

National Remote Sensing Center of China

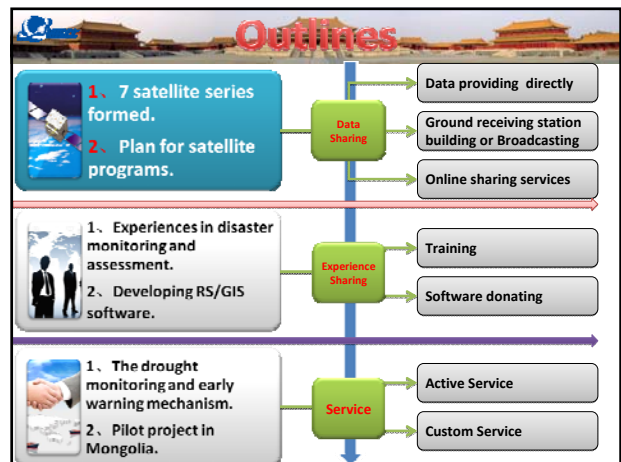
Actions in China—Experiences, Achievements and commitment

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November 27, 2013

National Remote Sensing Center of China

Space Technology for Sustainable Development



1, China's Satellite Observation Capability

Satellite development

- Satellite serialization, bus modulated family
- Transformation from experimental application mode to operational service mode

7 satellite series formed

- Comm. & broadcast
- Earth resources
- Disaster mitigation satellites
- Meteorological satellite
- Navigation & positioning
- Ocean satellite
- Scientific experiment

Independently developing and launching about 90 satellites

1, China's Satellite Observation Capability

China's Land Observation Satellite System

Development Overview

- Meteorological satellite series (FY1/2/3/4)
- Resources satellite series (CBERS-01/02/03/04, ZY-1-02C/ZY-3)
- Oceanic satellite series (HY-1A/1B/HY-2/HY-3)
- Disaster mitigation satellite constellation (HJ-1A/1B/HJ-2)
- New Generation EO System (GC-1/2/3/4/5...)

1、China's Satellite Observation Capability

Meteorological Satellite Development Plan

Chinese meteorological satellites have become an important part of the world's space-based observation network.

Satellites in orbit

FY-1D FY-2C FY-2D FY-2E FY-3A FY-3B

1、China's Satellite Observation Capability

China-Brazil Earth Resource Satellite (CBERS)

CBERS-01/02/03/04

1999 2003 2007 2012 2014 (年)

Launching Time

1、China's Satellite Observation Capability

Resources Satellite (ZY)

ZY-1-02C (2011.12)
ZY-3 (2012.01)

- Land resource survey
- Mineral resource survey
- Cities Delicacy Management
- Agriculture, forestry, water resource monitoring

Satellite, The Main Payload of ZY-3 Satellite Concludes:

- A Camera Aligned Normal to the Earth's Surface will Produce Images with a Spatial Resolution of 2.1m
- Another Two Camera, Offset at 22 Degrees Forward and After, Have Spatial Resolutions of 3.6m
- One Multispectral Scanner (IRMSS), With a Spatial Resolution of 5.8m

Sensor Specifications	
CAMERA MODE	Pushbroom; 3 (or) Nadir View / Multispectral; 5 km & 650
FOV	Pushbroom: 3.6m (Forward / Backward View)
WAVELENGTH	Pushbroom: 420 nm - 650 nm
Resolution	Blue: 450 nm - 520 nm Green: 520 nm - 590 nm Red: 630 nm - 690 nm Infrared: 770 nm - 890 nm
SWATH WIDTH	Pushbroom: 59 km; Nadir: 52 km (F/B)
Multispectral	52 km
OBTAIN CAPACITY	Pushbroom: 1,000,000 km ² / day
Multispectral	1,000,000 km ² / day

Satellite Specifications	
LAUNCH VEHICLE	CZ-40 carrier rocket
LAUNCH SITE	Taiyuan Satellite Launching Center
SATELLITE WEIGHT	3030 kg
MISSION DURATION	5 years
REVISIT CYCLE	3 days
ORBITAL ALTITUDE	303 km
ORBITAL INCLINATION	97.421°
EQUATOR CROSSING TIME	10:50 AM
ORBITAL TYPE	Sun Synchronous

1、China's Satellite Observation Capability

Oceanic Satellite Series (HY)

HY-1A (2002.05)
HY-1B (2007.04)
HY-2 (2011.08)

- Ocean pollution monitoring
- Coastline survey
- Ocean resource exploration

1、China's Satellite Observation Capability

Disaster mitigation satellite constellation

HJ-1A (2008.09)
HJ-1B (2008.09)
HJ-1C (2012.09)

- Surface water quality and atmosphere environment monitoring
- Disposal of major environmental pollution event
- Monitoring, assessment, and emergency response of major natural disaster

1、China's Satellite Observation Capability

Beijing-2 Small Satellite (will be launched in 2014)

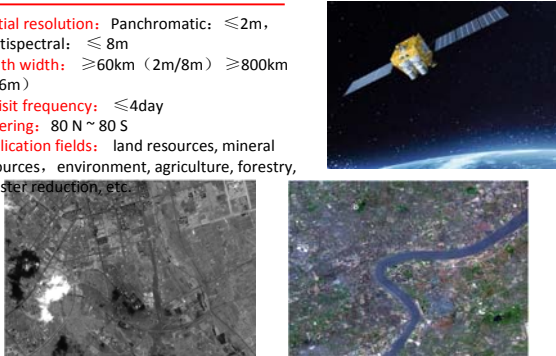
Beijing-1 Satellite:
resolution: 32m, multispectral remote sensing sensor
4m, panchromatic remote sensor

Beijing 2 Satellite has similar functions of Beijing 1, while the panchromatic resolution is improved to 2.5m so that it can draw the urban remote sensing map in smaller scale and reflect the urban water system, plants and land using conditions more clearly and directly.

1, China's Satellite Observation Capability

GF-1 Satellite (launched in 26 April, 2013)

Spatial resolution: Panchromatic: $\leq 2m$,
Multispectral: $\leq 8m$
Swath width: $\geq 60km$ (2m/8m) $\geq 800km$ (16m)
Revisit frequency: $\leq 4day$
Covering: 80 N ~ 80 S
Application fields: land resources, mineral resources, environment, agriculture, forestry, disaster reduction, etc.



1, China's Satellite Observation Capability

SJ-9: First satellite of China civil new technology testing satellite series

- SJ-9A (launched on 10/4/2012)
Spatial resolution:
Panchromatic: 2.5m
Multispectral: 10m
- SJ-9B (launched on 10/4/2012)
Spatial resolution: 73m

Application fields:
Land resources, environment, agriculture, forestry, urban-rural construction, disaster reduction, etc.

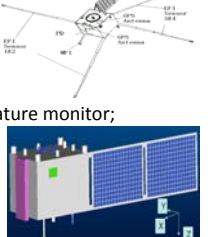


1, China's Satellite Observation Capability

Electromagnetic & Earthquake Satellite

Electromagnetic & earthquake satellite used for monitoring electromagnetic field changes to forecast the earthquake.

- Small satellite platform;
- 3 weight magnetic monitor and 3 weight electronic monitor;
- Electron feature monitor and proton feature monitor;
- GPS monitor in ionization.



1, China's Satellite Observation Capability

TanSat-Global CO2 observation and monitoring satellite will be launched in 2014.

Orbit: 500 km, Sun-Synchronous, 2.0 degree inclination
Platform: 1200 kg, 3-axis stabilization, 3.0W square configuration
Waveband: 660 nm, 750 nm, 865 nm, 1020 nm
Resolution: 1 km
Swath width: 1000 km
Revisit frequency: 1 day
Launch: 2014

Phase A/B **Phase C** **Phase D**

2011 **2012** **2013** **2014** **2015**



1, China's Satellite Observation Capability

China's remote sensing satellites

- China has operated remote sensing satellites in fields of meteorology, disasters relief, environmental protection, land surveying and mapping, etc.
- Built in 1986, the Remote Sensing Satellite Ground Station is the largest Earth Observation Satellite Data Archive in China. China can receive remote sensing satellite data covering 70% of the Asian landmass.



Miyun, Kashi, Sanya Ground

Outlines

1. 7 satellite series formed.

2. Plan for satellite programs.

Data Sharing

Data providing directly

Ground receiving station building or Broadcasting

Online sharing services

1. Experiences in disaster monitoring and assessment.

2. Developing RS/GIS software.

Experience Sharing

Training

Software donating

1. The drought monitoring and early warning mechanism.

2. Pilot project in Mongolia.

Service

Active Service

Custom Service

2. China's Satellite Data Sharing Service

China is one of the co-chair countries of GEO, who is coordinating the Asia-Pacific GEO member countries to participate in GEO activities, as well as promoting data sharing services and the goal realization of GEOSS in Asia-Pacific region.

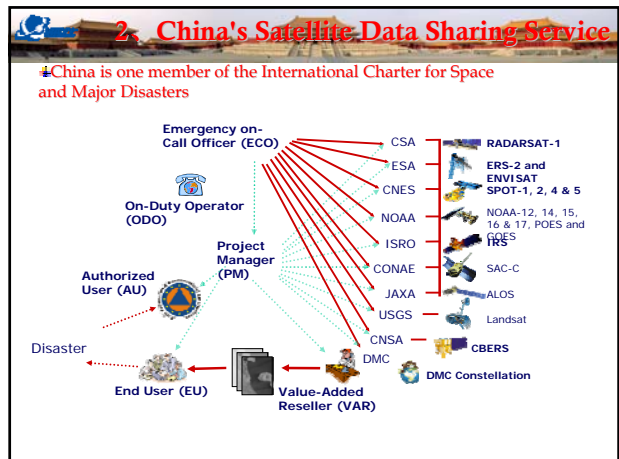


Cao Jianlin
Vice-Minister, Ministry of Science and Technology
GEO Co-chair

Group on Earth Observations (GEO)

An Intergovernmental Organization with 90 Members and 67 Participating Organizations





2. China's Satellite Data Sharing Service

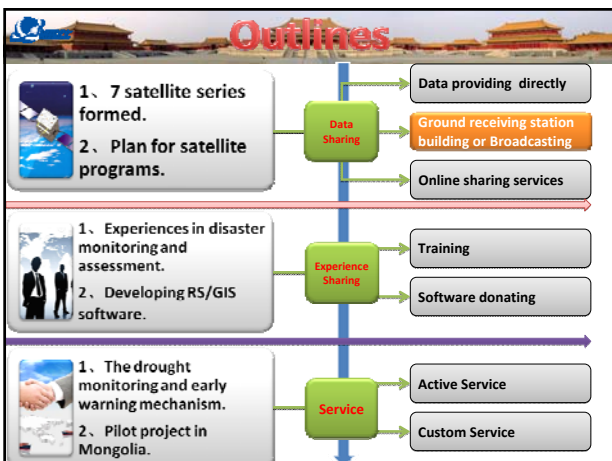
Committee on Earth Observation Satellites (CEOS)

- 33 space agencies with earth observation capability
- About 60 satellites involving in data sharing



2. China's Satellite Data Sharing Service

- Sep. 2013, Pakistan earthquake: China provided the imagery of GF-1, ZY-02C, ZY-3 and SJ-9 satellite to UNRESAP as soon as possible.
- Oct. 2013, Bushfires in Australia: China urged to conduct 9 times of land observation satellite imaging and acquired 24 scenes of disaster images as well as providing 6 scenes of images before the disaster. Meanwhile, China provided 10 remote sensing assessment reports to support the disaster relief work.
- Jul. 2013, Indonesia habitat survey of migratory birds: China provided data of ZY-3.
- 2013, Typhoon Haiyan, and Aug. 2012, Philippines flood: China provided data of BEIJING-1 and CBERS.
- 2013 Flood in China's northeast provinces. Satellite radar images from India, supplemented the information gap left by china's own satellites.

2. China's Satellite Data Sharing Service

China, Brazil to Offer Satellite Data to Africa






China-Brazil Earth Resources Satellite (CBERS).
China and Brazil will provide satellite observation data for African countries through a joint space program, according to agreements inked.

China has actively promoted the extensive applications of Earth observation satellite data with various countries. The CBERS satellites have become an important data source for the world and we will continue and expand cooperation with Brazil.

With China's help, a data receiving station of the Sino-Brazilian Earth Resources Satellite Program was established in South Africa.

In the inaugural meeting of the South African National Space Agency (SANSO), China, Brazil and South Africa jointly signed the memorandum of understanding on China-Brazil Earth Resources Satellite (CBERS-03) in South Africa receive, store and distribute.

2. China's Satellite Data Sharing Service

Thailand HJ-1A Ground Receiving Station Put into Operation



A naming and opening ceremony for the Thailand HJ-1A satellite (SMMS) ground receiving station was held on July 9, 2011 in Bangkok. Thai Princess Chulabhorn attended the ceremony at Kasetsart University campus and unveiled the ground receiving station which is named after her.



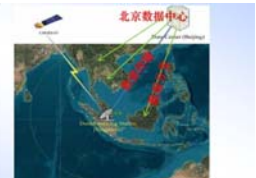
The ground receiving system for the HJ-1A satellite was constructed by Center for Resources Satellite Data and Applications (CRESDA), a subsidiary of China Aerospace Science and Technology Corporation (CASC), and was formally delivered to Thailand on April 1.

According to media reports, in its trial phase the ground station helped monitor the floods which hit southern Thailand.

2. China's Satellite Data Sharing Service

China-ASEAN Satellite Data Sharing Service Platform

- ❑ In the framework of China-ASEAN Cooperation, China actively conducted the data sharing platform development.
- ❑ On the 9th China-ASEAN Expo, Chinese government announced to share the data of CEBERS-03 satellite to ASEAN countries for free.
- ❑ China signed cooperation agreement with Myanmar, Indonesia, Thailand, Laos, etc. to promote data sharing mechanism.
- ❑ China is going to build the ground receiving station for CBERS-3 satellite data in Singapore.



2. China's Satellite Data Sharing Service

CMACast Architecture

CMACast uses AsiaSat-4 C band frequency to cover Asia and part of south-western Pacific area. Users located in the area between the middle of Iraq and the east side of New Zealand will be able to receive broadcast data on CMACast by using 1.8-2.4m aperture antenna.

CMACast is the next generation satellite data broadcast system of CMA based on DVB-S2 technology with both file and multimedia transmission capability. It is a major component of CMA national and international data dissemination network. CMACast is also a major component of IGDDS and GEONETCast.

2. China's Satellite Data Sharing Service

Installation of Foreign CMACast Data Receiving Station



Installation team finished the Installation and commissioning of CMACast receiving station in North Korea on February 7, 2012.

Installation team finished the Installation and commissioning of CMACast receiving station in Mongolia on January 12, 2012.

Installation team finished the Installation and commissioning of CMACast receiving station in Nepal on March 2, 2012.



Installation team finished the Installation and commissioning of CMACast receiving station in Indonesia on March, 2012.



Installation team finished the Installation and commissioning of CMACast receiving station in Laos on March 16, 2012.



Installation team finished the Installation and commissioning of CMACast receiving station in Malaysia on April 6, 2012.

2. China's Satellite Data Sharing Service

Installation of Foreign CMACast Data Receiving Station



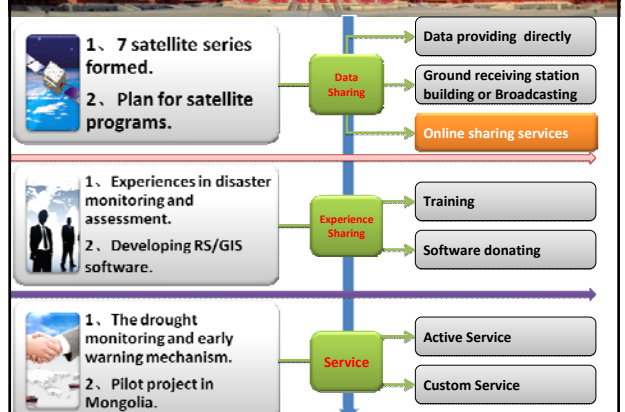
Installation team finished the Installation and commissioning of CMACast receiving station in Bengal on December 23, 2011.

Installation team finished the Installation and commissioning of CMACast receiving station in Pakistan on January 23, 2012.

Installation team finished the Installation and commissioning of CMACast receiving station in Thailand on June 22, 2012.

Until now, China donated 27 CMACast subscriber station systems and held the training courses to 19 developing countries in the Asia-Pacific region. had greatly promote the process of share earth observation data in this region. CMACast is an important contribution to the GEO, we will continue to promote CMACast construction and further improve the related systems and services.

Outlines



2. China's Satellite Data Sharing Service

- ◆ National integrated earth observation data sharing platform
- To establish the national integrated and comprehensive facilities for earth observation data sharing.
- To serve as the earth observation data sharing facility in Asia-Pacific region.

Outlines

1. 7 satellite series formed.
2. Plan for satellite programs.

1. Experiences in disaster monitoring and assessment.
2. Developing RS/GIS software.

1. The drought monitoring and early warning mechanism.
2. Pilot project in Mongolia.

Data Sharing

- Data providing directly
- Ground receiving station building or Broadcasting
- Online sharing services

Experience Sharing

- Training
- Software donating

Service

- Active Service
- Custom Service

3. Important Application

Remote Sensing Monitoring of Global Ecosystem and Environment

China has launched the Global Remote Sensing Monitoring on Ecosystem and Environment Program, which will make a series of global datasets on the ecosystem and environment available to users worldwide. The first Ecosystem and Environment report for 2012 was issued, including the land surface water, terrestrial vegetation growth.

The Datasets and Analysis of Global Land Surface Water 2010 and Dynamic Changes of Sample Lakes 2001-2011.

Global Datasets Development and Analysis Report on Changes of Vegetation Leaf Area Index (LAI) Dynamics from 1982 to 2011.

The datasets and reports are published at the Website of China Spatial Data and Information Network (http://www.csi.gov.cn/index_en.html).

3. Important Application

Inter-Ministerial Coordination Mechanism

April, 20th, 2013, 8:02am
Lushan 7.0 earthquake

April, 20th,
11:15 Before-earthquake data processing

16:50 Acquisition of the first group of unmanned aerial vehicle images

23:03 Acquisition of the first group of Aviation remote sensing images

April, 21st,
07:30 Complete the first imagery processing of RADARSAT-2 satellite

10:00 Sharing earthquake remote sensing data

National space data sharing service center
imagery data 130GB, Before disaster, 61GB after disaster, 69GB

Disaster relief on site | Disaster assessment | Technical support

Local government | Ministerial | Institutes & Organizations

3. Important Application

3. Important Application

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_6111



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