Space Technology for Sustainable Development in China
– Status, Achievements and Futures

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Outline

- Development of Earth Observation Capability of China
- Collaboration in Asian Pacific Region
  - Implementation and Application
  - Data Sharing
  - Capacity Building Activities
- Future Work
Development of Earth Observation Capability in China

Land Observation Satellite System of China

- Satellites launched in recent two years
  - Global CO₂ monitoring satellite - TanSat
  - High resolution satellite - GaoFen(GF)-3 and 4
  - Meteorological satellite - FengYun(FY)-4
  - Small satellite - Jilin-1, SuperView-1, and DMC3/TripleSat, …
GF-3
- C-band multi-polarization SAR radar satellite with 1m resolution
- Launched on Aug. 10th, 2016

The image of Airport, Beijing

GF-4
- 50m resolution geostationary satellite
- Launched on Dec. 29th, 2015

The image of Zhujiang, China
Development of Earth Observation Capability in China

**SuperView-1**
- 2 satellites launched on Dec. 28th, 2016; Other 2 will launched in the end of this year;
- 0.5m for panchromatic band and 2m for multispectral band
- For land resources survey, mapping, environmental monitoring, and financial insurance.

The images of Beijing, China

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**China Remote Sensing Satellite North Polar Ground Station**
- It was put into trial operation on Dec. 15th, 2016.
- It greatly enhanced the data receiving capabilities of Chinese satellites.
Outline

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- Collaboration in Asia-Pacific Region
  - Implementation and Application
  - Data Sharing
  - Capacity Building Activities
- Future Work

Collaboration in Asia-Pacific Region

- Implementation and Application- for Implementing the Sustainable Development Goals (SDGs)
  - China’s Plan for Implementing GEOSS(2016-2025)
  - Asia-Oceania GEOSS(AOGEOSS)
  - Digital Belt And Road(DBAR) Initiative
  - Global Ecosystems and Environment Observations: Annual Reports from China(GEOARC)
  - BeiDou Satellite Positioning Application
  - Water Cycle Observation Mission(WCOM)
  - Drought Monitoring
- Data Sharing
- Capacity Building Activities
China’s Plan for Implementing GEOSS (2016-2025)

- This plan will:
  - Guide the implementation of a series of projects, such as:
    - Development of national space infrastructure
    - AOGEOSS (Asia-Oceania GEOSS)
    - Spectrum Earth
  - Support the United Nations 2030 of Sustainable Development Goals (SDGs)
- The main tasks of this plan cover:
  - Promoting the establishment of global earth observation system
  - Earth Observation data processing and information sharing
  - Application on environment and ecological protection, disaster mitigation, earth science research, and so on
- The English version will be released in this October at GEO-XIV Plenary in Washington D.C., USA
Main Aims
  - Cope with global climate change and international cooperation
    - The 2030 Agenda for Sustainable Development
  - Develop and share global datasets
    - Focuses on regional and global scale
  - Analyze data and release report
    - Focuses on global ecological environment factors
  - Provide consultations and help decision making

Implementation and Application

Global Ecosystems and Environment Observations: Annual Reports from China(GEOARC)

<table>
<thead>
<tr>
<th>Year</th>
<th>Subject</th>
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<tbody>
<tr>
<td>2014</td>
<td>Supply Situation of Maize, Rice, Wheat and Soybean</td>
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<td>Large Area Wetlands of International Importance</td>
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<td></td>
<td>Africa Land Cover</td>
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<td></td>
<td>China-ASEAN Ecological and Environmental Conditions</td>
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<td>2015</td>
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Digital Belt And Road (DBAR)

- An international science program to promote Earth Observation cooperation and smart use of Big Earth Data among the Belt and Road countries.
- Initiated in 2016, fully supported by more than 20 countries
Implementation and Application

Farmland Management Information System

Bei Dou
Wide Area Realtime Precision Positioning

The geographic distribution of wheat rust disease and environmental factor

Implementation and Application

Water Cycle Observation Mission

- To develop remote sensing monitoring technology on the key elements of water resources
- To improve monitoring, simulation and prediction ability on onset, spatial distribution and duration of flood and drought
- To improve water resources management by integration with GIS technology

Constellation
Active & Passive sensors
Multi-Satellite Images

Hydrological model
Thematic Products
End User

Policy makers
Crisis managers
Governors
Drought Monitoring

- Under the framework of UNESCAP regional cooperative mechanism for disaster monitoring and early warning
- China is one of the two regional service nodes
- Provided space-based data and capacity building assistance for effective drought monitoring and early warning to pilot countries such as Mongolia and Sri Lanka

Implementation and Application

Data Sharing

- China National Earth Observation Data Sharing Platform
- China-ASEAN Remote Sensing Satellite Data Service Platform

Capacity Building Activities

Collaboration in Asia-Pacific Region
Data Sharing

China National Earth Observation Data Sharing Platform

- Has already established a Chinese platform to provide data for application on environment and ecological protection, disaster mitigation, earth science research at regional and global scale
- Provided about 120 GB data to New Zealand through this platform after the New Zealand earthquake happened on Nov. 14th, 2014
- Working on providing data to Mexico after the Mexico earthquake happened on Sep. 20th, 2017

- Has already collected more than 300TB remote sensing data and products, includes:
  - Metrological satellite data, such as FY2 and FY3
  - Land observing satellite data, such as ZY, HJ, CBERS, and BJ
  - Ocean observing satellite data, such as HY
  - 30m resolution global land cover datasets - GlobeLand30 dataset
  - And so on ….

- The English version will be released in this October at GEO-XIV Plenary in Washington D.C., USA.
China-ASEAN Remote Sensing Satellite Data Service Platform

- Launched on Sep. 22nd of 2012, at Nanning, China
- The aim is to construct the remote sensing satellite data service platform in ASEAN member states, and to provide application of remote sensing satellite data in ASEAN member states base on Chinese remote sensing satellite data resource.
- The platform includes three parts:
  - Data center in Beijing,
  - Data receiving station in Singapore
  - Data application terminal in ASEAN member states.

Collaboration in Asia-Pacific Region

- Implementation and Application
- Data Sharing
- Capacity Building Activities for recent years on
  - Digital Belt And Road (DBAR)
  - BeiDou Technology and Its Applications
  - CMACast
  - China-ASEAN Remote Sensing Satellite Data Service Platform
  - Modeling
  - Water Resource Management
  - Drought Monitoring Mechanism
  - Forest and Biomass Mapping
Capacity building activities

**Digital Belt And Road (DBAR)**

The International Symposium on Earth Observation for Maritime Silk Road held in Sanya was held in October of 2015.

The 2nd International Conference of Digital Belt and Road (DBAR 2017) will be held in the Chinese university of Hong Kong in December of 2017.

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**BeiDou Technology and Its Applications**

2016 International Training Workshop was held in Beihang University, Beijing, China during Jul. 11-30, 2016 with more than 30 students from 14 countries.
Future Work

- As member state of UNESCAP and co-leading country of AOGEOS, China focuses on the regional collaboration in Asia-Pacific area on utilizing space technology for sustainable development, and will
  - Support the United Nations 2030 of Sustainable Development Goals (SDGs)
  - Promote the establishment of global earth observation system and development of national space infrastructure
  - Promote the application on environment and ecological protection, disaster mitigation, earth science research, and so on
  - Share more earth observation datasets of regional and global scale for sustainable development and disaster risk reduction and other objectives
  - Promote capacity building activities

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Thanks for your attention!

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