperature Sounder</td>
</tr>
<tr>
<td>MWHS</td>
<td>MicroWave Humidity Sounder</td>
</tr>
<tr>
<td>MERSI</td>
<td>MEdium Resolution Spectral Imager</td>
</tr>
<tr>
<td>SBUS</td>
<td>Solar Backscatter Ultraviolet Sounder</td>
</tr>
<tr>
<td>TOU</td>
<td>Total Ozone Unit</td>
</tr>
<tr>
<td>MWRI</td>
<td>Microwave Radiation Imager</td>
</tr>
<tr>
<td>SIM</td>
<td>Solar Irradiation Monitor</td>
</tr>
<tr>
<td>ERM</td>
<td>Earth Radiation Measurement</td>
</tr>
<tr>
<td>SEM</td>
<td>Space Environment Monitor</td>
</tr>
</tbody>
</table>

**Payloads onboard on FY-3A**

- 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 was launched in Apr. 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 was successfully launched in Sep. 2007
Environment and Disaster Reduction Satellite

- Environment and Disaster Reduction Satellite (2 Optic and 1 SAS) will be launched in 2008.
Beijing No.1 Satellite

- **Small Satellites**: Beijing No.1 Satellite (Launched in Oct. 2005), provide good products for Olympic games in 2008.
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)
- ......
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.
CFERN (China Forest Ecological Research Network)

- CFERN has been operating by the Ministry of Forest since 1992.
- CFERN included 14 in-situ stations which are focusing on the forest eco-system structure and function observations.
Integrated Observation Systems over several sectors

- China Climate Observations System
- China Atmospherical 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)
Future of ground calibration sites for earth observation satellites
GEOSS Progress in China (3)

- 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.

- Three earth resource satellites have been successfully launched with the collaboration of China.
Welcome to Beijing GEO-V plenary session