China Satellite Data Applicaions and Global sharing

China Centre for Resources Satellite Data and Application (CRESDA)

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Beijing, Sept, 12, 2019

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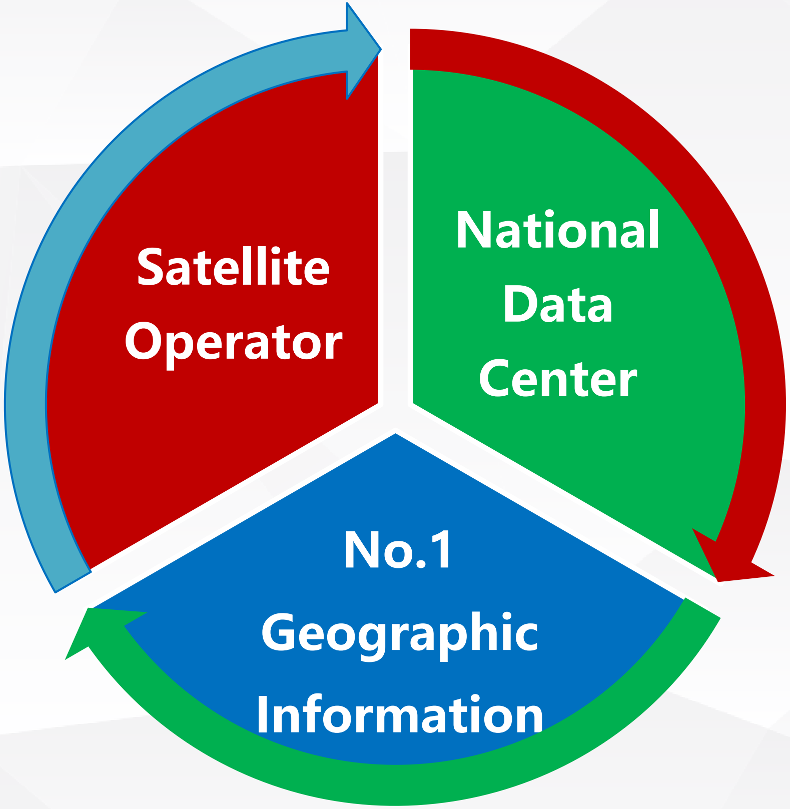
01

CRESDA



Satellite Operator

National Data Center

No.1 Geographic Information

HISTORY

1999

CBERS-01 (20m)
Successfully Launched

2003

CBERS-02 (20m)
First Miniaturization
Ground Processing System.

2007

CBERS-02B(2.36m)

South Africa Ground Station;

2008

HJ-1A/1B (30m)

Thailand station

2011-2013

ZY-02C, ZY-3,

HJ-1C, SJ-9A/9B

2013-2014

mance Computing
puting Power for Your Mission-Critical Applications

GF Series(GF-1&GF-2,CBERS-04)

Sub Meter Era

China-ASEAN Platform

2015-2016

Cloud
computing

Superview-1/2 (0.5m)
GF-3 (1m SAR)
Big Data
Cloud Computing
Architecture

2017-2018

Collaboration

AI Technology

Superview-3/4

GF-1B/C/D

GF-5

GF-6

ZH-1

02

SATELLITES & APPLICATIONS

SATELLITE RESOURCES

Successful Mission：26； 23 satellites in orbit

CBERS-01/02/02B
GF-1/2/3/4
HJ-1A/B/C
SJ-9A/B
ZY-1 02C
ZY-3

CBERS-1/2/02B/4

GF-1A/1B/1C/1D/2/3/4/5/6
Superview-1/2/3/4

HJ-1A/1B/1C

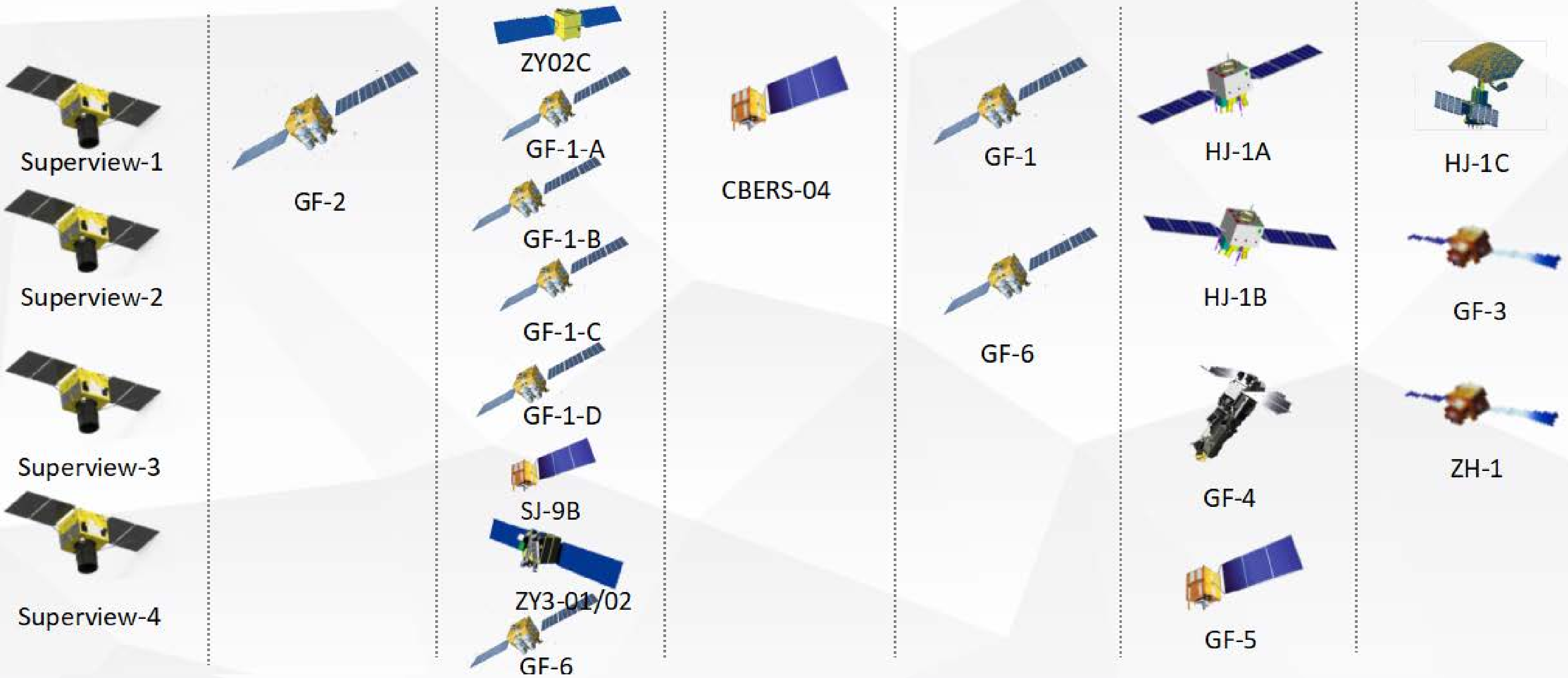
SJ-9A/9B

ZY-1-02C

ZY-3-01/02

SATELLITE RESOURCES

Successful Mission：26； 23 satellites working in orbit

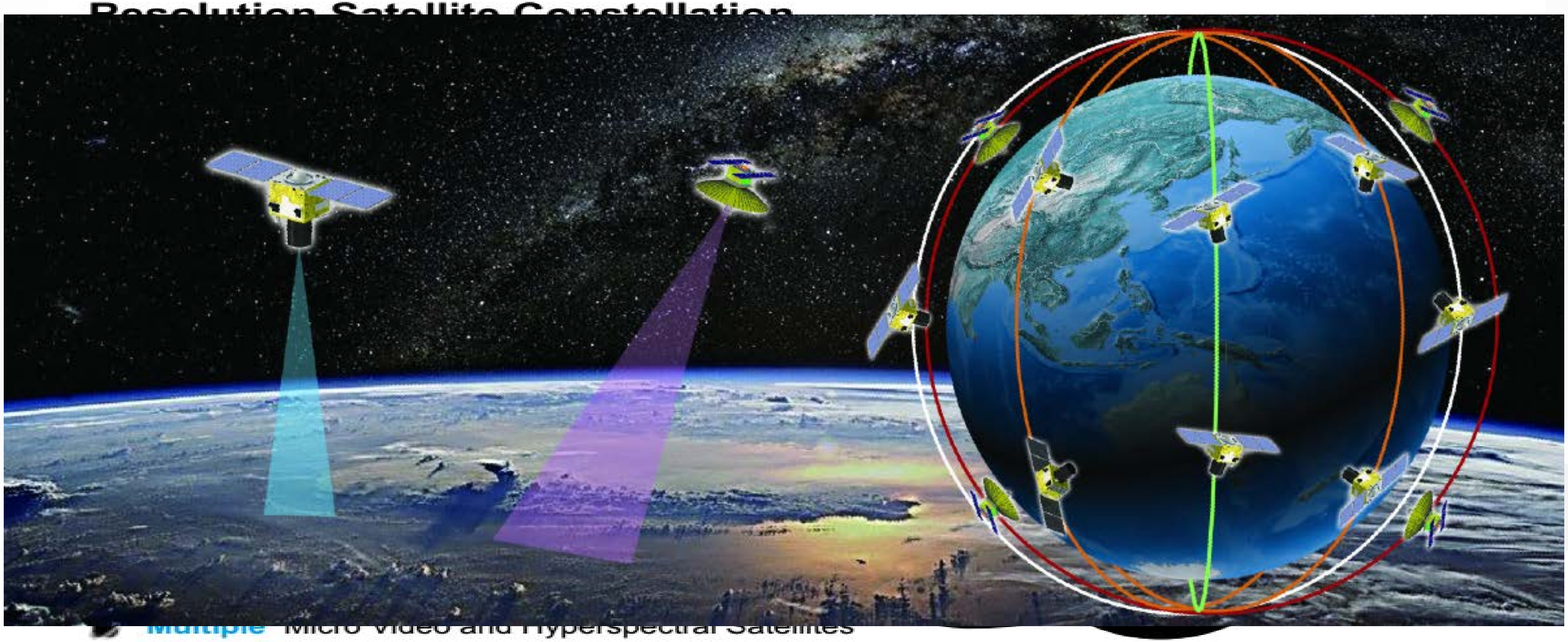


0.5m	0.8m	2m	5m	16m	30-50m	SAR
Superview-1	GF-2	ZY02C	CBERS-04	GF-1	HJ-1A	HJ-1C
Superview-2		GF-1-A		GF-6	HJ-1B	GF-3
Superview-3		GF-1-B			GF-4	ZH-1
Superview-4		GF-1-C			GF-5	
		GF-1-D				
		SJ-9B				
		ZY3-01/02				
		GF-6				

SATELLITE RESOURCES

The Very High Resolution--SuperView Constellation (0.5m)

“16+4+4+X” Multi-sensor Commercial High Resolution Satellite Constellation



- **Multiple** Micro Video and Hyperspectral Satellites

SATELLITE RESOURCES

The Very High Resolution--SuperView Constellation (0.5m)

1 satellite: 8 days

2 satellites: 4 days

4 satellites: 1 day

16 satellites: 0.25 day

… …

SATELLITE RESOURCES

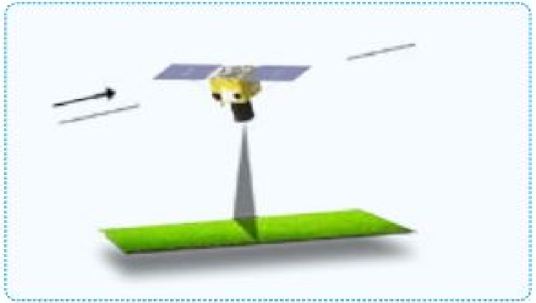
Launch Schedule

- First 2 on Dec. 28th .2016

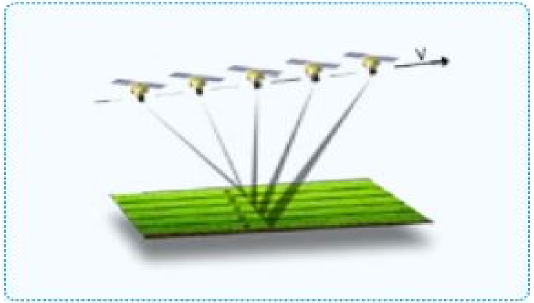
-Second 2 on Jan. 9th 2018

SATELLITE RESOURCES

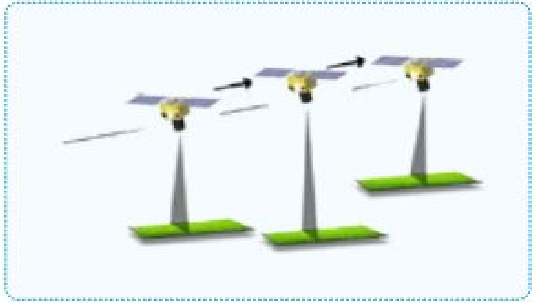
The Very High Resolution--SuperView Constellation (0.5m)



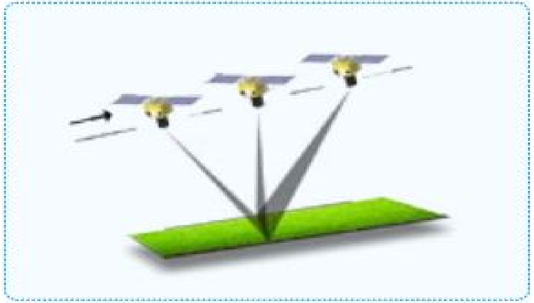
Long strip



Multiple strips collect



Multiple point targets collect



Stereo imaging

Archive Coverage

Low Spatial≥30m

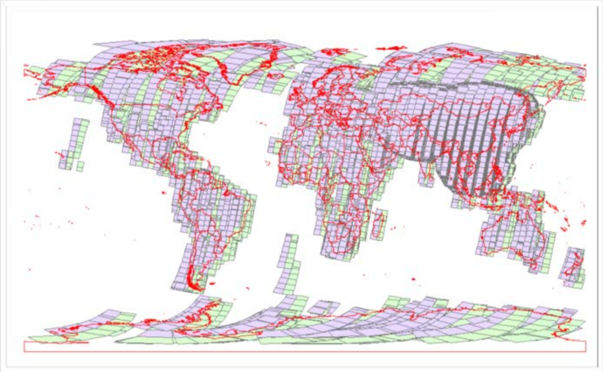
100%

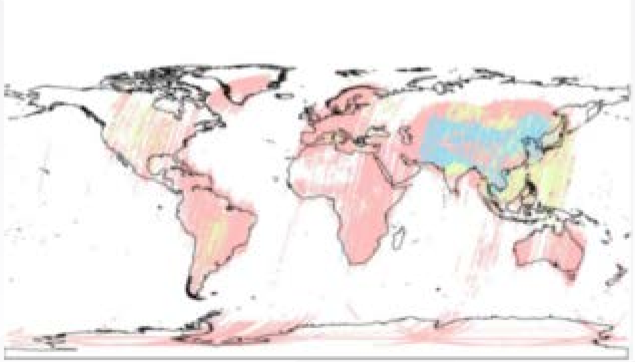
20m≥Medium Spatial＞2m

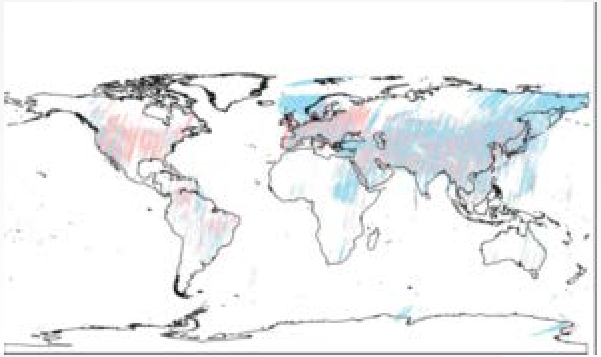
82%

2m≥High Spatial

51%







Total Distribution：17,021,009 Scenes

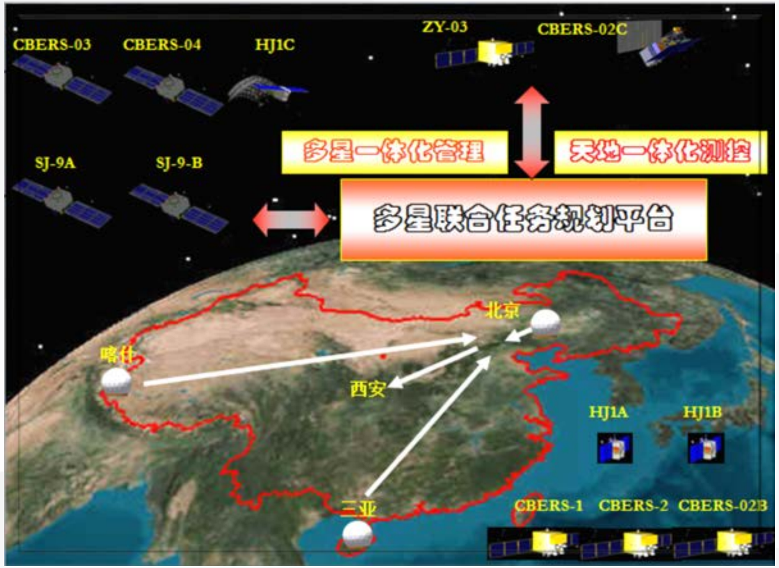
Daily Distribution：15,000 Scenes

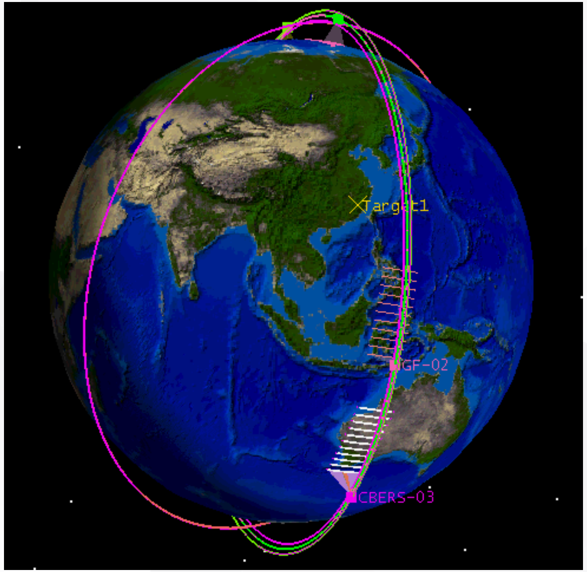
Processing Ability

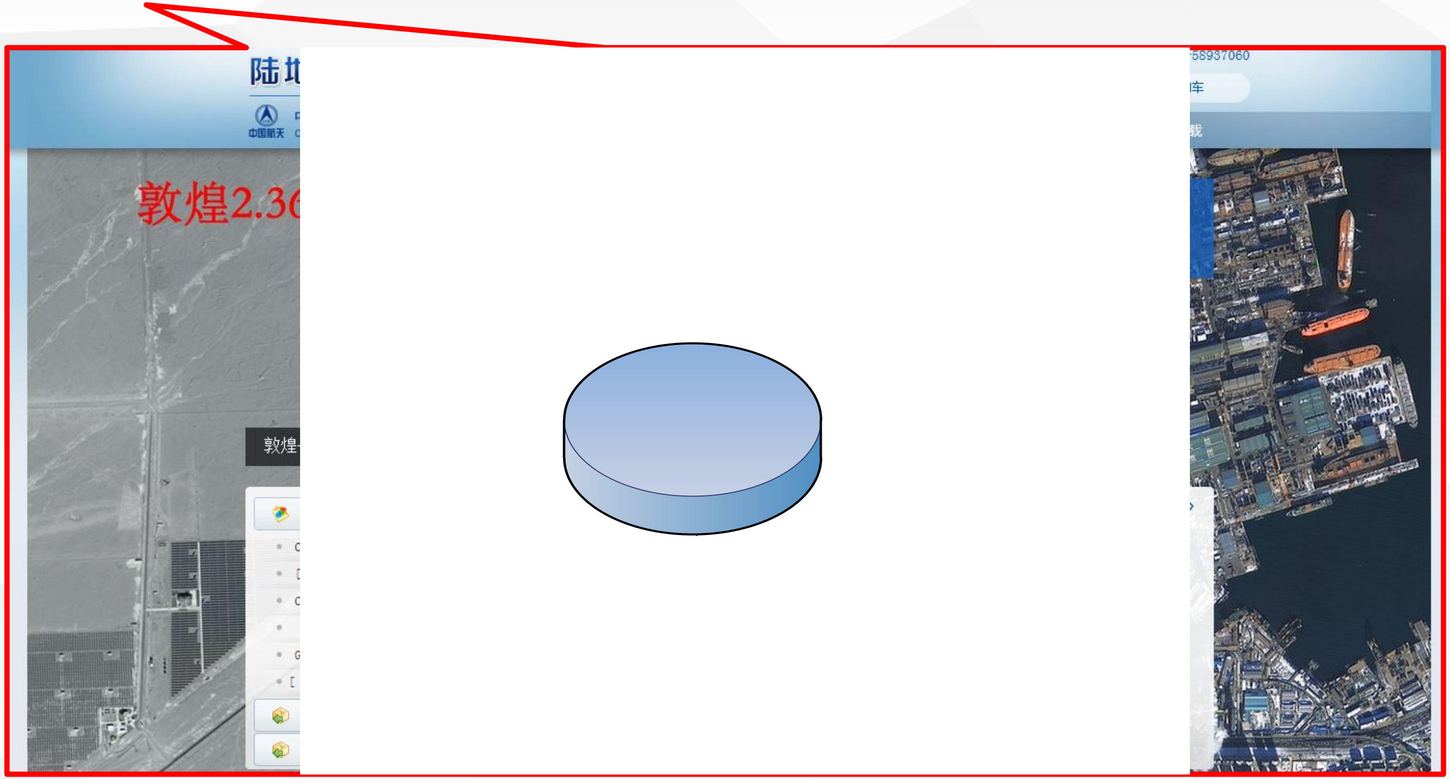
- 70 PB on-line storage； 7×24 automatically operation.
- 20TB Daily Production, 15000 Scenes Daily Dissemination.

Multi-satellites Tasking

Supporting 23 satellites tasking， scalability for 40 coming missions


CBERS-03
CBERS-04
HJ1C
ZY-03
CBERS-02C
SJ-9A
SJ-9-B
多星一体化管理
天地一体化测控
多星联合任务规划平台
北京
喀什
西安
三亚
HJ1A
HJ1B
CBERS-1
CBERS-2
CBERS-02B

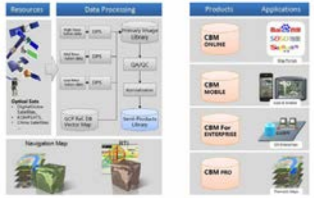

Target1
GF-02
CBERS-03


陆
中国航天
58937060
车
载
敦煌2.3
敦煌

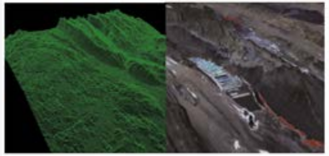
Satellite Application

Product Family

Standard Data Product


Resources
Data Processing
Products
Applications
Primary Image Library
QA/QC
Semi-Products Library
GCP Ref. DB Vector Map
Optical Data
Navigation Map
CBM ONLINE
CBM MOBILE
CBM For ENTERPRISE
CBM PRO

Shanghai


3D Visualization

Capital Airport

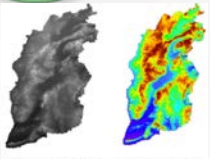
DPF

- Standard Product
- Thematic Product
- DOM
- DEM
- DRG
- DLG
- Mosaic

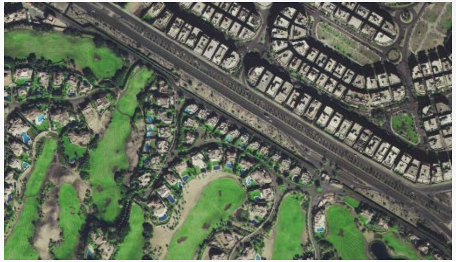
5 m, 330,000 km², Malaysia

Site NO.	A1
Collected in	2011
X coordinate	—
Land use	Opening
Change or not?	Y
Add	#. ** Street, City
Collected in	2012
Y coordinate	—
Land use	Residence
Floor area	210 m²

Urban Demolition

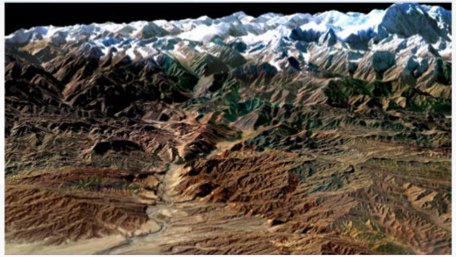

Provincial Map, Grid, 10 - m Spacing, Shanxi Province

SATELLITE IMAGERY

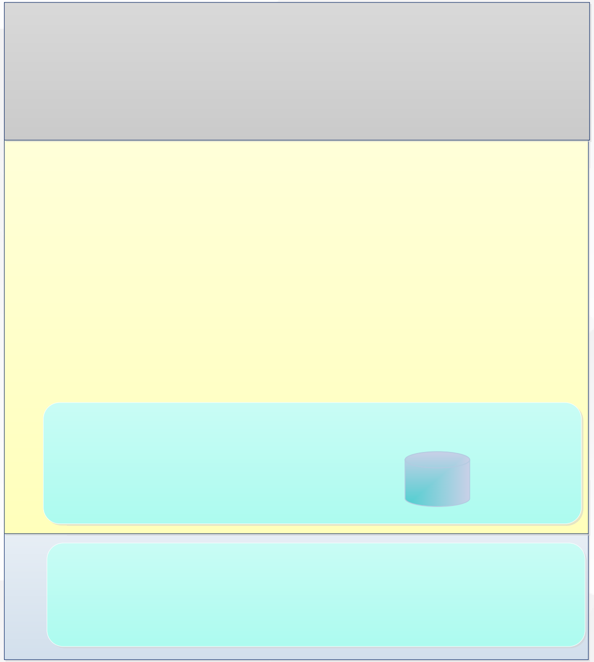


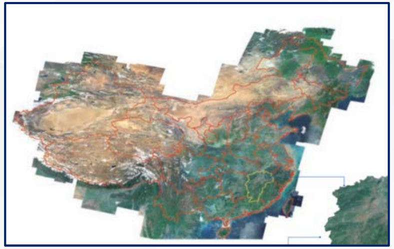
Optical(up to 0.5m)

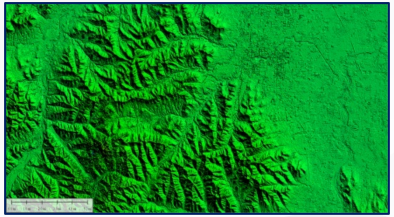
SAR(1m)



Terrain(DOM/DEM)





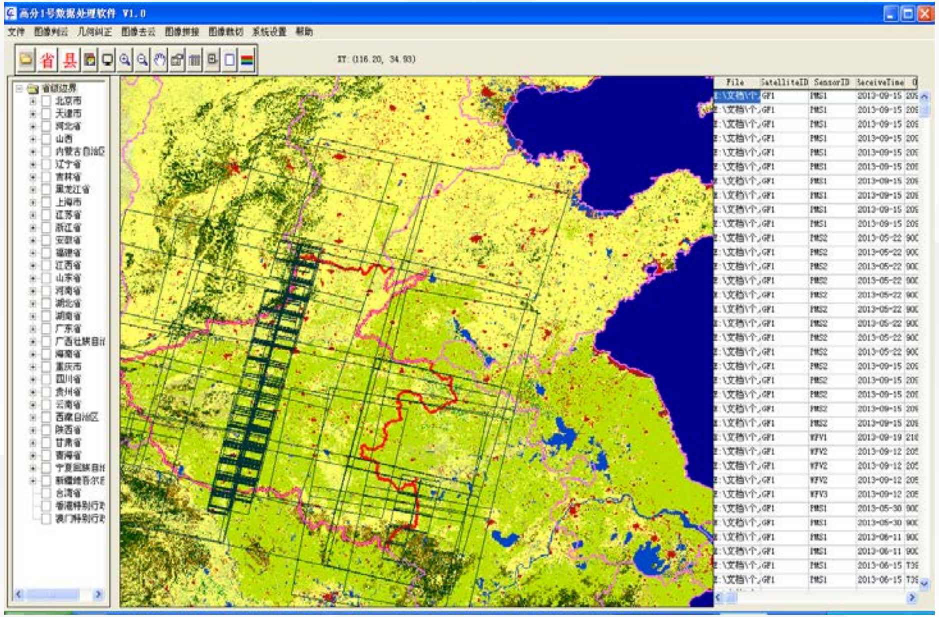


SATELLITE APPLICATION

Agricultural

National agricultural monitoring based on domestic satellite data in the remote sensing monitoring operation system of the ministry of agriculture:

- Annual national winter wheat planting area remote sensing monitoring;
- Remote sensing mapping of national agricultural zoning database;
- Remote sensing monitoring of desertification in northern grassland.


高分1号数据处理软件 V1.0
文件
图像判云
几何纠正
图像去云
图像拼接
图像裁切
系统设置
帮助
省
县
XY: (116.20, 34.93)
省级边界
北京市
天津市
河北省
山西
内蒙古自治区
辽宁省
吉林省
黑龙江省
上海市
江苏省
浙江省
安徽省
福建省
江西省
山东省
河南省
湖北省
湖南省
广东省
广西壮族自
海南省
重庆市
四川省
贵州省
云南省
西藏自治区
陕西省
甘肃省
青海省
宁夏回族自
新疆维吾尔
台湾省
香港特别行
澳门特别行

File	SatelliteID	SensorID	ReceiveTime
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS1	2013-09-15
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
E:\文档\个	GF1	PMS2	2013-05-22
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E:\文档\个	GF1	PMS2	2013-09-15
E:\文档\个	GF1	PMS2	2013-09-15
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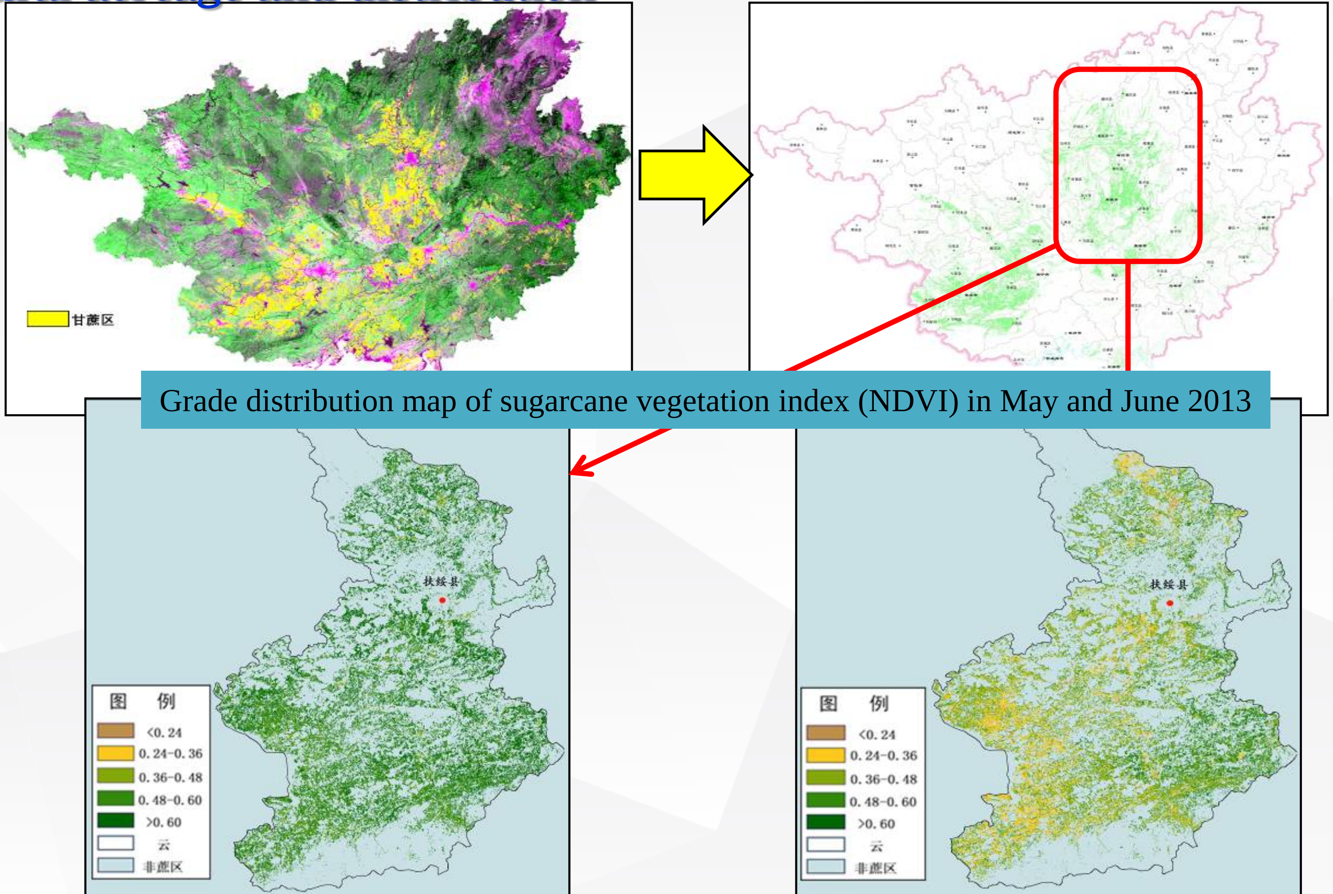
E:\文档\个	GF1	WFV3	2013-09-12
E:\文档\个	GF1	PMS1	2013-05-30
E:\文档\个	GF1	PMS1	2013-05-30
E:\文档\个	GF1	PMS1	2013-06-11
E:\文档\个	GF1	PMS1	2013-06-11
E:\文档\个	GF1	PMS1	2013-06-15
E:\文档\个	GF1	PMS1	2013-06-15

Results: the monitoring efficiency was greatly improved to provide basic data for the monitoring and evaluation of agricultural conditions and agricultural disasters, and the investigation and evaluation of agricultural resources

SATELLITE APPLICATION

Monitoring of agricultural acreage and distribution

The change trend of sugarcane planting area and area was investigated by using environmental disaster reduction satellite data, and the sugarcane growth dynamic monitoring and yield estimation were carried out by combining with multi-source satellite data.


甘蔗区
扶绥县
图 例
<0.24
0.24-0.36
0.36-0.48
0.48-0.60
>0.60
云
非蔗区
扶绥县
图 例
<0.24
0.24-0.36
0.36-0.48
0.48-0.60
>0.60
云
非蔗区

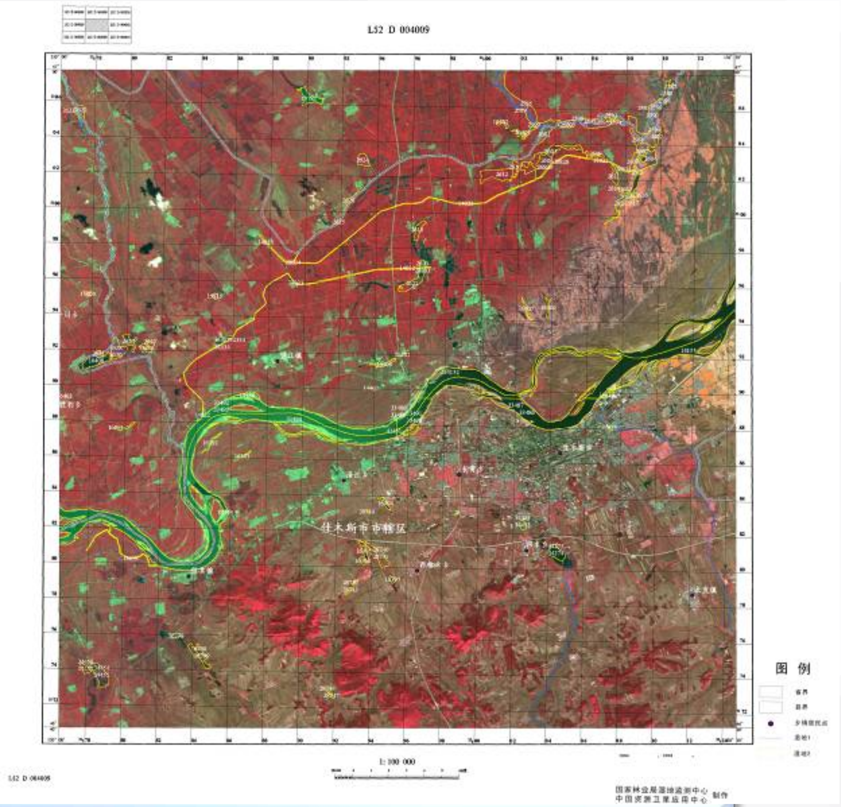
Grade distribution map of sugarcane vegetation index (NDVI) in May and June 2013

SATELLITE APPLICATION

Forestry

The state forestry administration has applied domestic satellite data in three aspects:

- Woodland: annual national woodland change survey, annual assessment of forest growth indicators, forest resources inventory, "one map" project;
- Wetlands: national wetland survey every 4 years;
- Desertification: desertification monitoring in northern China.

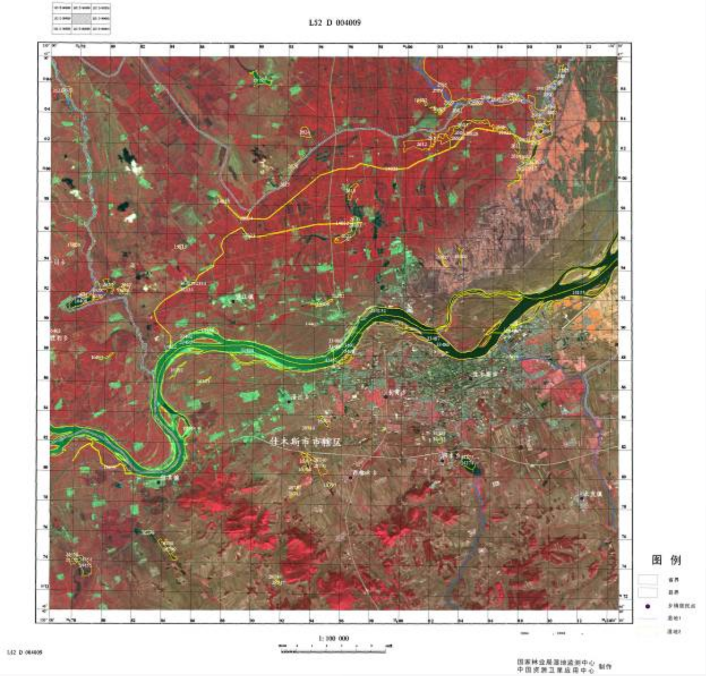


Results: 30% savings over conventional means, more than half the length of service

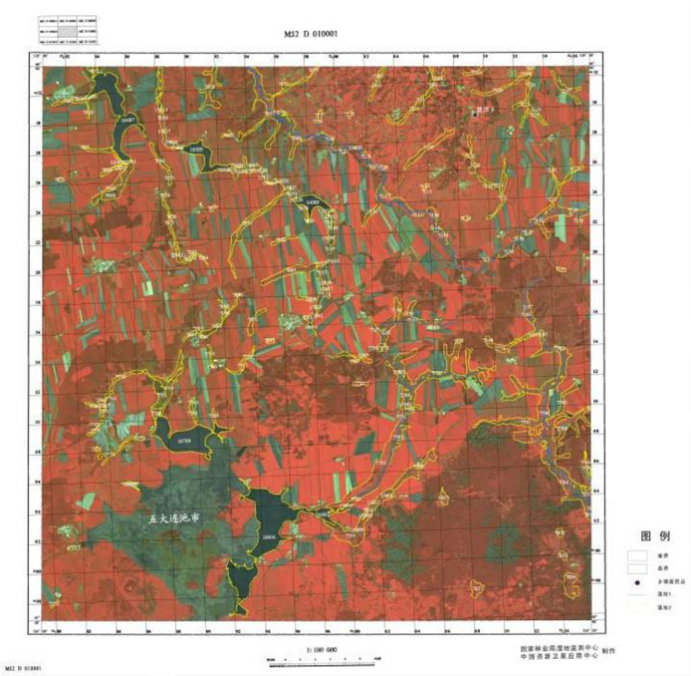
SATELLITE APPLICATION

Wetland resource survey

To investigate the area and types of wetlands and provide image value-added products, including image enhancement products, provincial inlaid uniform color products, 1:100,000 standard topographic map sub-image products, thematic images and other products.


L52 D 004009
佳木斯市市辖区
图 例
1:100 000

Jiamusi wetland 1:100,000 images


M52 D 010001
五大连池市
图 例
1:100 000

Wudalianchi wetland 1:100,000 images

SATELLITE APPLICATION

Water conservancy

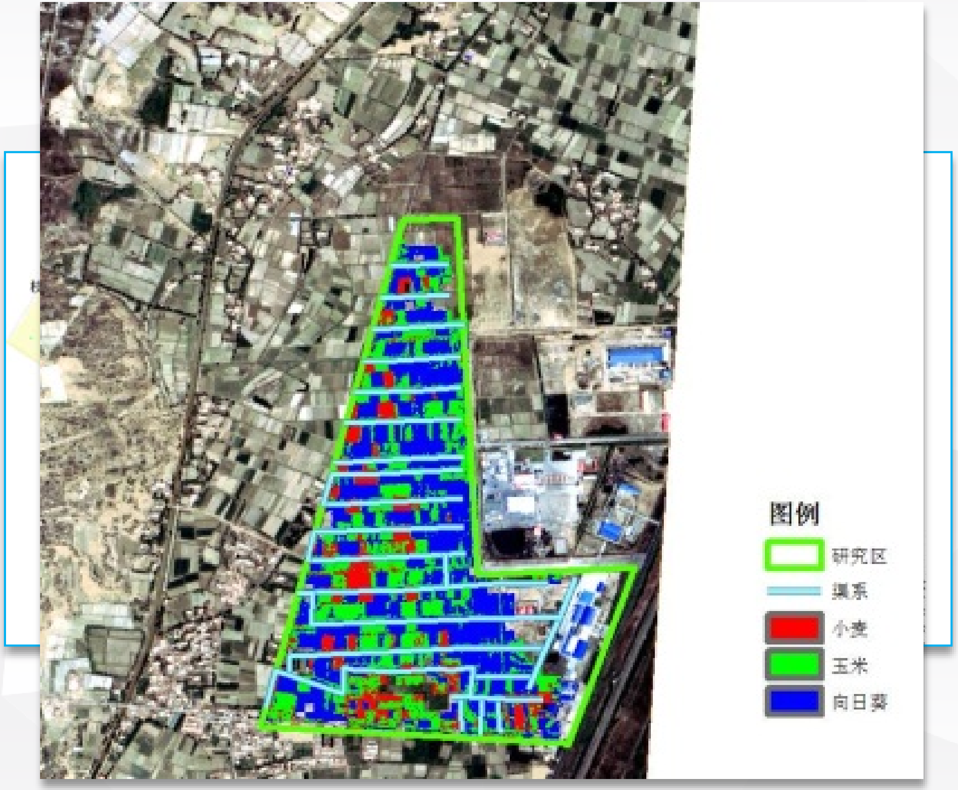
Satellite remote sensing technology has become an irreplaceable means to solve the four major water problems.

- Remote sensing monitoring of floods - lots of water
- Remote sensing monitoring of drought - water scarcity
- Remote sensing monitoring of water resources - less and dirty water
- Remote sensing monitoring of soil and water conservation -- muddy water

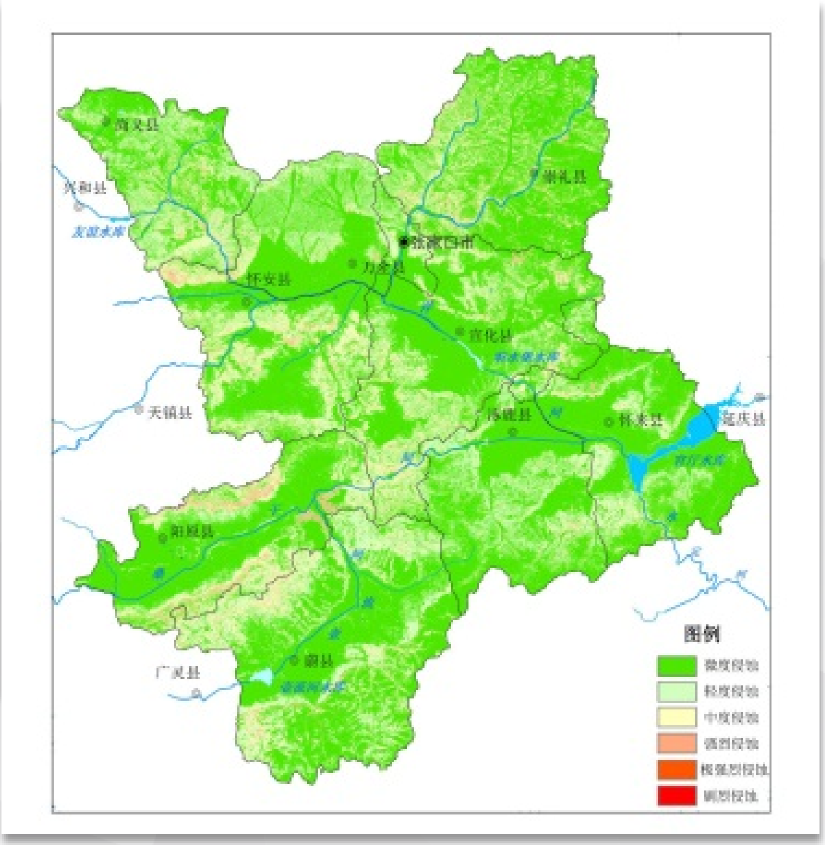
Results: the work that needs 3-5 years to complete by traditional means has achieved annual data update, improved work quality and provided detailed, reliable and strong current information support for the government's decision-making.

SATELLITE APPLICATION

Water application


图例
研究区
渠系
🟥 小麦
🟩 玉米
🟦 向日葵

Irrigation area monitoring


尚义县
兴和县
友谊水库
崇礼县
张家口市
万全县
怀安县
宣化县
天镇县
涿鹿县
怀来县
延庆县
官厅水库
阳原县
蔚县
广灵县
壶流河水库
图例
微度侵蚀
轻度侵蚀
中度侵蚀
强烈侵蚀
极强烈侵蚀
剧烈侵蚀

Soil erosion monitoring

Ecolo

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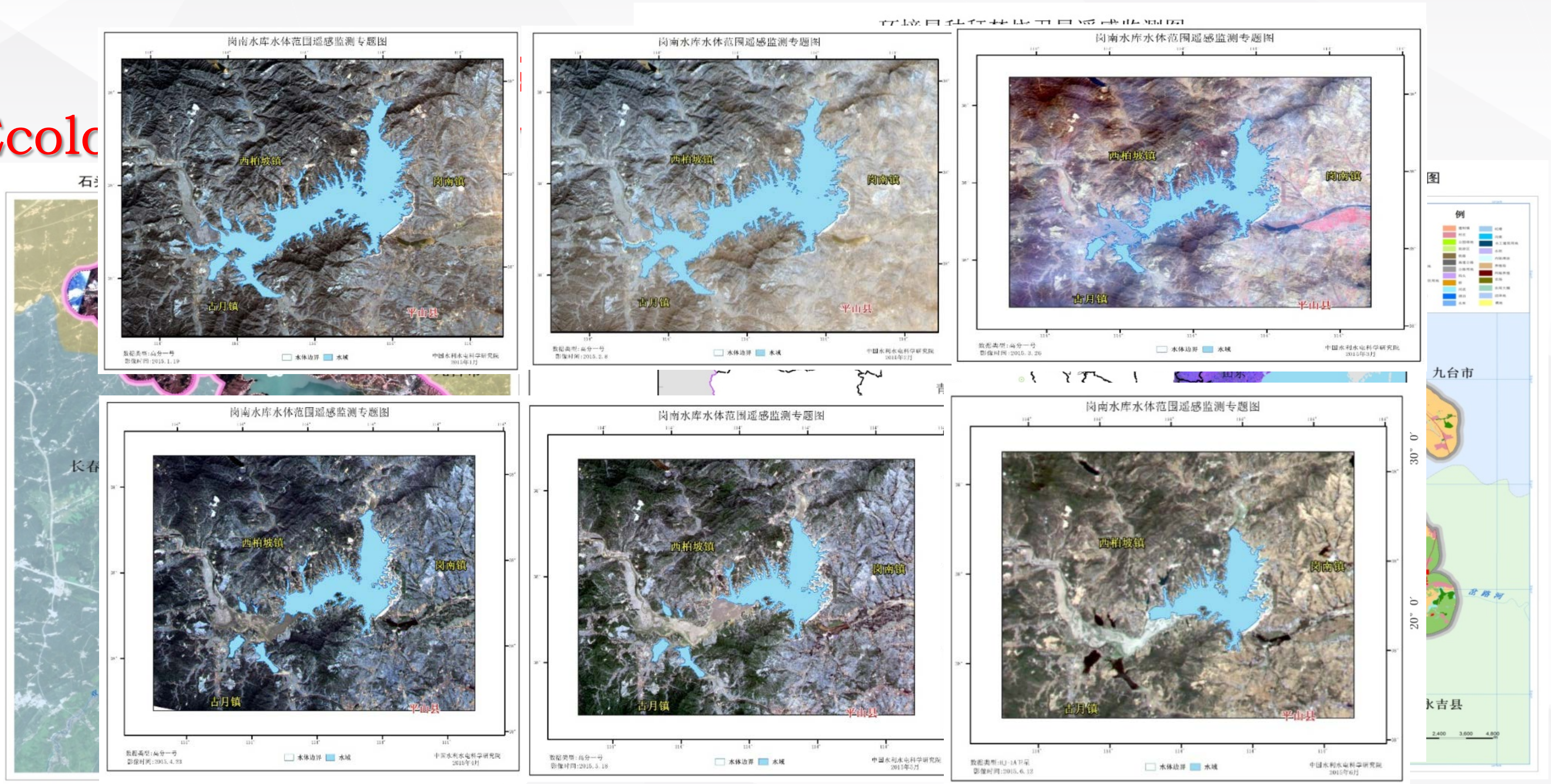
岗南水库水体范围遥感监测专题图
西柏坡镇
岗南镇
古月镇
平山县
水体边界
水域
数据类型：高分一号
中国水利水电科学研究院
九台市
永吉县
长春
图例

Gaofen-1 image of drinking
source protection area
shitongkoumen reservoir, jilin
province

area of shitoumen reservoir in
jilin province

mote sensing assessment map of
nking water wetland reserve in
shitoumen reservoir, jilin
province

Water source pollution monitoring

SATELLITE APPLICATION

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protection a

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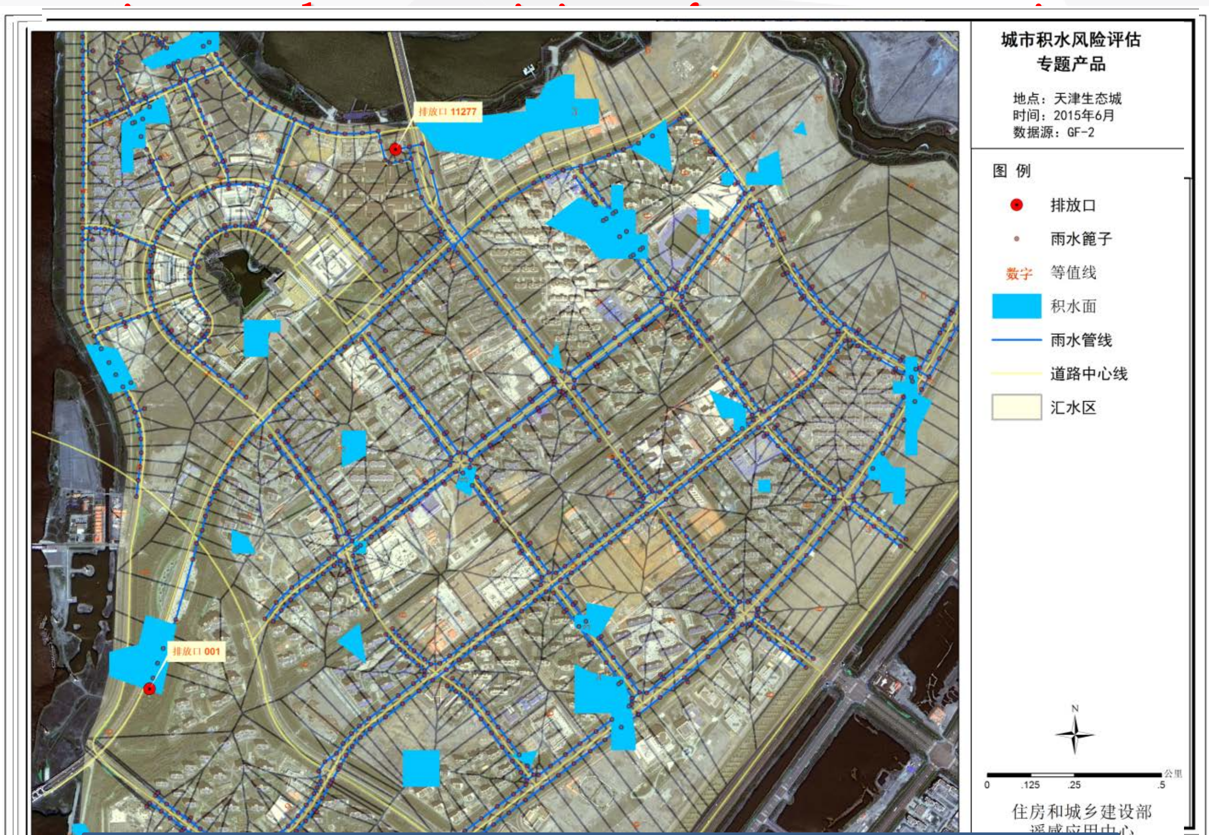
requirement


城市积水风险评估
专题产品
地点：天津生态城
时间：2015年6月
数据源：GF-2
图 例
● 排放口
• 雨水篦子
数字 等值线
积水面
雨水管线
道路中心线
汇水区
排放口 11277
排放口 001
N
0 .125 .25 .5 公里
住房和城乡建设部

Risk assessment map of urban water accumulation

SATELLITE APPLICATION

Remote sensing applications for transporta

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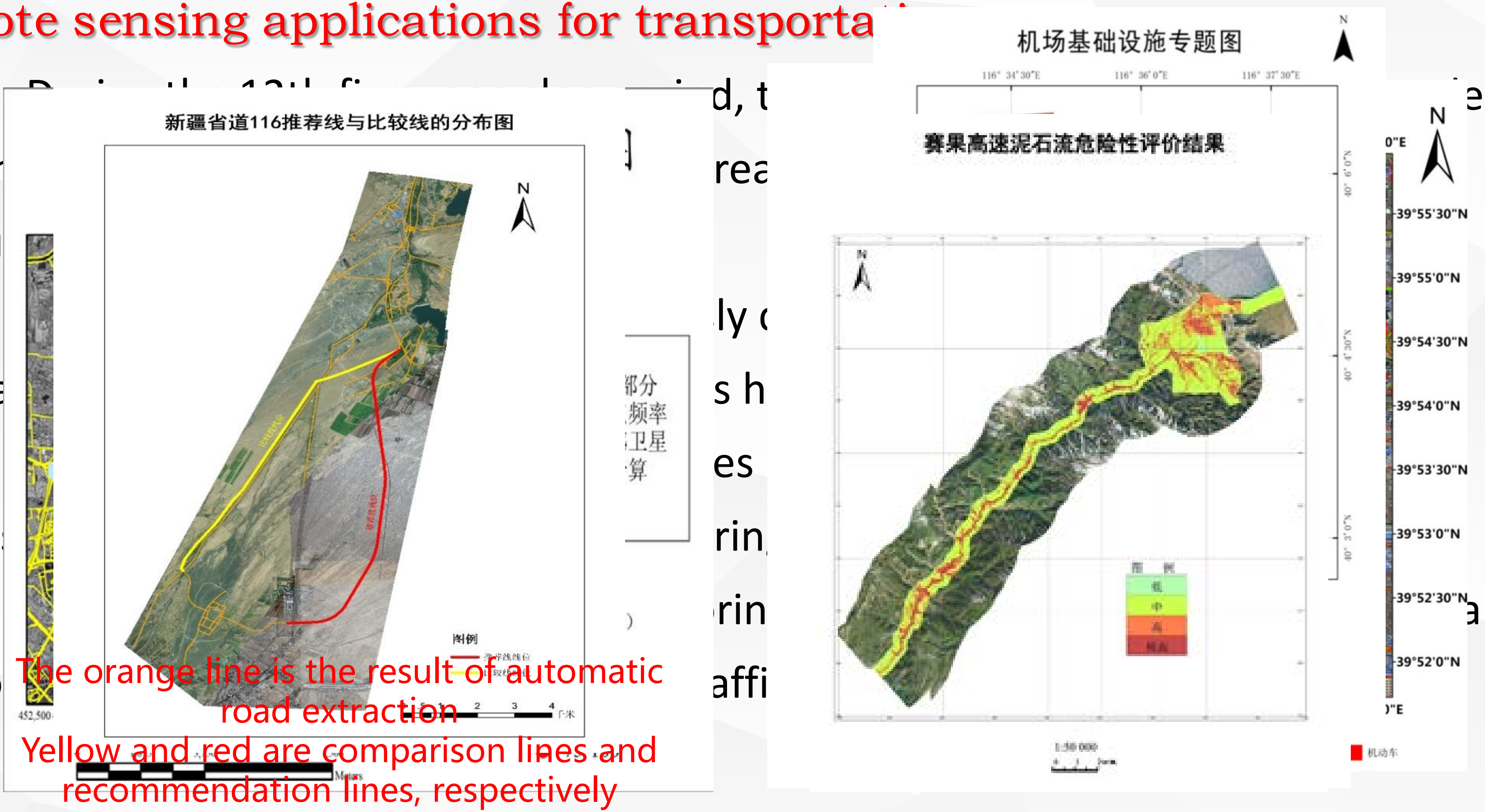

新疆省道116推荐线与比较线的分布图
N
图例
推荐线线位
比较线线位
.5 1 2 3 4
千米
452,500
Meters
机场基础设施专题图
N
116° 34′ 30″E
116° 36′ 0″E
116° 37′ 30″E
40° 6′ 0″N
40° 4′ 30″N
40° 3′ 0″N
赛果高速泥石流危险性评价结果
N
低
中
高
极高
1:50 000
部分
频率
卫星
算
机动车
N
0″E
39°55′30″N
39°55′0″N
39°54′30″N
39°54′0″N
39°53′30″N
39°53′0″N
39°52′30″N
39°52′0″N
0″E

The orange line is the result of automatic road extraction

Yellow and red are comparison lines and recommendation lines, respectively

SATELLITE APPLICATION

Disaster monitoring

The satellite "emergency response plan for major natural disasters" has been established, and the satellite monitoring and operation system for major natural disasters has been established. The response time is less than 2 hours, including all natural disasters, covering the whole world.

International space and major disaster charter data server, emergency CEO, executive secretary, coordinating services for global disaster monitoring.

More than 100 domestic disasters and 30 international disasters were monitored.

03

COOPERATION

International Organization

International Charter
SPACE & MAJOR DISASTERS

GEO GROUP ON
EARTH OBSERVATIONS

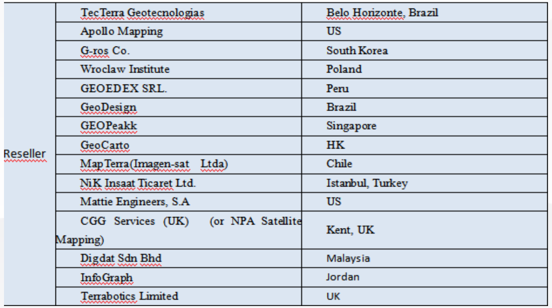
UNITED NATIONS
Office for Outer Space Affairs
UN-SPIDER

ASSOCIATION
OF SOUTHEAST
ASIAN NATIONS

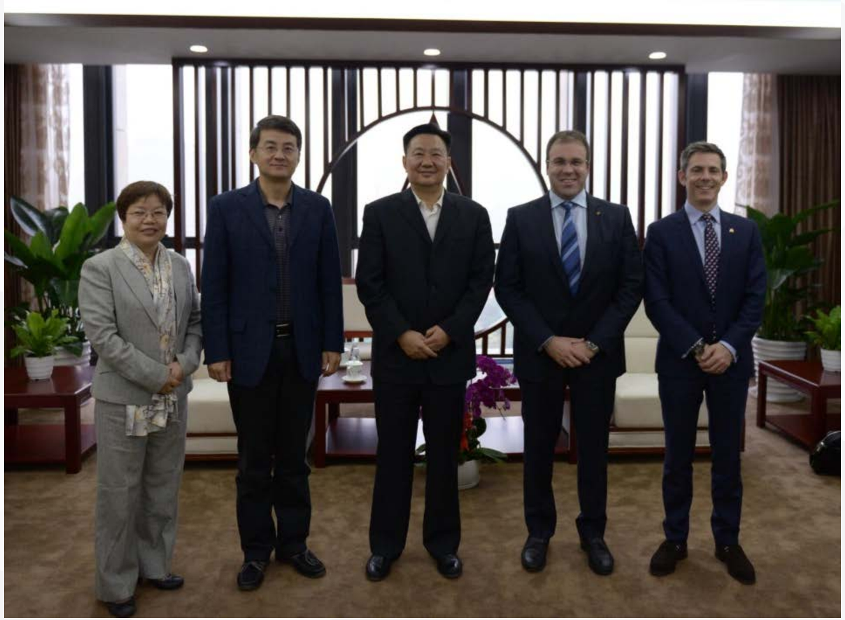
CEOS Committee on
Earth Observation Satellites

International Cooperation

23 countries; 35 Global or Regional Distributor



Reseller	TecTerra Geotecnologias	Belo Horizonte, Brazil
	Apollo Mapping	US
	G-ros Co.	South Korea
	Wroclaw Institute	Poland
	GEOEDEX SRL.	Peru
	GeoDesign	Brazil
	GEOPeakk	Singapore
	GeoCarto	HK
	MapTerra(Imagen-sat Ltda)	Chile
	NiK Insaat Ticaret Ltd.	Istanbul, Turkey
	Mattie Engineers, S.A	US
	CGG Services (UK) (or NPA Satellite Mapping)	Kent, UK
	Digdat Sdn Bhd	Malaysia
	InfoGraph	Jordan
	Terrabotics Limited	UK



International Cooperation

South Africa

CBERS ground station in South Africa enables 13 countries in Southern Africa have the opportunity to use CBERS-02B, CBERS-04 data， which bring many benefits to land resources management, crop growth analysis, disaster monitoring, water resources management, and urban construction, etc.

Mr Xu Wen
Dr Sandile Malinga
Mr José Bacellar

Signing Ceremony between China, Brazil and South Africa

International Cooperation

THAILAND

7.3m Fixed Data Receiving Station and Data Processing System.

CASC
中国航天
2011 3 3

Operation Ceremony

International Cooperation

Norway

GF-3 Data Processing System and Superview Reseller

Radarsat
17:55
the touch panel to get started

International Cooperation

Indoor Training: 6 countries(Thailand，Pakistan，Peru，Turkey，Bangladesh，Mongolia)；Around 300 trainees.

AFAD
ASIA-PACIFIC SPACE COOPERATION ORGANIZATION
APSCO
TÜBİTAK
UZAY

International Cooperation

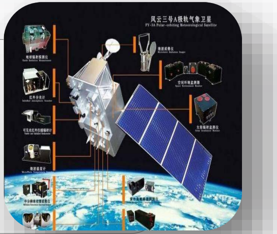
Outdoor Training: in Chinese Calibration Site;
7 countries; 20 trainees.

The 1st Training and Field Campaign
of Radiometric Calibration of Satellite Sensors Project

System Proposal

Available Satellites:

GJ-1 A/B/C/D (SuperView), GF-1, GF-2, GF-4, GF-5, GF-6, CBERS, ZY-3 01/02

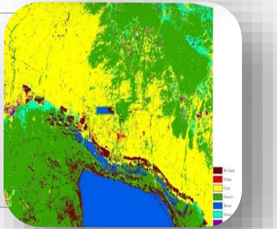


System Design:

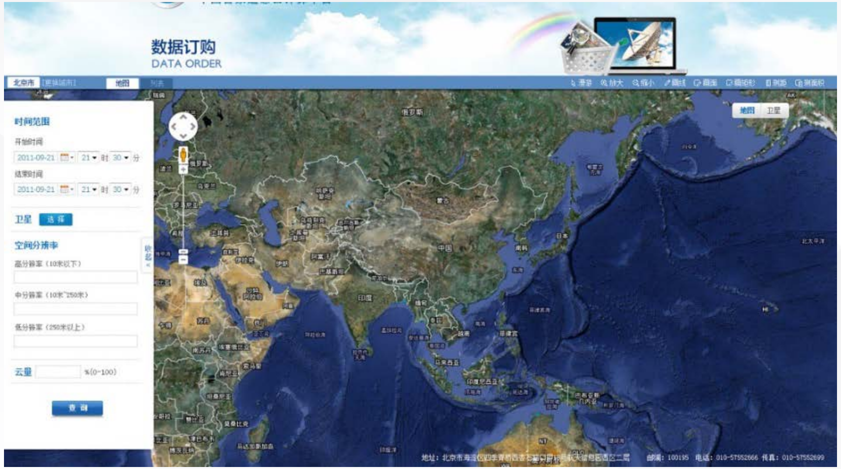
Architecture, Composition, Function, Subsystems

Services:

Imaging Tasking, Training, Calibration



GROUND DATA SYSTEM SOLUTION



数据订购
DATA ORDER
北京市
地图
列表
卫星
选择
查询

时间范围

开始时间 2011-09-21 21 时 30 分

结束时间 2011-09-21 21 时 30 分

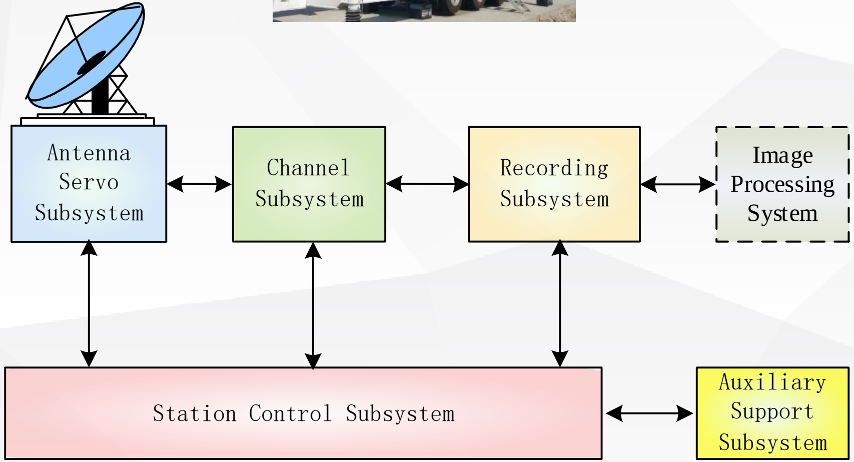
空间分辨率

高分辨率（10米以下）

中分辨率（10米~250米）

低分辨率（250米以上）

云量 %(0~100)



Antenna Servo Subsystem

Channel Subsystem

Recording Subsystem

Image Processing System

Station Control Subsystem

Auxiliary Support Subsystem

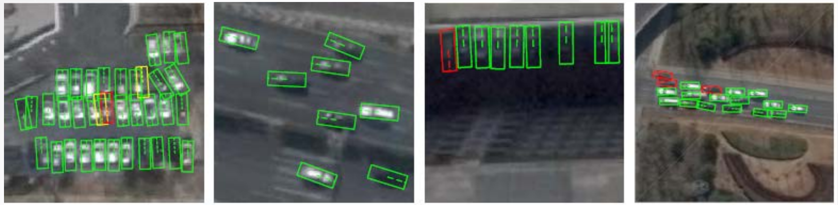
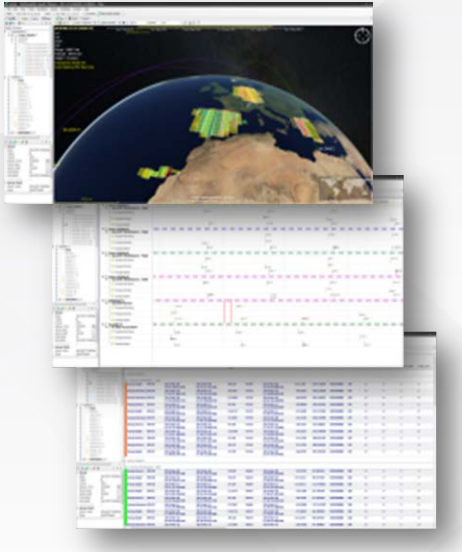
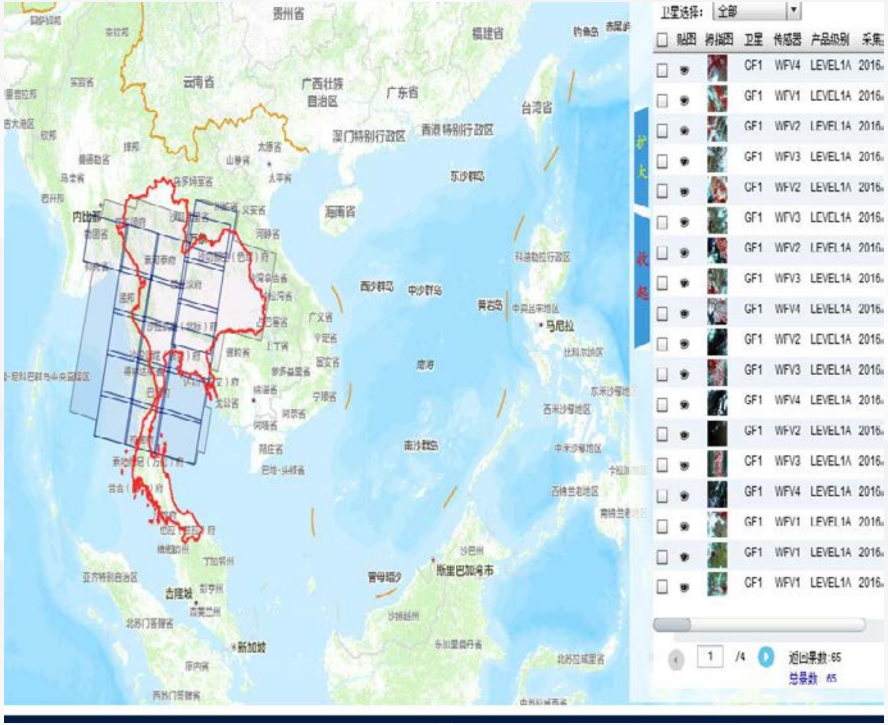


IMAGE ACQUISITION SERVICE



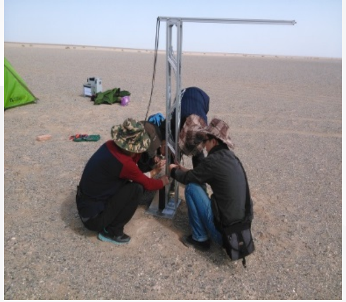

贵州省
云南省
广西壮族
自治区
广东省
福建省
台湾省
澳门特别行政区
香港特别行政区
东沙群岛
海南省
西沙群岛
中沙群岛
黄岩岛
马尼拉
南海
南沙群岛
曾母暗沙
斯里巴加湾市
吉隆坡
新加坡
钓鱼岛
赤尾屿
扩大
收起

卫星选择: 全部

☐	贴图	拇指图	卫星	传感器	产品级别	采集
☐	●		GF1	WFV4	LEVEL1A	2016
☐	●		GF1	WFV1	LEVEL1A	2016
☐	●		GF1	WFV2	LEVEL1A	2016
☐	●		GF1	WFV3	LEVEL1A	2016
☐	●		GF1	WFV2	LEVEL1A	2016
☐	●		GF1	WFV3	LEVEL1A	2016
☐	●		GF1	WFV2	LEVEL1A	2016
☐	●		GF1	WFV3	LEVEL1A	2016
☐	●		GF1	WFV4	LEVEL1A	2016
☐	●		GF1	WFV2	LEVEL1A	2016
☐	●		GF1	WFV3	LEVEL1A	2016
☐	●		GF1	WFV4	LEVEL1A	2016
☐	●		GF1	WFV2	LEVEL1A	2016
☐	●		GF1	WFV3	LEVEL1A	2016
☐	●		GF1	WFV4	LEVEL1A	2016
☐	●		GF1	WFV1	LEVEL1A	2016
☐	●		GF1	WFV1	LEVEL1A	2016
☐	●		GF1	WFV1	LEVEL1A	2016

1 /4 返回景数:65
总景数 65

CROSS-CALIBRATION SERVICE


BRDF

Reflectance

ASD

Atmospheric profile

Temperature and pressure

CE318

TECHNIQUE TRAINING

CRESDA held the Training Course on data processing system and geo-informatics technology, especially for project partners.

Many thanks for you attention!

Kevinwang2000@163.com