# Data Sharing and Applications of China's Natural Resources Satellites for SIDS

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5th SEP,2025

01

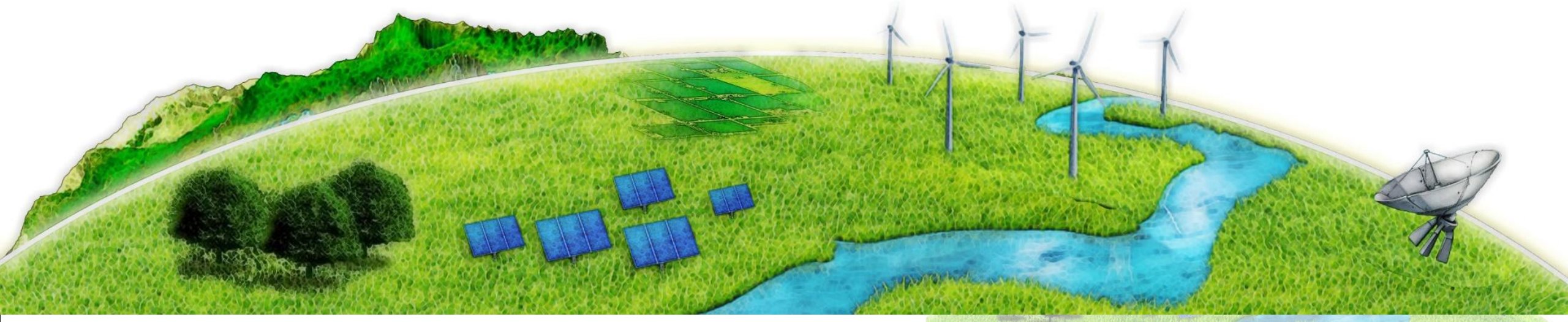
Developent of Satellites Observation Systems

02

Applications and data sharing to SIDS

03

Suggestions and sloutions



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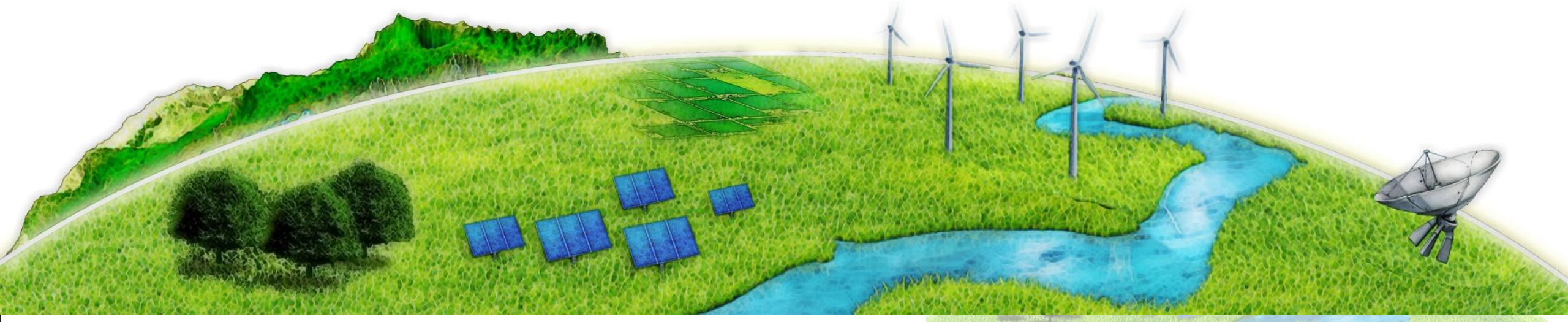


# Background Info from SIDS4

“The Antigua and Barbuda Agenda for Small Island Developing States: A Renewed Declaration for Resilient Prosperity”

How do small island developing States get there?

A. Build economic resilience

B. Scale up climate action and support, including climate finance,in line with existing commitments and obligations under the United Nations Framework Convention on Climate Change and the Paris Agreement

C. Scale up biodiversity action

D. Conserve and sustainably use the ocean and its resources

E. Mainstream disaster risk reduction

F. Safe and healthy societies

G. Data collection, analysis and use

H. Science, technology, innovation and digitalization

I. Productive populations

J. Partnerships

# Background from SIDS4

G. Data collection, analysis and use

Enhancing science-based and innovative approaches, including sustainable development-oriented, inclusive and responsible use of artificial intelligence, in the non-military domain, in full respect, promotion and protection of human rights and international law, for the collection, storage, analysis, disaggregation, dissemination and use of demographic data in small island developing States, including use of geospatial technologies;

# Analysis of Global Remote Sensing Satellites

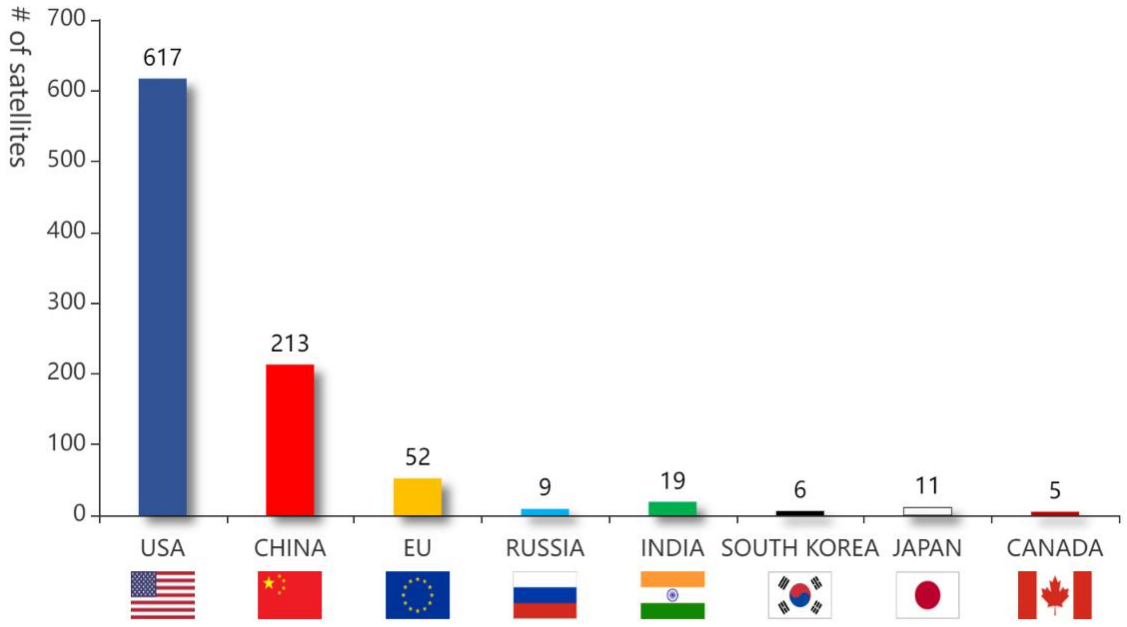



Figure 1.Global statistics of main operational land satellites (including micro satellites)

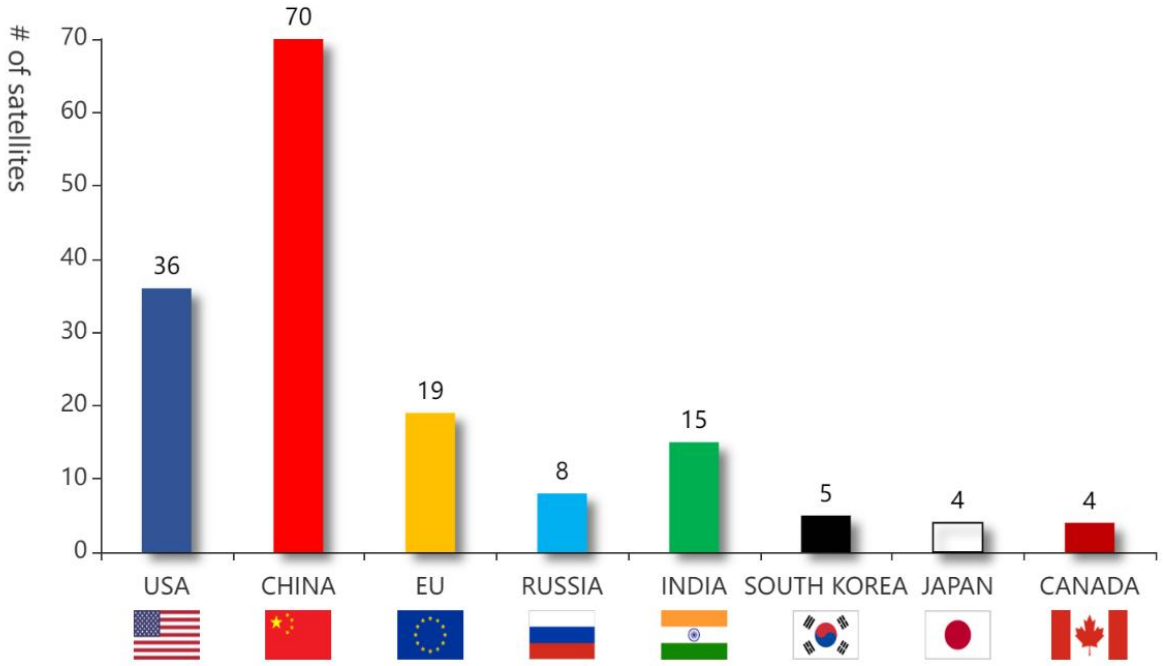
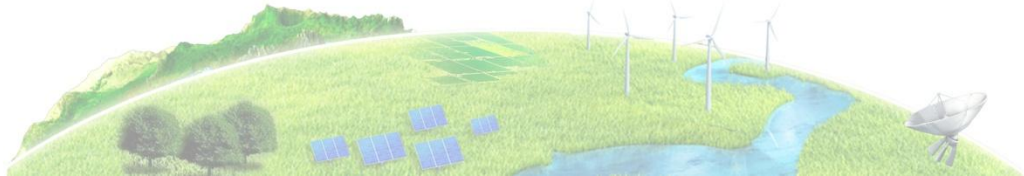



Figure 2.Global statistics of main operational land satellites (excluding micro satellites)



# Analysis of Global Remote Sensing Satellites

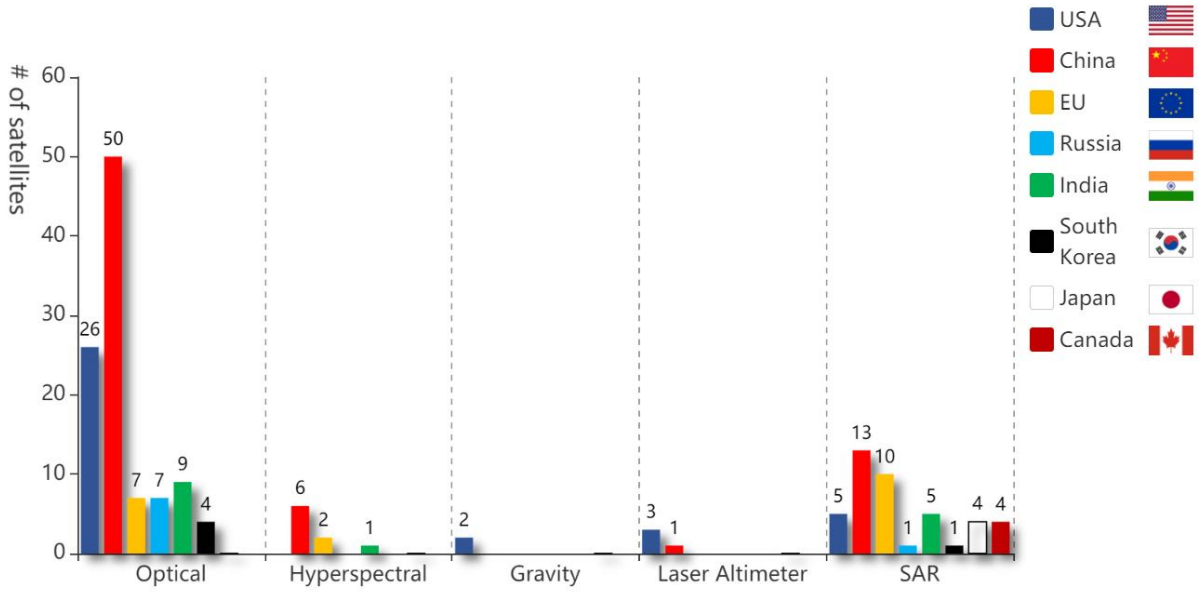



Figure 1.Global statistics of main operational land satellites by sensor and ownership (excluding micro satellites)

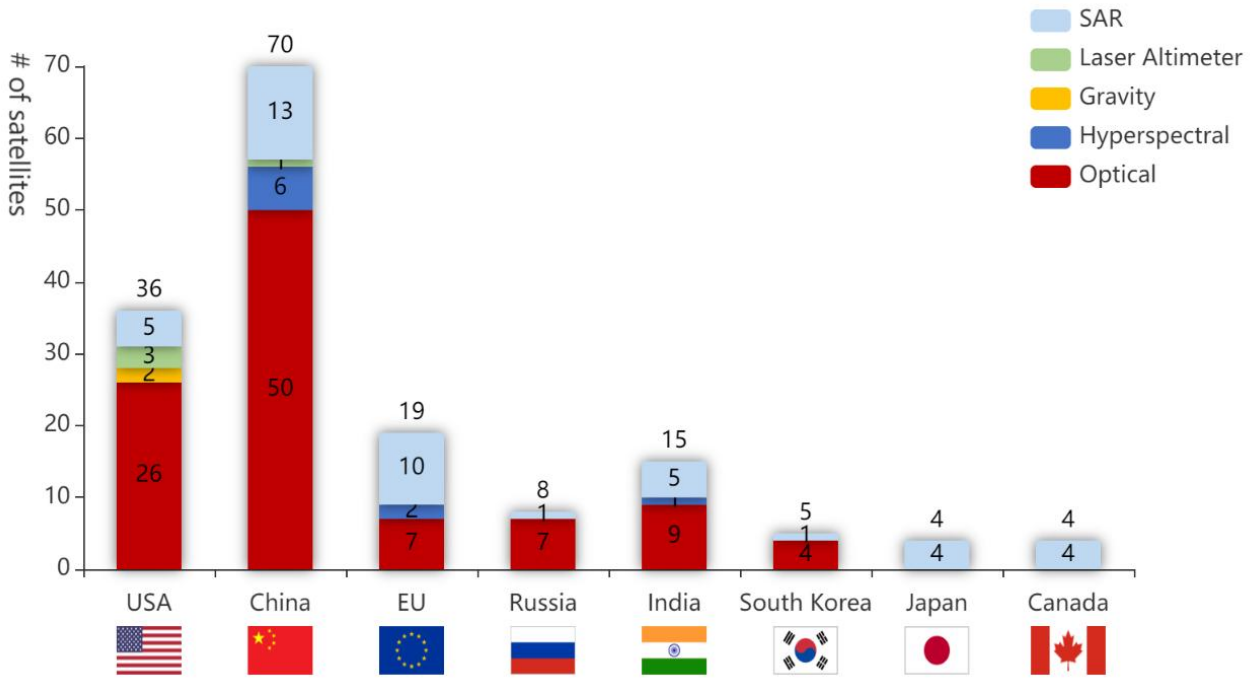
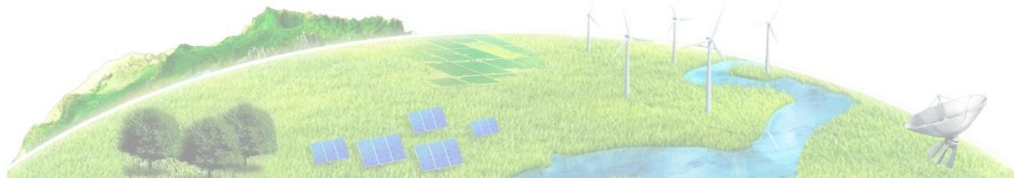



Figure 2.Global statistics of main operational land satellites by ownership (excluding micro satellites)



# Satellite Remote Sensing Technologies

**LT4**
Geosynchronous 20 meter SAR

**ZY3-01**
2.1mNAD、5.8MUX、3.5m DLC
**ZY3-02/03**
2.1m、2.7m DLC

**LT1Differential InSAR Satellite**
3mL-SAR

**HJ-2A/2B**
16mMUX、48m AHSI/VNI

**HJ-2E/2F**
5m S-SAR

**HJ Satellites**

**HJ-1A/B** 30mMUX、
100mAHSI、150m/300mVNI

**GF7 1:10000 Stereo Mapping Satellite**

**ZY1 02D/E,** 2.5m/10mVIS/NIR,30mAHSI

**ZY1 02C,** 2.36mPAN、5/10m MUX

**ZY Satellites**

**CBERS-04/04A**
5m/10mPMS、20mMUX、73mWFI

**GF Satellites**

**2m /8mConstellation**
2mPAN、8m MUX

**GF5**
first satellite observing land and atmosphere simultaneously in the world

**BJ-2**
0.8mPAN 3.2mMUX

**BJ-3**
0.5mPAN
2.0mMUX

**GF-4**
earth geostationary orbit satellite,
50m resolution

**GF-3**
1mCSAR

**JL-1**
constellation
108 satellites

**Commercial Satellite**

**GF-2**
0.8mPAN、3.2mMUX

**Ocean Satellites** HY-1C/D、HY-2A/B/C/D、CFOSAT、1mC-SAR/01

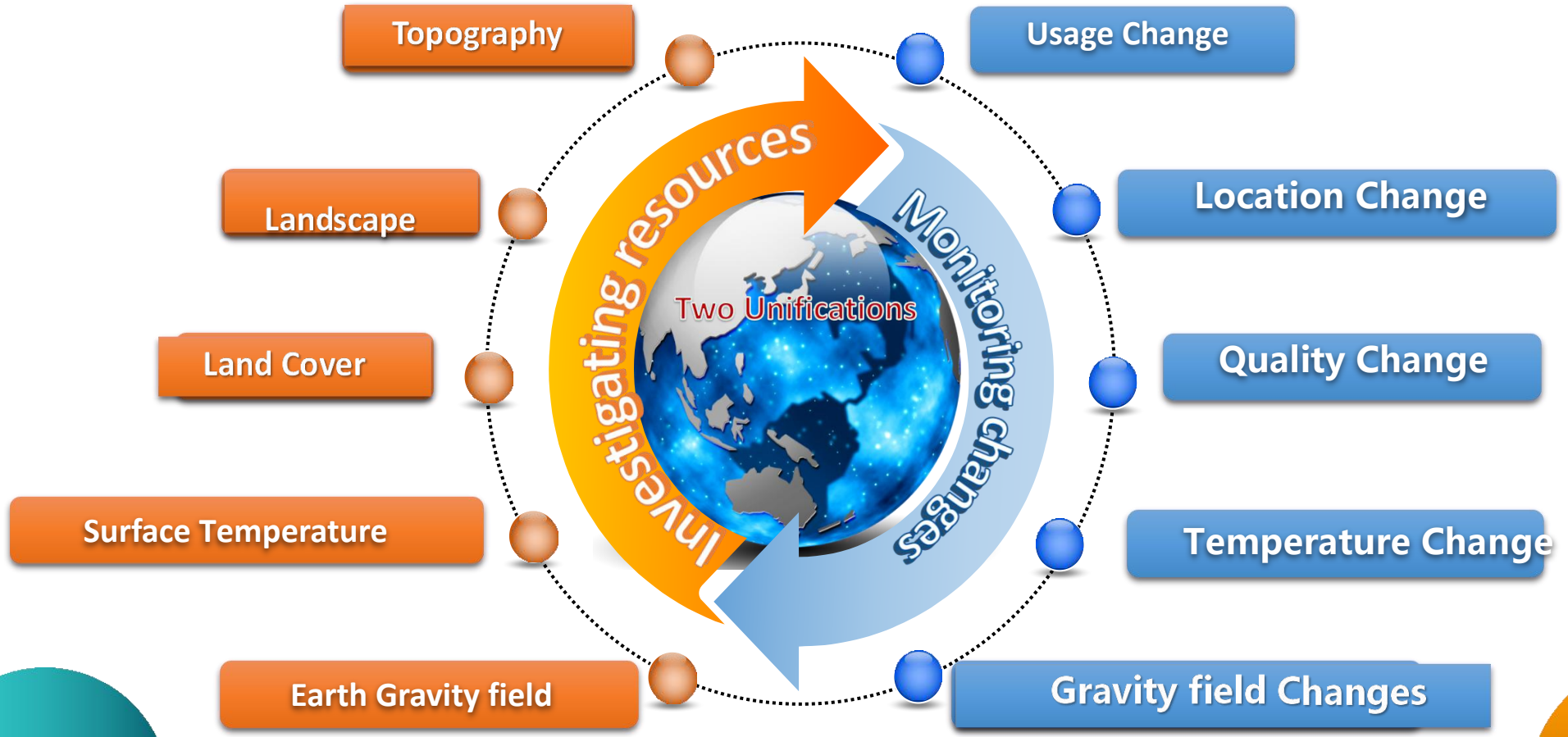
**GF-1、GF6**
2mPAN、8mMUX

**Meteorological Satellites** FY-2F/G/H、FY-4A/B、FY-3B/C/D/E、TANSAT

**SV1-01/02**
0.5mPAN、2mMUX

**ORBIT Constellation**
OVS/OHS 12 satellites network operation

# Satellites Types in MNR, China




Gravity satellite

Laser altimetry satellite

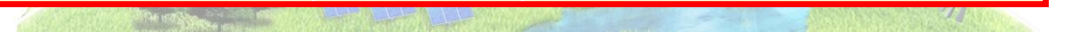
Optical (visible light) satellite

Hyper spectral satellite

Radar satellite

# China's Land Satellites

| Type | Satellite | Quantity | Launch Time | Major Payloads | Resolution (meters) | Main Purposes |
|---|---|---|---|---|---|---|
| Optical | **ZY3** | 3 | 2012，2016，2020 | optical, near-infrared laser altimeter (02, 03 satellites) | **2**/8 | 1:50000 stereo mapping |
| | **ZY1** | 1 | 2011 | optical, near-infrared | 2.36/10 | natural resources monitoring |
| | **GF1** | 4 | 2013， 2018 | optical, near-infrared | 2/8 | feature update, natural resources monitoring |
| | **GF2** | 1 | 2014 | optical, near-infrared | 0.8/3.2 | feature update, natural resources monitoring |
| | **GF7** | 1 | 2019 | optical, near-infrared laser altimeter | **0.65**/0.79 | 1:10000 stereo mapping |
| | **GFDM** | 1 | 2020 | optical, near-infrared, polarization detection, atmospheric exploration | 0.41/1.64 | feature update, natural resources monitoring |
| Hyperspectral | **ZY1 02D/E** | 2 | 2019，2021 | optical, near-infrared, hyper-spectral | 2/20 | geological survey, vegetation fine classification |
| Radar | **3m L-SAR** | 2 | 2022 | L-SAR | 3/6/12/30 | topographic mapping |



# GF-7Satellite and 1:10,000 satellite surveying and mapping

## ZY-3 Without GCPs

**Positioning accuracy→10m**

**Elevation accuracy ≤ 5m**

**Directly meet the precision requirements of 1:50,000 in hilly, mountainous and alpine areas.**

## ZY-3 With GCPs

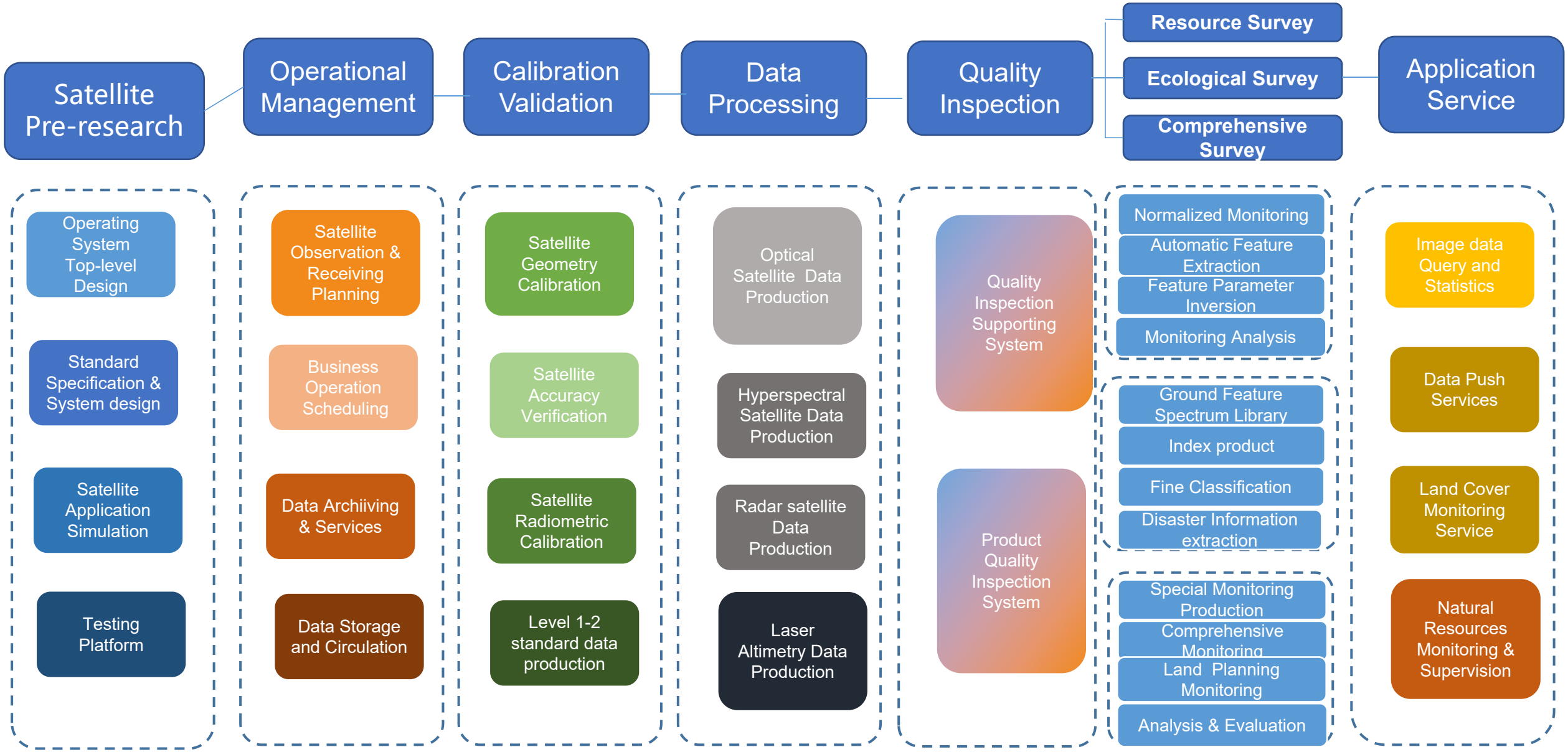
**Plane precision≤3m,Elevation precision ≤2m**

**Comprehensively superior to the parameters designed for 1:50,000 stereo mapping satellite**

**The Elevation Precision has been improved from 5m to 1.5m!**

| Technical Parameter | | ZY3 | GF-7 |
|---|---|---|---|
| Resolution(m) | | NAD 2.1<br>FWD/BWD 3.5 | FWD 0.65<br>BWD 0.80 |
| Baseline height ratio | | 0.882 | 0.6 |
| Gray quantization value | | 10bit | 10bit |
| None-control precision | Plane(m) | 10 | 5 |
| | Elevation(m) | 5 | 1.5 |
| Precision With Control Point | Plane(m) | 3 | 0.8 |
| | Elevation(m) | 2-3 | 0.6 |

# 技术体系 Technology System



# 运行能力 Operation Capacity

## Satellite in Orbit

- 8 2-meter optical Sats
- 3 submeter optical Sats
- 2 hyper spectral Sat
- 2 Radar Sat

## Data Acquisition

- Average daily 80 passes
- Daily average of 9500scenes
- Daily average of 15TB

## Data Processing

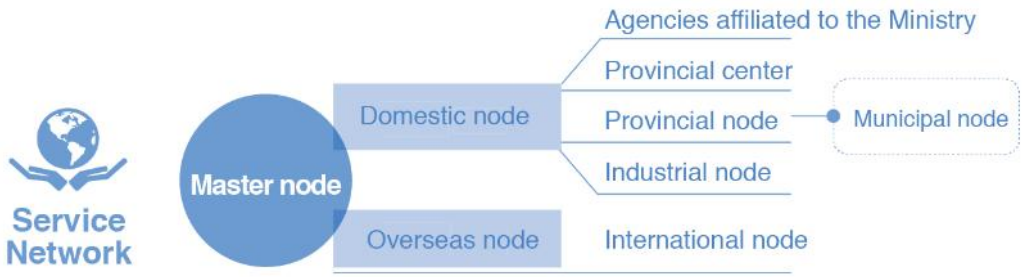
- Daily data processing: image data acquisition, processing and quality inspection and distribution at the same day
- Monthly conclusion: the monitoring images are archived monthly and uploaded to the cloud within the same month

## Product System

- Visible light product system: SC, DOM, DSM, DOM+...
- Hyperspectral product system: index products, vegetation growth products...

# International Data sharing and Service

**35 international nodes, 10229 batches, 294927scenes, 380 TB data push in total, Covered 95 countries and 18 regions**


**1. High-resolution（2m） satellite data free of charge under the 3/5 year MOU/writing consents.**

**2.Data sources include images of such Chinese satellite as ZY3-01/02/03,GF1-B/C/D and ZY1-02C/02D**

**http://www.sasclouds.com/english/home**

| Software and hardware configurations | |
|---|---|
| Equipment | Basic Requirement |
| Server | 8 Core, 16GB RAM |
| HHD | 2TB to 10TB |
| Internet | >20MB/S |
| Operation System | WIN Server 2012 / 2016 |
| Browser | IE 11 / Chrome 49.0 |
| Client * | Query, Management, Receiving, Statistics |

* Deployed by LASAC (can be configured remotely )

| | 国家 Country | 合作机构 Cooperation Partners | 开通时间 Time | 覆盖率% Coverage | | 国家 Country | 合作机构 Cooperation Partners | 开通时间 Time | 覆盖率% Coverage | | 国家 Country | 合作机构 Cooperation Partners | 开通时间 Time | 覆盖率% Coverage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 亚洲 ASIA 13 | 泰国 Thailand | 泰国地理信息与空间技术发展局GISTDA | 2017 | 100 | 非洲 AFRICA 12 | 乌干达 Uganda | 乌干达国家公路局 Uganda National Roads Authority | 2017 | 99 | 欧洲 EUROPE 4 | 英国 UK | 英国诺丁汉大学 University of Nottingham | 2017 | 46 |
| | 老挝 Laos | 老挝内政部国家测绘局 NGD | 2017 | 100 | | 加纳 Ghana | 加纳苏尼亚尼自然资源与能源大学 UENR | 2018 | 100 | | 奥地利 Austria | 维也纳大学地球科学地理和天文学院 UNIVIE | 2017 | 100 |
| | 蒙古国 Mongolia | 蒙古土地管理、大地测量和制图局 ALAMGC | 2017 | 100 | | 赞比亚 Zambia | 赞比亚大学 University of Zambia | 2019 | 100 | | 挪威 Norway | 挪威测绘地籍管理局NGO | 2017 | 90 |
| | 斯里兰卡 Sri Lanka | 斯里兰卡测绘局 Survey Department | 2018 | 97 | | 卢旺达 Rwanda | 卢旺达航天局 RSA | 2021 | 100 | | 俄罗斯 Russia | 俄罗斯科学院空间观测科学研究所 AEROCOSMOS | 2020 | 1.2 |
| | 孟加拉 Bangladesh | 孟加拉测绘局 Survey Department | 2018 | 98 | | 埃及 Egypt | 埃及航天局 EgSA | 2021 | 100 | 拉丁美洲 Latin Ameri-ca 4 | 委内瑞拉 Venezuela | 委内瑞拉国家航天局ABAE | 2018 | 96 |
| | 尼泊尔 Nepal | 尼泊尔国家土地管理、合作和减贫部测绘局 Survey Department | 2018 | 100 | | 埃塞俄比亚 Ethiopia | 埃塞俄比亚空间科学与地理空间研究局SSGI | 2023 | 100 | | 秘鲁 Peru | 秘鲁国家航空航天研究与发展委员会CONIDA | 2021 | 99 |
| | 柬埔寨 Cambodia | 柬埔寨亚星资源集团有限公司 | 2018 | 100 | | 尼日利亚 Nigeria | 尼日利亚国家空间研究与发展局 NASRDA | 2023 | 100 | | 阿根廷 Argentina | 阿根廷国家空间活动委员会 CONAE | 2022 | 99 |
| | 印度尼西亚 Indonesia | 印度尼西亚国家航天局 LAPAN | 2019 | 81 | | 津巴布韦 Zimbabwe | 津巴布韦国家地理空间和航天局 ZINGSA | 2023 | 100 | | 墨西哥 Mexico | 墨西哥国家统计与测绘局INEGI | 2023 | 100 |
| | 约旦 Jordan | 约旦皇家地理中心 RJGC | 2019 | 100 | | 塞内加尔 Senegal | 塞内加尔国家空间规划局 ANAT | 2023 | 100 | 国际组织 Int'l Organiz-ations 3 | 非洲资源测绘发展区域中心 RCMRD | | 2016 | 97 |
| | 亚美尼亚 Armenia | 亚美尼亚共和国教育、科学、文化和体育部科学委员会、亚美尼亚共和国国家科学院 Science Committee MESCS RA, NAS RA | 2022 | 100 | | 科特迪瓦 Côte d'Ivoire | 科特迪瓦国家技术和发展研究局 BNETD | 2024 | 100 | | 联合国空间科学技术教育西亚区域中心 RCSSTEWA | | 2019 | 100 |
| | 印度 India | 德里大学 University of Dehli | 2023 | / | | 佛得角 Cabo Verde | 佛得角国家土地管理局INGT | 2024 | 100 | | 联合国粮食及农业组织 FAO | | 2021 | 84 |
| | 塔吉克斯坦 Tajikistan | 塔吉克斯坦国家科学院科学与新技术创新发展中心 CIDSNT | 2023 | 97 | | 喀麦隆 Cameroon | 喀麦隆国家气候变化观测站 ONACC | 2025 | 99.95 | | | | | |

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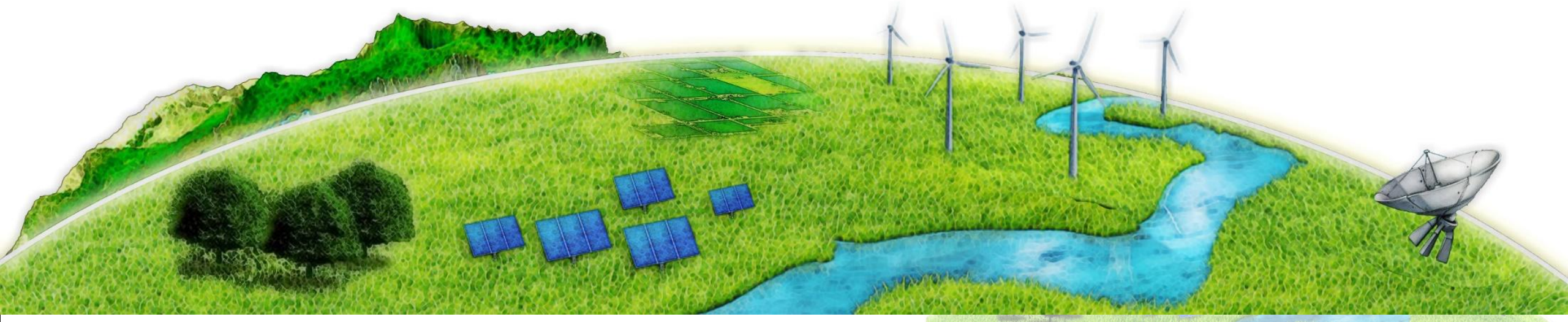
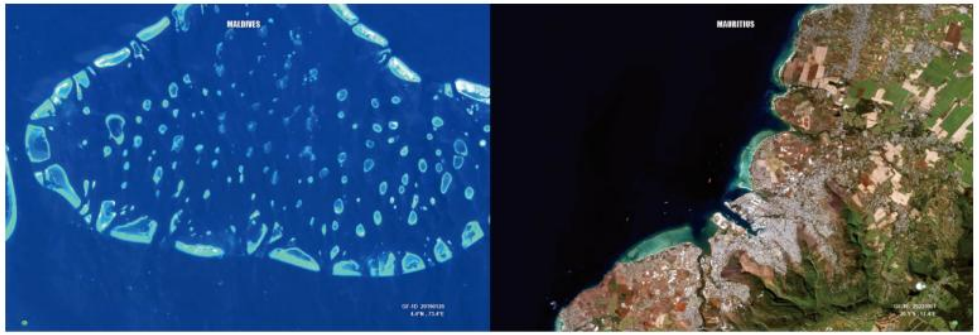


# Difficulties of Data Acquiring for SIDS and PICTs



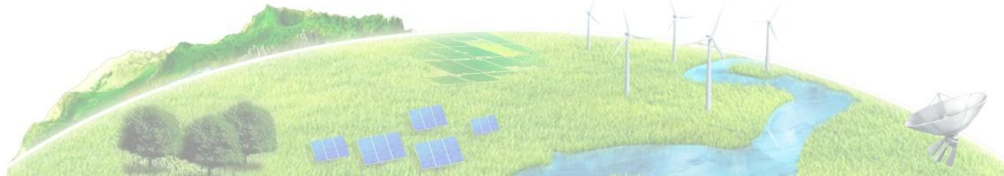





Open Source:
ESA,NASA
Sentinel 10-meter
Landsat 15-meter

MNR:
ZY3， 2m8m Sat(GF1-B/C/D) ,
5m Sat(ZY1-02D/E) 2-meter

Lack of satellite system to turn on the camera over the seas



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| | 蒙古国 Mongolia | 蒙古土地管理、大地测量和制图局 | 2017 | 100 | | 赞比亚 Zambia | 赞比亚大学 University of Zambia | 2019 | 100 | | 挪威 Norway | 挪威测绘地籍管理局NGO | 2017 | 90 |
| | 斯里兰卡 Sri Lanka | 斯里兰卡测绘局Survey Department | 2018 | 97 | | 卢旺达 Rwanda | 卢旺达航天局 RSA | 2021 | 100 | | 俄罗斯 Russia | 俄罗斯科学院空间观测科学研究所 AEROCOSMOS | 2020 | 1.2 |
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| | 柬埔寨 Cambodia | 柬埔寨亚星资源集团有限公司 | 2018 | 100 | | 尼日利亚 Nigeria | 尼日利亚国家空间研究与发展局 NASRDA | 2023 | 100 | | 阿根廷 Argentina | 阿根廷国家空间活动委员会 CONAE | 2022 | 99 |
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| | | 塔吉克斯坦国家科学院科 | | | | 喀麦隆 Cameroon | 喀麦隆国家气候变化观测站 | 2025 | 44.85 | | | | | |

# International Cooperation on SIDS

- Support FAO Hand in Hand Initiative- SIDS
- MoU and Implementation Agreement signed on 14 DEC 2021
- Support UN-GGKIC

| No. | Name of PICT | Land Area (km2) | Area Under Programming (km2) | 2021 Data Coverage Rate |
|---|---|---|---|---|
| 1 | Independent State of Papua New Guinea | 468595.83 | 72168.04 | 84.60% |
| 2 | Commonwealth of the Northern Mariana Islands | 512.22 | 2.16 | 99.58% |
| 3 | French Polynesia | 4037.77 | 1437.63 | 64.40% |
| 4 | The Territory of Guahan | 589.66132 | 0.00 | 100.00% |
| 5 | Republic of Kiribati | 1260.08 | 897.52 | 28.77% |
| 6 | Cook Islands | 280.33 | 233.38 | 16.75% |
| 7 | Republic of the Marshall Islands | 203.26 | 72.88 | 64.14% |
| 8 | American Samoa | 224.46 | 129.20 | 42.44% |
| 9 | Federated States of Micronesia | 703.70 | 26.42 | 96.25% |
| 10 | Niue | 297.71 | 0.00 | 100.00% |
| 11 | Republic of Palau | 467.54 | 0.00 | 100.00% |
| 12 | Pitcairn | 58.86 | 9.38 | 84.06% |
| 13 | Independent State of Samoa | 3048.07 | 0.00 | 100.00% |
| 14 | Solomon Islands | 29389.92 | 3615.52 | 87.70% |
| 15 | Kingdom of Tonga | 760.09 | 59.99 | 92.11% |
| 16 | Tuvalu | 30.52 | 6.82 | 77.65% |
| 17 | Tokelau | 20.55 | 0.72 | 96.50% |
| 18 | Wallis and Futuna | 185.58 | 19.69 | 89.39% |
| 19 | Republic of Vanuatu | 13266.32 | 31.94 | 99.76% |
| 20 | New Caledonia | 21779.44 | 307.79 | 98.59% |
| 21 | Republic of Nauru | 18.263787 | 0.00 | 100.00% |
| 22 | Republic of Fiji Islands | 20096.67 | 2816.50 | 85.99% |
| Sum | | 565826.83 | 81835.58 | 85.54% |


- GEO PIAG

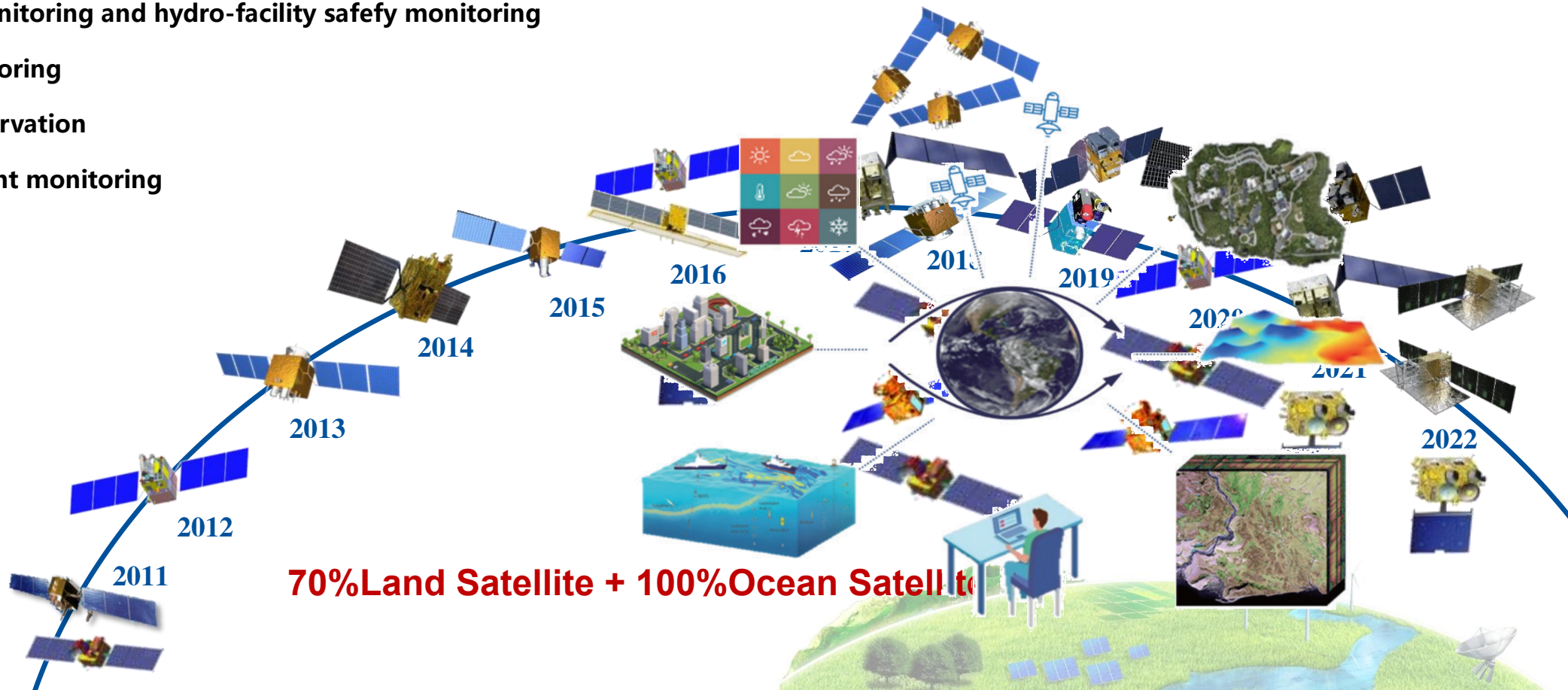
2021-2024


# Satellite RS Technology Application in various domains

**More than 100 kinds of satellite remote sensing technology application**

- **Land management and monitoring**
- **Mineral resources exploration**
- **Road network safety monitoring**
- **Flood disaster monitoring and hydro-facility safefy monitoring**
- **Earthquake monitoring**
- **Metrological observation**
- **Ocean environment monitoring**
- **……**

- Atmosphere environment and water environment pollution monitoring
- Crop and forest conditions moniroting and yield estimation, pest&disease monitoring
- Geological disaster warning and monitoring



# Priorities of Applications in PICTs

## Tier 1

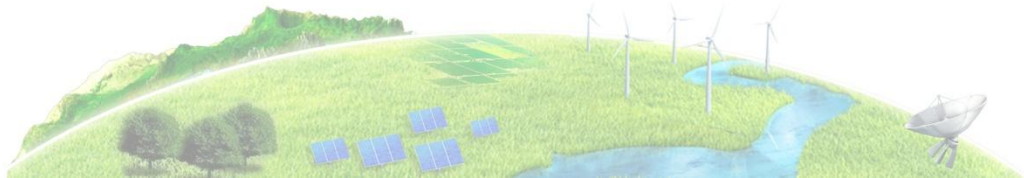
- Land Cover Change Detection
- Coastline Change Detection
- Agricultural Census
- Vegetation Indexes – Crop and Disease Detection

## Tier 2

- Hazards Impact Mapping - Cyclones, Tsunami, Droughts
- Digital Elevation Models - for Coastal Inundation
- Fishing Vessels Tracking - Unregulated
- Mapping Buildings and Population
- Mangroves Change Detection
- Near-Shore Bathymetry

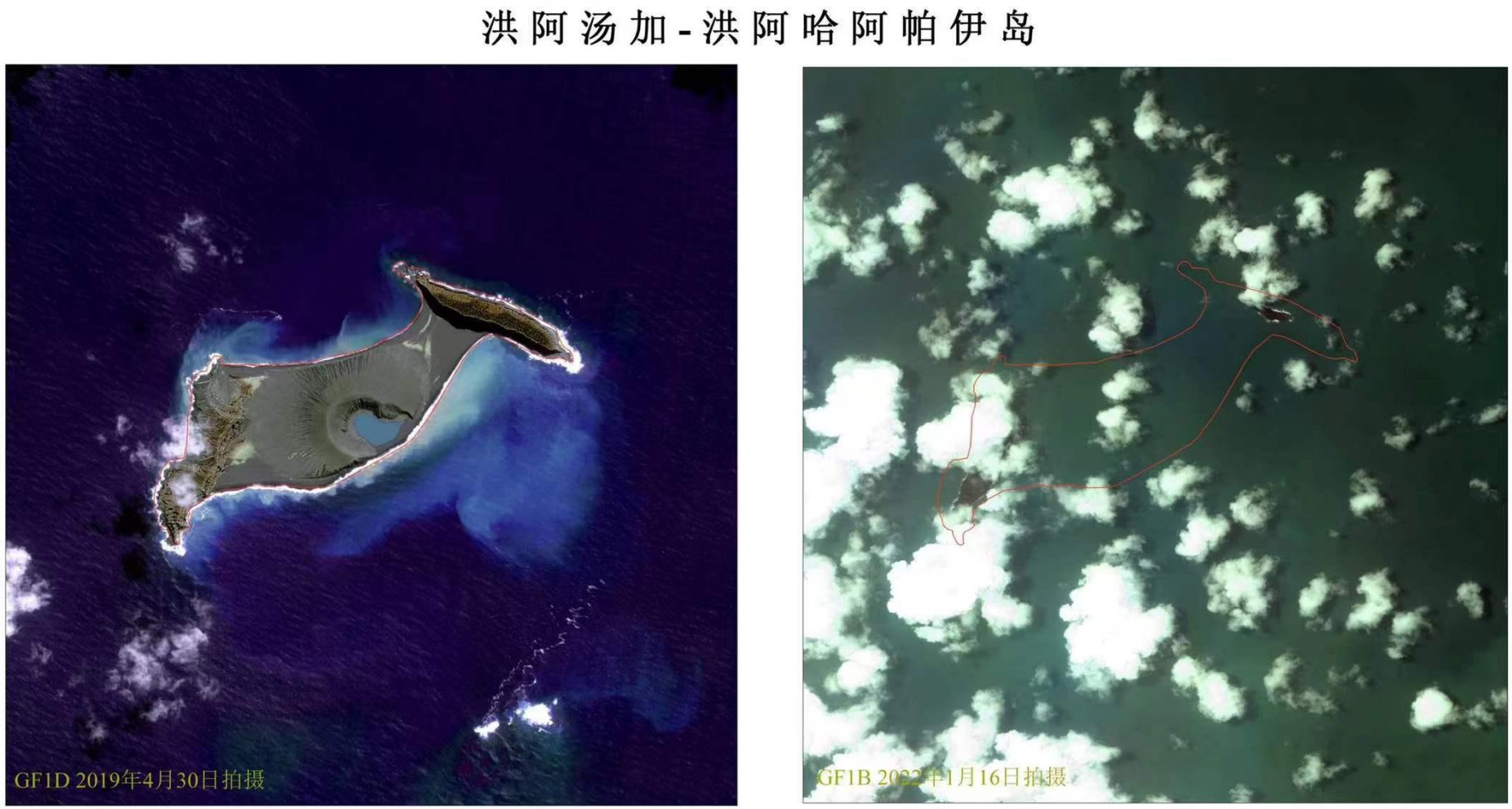

Other areas thematic areas of interest include environment impact assessment and disaster waste mapping.

Source:Pacific Satellite Data Needs Report,PIAG, October 2023



# Disaster Response to UNESCAP and SPC for Tonga

## Hunga Haapai

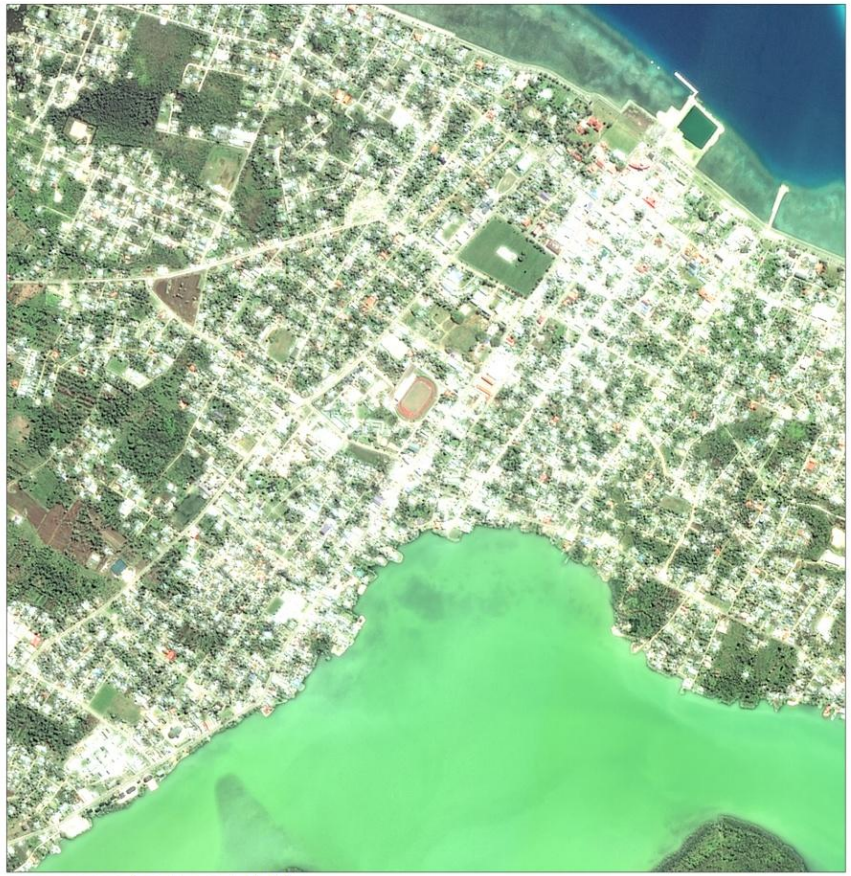



- 10 post-disaster scenes of Chinese satellites on the cloud server
- Disaster analysis

# Disaster Response to UNESCAP and SPC for Tonga

## Nukualofa

汤加首都-努库阿洛法



GF1B 2020年8月26日拍摄
火山喷发前

2米分辨率

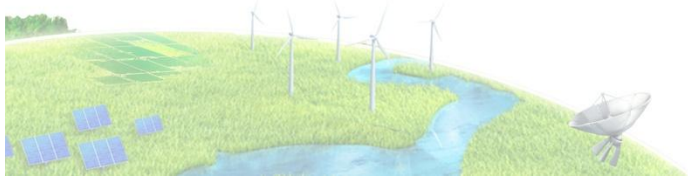
GF7 2022年1月17日拍摄
火山喷发后

0.65米分辨率

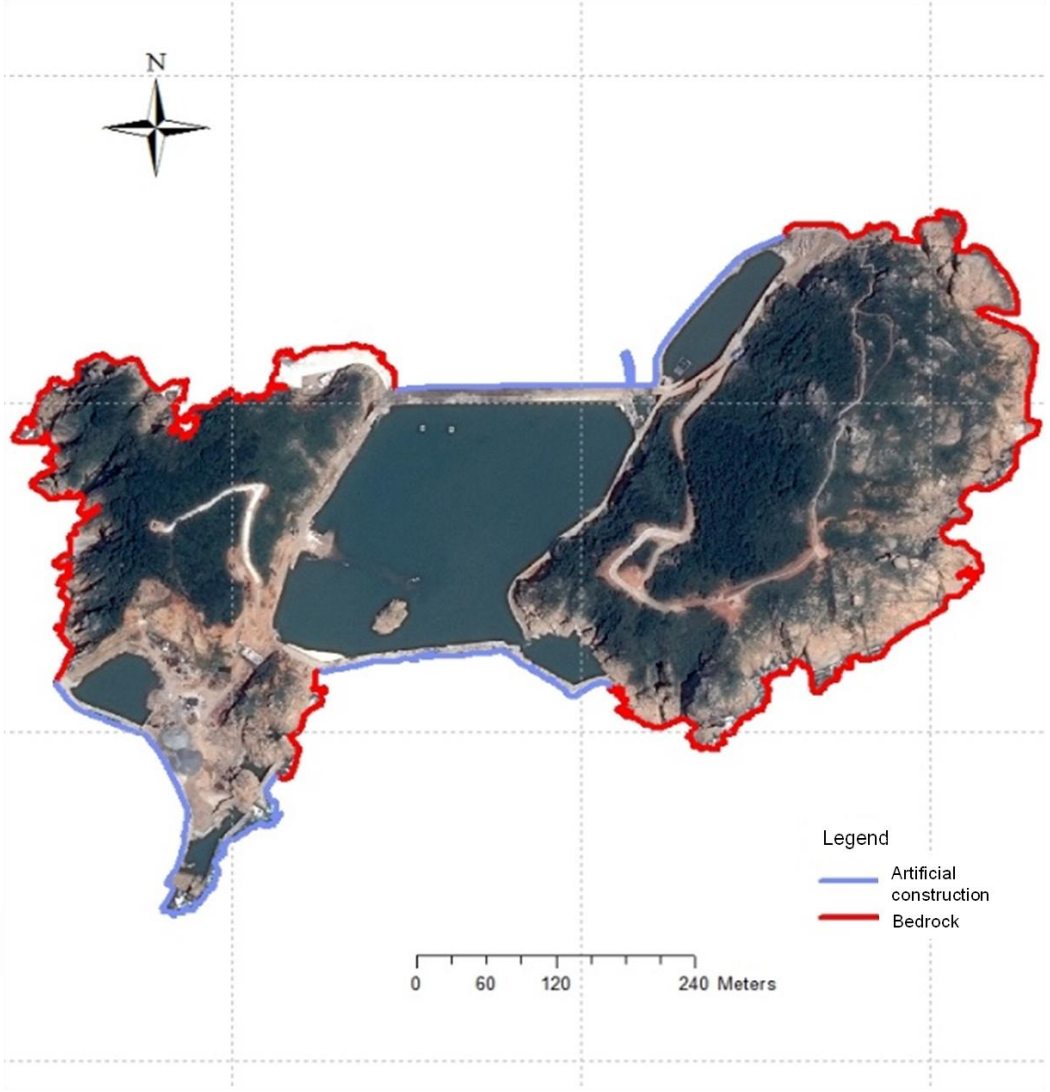
自然资源部国土卫星遥感应用中心

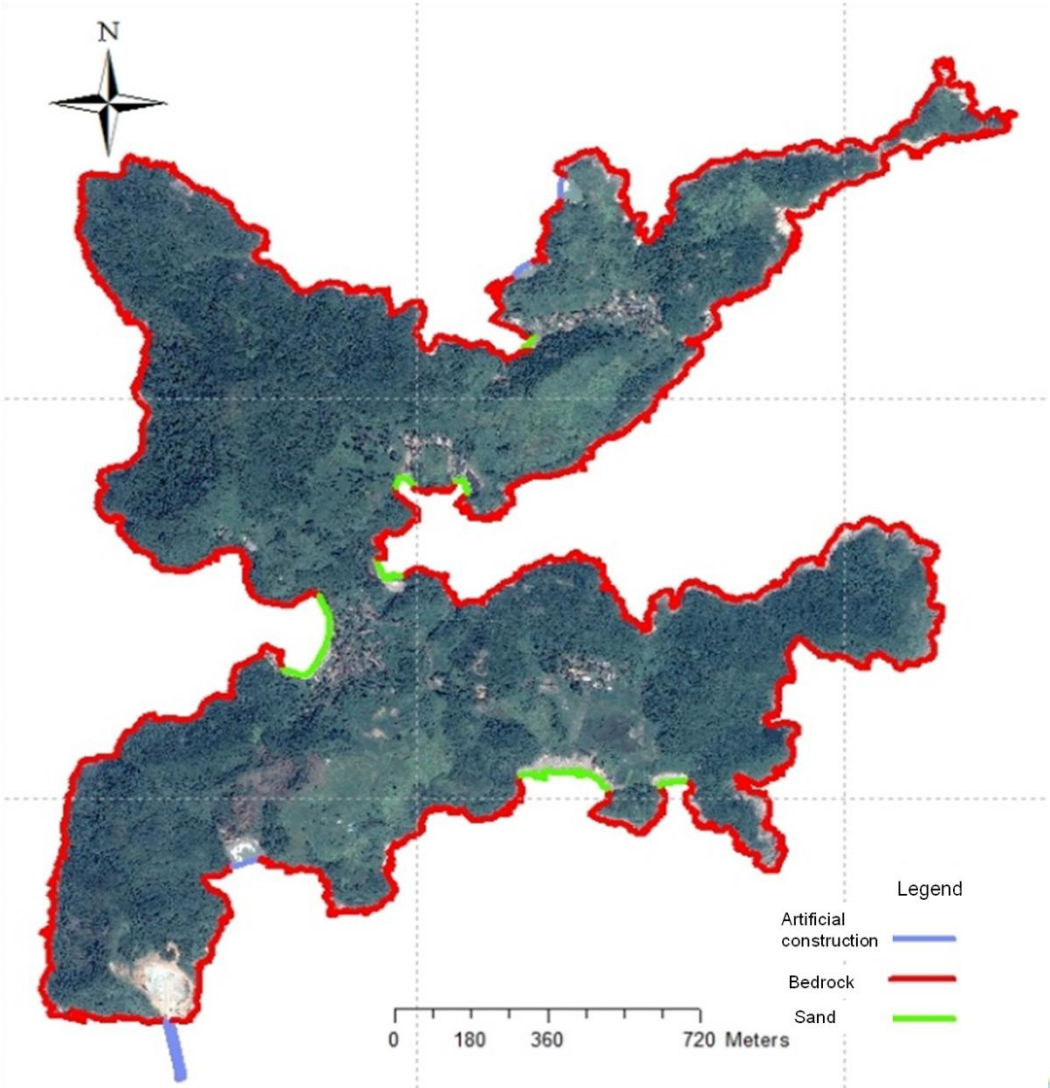
制图时间：2022年1月19日

- **Real-time remote sensing monitoring**
  For forest fire, flood, landslide, debris flow and other natural disasters and geological disasters
- **4 emergency maps**
  "traffic map + 3D terrain map + pre-disaster high-definition image map + Post-disaster high-definition image interpretation map "
- **Hour-level response and continuous observation** for 5 days after disaster

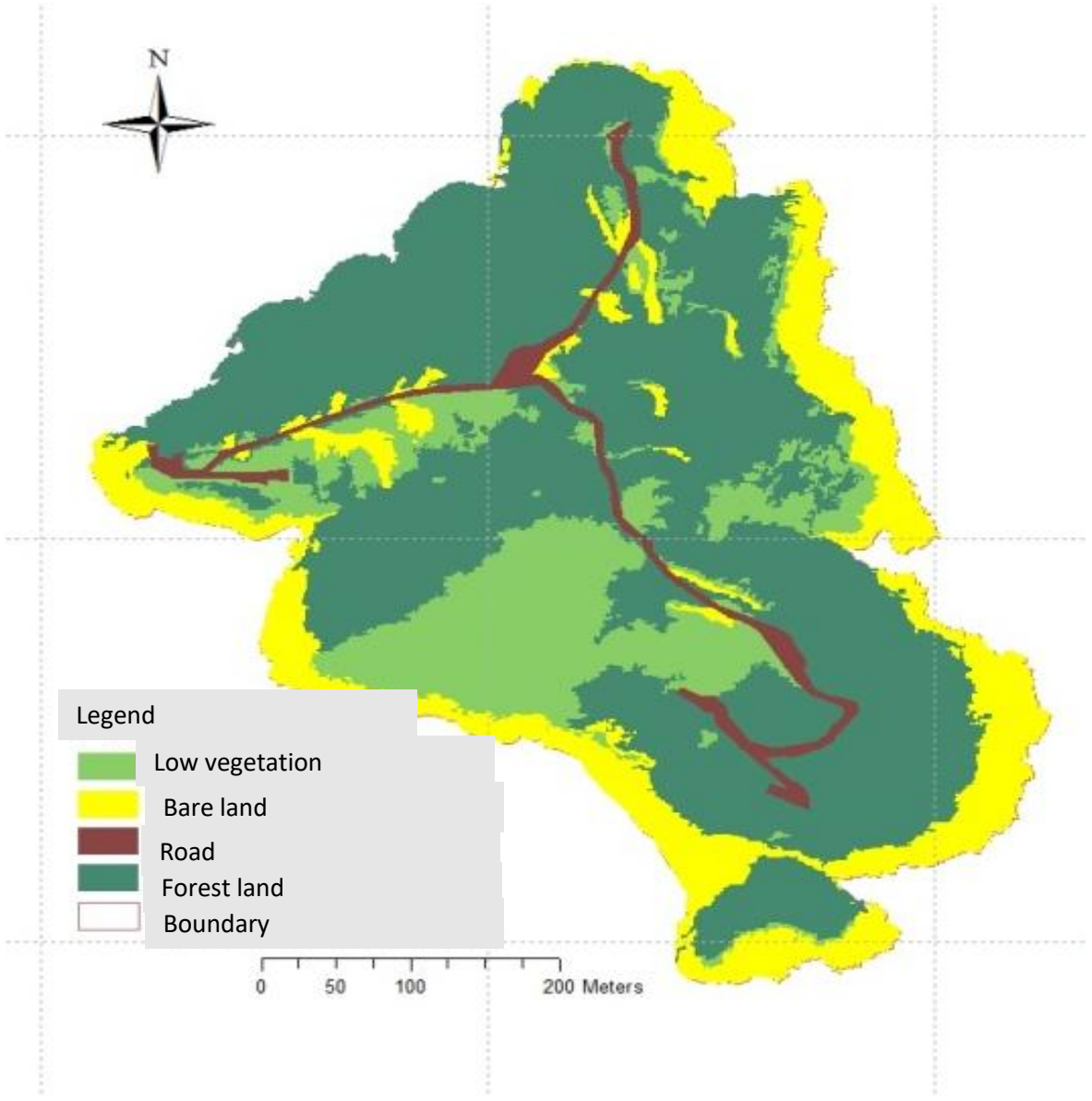


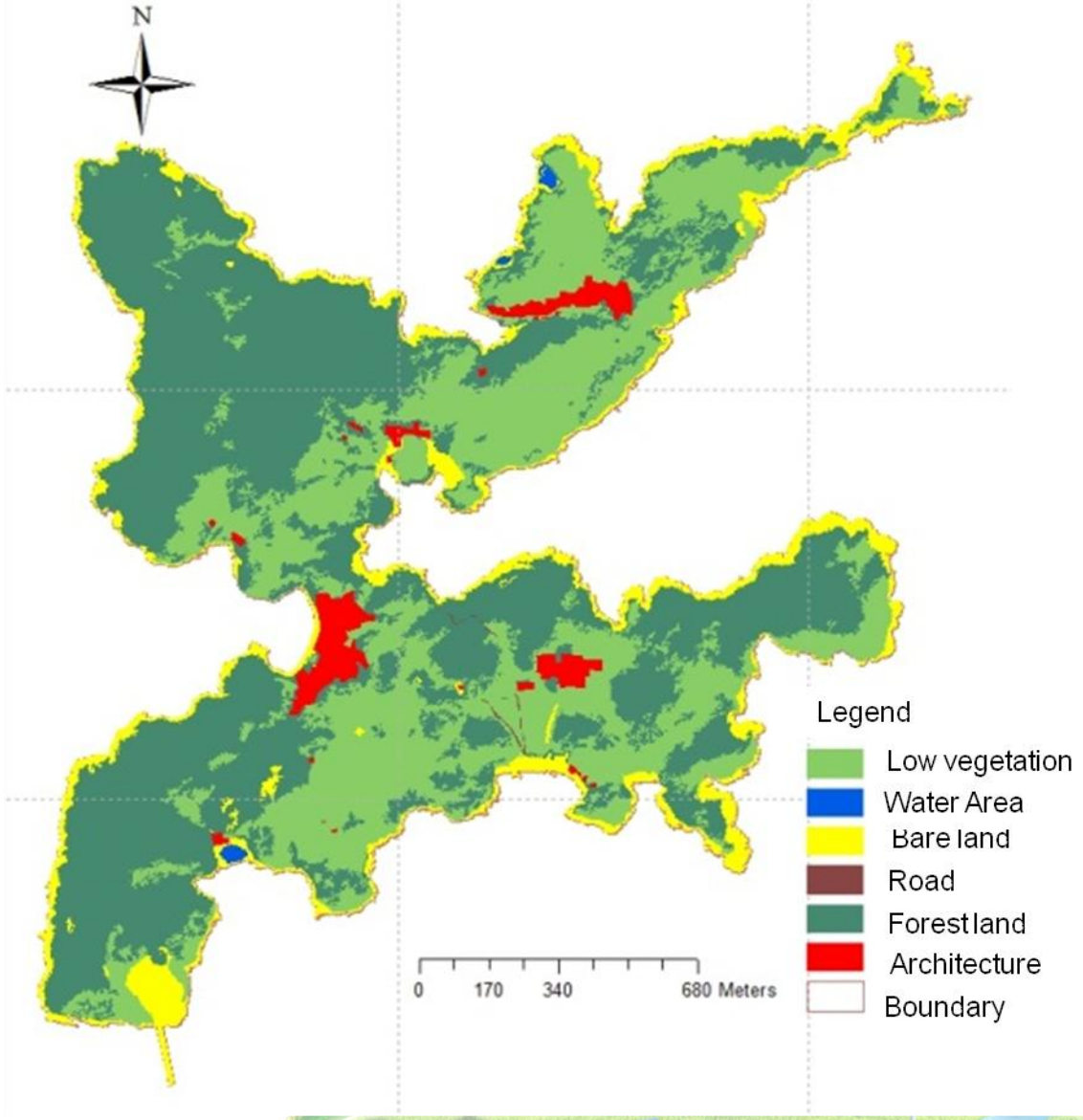
# Island Coastline Monitoring



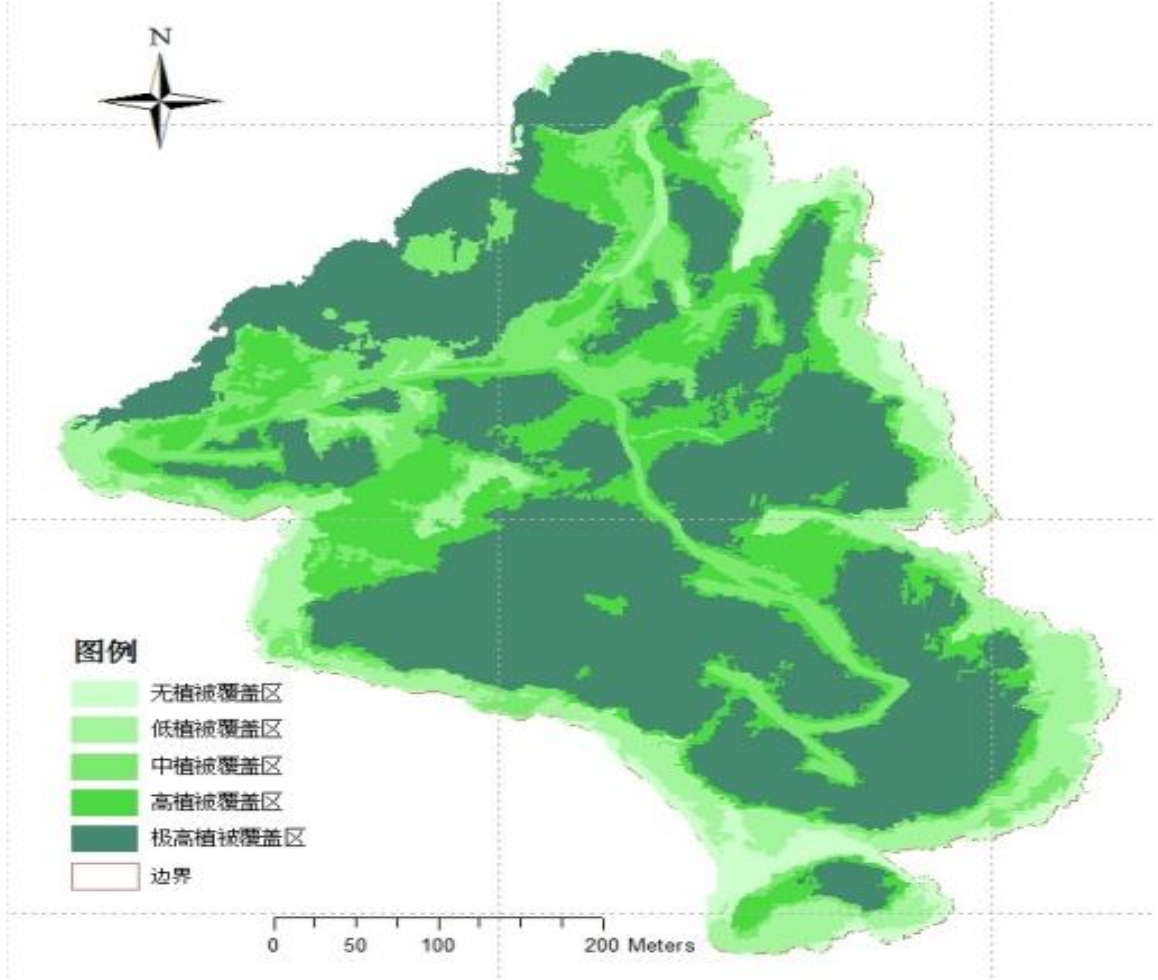



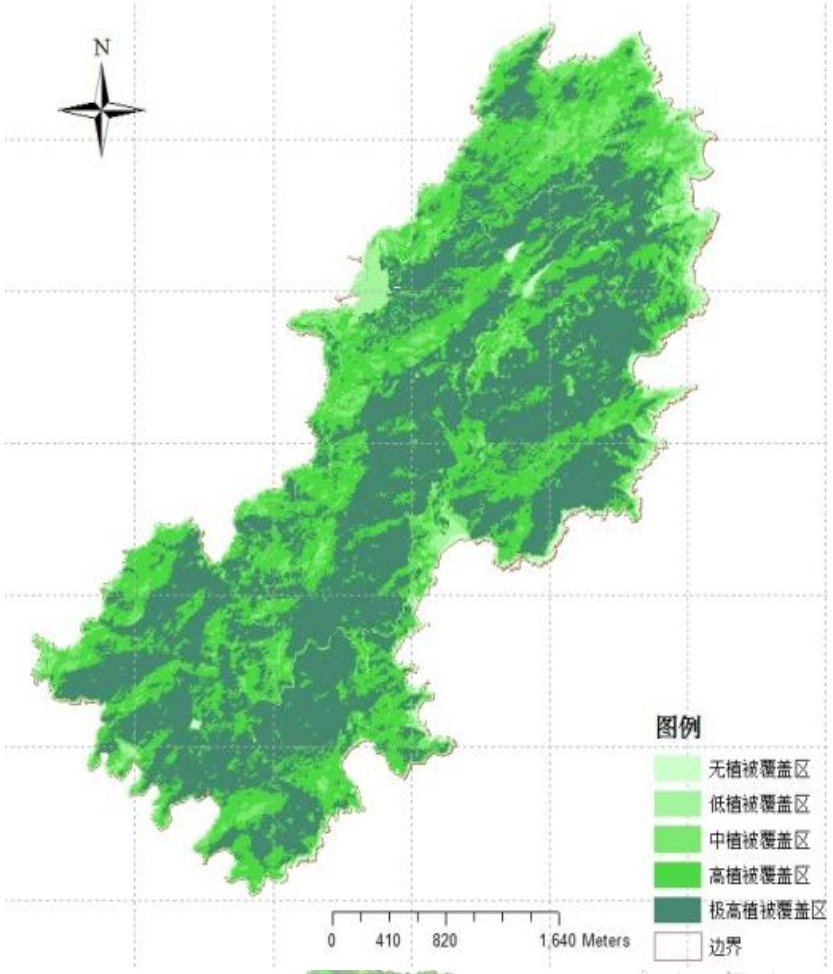

# Island Land Use Monitoring




# Island NDVI

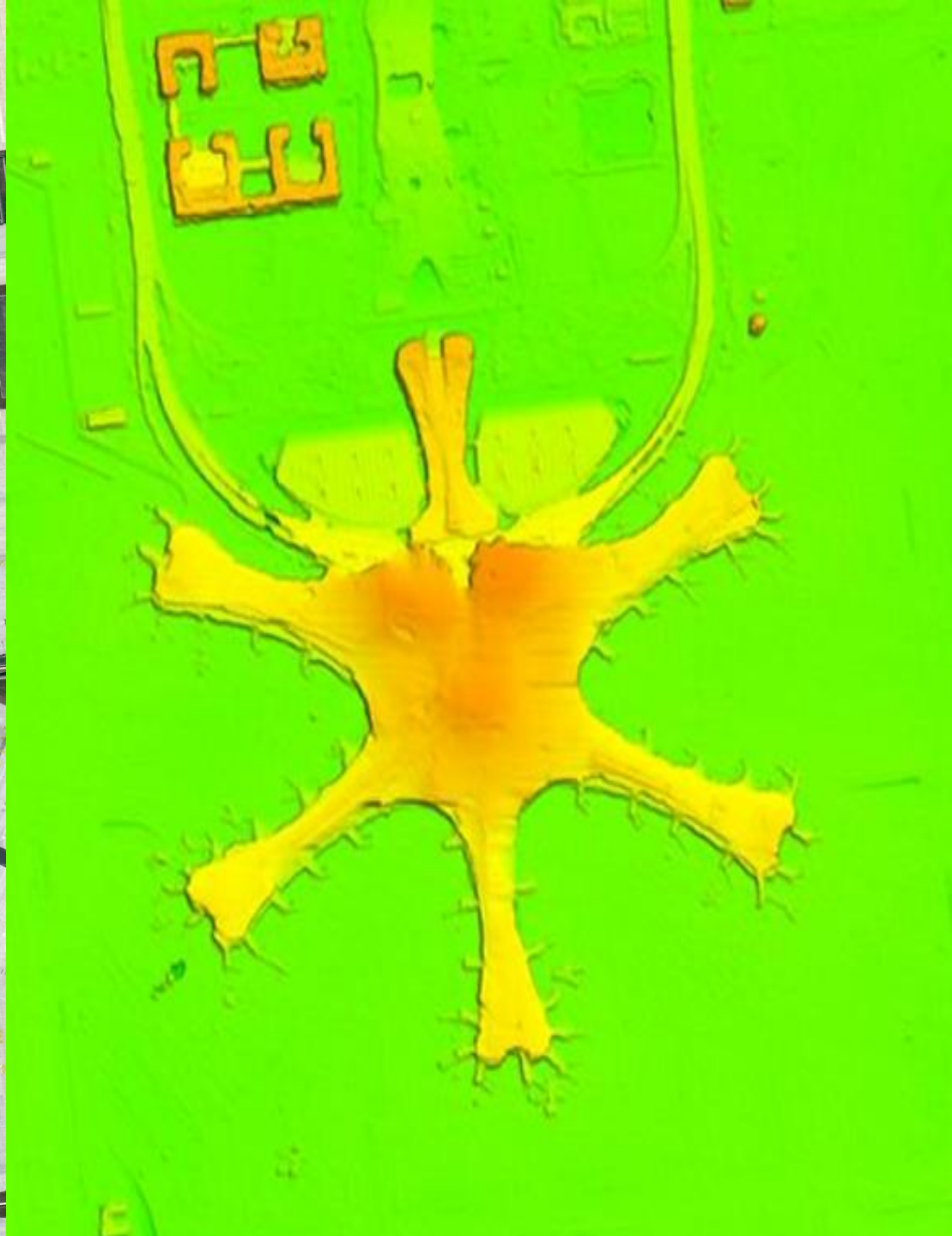


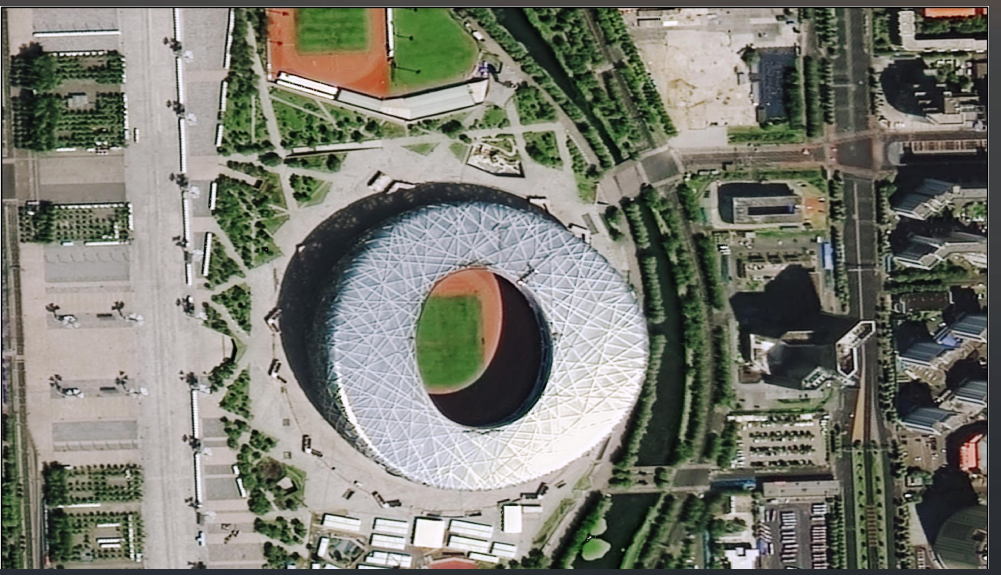




By NDVI（0%-20%，20%-40%，40%-60%，60%-80%，80%-100%）

# RCNN-based remote sensing image target detection

Beijing Daxing Airport





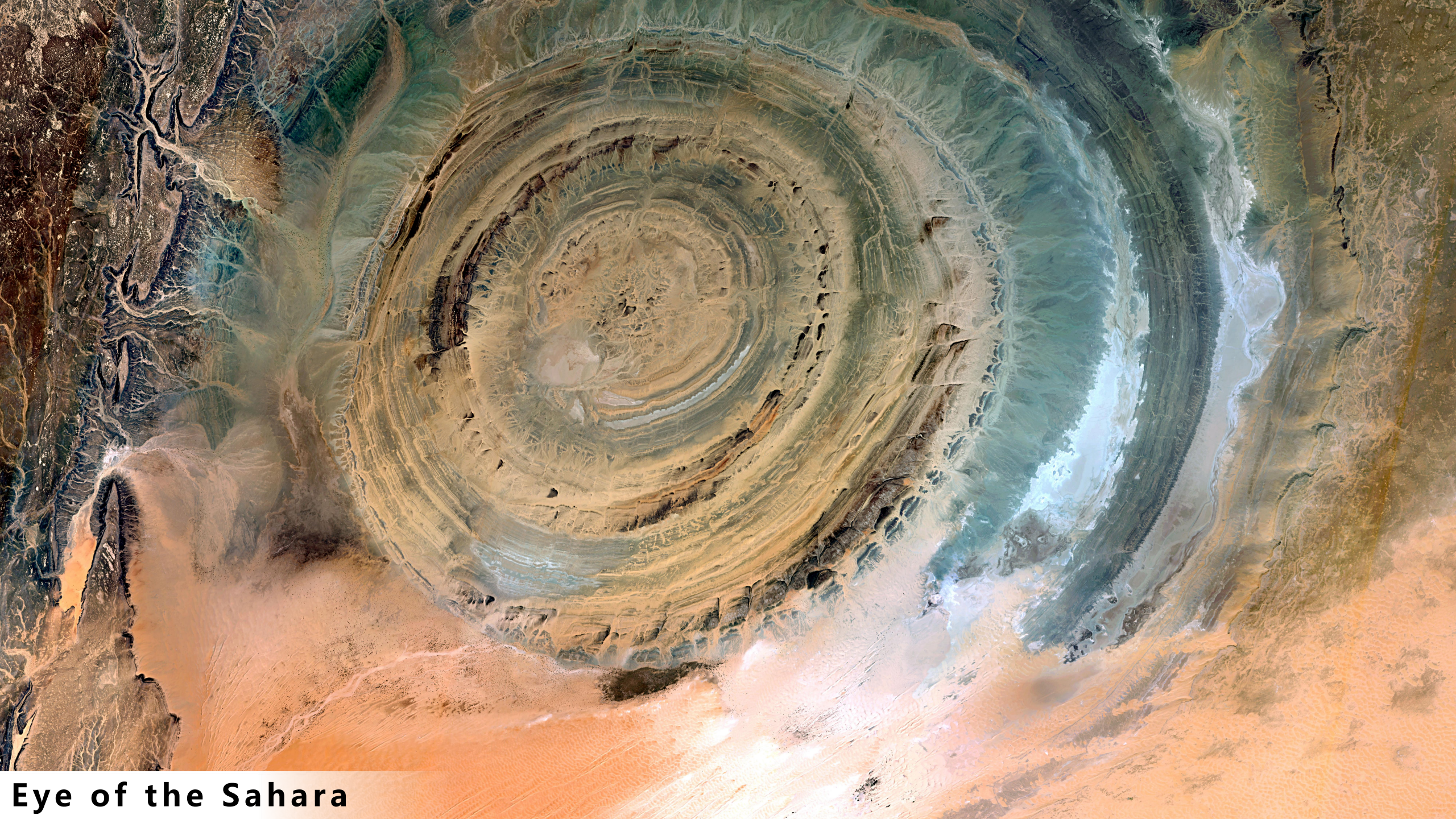
Beijing National Stadium

GF-7 3D Scene

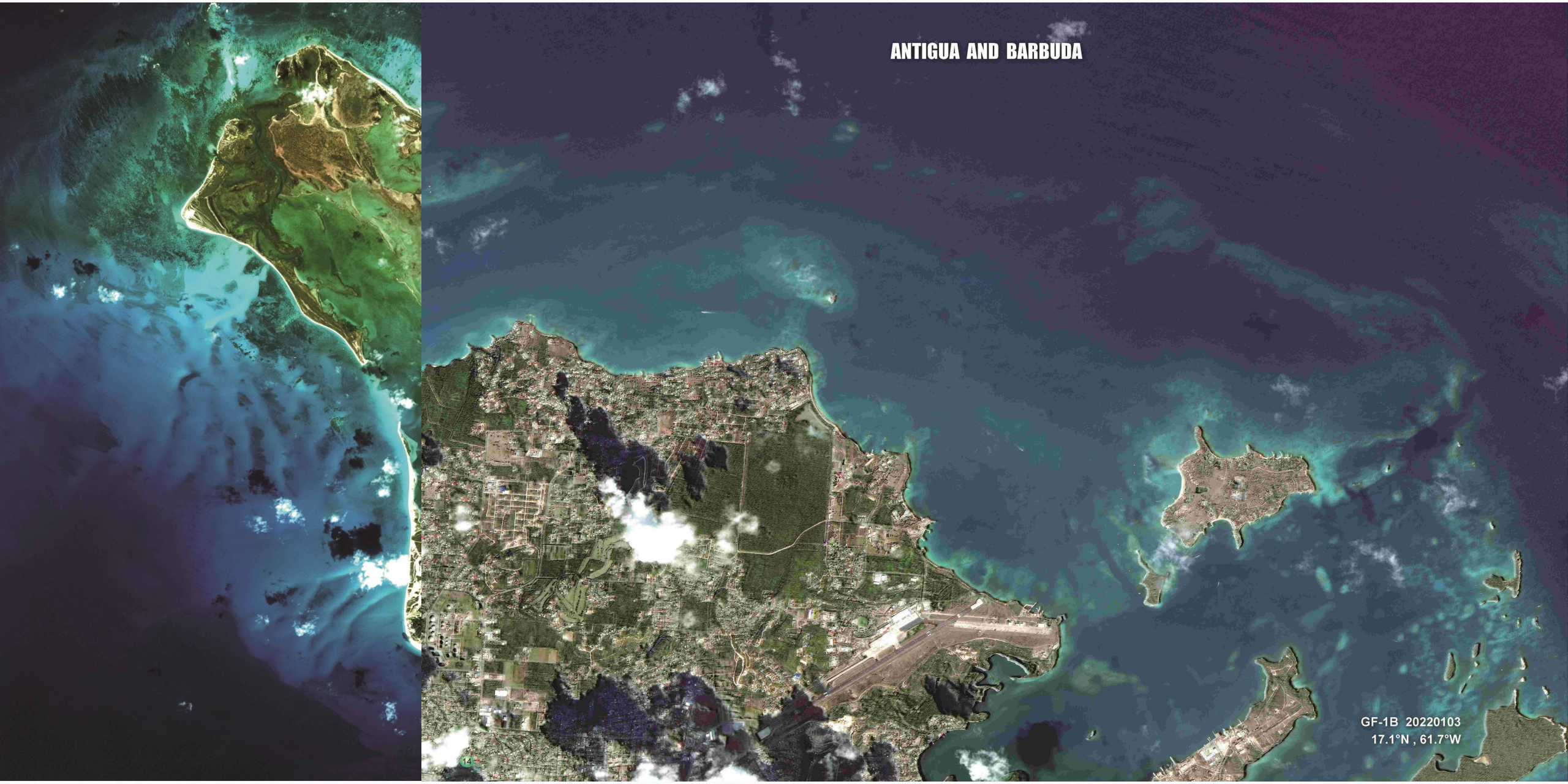
Winter in Songhua River

Zhongguancun,Beijing

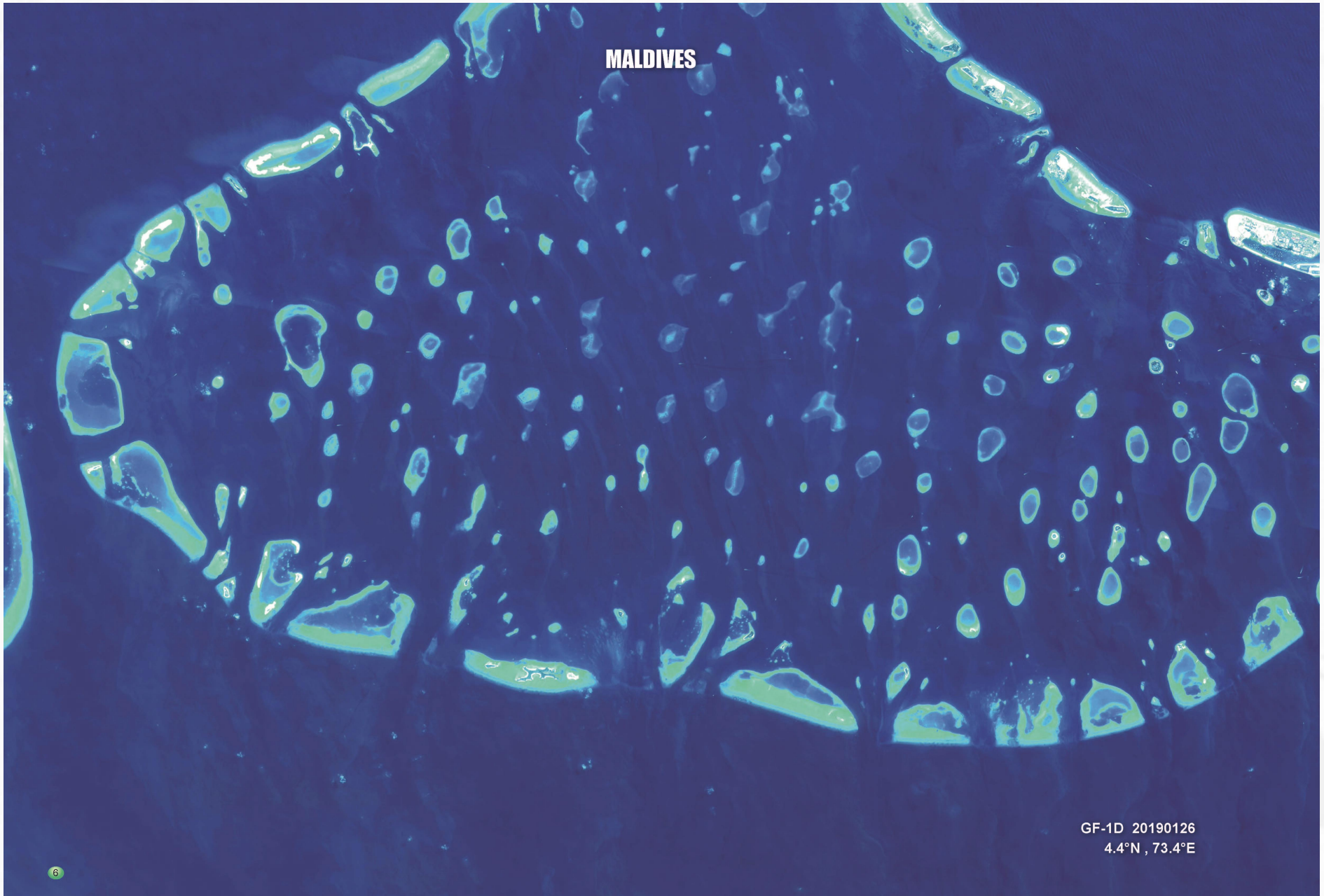
Pyramid



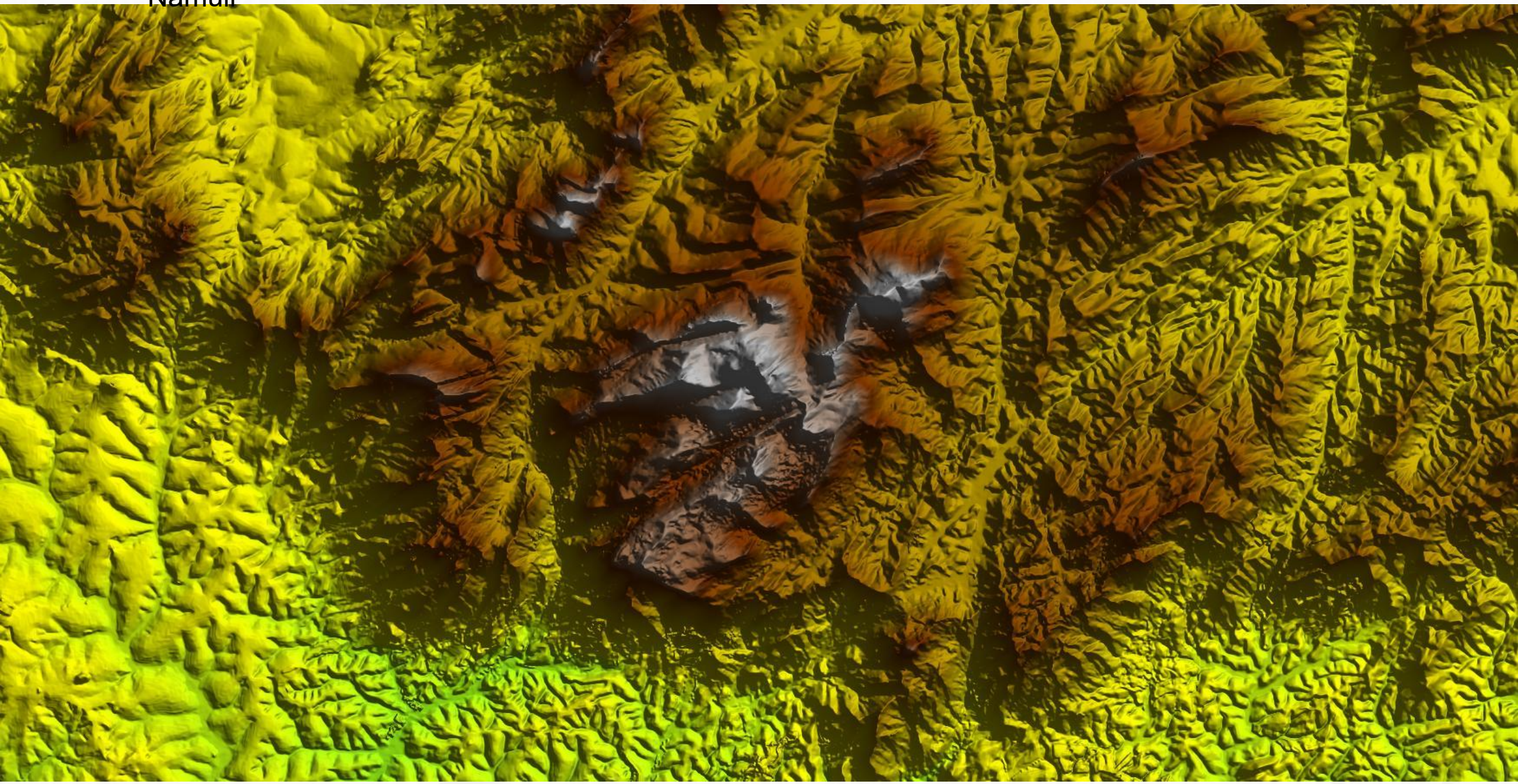
Eye of the Sahara


ANTIGUA AND BARBUDA
GF-1B 20220103
17.1°N , 61.7°W

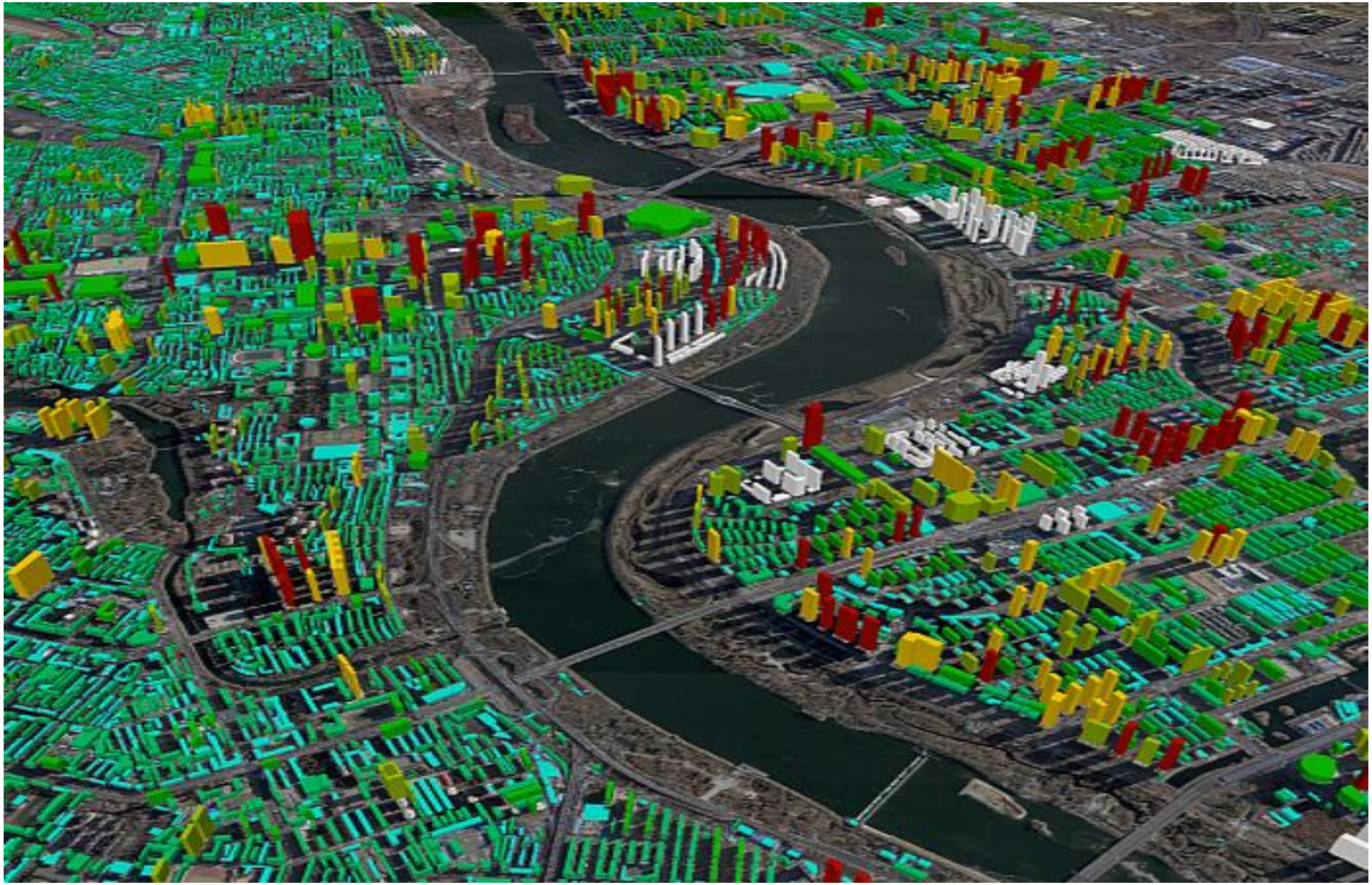

SAO TOME AND PRINCIPE
GF-2 20220125
0.4°N , 6.5°E


MALDIVES
GF-1D 20190126
4.4°N , 73.4°E

Namuli



# GF-7 Satellite and 1:10,000 mapping



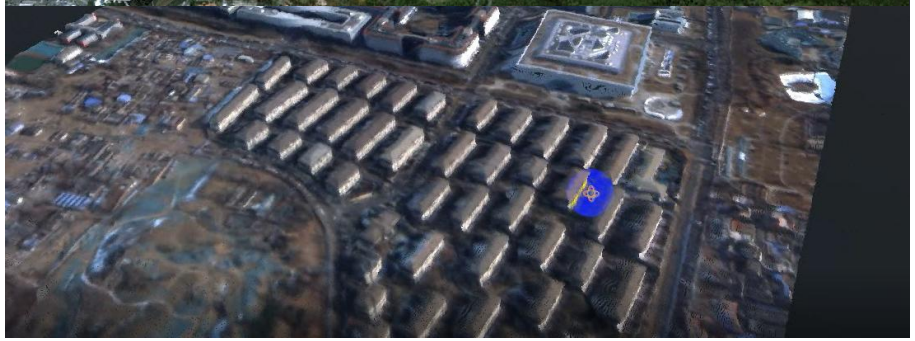
Elevation Accuracy:
3-5m (without laser)
1.5m (with laser altimetry)

# SDP

## Stereo

DSM

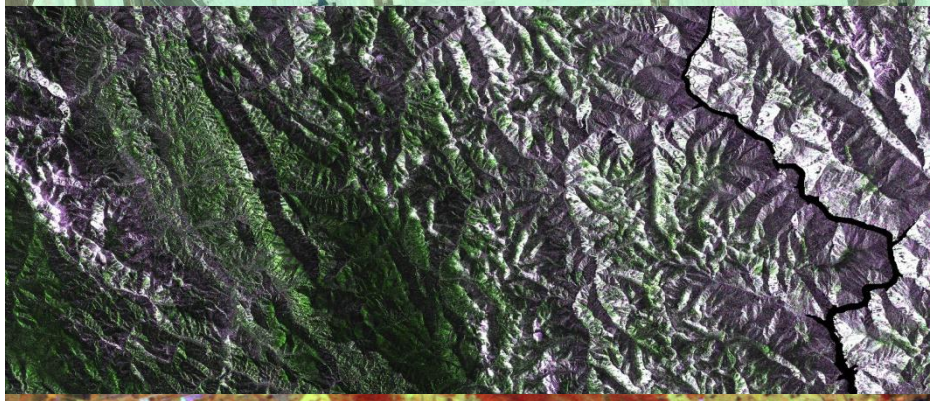
Point Cloud



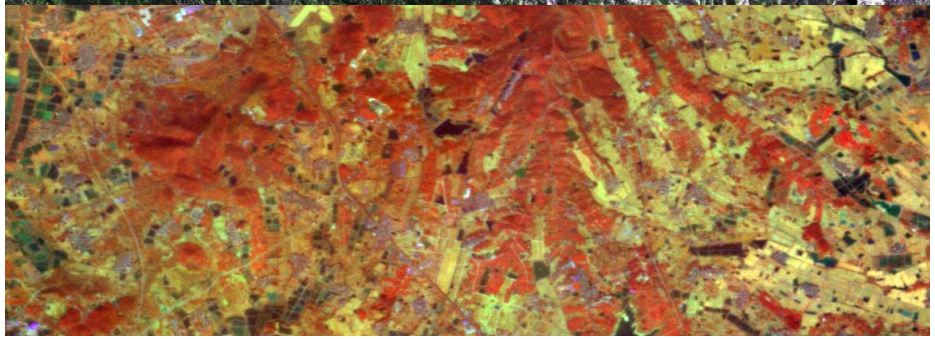
3D Model

## Non-Stereo

Optical DOM



SAR DOM



Hyper-Spectral DOM

# Feature Automatic Extraction

**Automatic extraction of architectures, roads, water bodies and airports**

AI Interpretation

Dynamic Change Detection

RS Quantitative Inversion

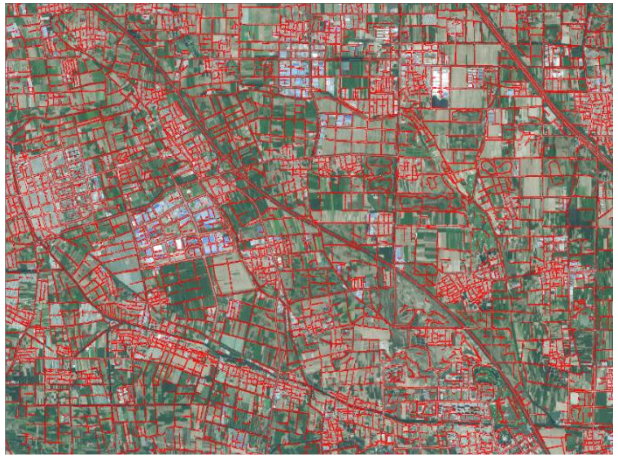
**Monitoring and warning index system**

Land Cover Change | Topography Change | Changes of ecological characteristic parameters

Dynamic Perception

Forecast and Early Warning

Architectures



Roads

Water Body

Airports

# Feature Automatic Extraction

## Photovoltaic power monitoring

Onsite Photo

Image Feature

## Wind power monitoring

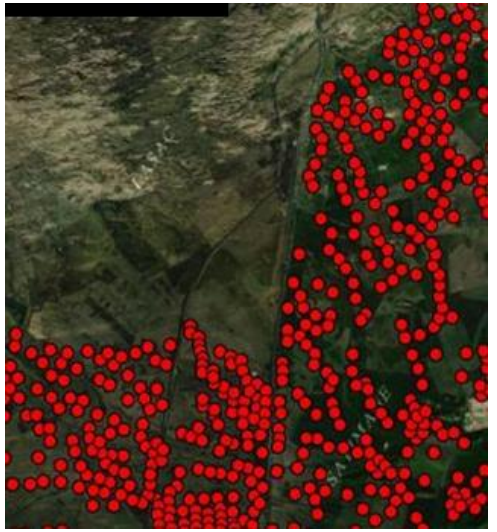


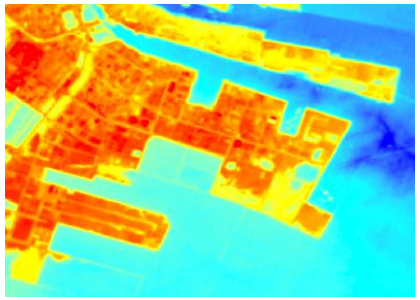
Image Feature

Onsite Photo

# Temperature Monitoring

**Thermal infrared remote sensing monitoring and temperature inversion**

**Thermal infrared data**



**ZY3**

**GF1**

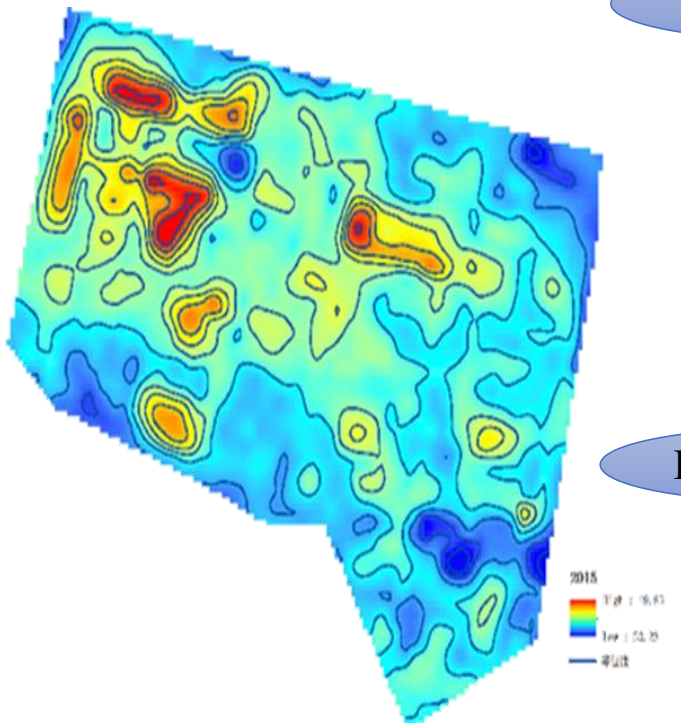


Image screening

Cloud mask

Radiometric correction

Atmospheric correction

Surface emissivity calculation

Re-sampling

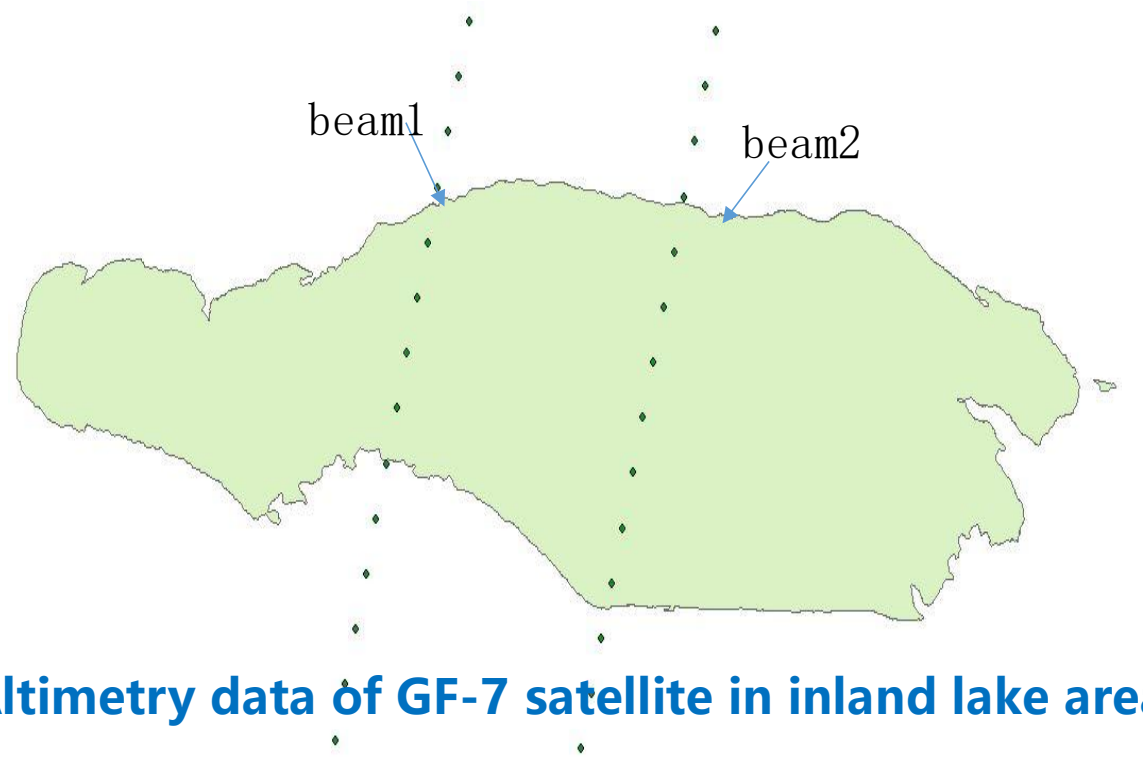
Land surface temperature inversion

Temperature data synthesis

Many mature algorithms for the inversion of surface temperature exists from thermal infrared data. Through the fusion processing of optical and hyperspectral data, a more reliable inversion algorithm model is established to realize continuous monitoring of regional temperature.

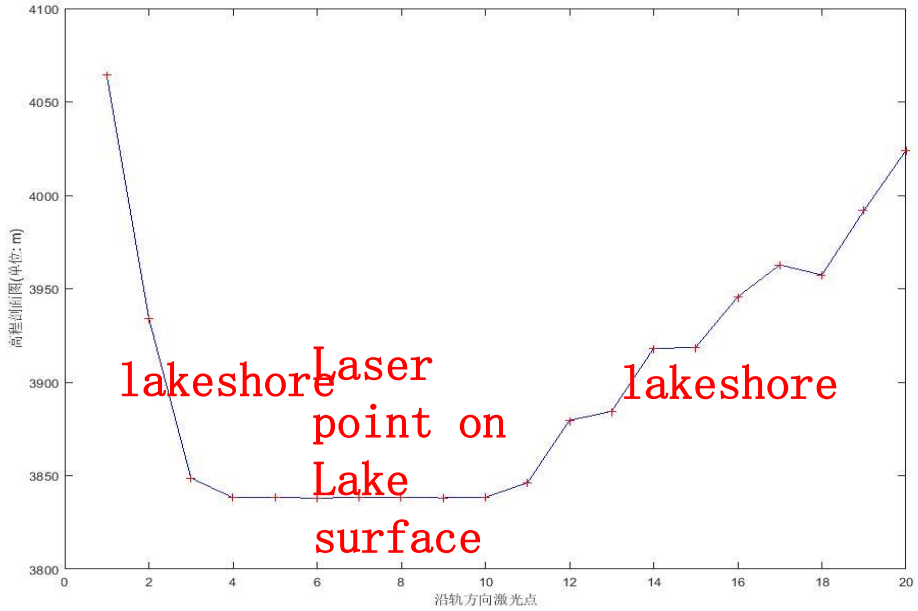
# Water Elevation Monitoring Application

**Lake Elevation Monitoring Demonstration**

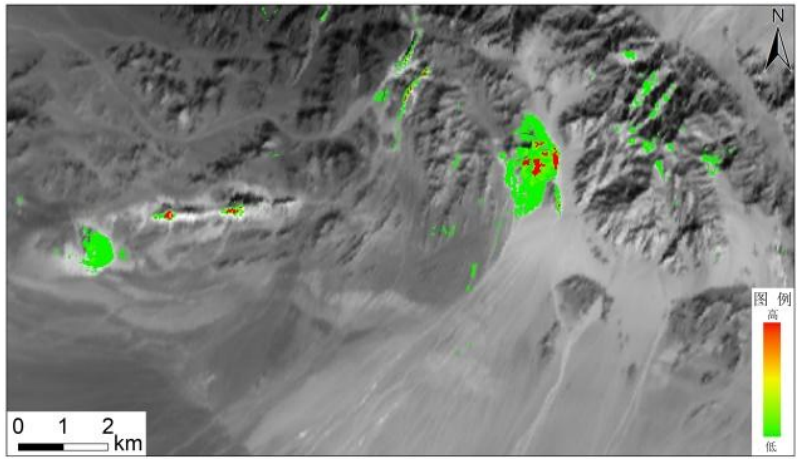



**Altimetry data of GF-7 satellite in inland lake area**

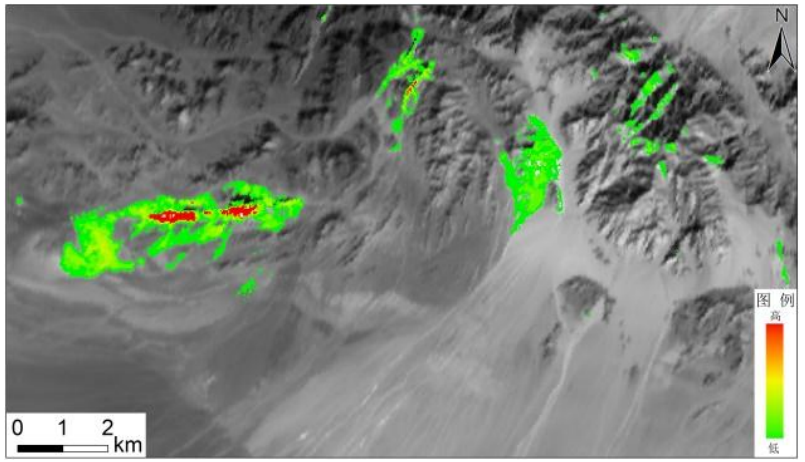
**The relative elevation error of the laser points in the lake area is 0.11m, which is expected to support the application of water level monitoring in large lakes and reservoirs.**



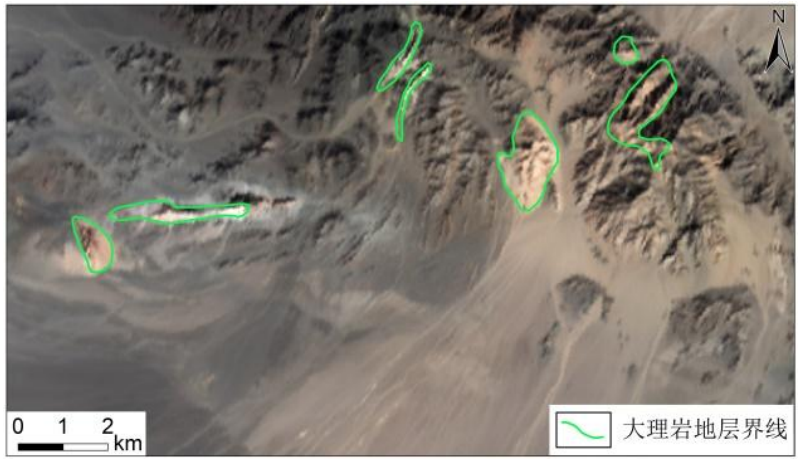
# Evaluation of Basic Geological Remote Sensing Application



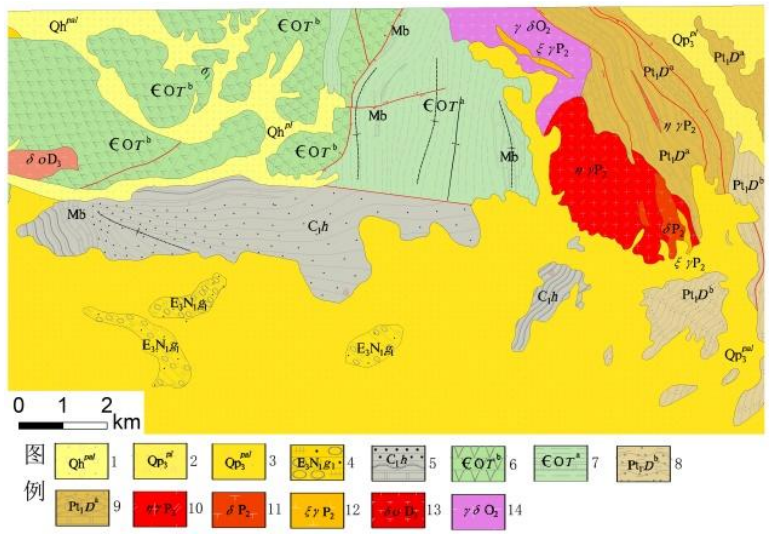

Calcite mineral information




Dolomite mineral information




Marble formation image



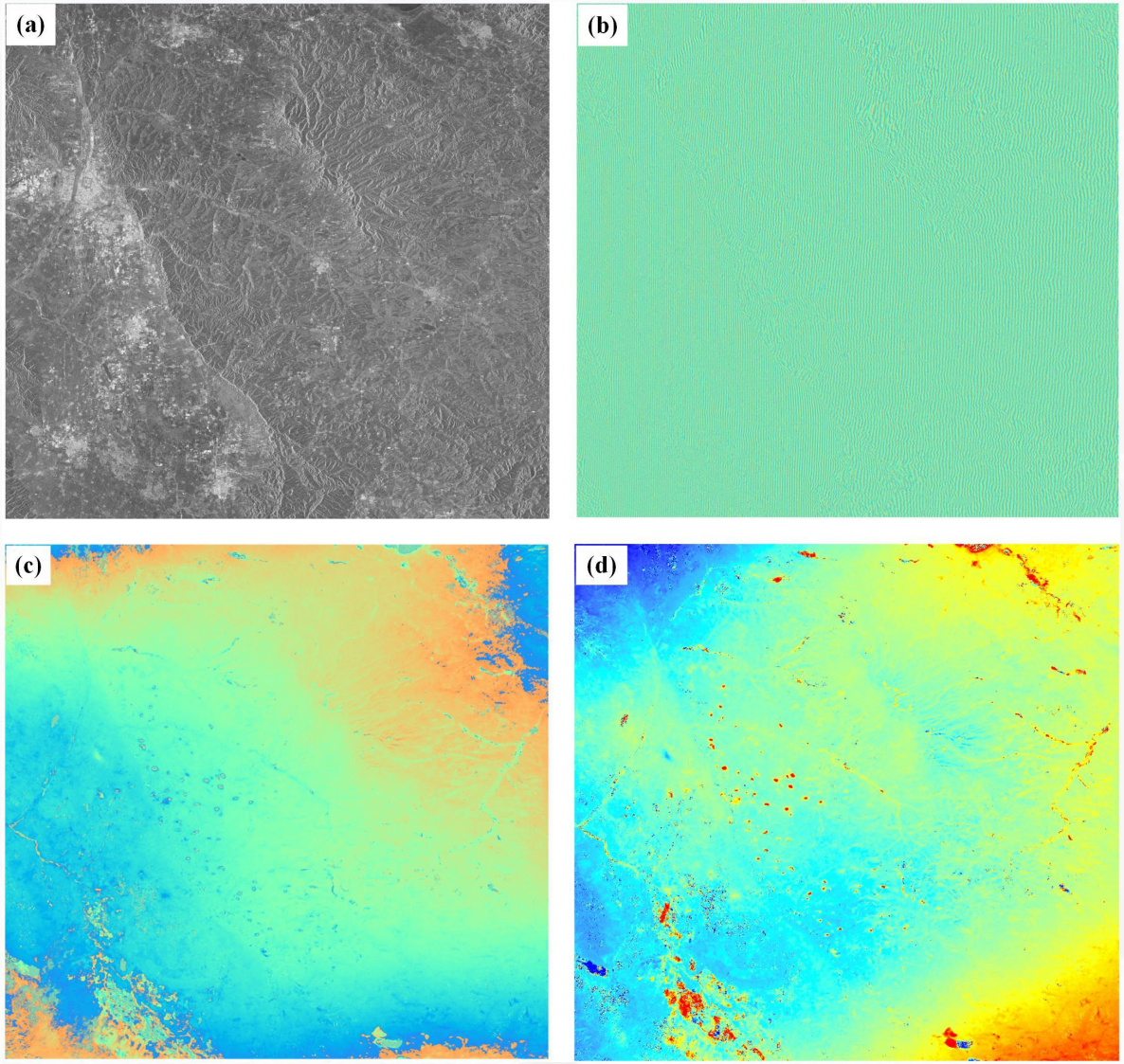

Geological Map of Northeast of Lenghu Lake East Demonstration Area

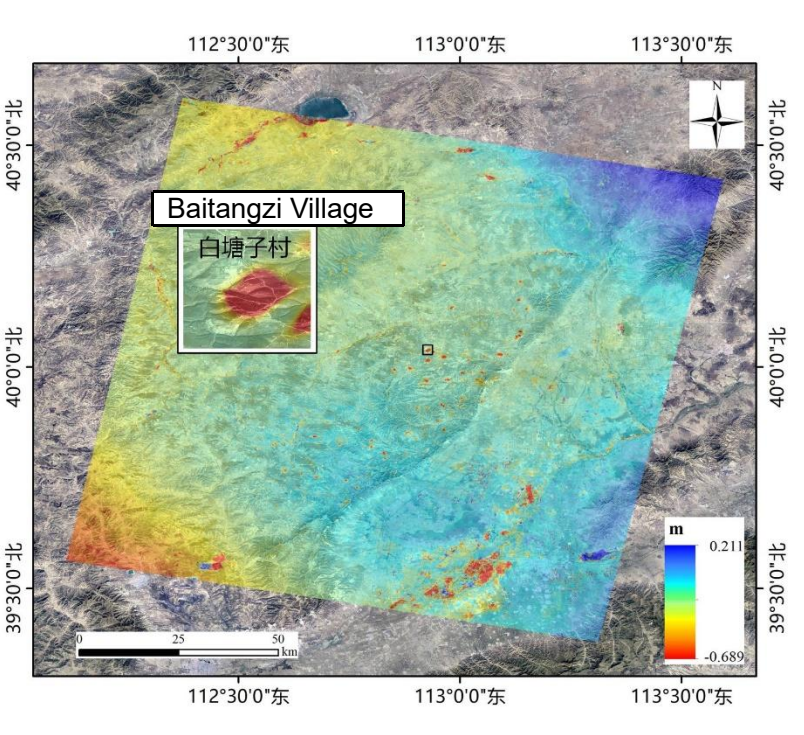
## Mineral information extraction and analysis

The mineral information of calcite and dolomite can be found in the marble strata in the northeast of the demonstration area. The distribution and shape of calcite are consistent in 4 distributed sections concentratedly, and the concentration intensity of mineral information has fine consistency.

# 4. SAR Satellite Deformation Monitoring

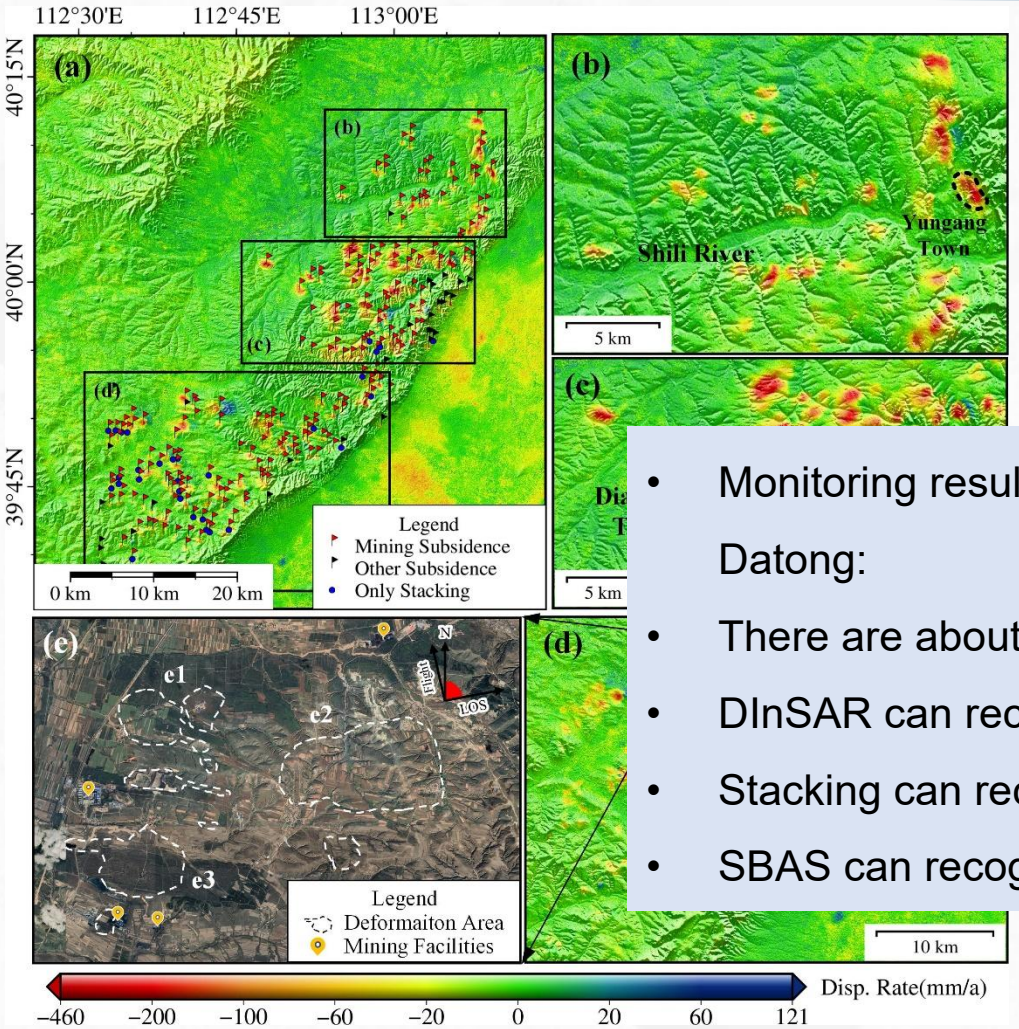
Mining area deformation monitoring of LT1 Interferometric Radar Satellite-deformation group near Datong



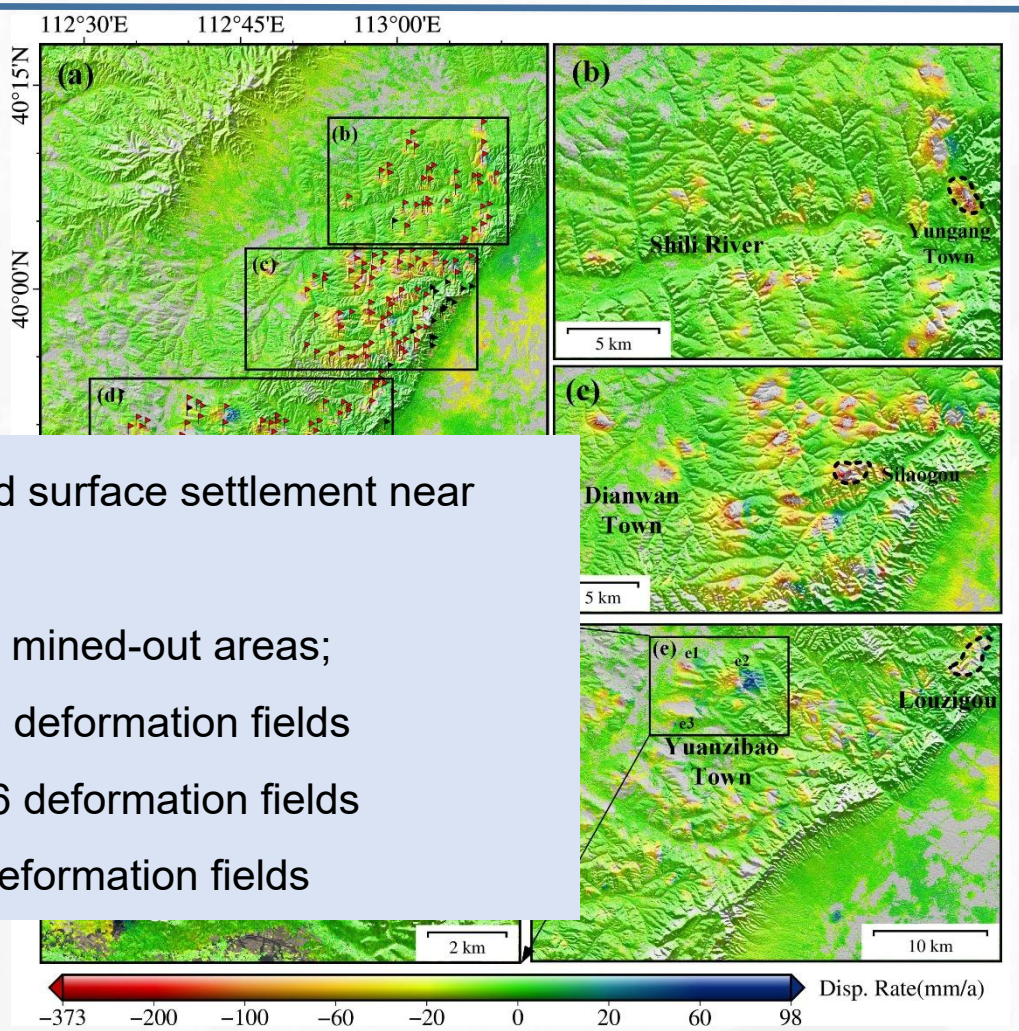




There is interference between Satellite A and Satellite B;
The spatial baseline is 171.0 meters;
The time baseline is 47 days (3.2-4.18);
The maximum vertical deformation is 68.9cm and there is a risk of collapse;
Region of Datong, Shanxi Province;
Ground subsidence caused by coal mining;

# 4. SAR Satellite Deformation Monitoring




- Monitoring results of ground surface settlement near Datong:
- There are about 218 actual mined-out areas;
- DInSAR can recognize 130 deformation fields
- Stacking can recognize 256 deformation fields
- SBAS can recognize 226 deformation fields




Through Stacking analysis of Sentinel-1A data of 28 scenes from November 5, 2020 to October 31, 2021, the deformation rate field was obtained.

Through SBAS analysis of Sentinel-1A data from November 5, 2020 to October 31, 2021, the deformation rate field was obtained.

# Cooperation with Thailand

## Geo-Informatics and Space Technology Development Agency， GISTDA

- **Joint satellite data processing and precision test of ZY3-01 and THEOS**
- **Using Natural Resources Satellite for Orthophoto,1:25,000 Base Map(ZY3-83%) and Web Map Service**
- **Application in the national project of the coastal area**



泰国 THEOS 卫星数据处理试验报告

一、试验目的

开展泰国方面提供的 THEOS 卫星数据（以下简称 THEOS）正射纠正等相关数据处理，同时验证 THEOS 卫星数据的几何定位精度，旨在评价高质量高效率处理 THEOS 卫星数据的可能性，验证 THEOS 卫星数据在全球测图等项目中应用的能力。

二、已有 THEOS 数据分析

1-TH_CAT_170220073941907_1_1M_S477280_R16175_60ARC0056_W1448
2-TH_CAT_170220073436625_1_1P_S477324_R16175_60ARC0056_W1449
3-TH_CAT_170220073550415_1_1P_S477325_R16175_60ARC0056_W1450
4-TH_CAT_170220073652359_1_1P_S477326_R16175_60ARC0056_W1451
5-TH_CAT_170220073729924_1_1P_S477327_R16175_60ARC0056_W1452
6-TH_CAT_170220075014676_1_1M_S191820_R06072_60ARC0056_W1453
7-TH_CAT_170220075213522_1_1P_S191879_R06072_60ARC0056_W1454
8-TH_CAT_17022007530789_1_1P_S191880_R06072_60ARC0056_W1455
9-TH_CAT_170220075348349_1_1P_S191881_R06072_60ARC0056_W1456
10-TH_CAT_170220075444370_1_1P_S191882_R06072_60ARC0056_W1457
11-TH_CAT_170220074101526_1_1M_S342350_R11682_60ARC0056_W1458
12-TH_CAT_170220074144206_1_1M_S342351_R11682_60ARC0056_W1459
13-TH_CAT_17022007452423_1_1P_S342485_R11682_60ARC0056_W1460
14-TH_CAT_170220074616613_1_1P_S342486_R11682_60ARC0056_W1461
15-TH_CAT_170220074707425_1_1P_S342487_R11682_60ARC0056_W1462
16-TH_CAT_170220074801624_1_1P_S342488_R11682_60ARC0056_W1463
17-TH_CAT_170220073857402_1_1M_S477279_R16175_60ARC0056_W1464

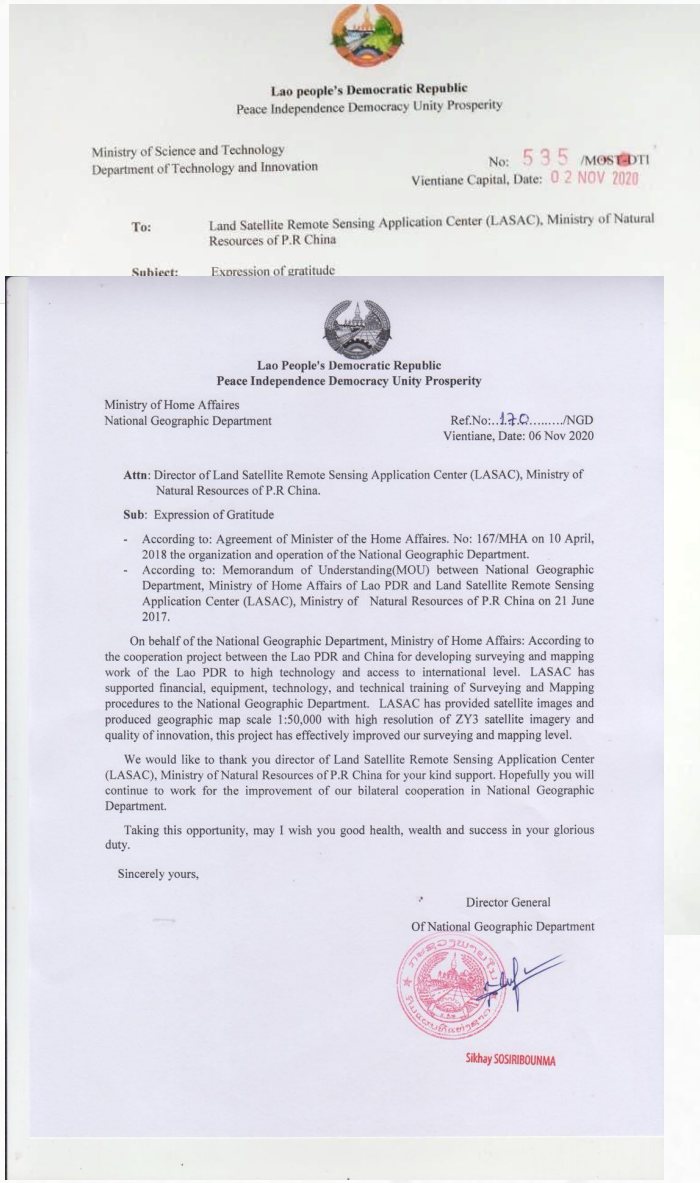
图 1 · 已有 THEOS 卫星数据详细信息

LASAC

# Cooperation with Lao P.D.R

## National Geographic Department (NGD), Ministry of Home Affairs of Lao P. D. R.

- **National Key Research Project(2017-2020)**
- **Constructing DOM,DSM of Laos to NGD**
- **Emergency response for dam-break, flooding and forest fire in Laos**

Lao people's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Science and Technology
Department of Technology and Innovation

No: 535 /MOST.DTI
Vientiane Capital, Date: 02 NOV 2020

To: Land Satellite Remote Sensing Application Center (LASAC), Ministry of Natural Resources of P.R China

Subject: Expression of gratitude

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Home Affaires
National Geographic Department

Ref.No:...170...../NGD
Vientiane, Date: 06 Nov 2020

**Attn**: Director of Land Satellite Remote Sensing Application Center (LASAC), Ministry of Natural Resources of P.R China.

**Sub**: Expression of Gratitude

- According to: Agreement of Minister of the Home Affaires. No: 167/MHA on 10 April, 2018 the organization and operation of the National Geographic Department.
- According to: Memorandum of Understanding(MOU) between National Geographic Department, Ministry of Home Affairs of Lao PDR and Land Satellite Remote Sensing Application Center (LASAC), Ministry of Natural Resources of P.R China on 21 June 2017.

On behalf of the National Geographic Department, Ministry of Home Affairs: According to the cooperation project between the Lao PDR and China for developing surveying and mapping work of the Lao PDR to high technology and access to international level. LASAC has supported financial, equipment, technology, and technical training of Surveying and Mapping procedures to the National Geographic Department. LASAC has provided satellite images and produced geographic map scale 1:50,000 with high resolution of ZY3 satellite imagery and quality of innovation, this project has effectively improved our surveying and mapping level.

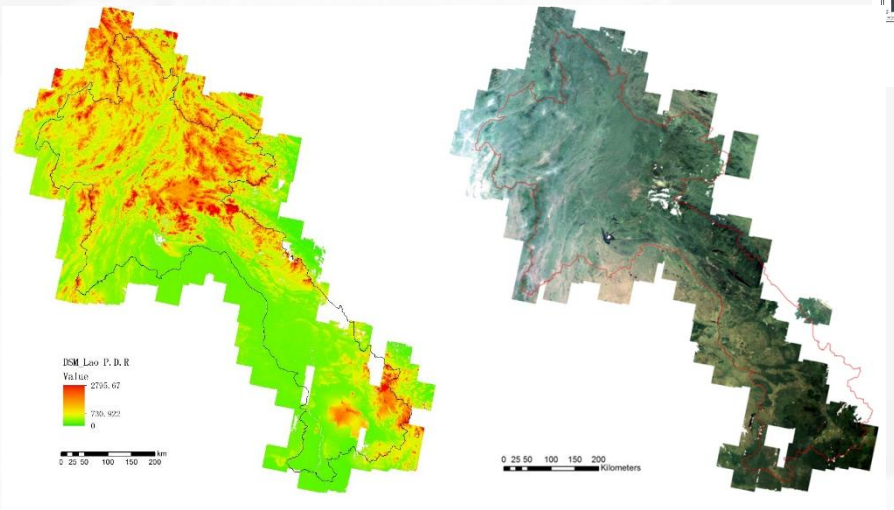
We would like to thank you director of Land Satellite Remote Sensing Application Center (LASAC), Ministry of Natural Resources of P.R China for your kind support. Hopefully you will continue to work for the improvement of our bilateral cooperation in National Geographic Department.

Taking this opportunity, may I wish you good health, wealth and success in your glorious duty.

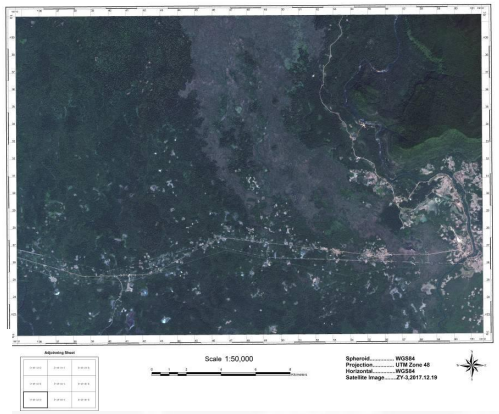
Sincerely yours,

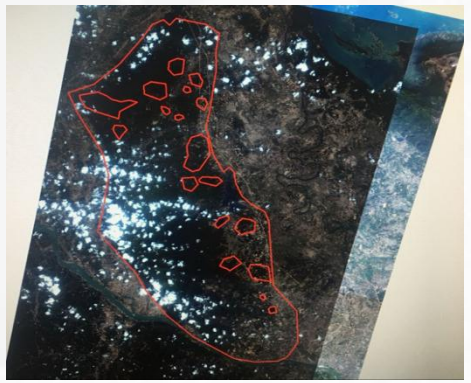
Director General
Of National Geographic Department

Sikhay SOSIRIBOUNMA


10m grid DSM covering most area of Lao P.D.R utilizing ZY-3 images



2.1m DOM 2016-18 covering most area of Lao P.D.R utilizing ZY-3 images

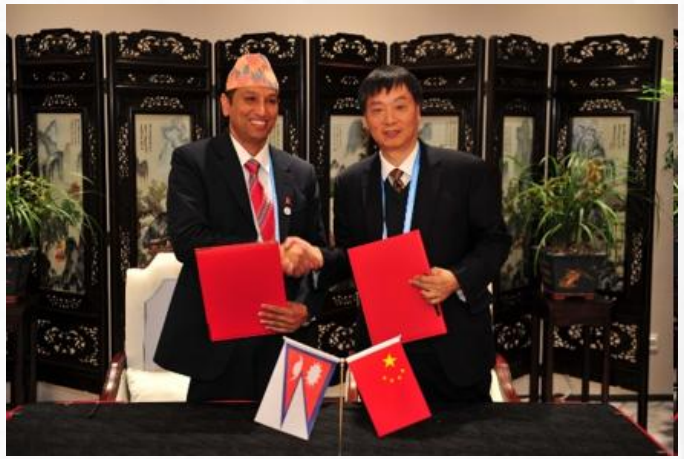
# Cooperation with Nepal

## The Survey Department, Ministry of Land Management, Cooperatives and poverty Alleviation, Government of Nepal

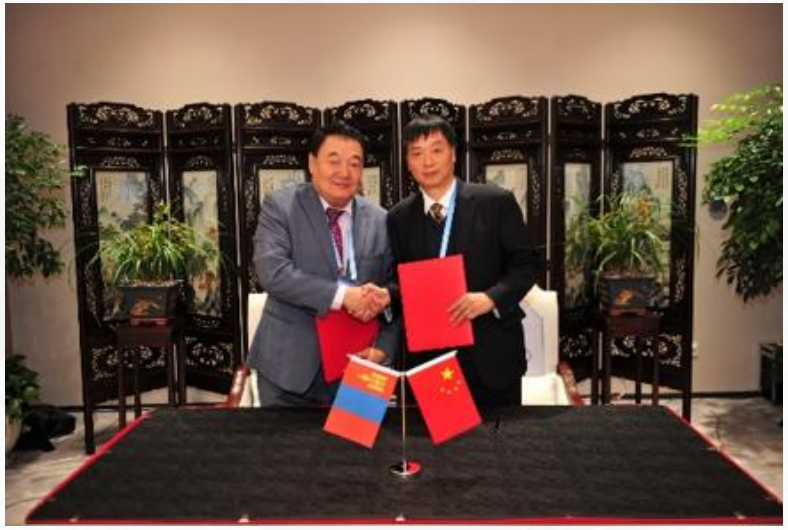
- **Topographical base map updates：update 208 sheets of 1:25,000 scale in 2018/2019 and 251 Sheets of 1:25,000 scale in 2019/2020**

- **Land Use Mapping and Planning：In 2019-2020，land use maps of 163 local bodies of 19 districts, sharing land use maps for 221 local bodies of 27 districts**

- **Data distribution：planning works from different ministries, academic institution and researchers.**

# Cooperation with Mongolia



## Agency for Land Administration and Management, Geodesy and Cartography (ALAMGC) in Mongolia

- Land monitoring
- Base map service
- Topographic map update

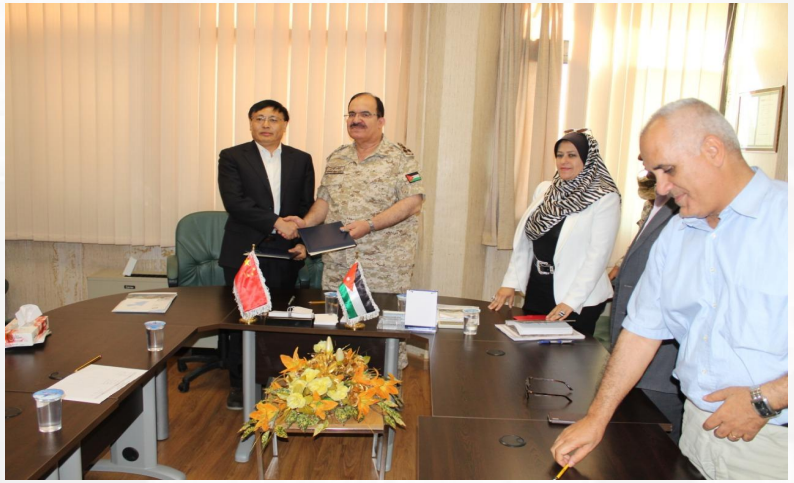
**Currently, ALAMGC and its branches in 21 provinces are using ZY-3 satellite data**

| No | Usage | Examples |
|---|---|---|
| 1 | Land monitoring: To measure modification of particular area during certain period of time | High-resolution imagery enables local governments to monitor land-use changes. For instance, mining sites' are being monitored in Dornod province. |
| 2 | Base map service: Overlaying vector layers on the imagery | To publish ortho imageries in geoportal encourages users to consume them more often nowadays when they are online. This enables them to access easily without downloading enormous sized files. For instance, urban developers prefer to apply web services whenever they use imageries as a base map. Recently, Kharkhorin city's master plan is depicted on the imagery, covering Uvurkhangai province by Department of urban planning at ALAMGC. |
| 3 | Topographic map update: Identifying objects on the ground and enriching large and medium scale topographic maps' database | ZY-3 satellite image is appropriate for clarifying natural objects and man-made establishments and enriching large and medium topographic map database. It is universally acknowledged that database of topographic map consists of multiple layers and each of them should be updated frequently. For example: If winter shelters are displayed in high-resolution image, they will be added to the database as points. |

# Cooperation with Jordan

## Royal Jordanian Geographic Centre(RJGC)

- **MoU signed in 9 2018**
- **2020,Providing GF-2 images covering some provinces of the northern Jordan through the Cloud Platform to help fight against the COVID-19 epidemic.**
- **2022,co-testingon GF-7 satellite images.**



المركز الجغرافي الملكي الأردني
ROYAL JORDANIAN GEOGRAPHIC CENTRE

Ref.: 9/8/1780 الرقم :

Date: 8 / 8 / 2022 التاريخ : / /

**GF-7 satellite images technical report**

GF-7 Satellite stereo images (2 scenes) with resolution (0.75 meter) covered apart of Jordan (Fig.1) , west part of this area is urbanized ,mountain area , the other part (east ) is flat one.

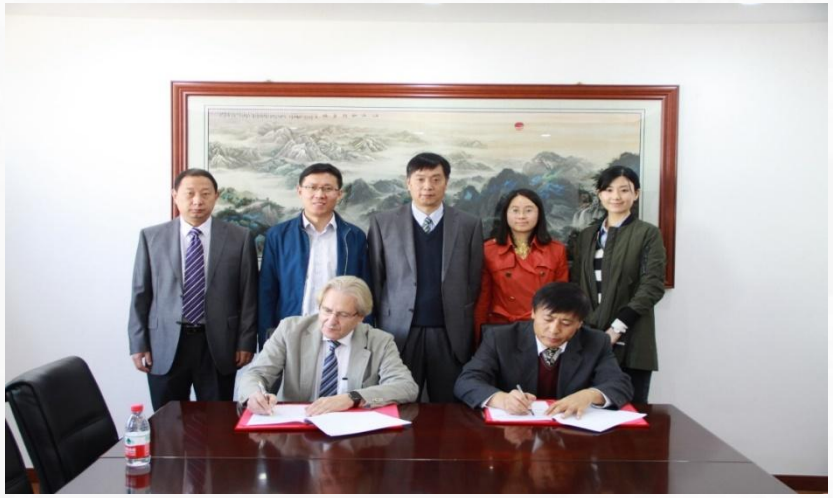
Fig. 1: covered areas

LASAC

# Cooperation with Austria

**The University of Vienna in Austria has**

- **Sharing Austria territory 2m satellite data**
- **Launched a research on dynamic visualization of the acquisition of ZY3 Satellite.**
- **At present, Austria has promoted the visualization and dynamic display of ZY3 Satellite images' quick view on the hyperglobe in the test area, scoring phased achievements**




# Cooperation with Ghana

**March,May.2018**

**The University of energy and natural resources. Sunyanni, Ghana**

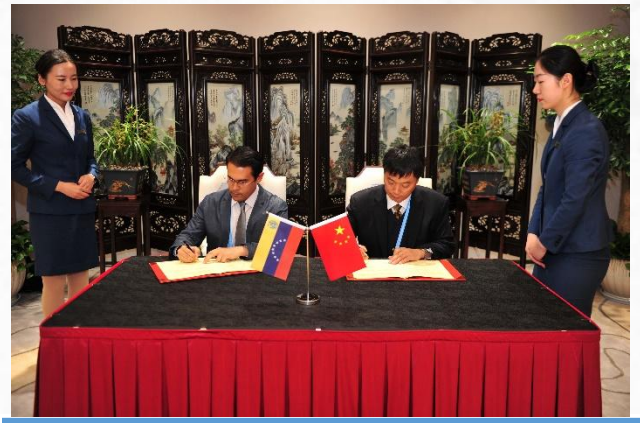
**•Sharing 2m resolution satellite image data**

LASAC

# Cooperation with Venezuela

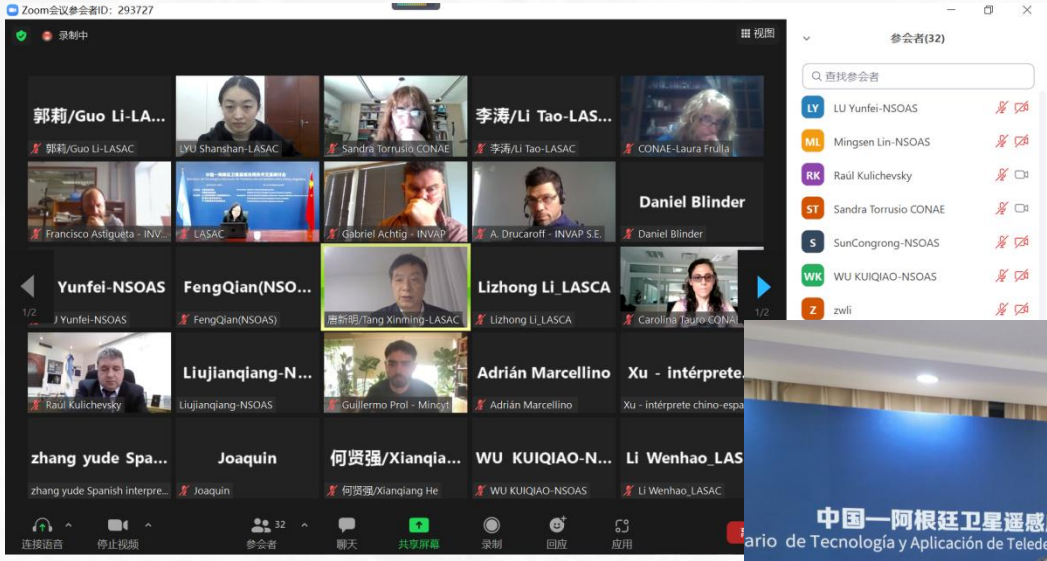
## ABAE

- MoU signed and the platform node established in Nov.2018
- Exchange visits and training since 2012
- On site raining planned for multi ministries
- The local applications are expected to be expanded.

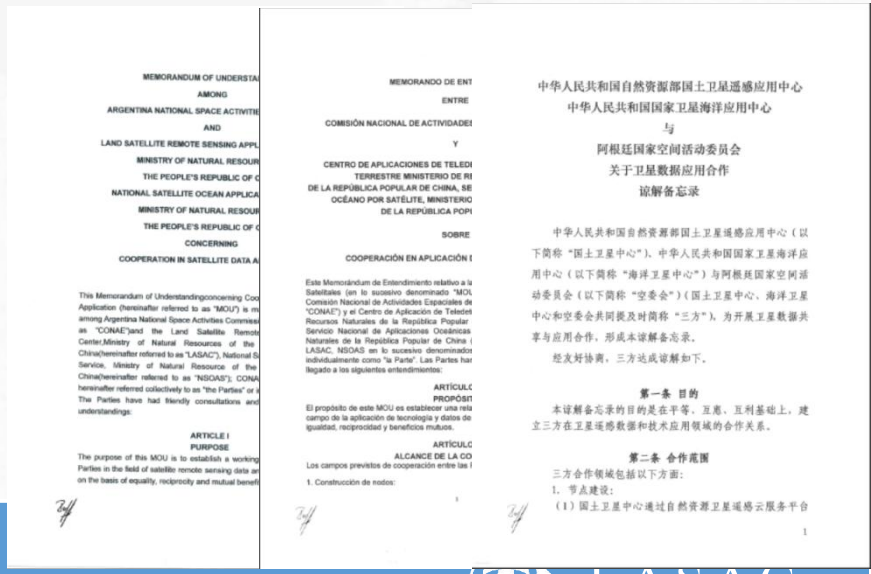


# Cooperation with Argentina

- **MoU signed on 28 Jan 2022,and the platform node established on 10 August 2022**
- **Seminar held on 1-3 Dec 2021 by LASAC and CONAE and hosted by MNR of China and Ministry of S&T innovation of Argentina**

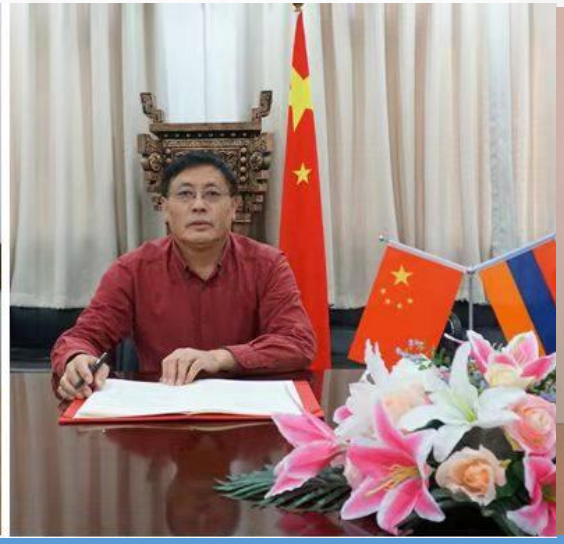






# Cooperation with Armenia

**NAS RA,MESCS RA,IGES**
**NAS RA**



Chinese Ambassador to Armenia

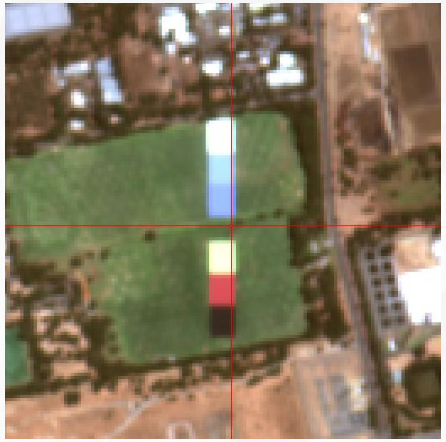
Chinese Ambassador to Armenia
1 дн. ·

🇨🇳🇦🇲Между Китаем и Арменией подписан Меморандум о взаимопонимании «О сотрудничестве в области применения #спутниковойсъемки».🛰️
Целью меморандума является развитие армяно-китайского научного сотрудничества в области применения данных и технологий спутникового дистанционного зондирования Земли.
В рамках сотрудничества китайская сторона безвозмездно предоставит армянской стороне данные, полученные в результате спутникового дистанционного зондирования природных ресурсов Армении. 🛠️🛠️
Չինաստանի և Հայաստանի միջև ստորագրվել է «Արբանյակային պատկերների կիրառման ոլորտում համագործակցության մասին» փոխըմբռնման հուշագիր: Հուշագրի նպատակը երկրի արբանյակային հեռազննման տվյալների և տեխնոլոգիաների կիրառման ոլորտում հայ-չինական գիտական համագործակցության զարգացումն է: Համագործակցության շրջանակներում չինական կողմը հայկական կողմին անվճար կտրամադրի ՀՀ բնական ռեսուրսների վերաբերյալ արբանյակային հեռազննման արդյունքում ստացած տվյալներ:

# Cooperation with Australia

**CSIRO : ZY-3 Satellite Calibration and Validation Overseas**

More than 3 million km$^2$ of Australia was provided to CSIRO, Free of Charge



**20180425**
**Perth, Australia**

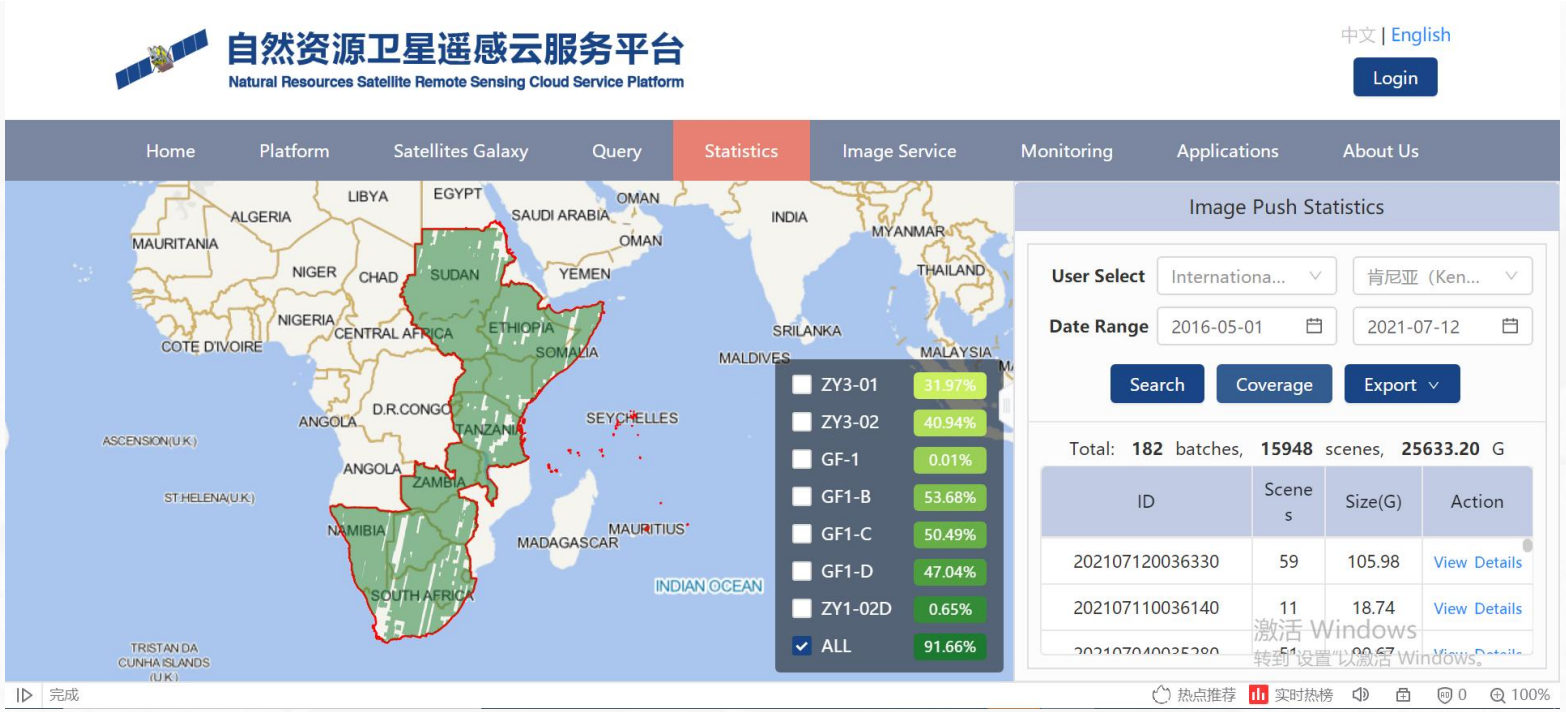
**20161031**
**Perth, Australia**

**20140208**
**Perth, Australia**

LASAC

# Cooperation with RCMRD

**Regional Centre for Mapping of Resources for Development, RCMRD, Kenya(AfriGEO SEC)**





LASAC

# Cooperation with RCSSTEWA

Regional Centre for Space Science and Technology Education for Western Asia/UN,RCSSTEWA

**Participating Region Countries (Hashemite Ki**

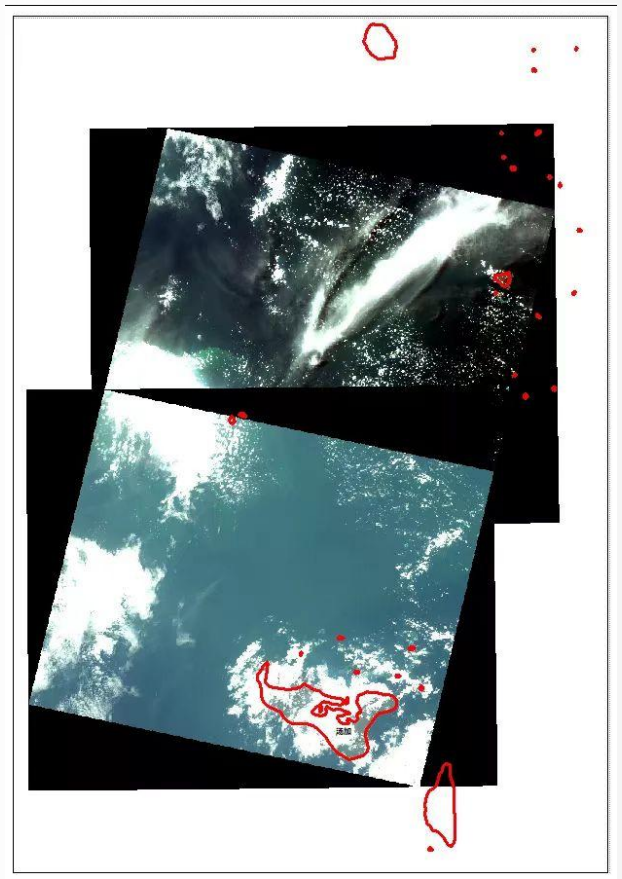
- The United Arab Emirates.
- The Syrian Republic.
- The Republic of Lebanon.
- The Republic of Iraq.
- Libyan Republic.
- Kuwait.
- The Egyptian Arabic Republic.
- Republic of Sudan.
- Republic of Yemen.
- Sultanate of Oman.
- State of Palestine.
- Qatar.

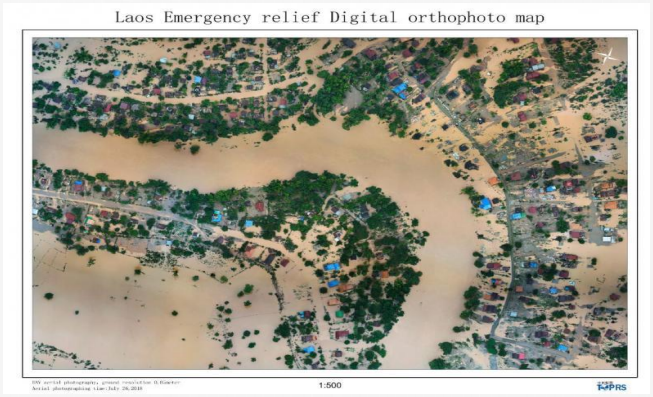
+Jordan and Saudia Arabia

LASAC

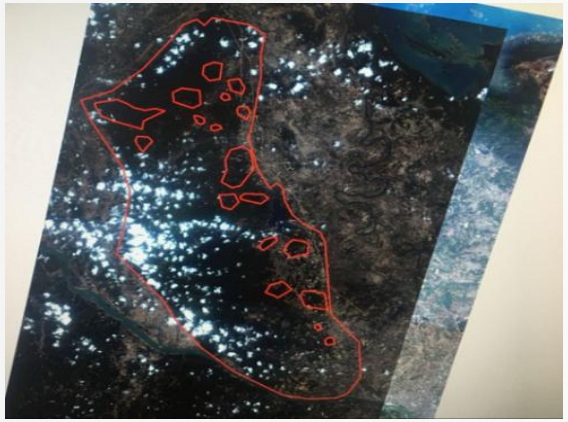
# 国际应急救灾 International Emergency Response

- **向老挝、巴基斯坦、汤加、巴西、伊朗等国家提供洪水、溃坝、山火等应急救灾影像及监测服务**
  Provide satellite remote sensing imagery of flood, dam break, bushfire and monitoring services to Laos, Pakistan, Tonga, Brazil, Iran and etc.









# 培训与交流 Training and People-to-People Exchanges

Seminar on ZY3 Data-sharing and Application
Beijing, China

**2017**

资源三号卫星数据共享与应用研讨会
中国北京


Seminar on South-east Satellite Application
Xi'an, China

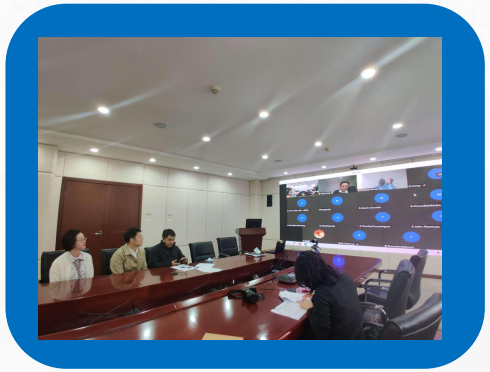
**2019**

东南亚卫星应用研讨会
中国西安


China-ASEAN Training Course on GF Satellite Imagery Application
Vientiane, Laos

**2019**

中国—东盟区域高分辨率卫星影像应用培训班
老挝万象



Online Training Course on GF Satellite Imagery Application (Africa)
Beijing, China

**2020**

国产高分辨率卫星影像应用线上培训班（非洲区域）
中国北京

Seminar on China-ASEAN Satellite Remote Sensing
Nanning, China

**2021**

中国—东盟卫星遥感研讨会
中国南宁

## Training Courses and Seminars 其他会议与培训

| | |
|---|---|
| International Forum on Satellite Gravity Cooperation 2021 | 卫星重力国际合作研讨会 2021 |
| GEO-Symposium 2021 | GEO卫星应用技术边会 2021 |
| Training Course on China's High Resolution Satellite Image Data Processing and Cloud Service Technology 2021 | 中国高分辨率卫星影像数据处理及云服务技术培训班 2021 |
| China-Argentina Satellite Remote Sensing Application Technology Seminar 2021 | 中国—阿根廷卫星遥感应用技术交流研讨会 2021 |
| APSCO-LASAC Short Training Course on "Natural Resources Satellite Remote Sensing Technologies and Applications" 2022 | 自然资源卫星遥感技术与应用短期培训班 2022 |

# 国际组织合作 Cooperation with International Organizations

GEO GROUP ON EARTH OBSERVATIONS

FAO Food and Agriculture Organization of the United Nations

APSCO

isprs information from imagery

# 工作背景 Background of CACSA


# 工作背景 Background of CACSA

## 中非合作论坛第八届部长级会议

The Eighth Ministerial Conference of the FOCAC


**2021年11月29日，国家主席习近平在北京以视频方式出席中非合作论坛第八届部长级会议开幕式并发表主旨演讲**

On November 29, 2021, President Xi Jinping delivered a keynote speech at the Eighth Ministerial Conference of the FOCAC

**提出了加强中非务实合作“九项工程”**

President Xi Jinping proposed “ 9 Projects” of China-Africa practical cooperation

**提出“建设中非卫星遥感应用合作中心”**

President Xi Jinping made promise of setting up centers for **China-Africa cooperation Center on satellite remote-sensing application (CACSA)**

**卫星遥感应用领域的“第一次”**

The project of CACSA is the first time being proposed in satellite remote sensing application field for both Africa and China


# Future Outlook

H.E. Csaba Korosi, 77th President of the UN General Assembly

‘Africa's development requires a tailored approach, leveraging global opportunities while adapting them to local contexts, cultures, and economies, to create a unique path of growth that suits its distinct needs and aspirations.’

September FBAS 2024




Together, we can contribute to change the history in Africa

CACSA


# 工作背景 Background

## 中非合作论坛—达喀尔行动计划（2022-2024）

Forum on China-Africa Cooperation  Dakar Action Plan (2022-2024)

**4.5.7 中方将建设中非卫星遥感应用合作中心。**

China will set up centers for China-Africa cooperation on satellite remote sensing application.

**7.1.6 双方将在自然资源领域应用卫星遥感技术开展深度合作。中方将向更多非洲国家推介自然资源卫星遥感云服务。**

The two sides will carry out in-depth cooperation on the application of satellite remote-sensing technology in the field of natural resources. China will propose  satellite remote-sensing Cloud services to more African countries.

# 工作背景 Background

## 中非合作论坛—北京行动计划（2025-2027）

Forum on China-Africa Cooperation  Beijing Action Plan (2025-2027)

**2.2.9 建设中非卫星遥感应用合作中心非洲中心。**

Build the Africa Center of China-Africa Cooperation Center on Satellite Remote Sensing Application.

**9.3.5 中方将与非洲国家深入推进中非卫星遥感应用合作中心建设，与非方共享自然资源陆海卫星数据、产品、软件和工具，在卫星遥感技术应用方面开展深度示范合作。**

China will work with African countries to further advance the building of the China-Africa Cooperation Center on Satellite Remote Sensing Application, share with the African side data, products, software and tools provided by land and marine satellites for natural resources，and carry out in-depth demonstration cooperation in the application of satellite remote sensing technology.

# 目前进展 Updates

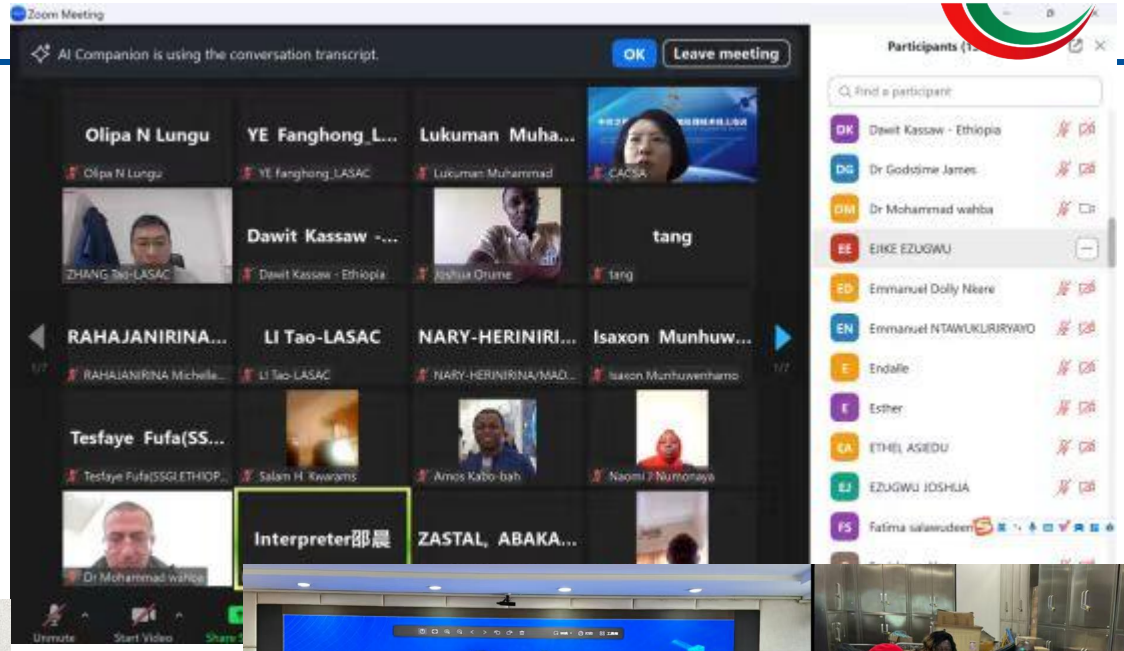


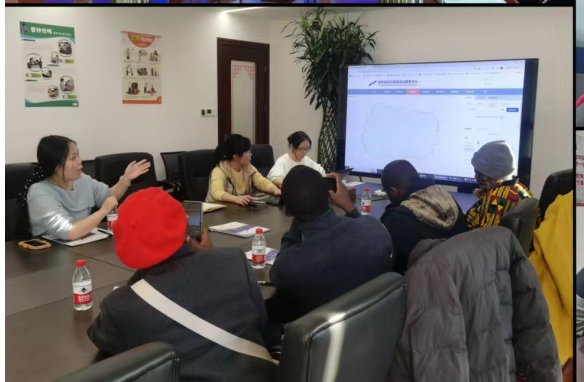

# 目前进展 Updates

# 目前进展 Updates

## China Hosts Seminar on China-Africa Cooperation in Satellite Remote Sensing

February 19, 2025 | In News | By Mustapha Iderawumi

# 目前进展 Updates

## 非洲合作伙伴名单 African Partners

**达成共建国家中心合作文件已签署（11）**
MOU signed on co-build national cooperation centers

**埃塞俄比亚创新科技部空间科学与地理空间研究所**
Space Science and Geo-Spatial Institute Ministry of Innovation and Technology of the Federal Democratic Republic of Ethiopia（SSGI)

**加纳空间科学与技术研究所**
Ghana Space Science and Technology Institute (GSSTI)

**佛得角国家土地管理研究所**
Instituto Nacional de Gestao do Territorio of the Republic of Cabo Verde(INGT)

**津巴布韦国家地理空间与航天局**
Zimbabwe National Geospatial and Space Agency(ZINGSA)

**科特迪瓦国家技术和发展研究局**
Bureau National d’ Etudes Techniques et de Développement (BNETD)

**莱索托王国通信与科技部信息通信司**
Department of ICT, Ministry of Information Communications Science Technology and Innovation Government of Lesotho (MICSTI-ICT)

**卢旺达航天局**Rwanda Space Agency(RSA)

**尼日利亚国家空间研究与发展局**
National Space Research and Development Agency(NASRDA)

**塞内加尔国家空间规划局**
National Spatial Planning Agency, the Republic of Senegal(ANAT)

**埃及航天局** Egyptian Space Agency (EgSA)

**喀麦隆国家气候变化观测站**The National Observatory on Climate Change of Cameroon（ONACC）

**合作伙伴(4)** Initial Partners of satellite data cooperation MOU

**非洲资源测绘发展区域中心**
Regional Centre for Mapping of Resources for Development (RCMRD)

**乌干达国家公路局** Uganda National Roads Authority

**加纳苏尼亚尼自然资源与能源大学**
University of Energy and Natural Resources

**赞比亚大学** University of Zambia

# 目前进展 Updates

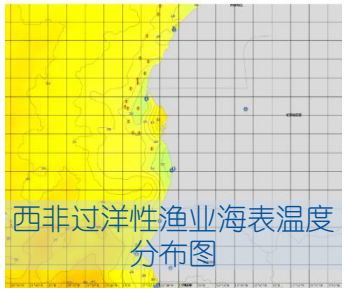
## 中方共建单位名单（13家）
## Domestic Partners

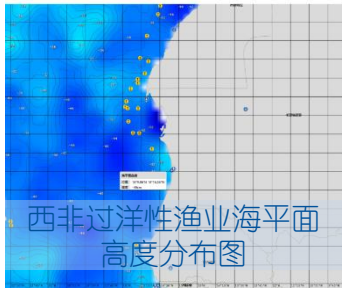
自然资源部国土卫星遥感应用中心
Land Satellite Remote Sensing Application Center,MNR
国家卫星海洋应用中心
National Satellite Ocean Application Service
生态环境部卫星环境应用中心
Satellite Application Center for Ecology and Environment, MEE
应急管理部国家减灾中心
National Disaster Reduction Center of China
中国空间技术研究院
China Academy of Space Technology
上海航天技术研究院
Shanghai Academy of Spaceflight Technology
中国长城工业集团有限公司
China Great Wall Industry Corporation
中国资源卫星应用中心
China Centre for Resources Satellite Data and Application

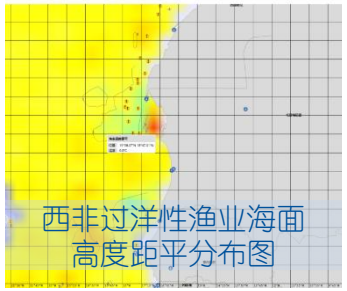
中国科学院空天信息创新研究院
Aerospace Information Research Institute, Chinese Academy of Sciences
中国科学院中非联合研究中心
Sino-Africa Joint Research Center, Chinese Academy of Sciences
中国农业科学院农业资源与农业区划研究所
Institute of Agricultural Resourc
深圳大学
Shenzhen University
武汉大学
Wuhan University

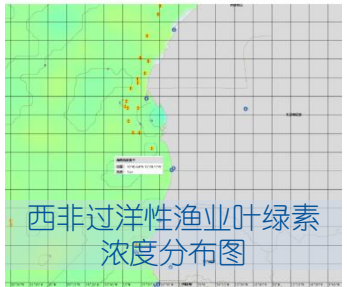
# 前期工作基础 Working basis and Progress

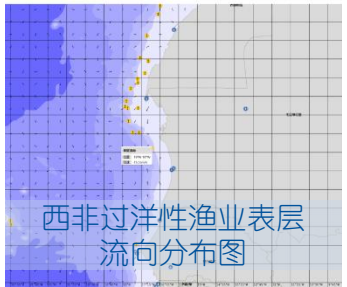
- 国家卫星海洋应用中心 National Satellite Ocean Application Service
  - 与肯尼亚开展卫星遥感海洋渔业应用技术推广与合作，希利用我国海洋卫星数据开展周边渔场资源开展调查与评估
  - Cooperate with Kenya on satellite remote sensing application on marine fishery.
  - 针对西非海洋渔业捕捞需求，在摩洛哥、毛里塔尼亚等海区开展了渔场环境保障和渔情分析的示范应用
  - Demonstration projects on fish farm environmental protection and fishery analysis in Morocco and Mauritania.
  - 针对非洲莫桑比克飓风事件，根据要求提供了海洋一号C星数据产品，收到较好应用效果
  - Provide HY-1C data products on hurricane to related authorities of Mozambique and received good application results.

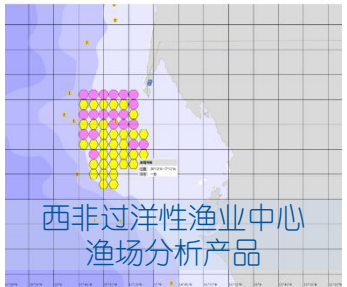


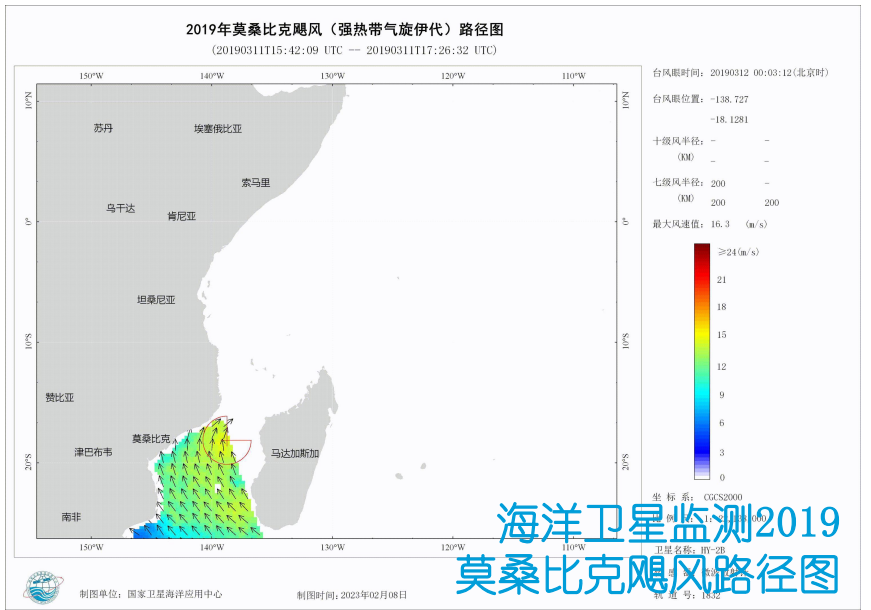




海洋卫星监测2019
莫桑比克飓风路径图

# 非洲需求 Major needs of African countries

## 生态环境

气候变化、荒漠化防治、大型动物迁徙观测

Eco-Environment

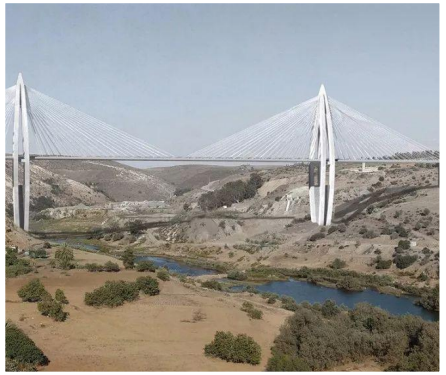
climate change, desertification prevention, animal migration observation

## 资源管理

森林盗伐、石油开发、矿产勘探

Resource Management

unlawfully felling, oil development, mining exploration



## 工程建设

城市与基础设施建设、基础测绘、形变监测

Engineering Construction

city&infastructure construction, basic surveying&mapping,deformation monitoring

## 和平安全

国防安全、应急救援

Security

defense security, emergency rescue

Global Trade

ship recognition monitoring, import&export volume evaluation,shipping environment forecast

Agriculture

crops&forest monitoring,crop yield estimation, aquaculture scale monitoring

## 农业生产

农林作物监测、粮食估产、水产规模监测

## 全球贸易

船舶识别监测、进出口量评估、航运环境预报

## 地质灾害

旱涝灾害治理、森林火灾监测

Geological Disaster

drought&flood disaster control, forestfire monitoring

# 中非卫星中心建设目标 Construction Objectives of CACSA

## 以习近平主席关于“携手构建新时代中非命运共同体”的重要讲话精神为指导

Jointly Build a China-Africa Community With a Shared Future in the New Era

- To bring satellite  remote sensing technology and resource advantages into full play
- To provide more African countries with natural resources satellite remote sensing cloud services
- To promote atellite remote sensing imagery application for African countries
- To deepen China-Africa practical cooperation in satellite remote sensing application
- To promote satellite remote sensing achievements to bring more tangible benefits to African people

充分发挥我国卫星遥感应用技术和资源优势

向更多非洲国家提供自然资源卫星遥感云服务

拓展中国卫星遥感影像在非洲的深度应用

深化中非在卫星遥感应用领域全链条多维度务实合作

促进中国卫星遥感成果惠及非洲人民

进一步加强与非洲国家和相关国际组织合作，联合共建中非卫星遥感应用合作中心，推进共建“一带一路”高质量发展和全球发展倡议实施

Further strengthen cooperations with African countries and relevant international organizations; to jointly build CACSA, and to promote high quality development of the Belt&Road Initiatives and Global Development Initiative

# 中非卫星中心工作任务 CACSA Main Tasks

**建立中非卫星遥感应用合作长效机制**

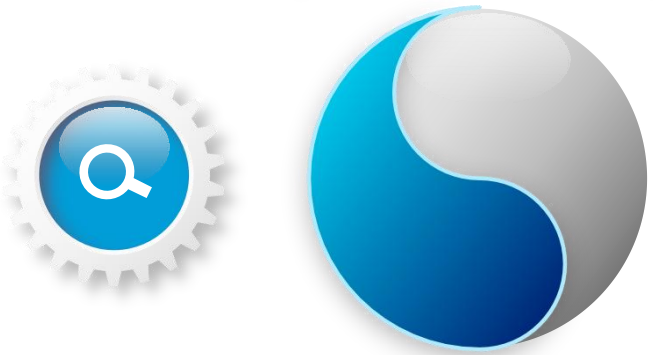
To build long-term cooperation mechanism for China-Africa satellite remote sensing application

**建设卫星检校及卫星地面基础设施**

To construct satellite data calibration and on-ground infrastructure

**构建中非卫星遥感数据共享网络体系**

To build China-Africa satellite remote sensing data sharing network system



**组织教育培训和人才培养**

To organize personnel training&education courses

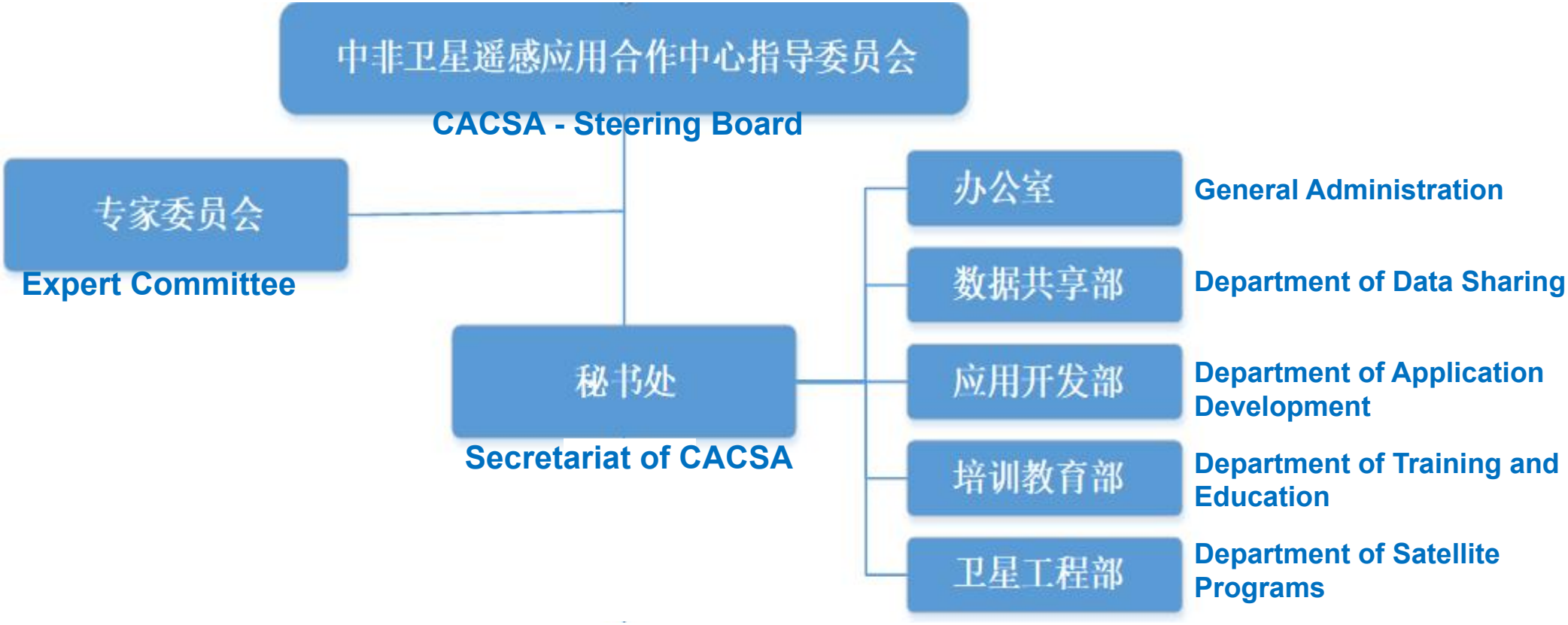
**开展卫星遥感动态监测及示范应用**

To develop satellite remote sensing dynamic monitoring and pilot project application

**推进卫星遥感领域商业化合作**

To promote satellite remote sensing commercial cooperation

# 组织架构 Organizational Structure



# “1+5+N”业务布局 Business Layout

**1** — 非洲卫星遥感应用合作中心

(主中心，落户其中1个区域中心)

Africa Satellite Remote Sensing Application Cooperation Center

( Main Center, locate in one of the regional centers)

**5** — 非洲区域中心

Africa Regional Centers

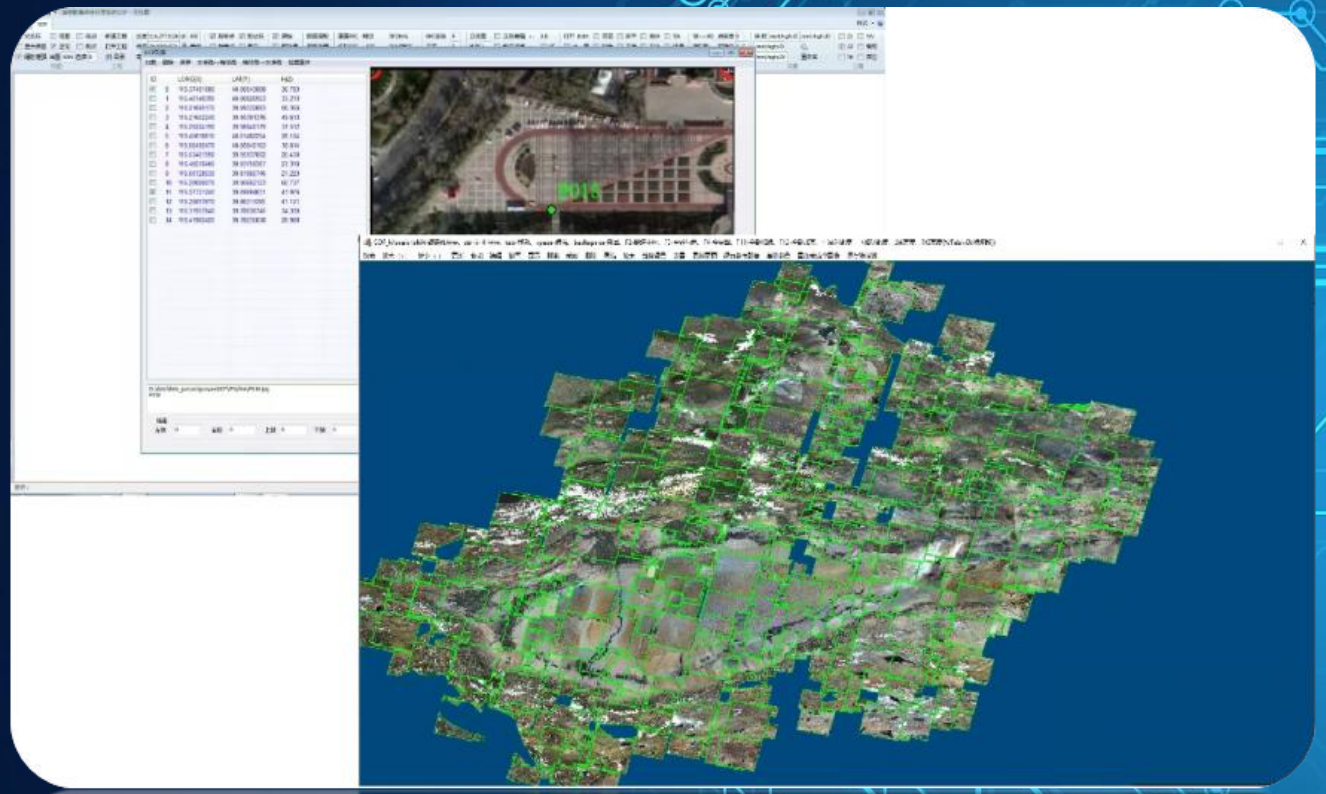
**N**— 非洲国家中心

National-level cooperation centers



# 1. SDP(Space-Data-Processor)

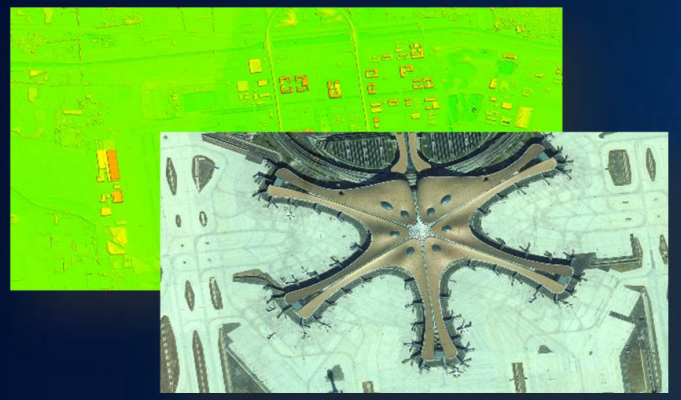
SDP (Space-Data-Processor) is an integrated remote sensing image processing system, which can be used for satellite geocoded Optical, SAR and Hyperspectral image products such as DOM, stereo products such as DSM and 3D products such as MESH and building while model. This software support varied satellite data of China and foreign countries, and it has multi-core multi-node parallel computing ability.



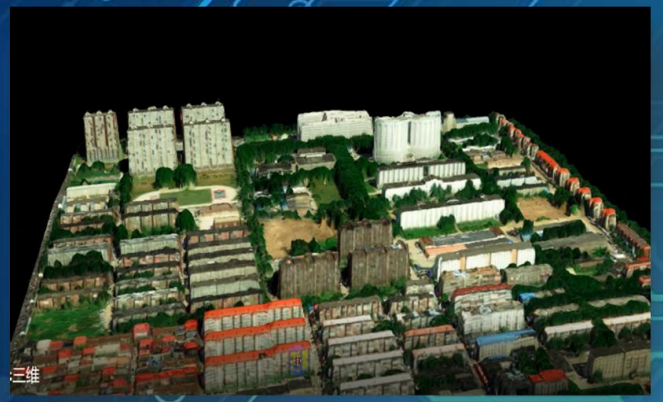
# 1. SDP(Space-Data-Processor)

**Products:**

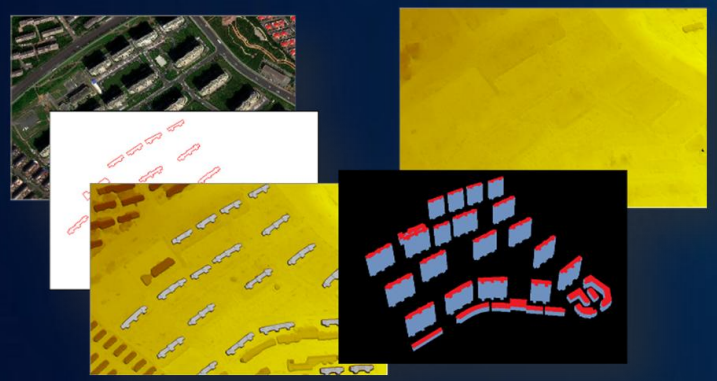
- DSM&DOM
- MESH
- Biulding Model
- SAR DOM
- Hyperspectral DOM



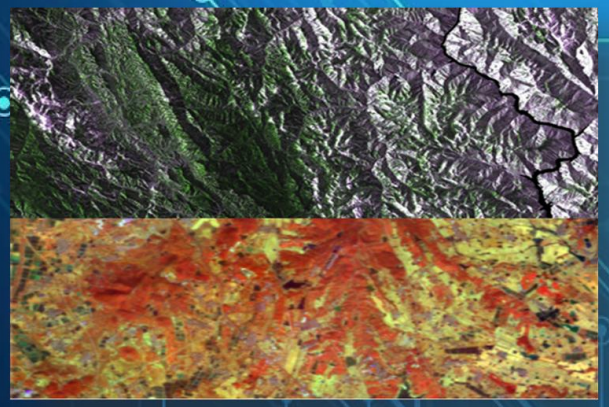
DSM&DOM



MESH

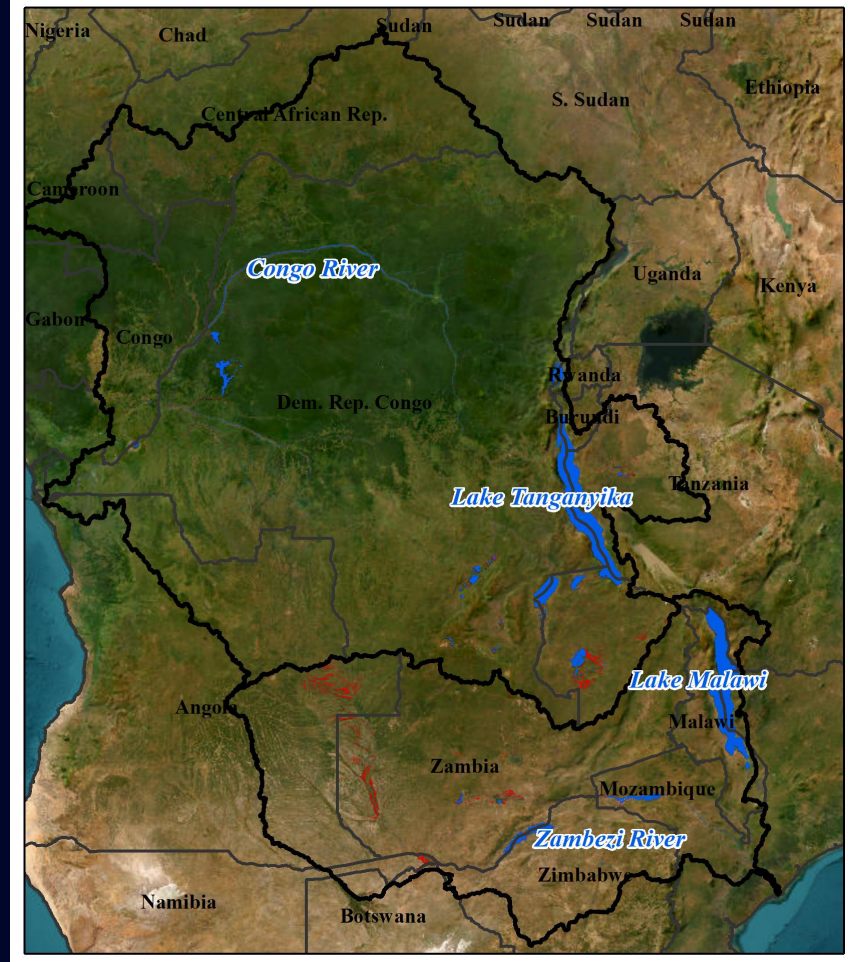


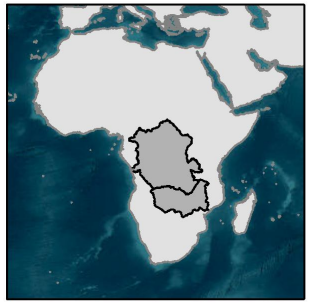
Biulding Model



SAR & Hyperspectral DOM

# 2. The monitoring products for water resources in typical African regions based on multimodal remote sensing data(CZW)




0 240 480 960
km

Legend

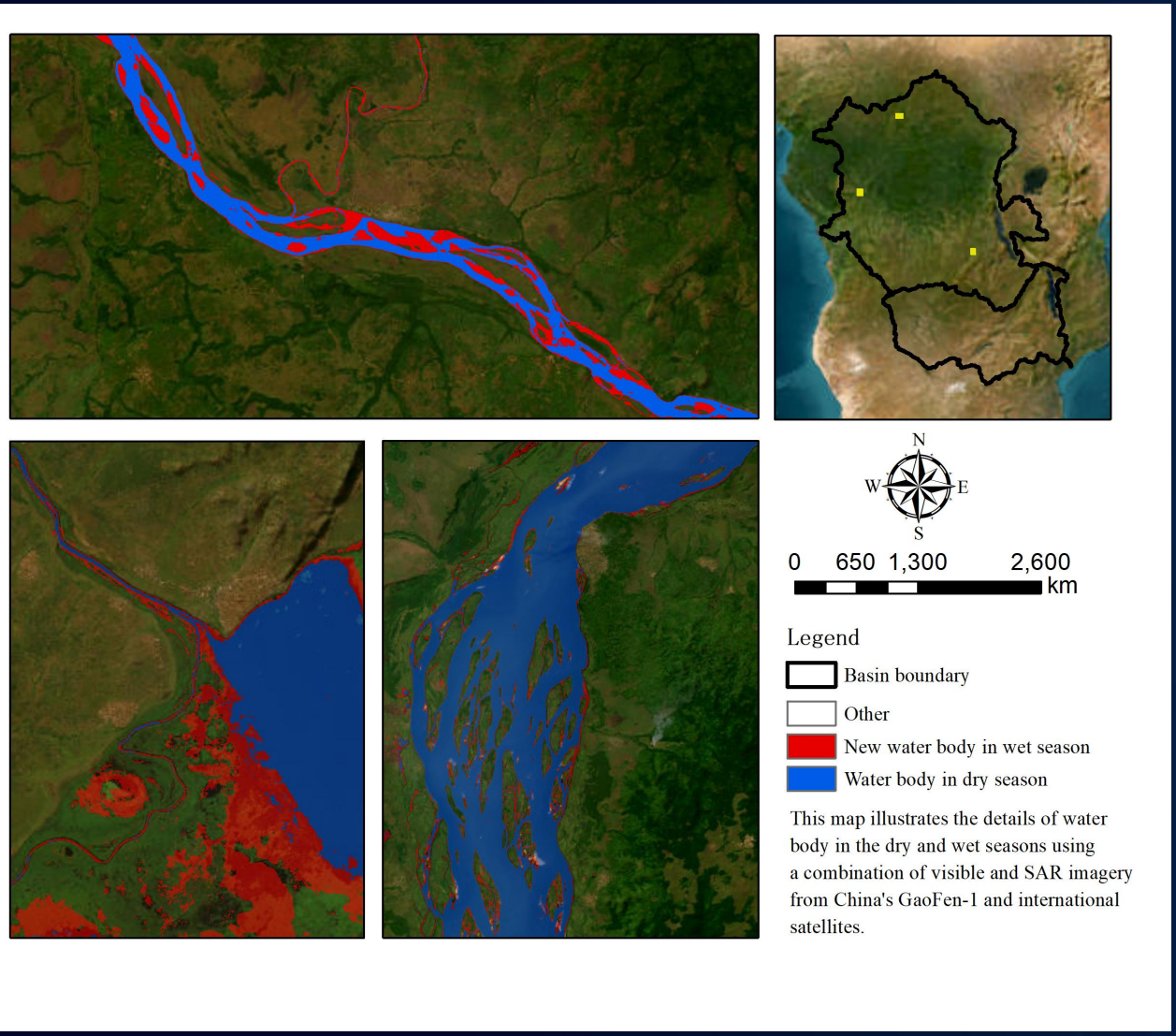
- Basin boundary
- Other
- New water body in wet season
- Water body in dry season

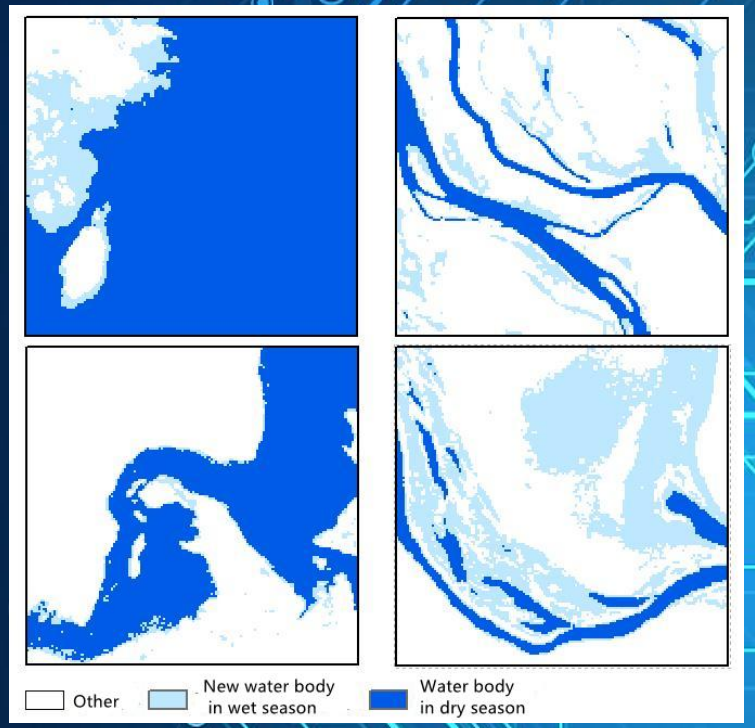
This map illustrates the product of water body in the dry and wet seasons using a combination of visible and SAR imagery from China's GaoFen-1 and international satellites.

The Congo and Zambezi river basins, 2015/2023, 10-16m, monthly

The product provides long-term remote sensing monitoring results at the basin and lake scales. By integrating multimodal data such as SAR and multispectral, it has achieved water body extraction for the Congo and Zambezi river basins in Africa for 2015 and 2023.

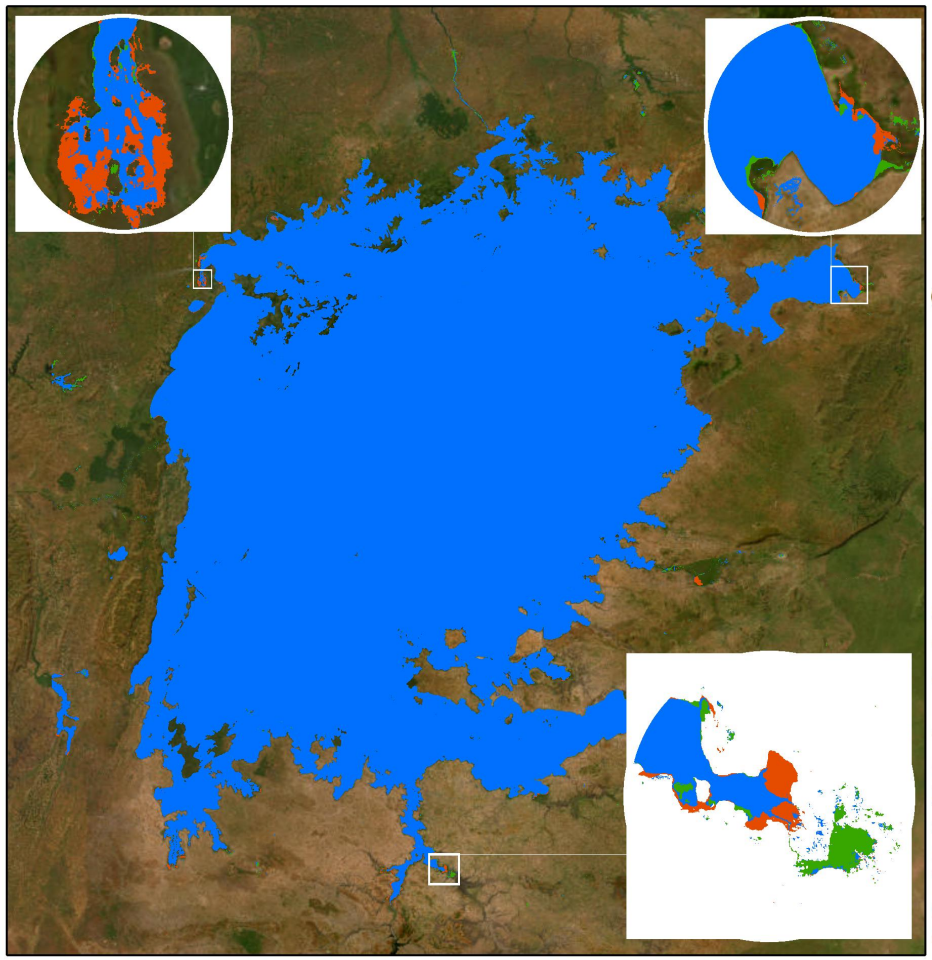
# 2. The monitoring products for water resources in typical African regions based on multimodal remote sensing data(CZW)




**Time series characteristics (frequency of water accumulation) are used to extract the wet and dry seasons.**

# 2. The monitoring products for water resources in typical African regions based on multimodal remote sensing data(CZW)

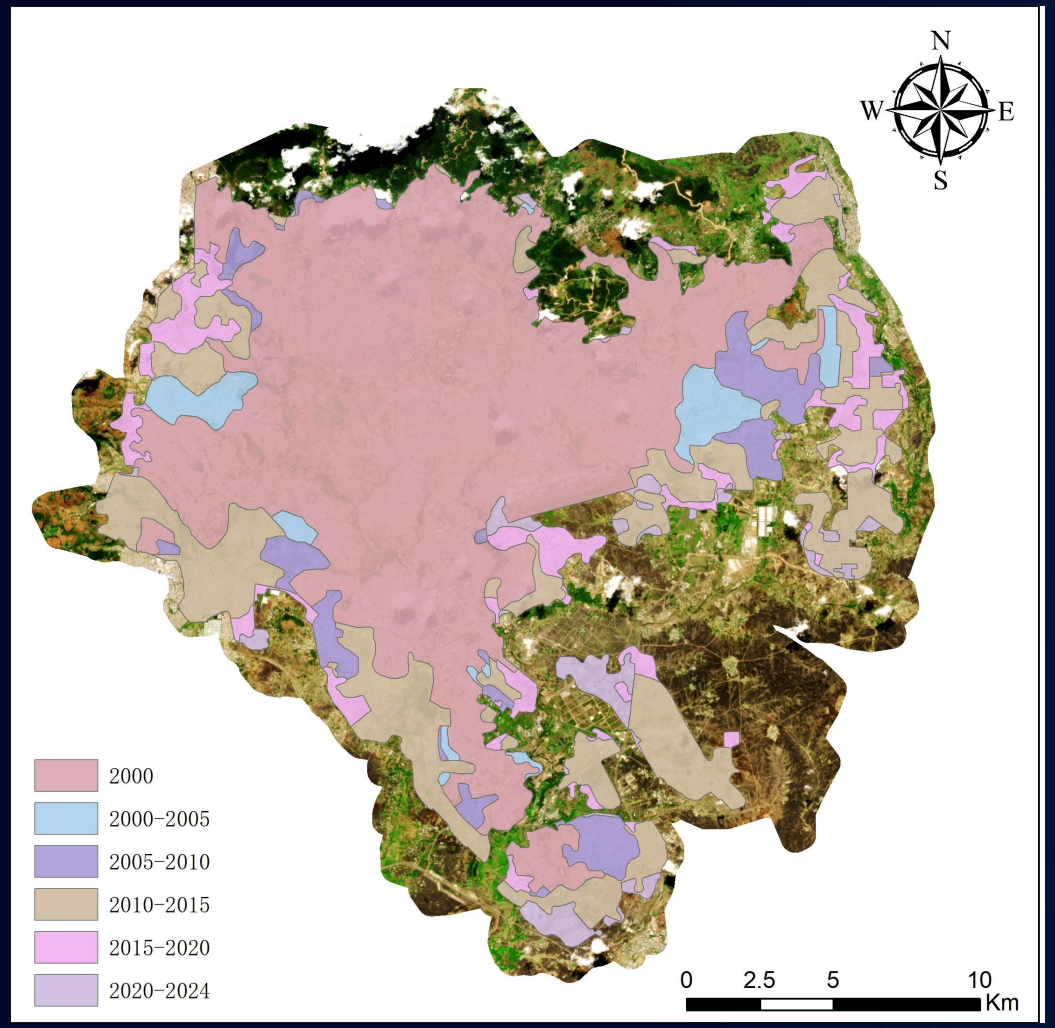



Lake Victoria, 1990-2024, 16-30m

The long-term observation of Lake Victoria from 1990 to 2024 has completed using China's Gaofen satellite images.

Data can support for the water resource management, ecological protection, risk assessment and response to the global climate change.

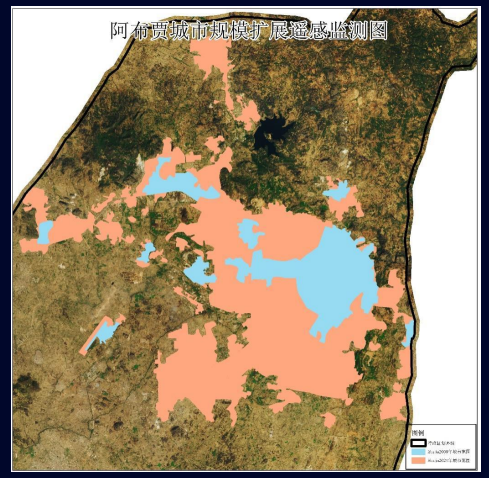
# 3.The monitoring dataset for the development of typical African cities from 2000 to 2024 (ACD-16)

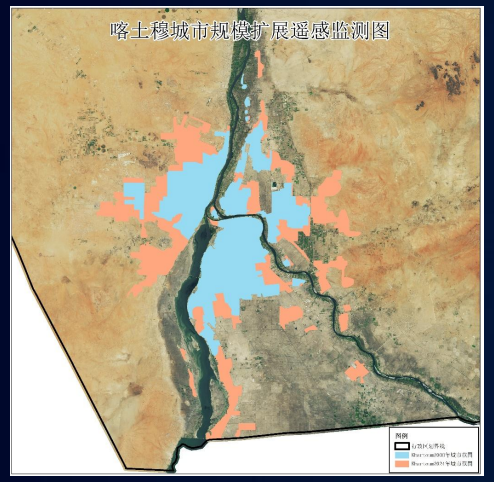


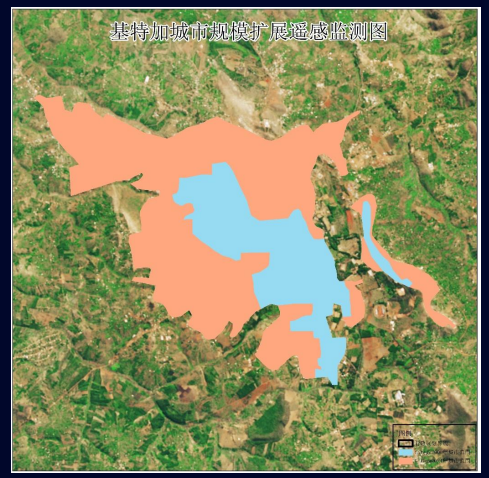

Addis Ababa-Ethiopia, 2000-2024, 16-30m

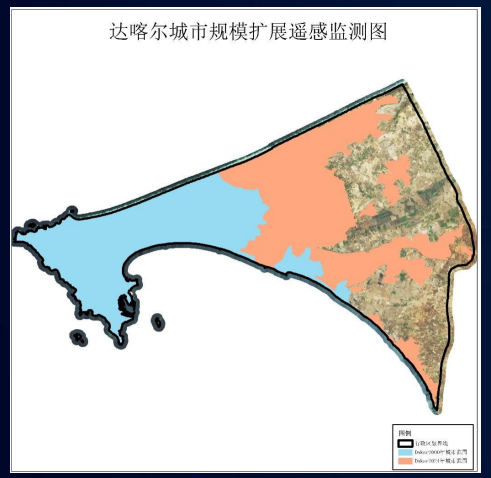
- This product focuses on the rapid urbanization status in Africa, and for the first time, it combines satellite data from China's Gaofen series to monitor the urban scale changes of 16 typical cities in Africa from 2000 to 2024.
- It provides the latest reference data for urban planning, which helps in scientifically analyzing urban spatial evolution and the urbanization process.

# 3.The monitoring dataset for the development of typical African cities from 2000 to 2024 (ACD-16)




## Key Features:

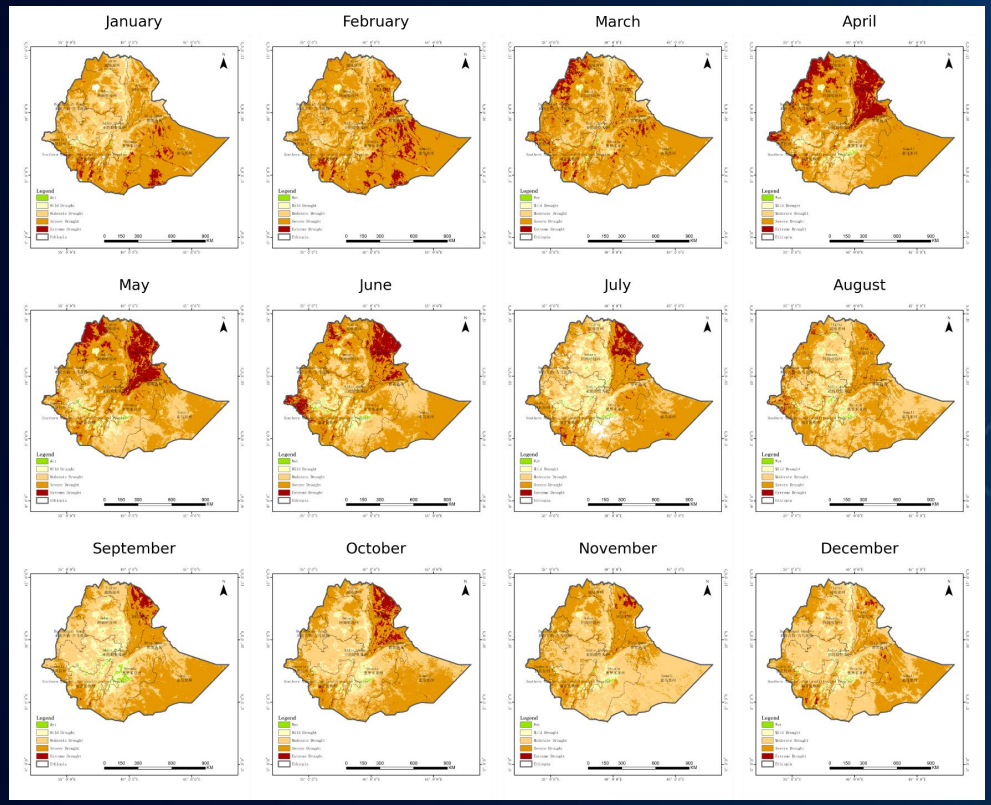
- Region-Specific Data: 16 typical cities in Africa
- Long Term Monitoring: 2000 to 2024
- China’s 16m Satellites Data Used: GF1
- Continuous Update

## Benefits for Users:

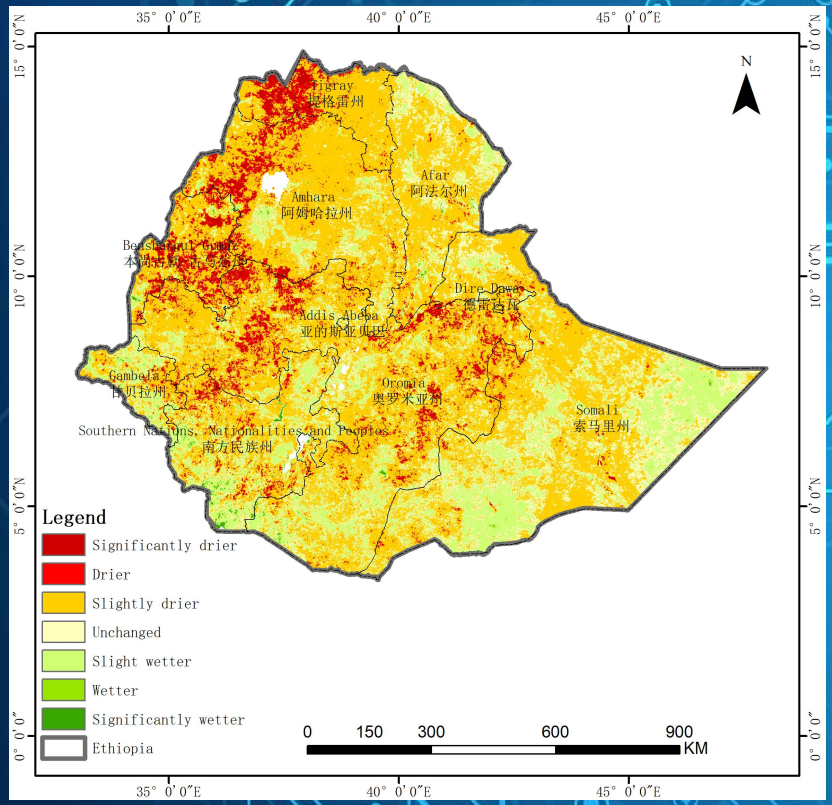
Data can support scientific research, sustainable development analysis、land resource management and urban planning etc.

# 4.Drought Monitoring Map for Ethiopia

- **Coverage:**
  Ethiopia,
- **Space Resolution:**
  500 m,
- **Time:**
  2010-2023,
  monthly.




Degree of drought(2023,monthly)




Variation trend of drought

# 4.Drought Monitoring Map for Ethiopia

## ● Key Features

### Spatial-temporal Analysis

- 2010~2023, monthly

### China’s New Satellites Data Used

- FengYun meteorological satellites data
- GaoFen series satelites data

## ● Applications

### Environmental Monitoring

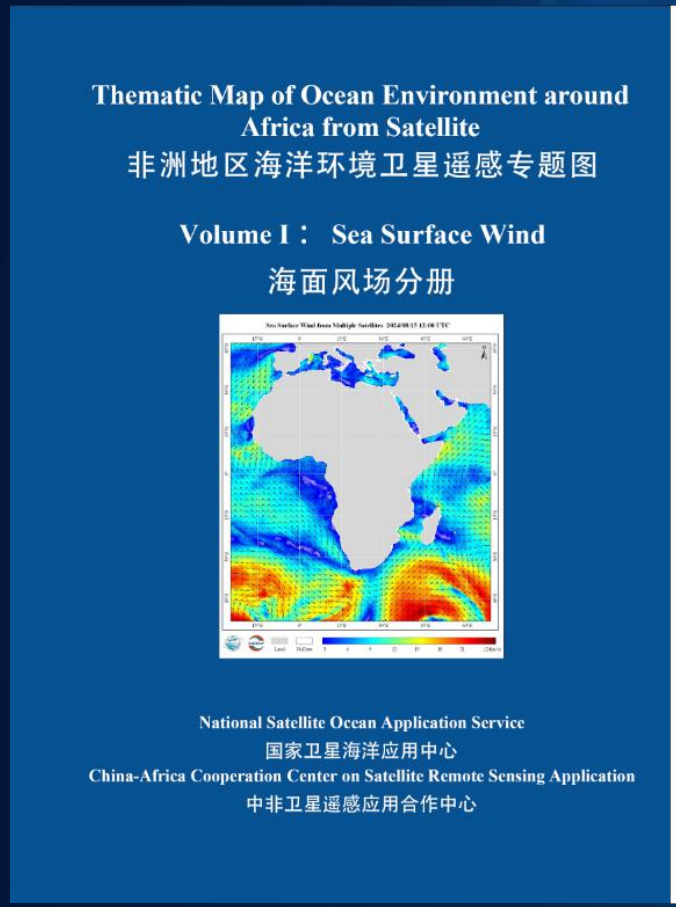
- Track and assess the the drought

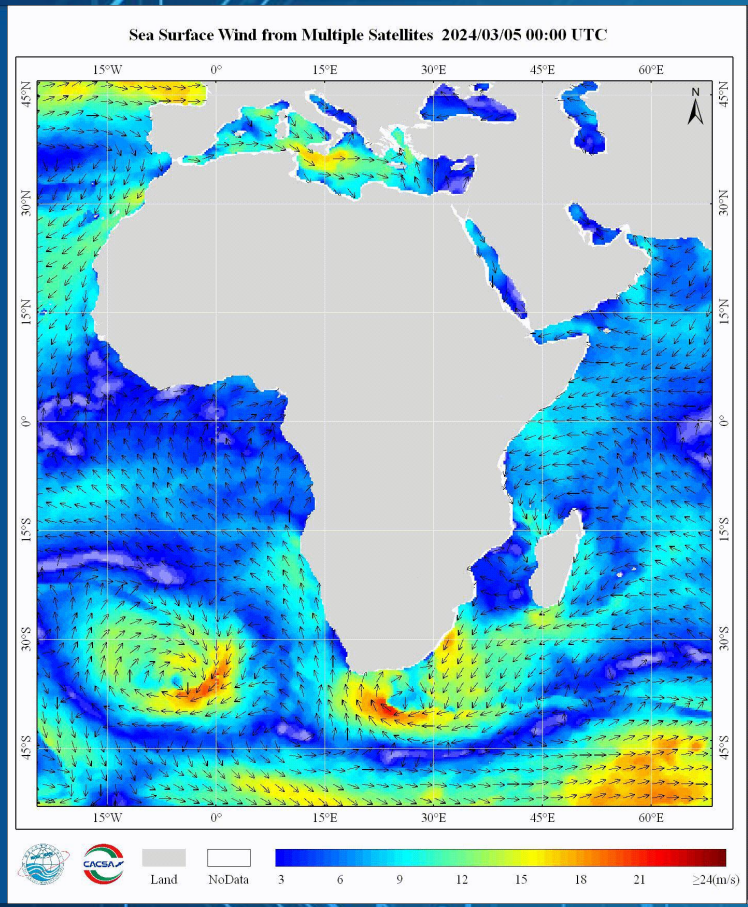
### Resource Management

- Sustainable management of agricultural
- Rational allocation of water resources

# 5. Thematic Map of Satellite Remote Sensing Ocean Environment in Africa：Sea Surface Wind and Sea Surface Temperature

Thematic map of sea surface wind around Africa from satellite is based on blended sea surface wind data product from multiple satellites, covering all the open sea areas within the range of 20°W to 65°E and 45°N. The blended sea surface wind data product from multiple satellites are developed by NSOAS, the root mean square error of the data is less than 1.6 m/s for wind speed and less than 18° for wind direction. The data is a gridded data product with resolution of 0.25°×0.25°, which can cover all the open sea areas around Africa four times a day on 00:00, 06:00, 12:00, and 18:00 UTC, respectively, and is updated in near-real-time. The thematic map and data product can be accessed from ftp://osdds-ftp.nsoas.org.cn.



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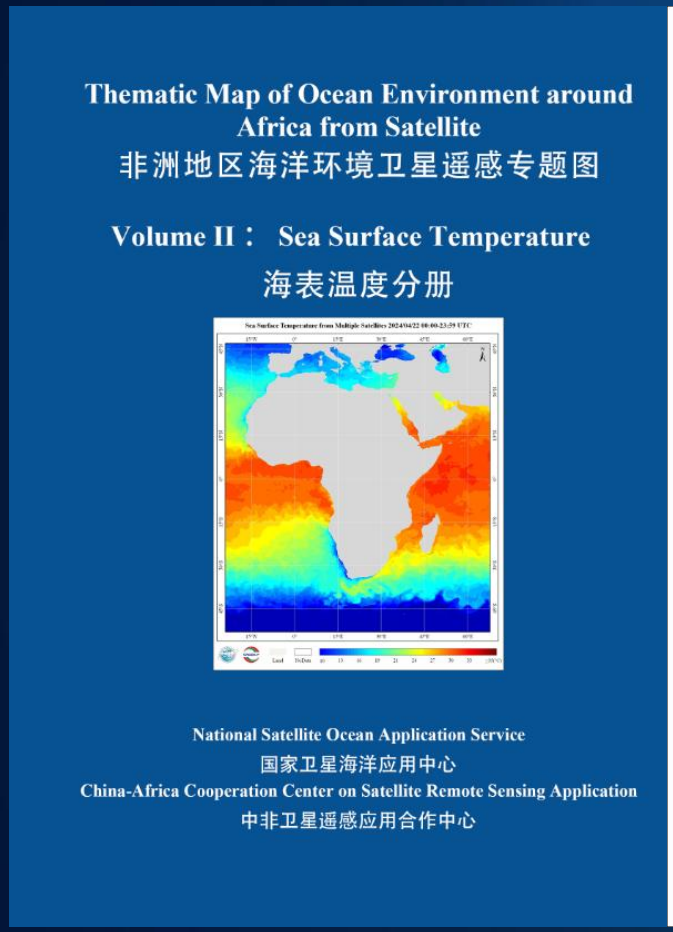
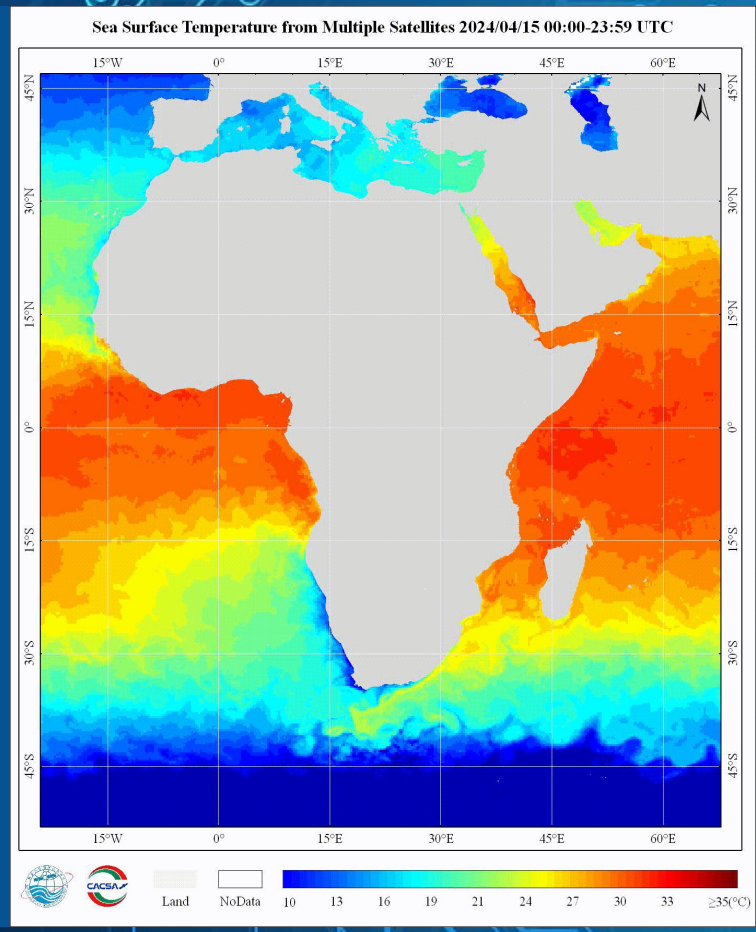
Thematic map of sea surface temperature around Africa from satellite is based on blended sea surface temperature data product from multiple satellites, which is developed by NSOAS, the root mean square error of the data is less than 0.7 ℃. The data is a gridded data product with resolution of 0.25°×0.25°, which can cover all the open sea areas around Africa once a day, and is update in near-real-time.
These data provid important reference for marine disaster prevention and mitigation, ensuring offshore fishing activities, ocean numerical model forecasting, as well as marine scientific research and climate change studies in Africa, which are essential for implemention of the 2030 Sustainable Development Goals.



01

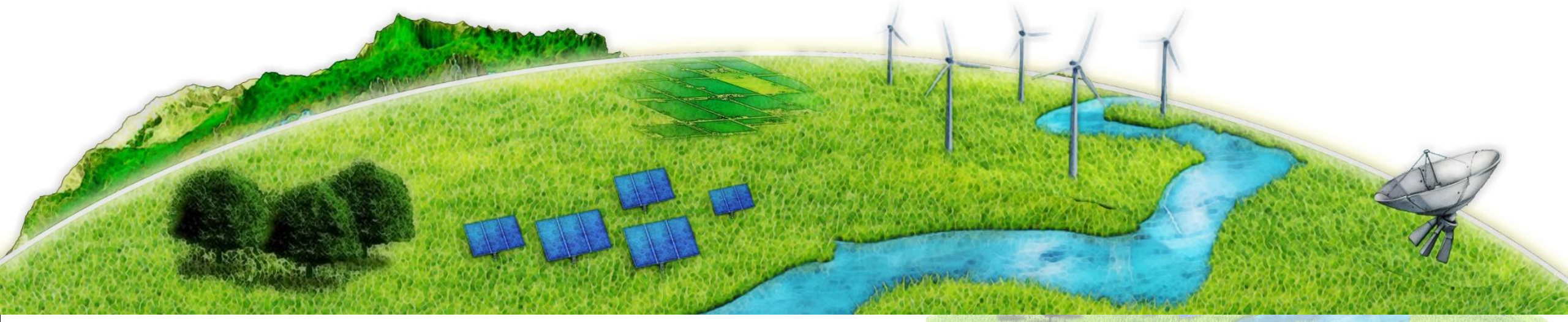
Developent of Satellites Observation Systems

02

Applications and data sharing to SIDS

03

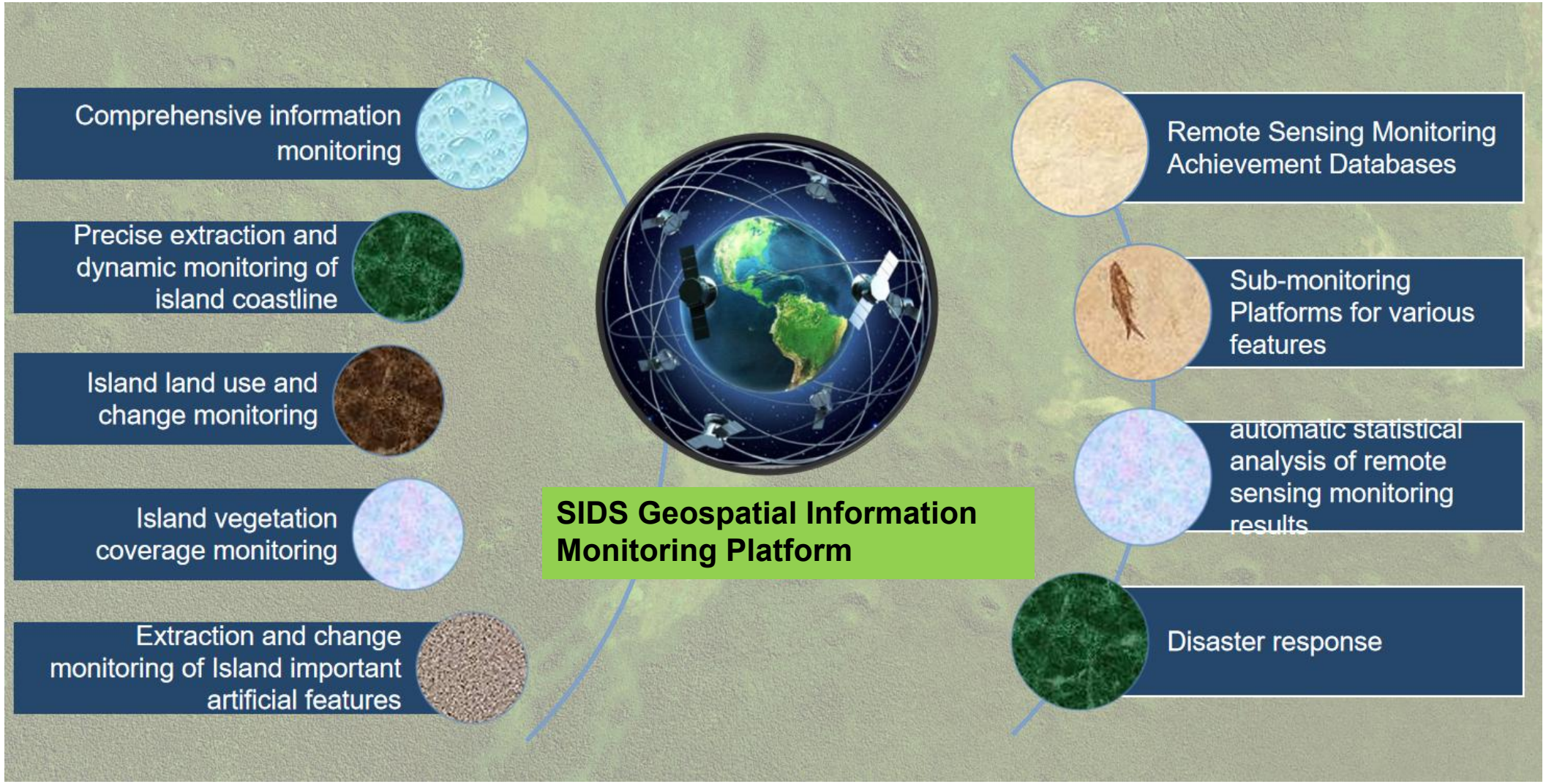
**Suggestions and sloutions**



# SIDS Geospatial Information Monitoring Platform

- Focus on Geographical and natural resource characteristics of SIDS and its surrounding areas
- Utilize the satellite remote sensing integrated acquisition mechanism, artificial intelligence, big data analysis and other technical means
- Carry out Chinese and all Global high-resolution satellite image production and data services,
- Realize remote sensing monitoring of SIDS integrating a variety of features analysis and evaluation
- Build a remote sensing data sharing service platform for SIDs
- ARD+AI modelling to support environmental and economical social governance
- China-SIDS Cooperation Center on Satellite Remote Sensing Application

# SIDS Geospatial Information Monitoring Platform



# High-resolution Satellite Data for SIDS

- sincere regional and global cooperation through satellite image resource sharing, technical research, personnel exchange, joint project implementation and emergency response
- For platform node to get  the satellite data covering the entire country with software,tools and trainings free of charge

**1. High-resolution（2m） satellite data free of charge under the 3/5 year MOU/writing consents.**

**2.Data sources include images of such Chinese satellite as ZY3-01/02/03,GF1-B/C/D and ZY1-02C/02D**

| Software and hardware configurations | |
|---|---|
| Equipment | Basic Requirement |
| Server | 8 Core, 16GB RAM |
| HHD | 2TB to 10TB |
| Internet | >20MB/S |
| Operation System | WIN Server 2012 / 2016 |
| Browser | IE 11 / Chrome 49.0 |
| Client * | Query, Management, Receiving, Statistics |

* Deployed by LASAC (can be configured remotely )


- **Contact for details：**

**Ms YE Fanghong**

**Professor,**
**Foregin Affairs Office,**
**Land Satellite Remote Sensing Center, Ministry of Natural Resources of P.R.China**

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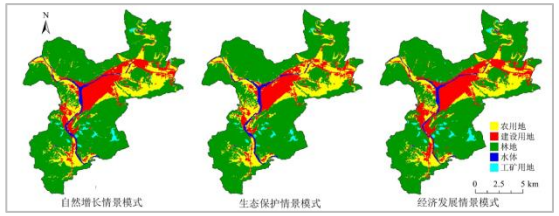
**Mob：+86-13911294687**
**Tel/Fax：+86-10-68412199**
**Email: helenye001@126.com**

**WeChat:46189577**

# 未来展望 Prospectives

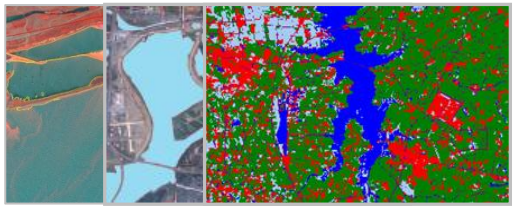

决策支持
Decision making




应用服务体系
Application Service System

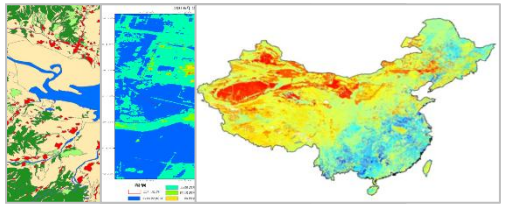
云服务 Cloud service platform

云监督 Cloud supervision platform



知识
Knowledge

二次评估
Double evaluation



产品体系
Product System

DOM DEM DSM ……

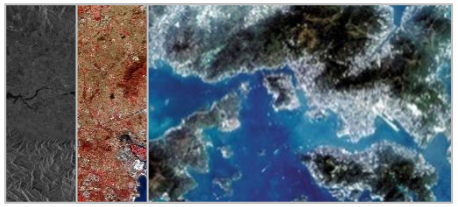
监测体系
Monitoring System

Nature Resource survey monitoring

Natural Ecological monitoring

Comprehensive Governance monitoring

质量监测
Qualitymonitoring



信息
Information

观测系统
Observation system

Gravity satellite

Laser altimetry satellite

Optical (visible light) satellite

Hyperspectral satellite

Radar satellite

Marine satellite

影像
Image

数量监测
Quantity monitoring

# Thank You !

2m resolution satellite data , for non-commercial use,
Free of Charge for your country!

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