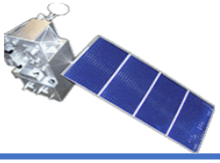

Fengyun International User Conference

2019

Overview of Fengyun satellite global data sharing and application service

Tang Shihao

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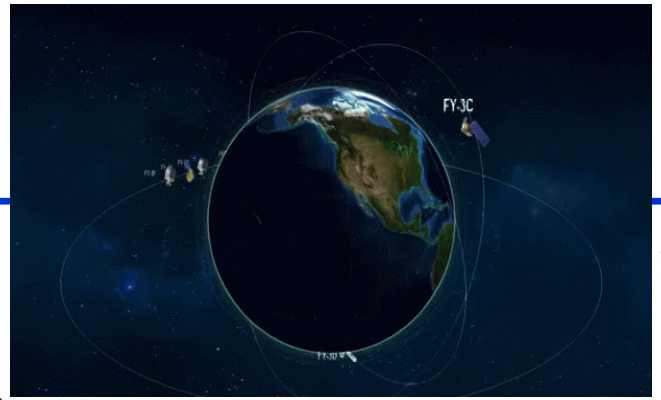
Center of Remote Sensing Applications&Services,
National Satellite Meteorological Center,CMA

Nov. 15-17 , 2019,Haikou, China

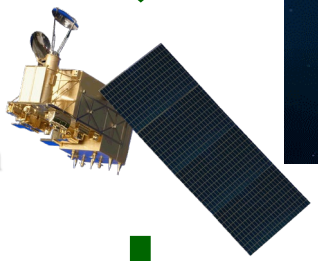
Overview of Chinese FENGYUN Meteorological Satellites

Polar System

First Generation
FY-1 A, B, C, D

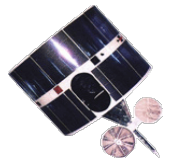


Second Generation
FY-3 A, B, C, D

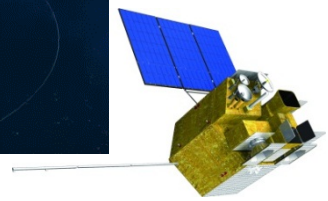


FY-3E,F, G planned until 2025

Geostationary System

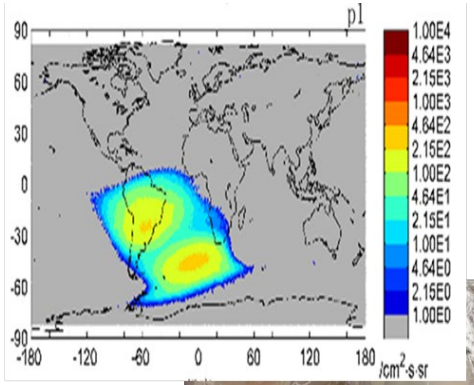


First Generation
FY-2 A, B, C, D, E,
F, G, H

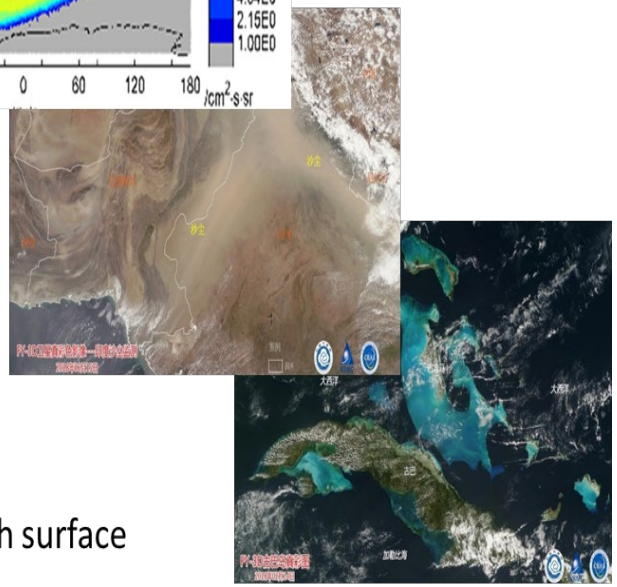


Second Generation
FY-4 A

FY-4B,C,D planned until 2025



Space weather

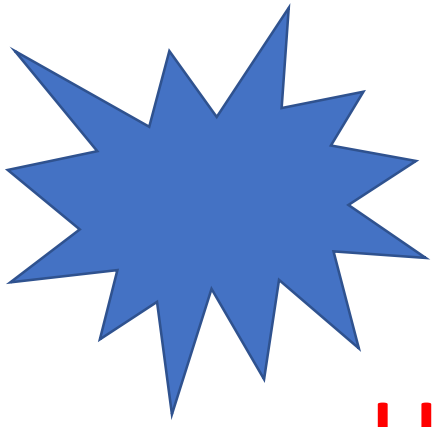


Atmosphere

Earth surface

FY-3D

Cloud	Atmosphere	Land surface	sea surface	Space weather
Cloud mask, Cloud Amount, cloud type, cloud phase, cloud top temperature/height, cloud optical depth, Cloud Physical Parameters ,cloud water content,	Atmospheric Total Precipitable Water ,Dust Storm Index, Aerosol optical depth, rain detection, Atmospheric Humidity/temperature Profile(GNOS,VASS), Precipitation, Ice Water Path, Microwave Rain Rate, Cloud Liquid Water, Fog detection, Outgoing longwave	Global Fire detection ,Land Cover, Land Surface reflectance, Land Surface Temperature, Soil moisture, NDVI, Snow Cover, Snow cover Fraction, LAI, FPAR ,NPP, Albedo, Snow depth/Snow Water Equivalent	SST, Sea-Ice cover, Ocean Color/Chlorophyll, Sea surface wind speed	radiation flux of high energy particles, surface electric potential, radiation dose, GNOS Electron Density Profile, Ionospheric O/N2 Column Ratio, Aurora Mapping Products

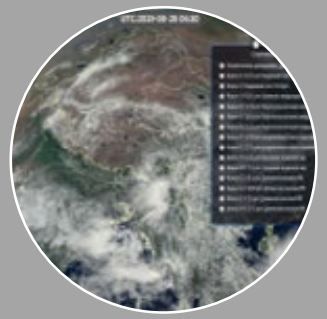


How to get the data?

How to use the data?

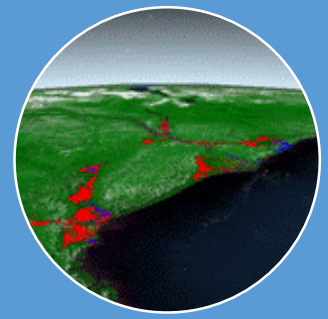
How about our future service Plan?

1. Data service



2.Software service

3.application service

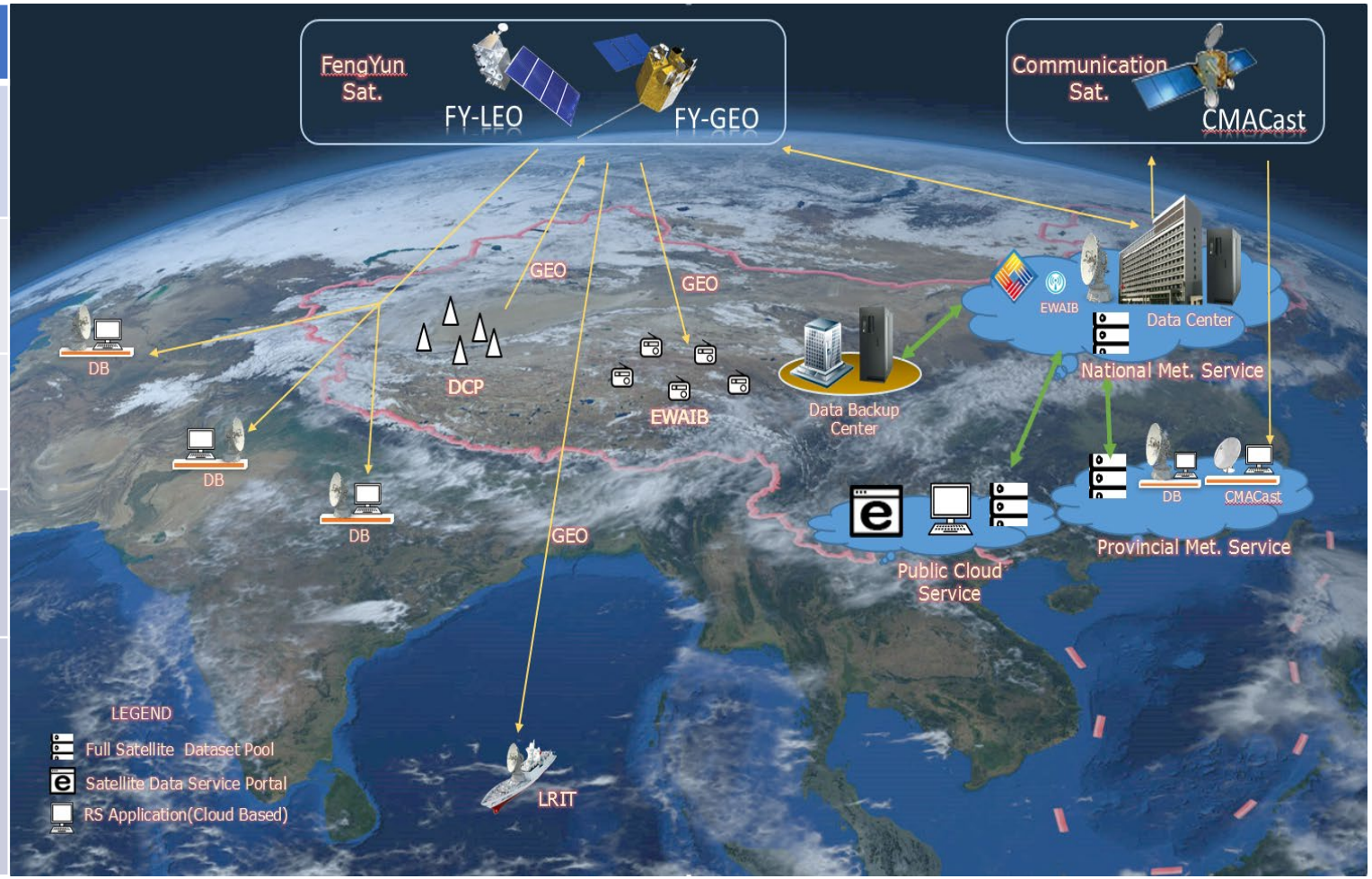


4. Communication and training service

1. Data service

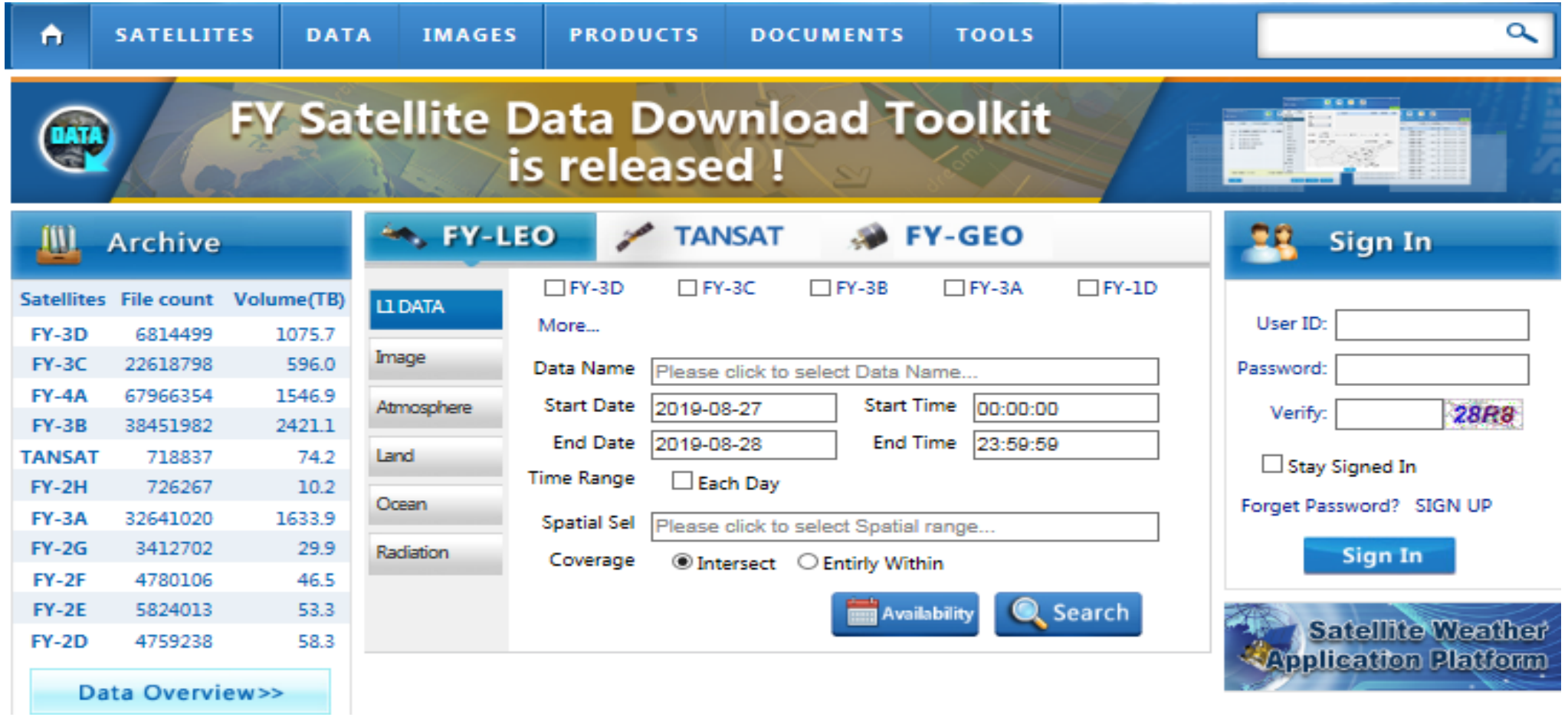
Integrated Space and Ground Based FY Satellite Data Service System

Type	User	Time
DB station	Agreement user	Real-time dataset
CMAcast	Agreement user	Real-time dataset
Webpage	All user	Nonreal-time
Cloud service	All user	Nonreal-time
FTP: traditional method,Green Channel, Data download toolkit, ...	All user	Nonreal-time



1. Data service

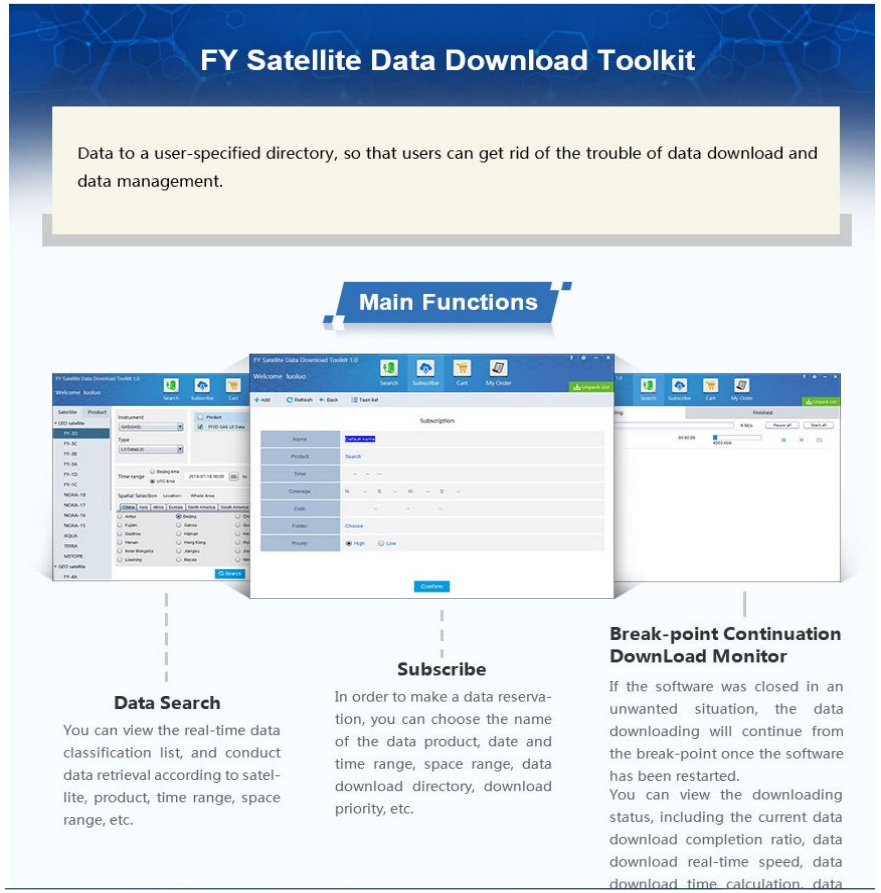
Web portal

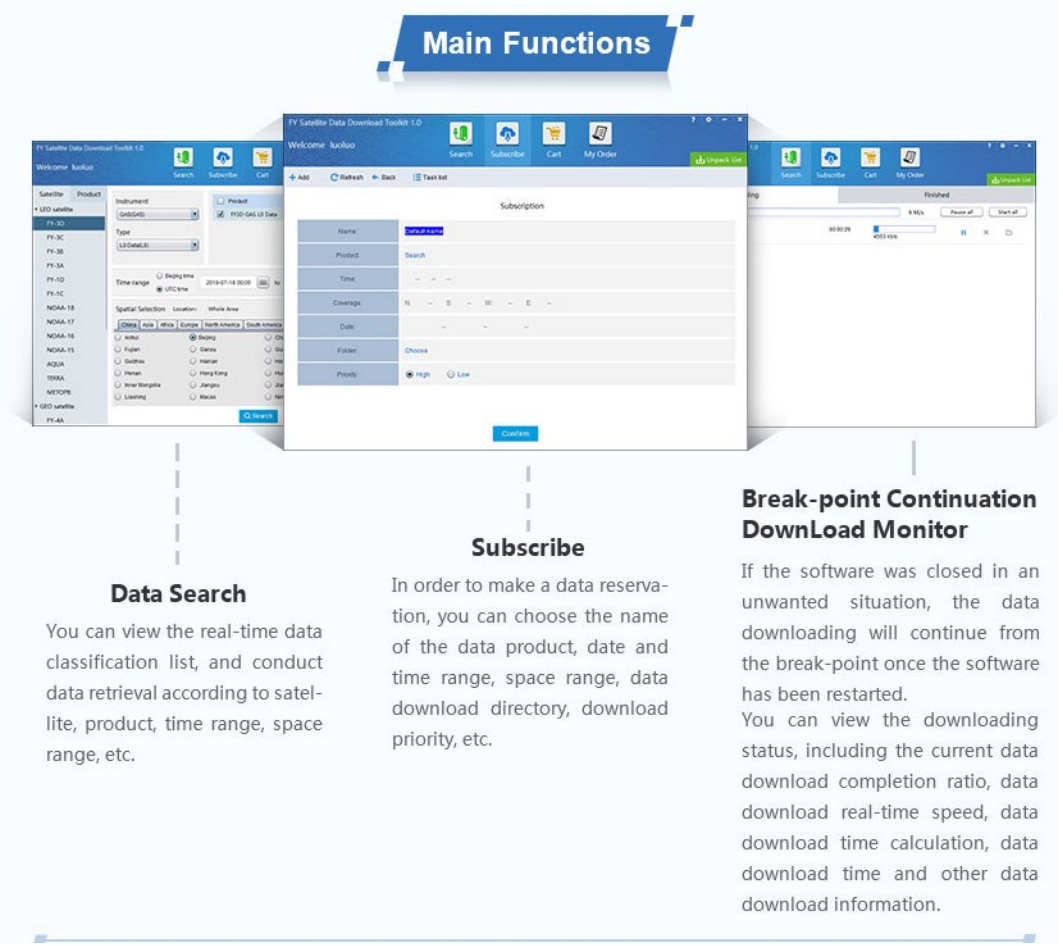


http://satellite.nsmc.org.cn
http://data.nsmc.org.cn

1. Data service

FY Satellite Data Download Toolkit





http://fy4.nsmc.org.cn/nsmc/en/data/pcclient.html

1. Data service

Emergency Service

Establishment of the Emergency Support Mechanism of FENGYUN Satellite (FY_ESM)

China provides timely and efficient observation of extreme weather, climate and environmental events regionally and globally by operating both geostationary and polar-orbiting meteorological satellites. China Meteorological Administration (CMA) issued the Emergency Support Mechanism of FENGYUN (FY) Satellite (FY ESM) in 2018.

Open to all WMO members.

1. Data service

How to join FY_ESM

- A Permanent Representative with WMO presents a written application to the Permanent Representative of China with WMO and designates a focal point as an authorized user.

  The application form can be download from the website.

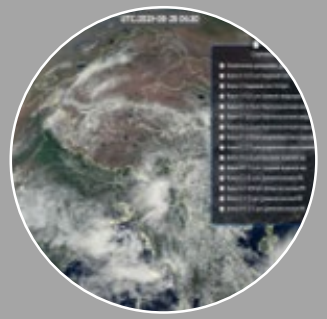
  https://fy4.nsmc.org.cn/download/documents/FY_ESM_registration_EN.doc

Benefits

FY_ESM users can start this mechanism when suffered such **extreme events as typhoon, heavy rain, severe convection, forest or grassland fire and sand and dust storm**.

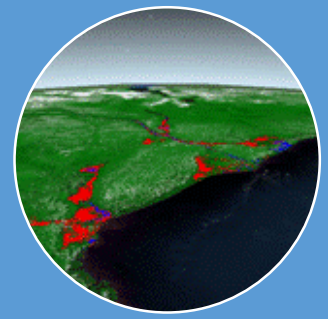
Once the request is approved, CMA will command the on-duty FY satellite for frequent and targeted observation over affected areas.

1. Data service



2.Software service

3.application service



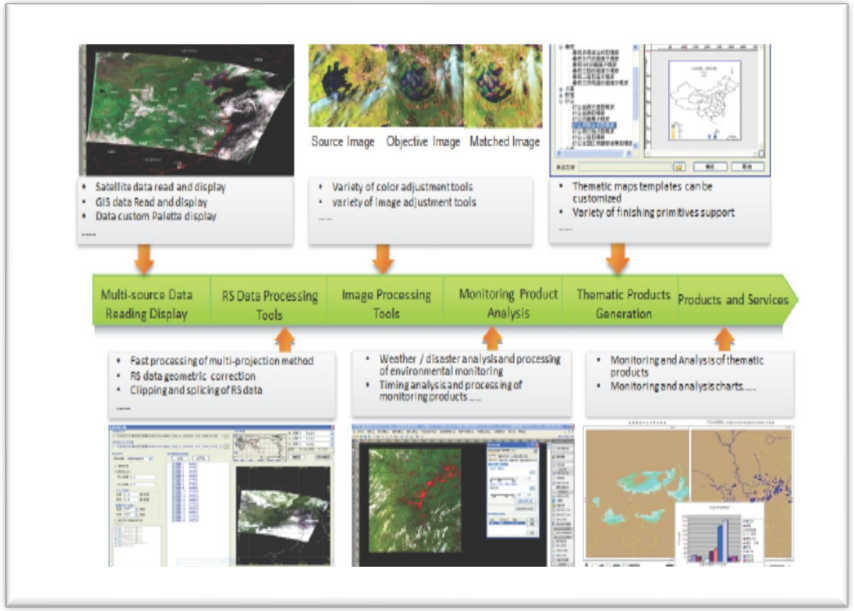
4. Communication and training service

2. Software service

Application tools

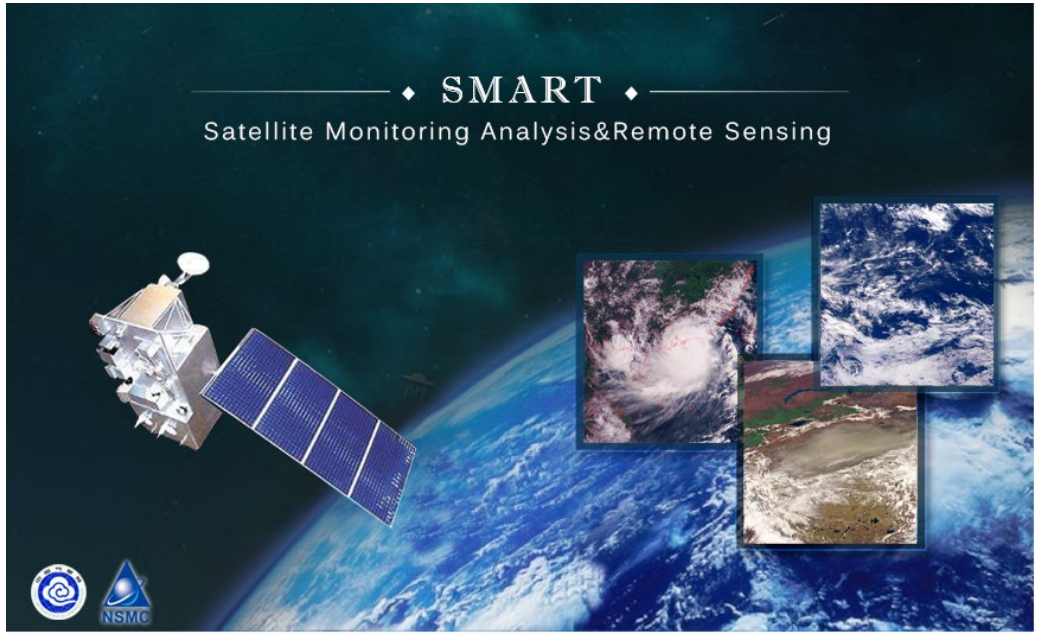
Satellite Weather Application Platform - SWAP

Weather monitoring and analysis
---Geostationary Satellite data (FY-2/FY-4)



Satellite Monitoring Application Remote sensing Toolkit -SMART

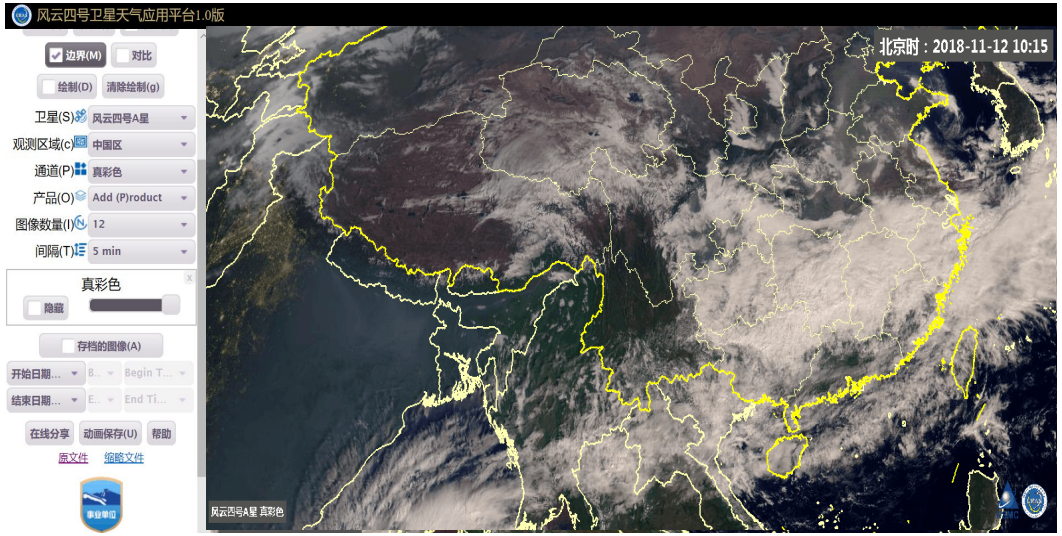
Natural disaster and environment monitoring and analysis
---polar orbit Satellite data

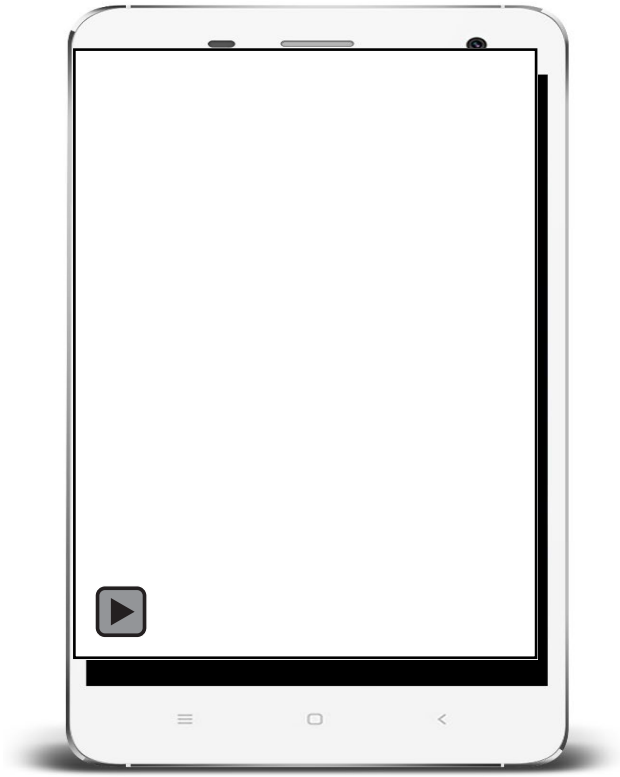


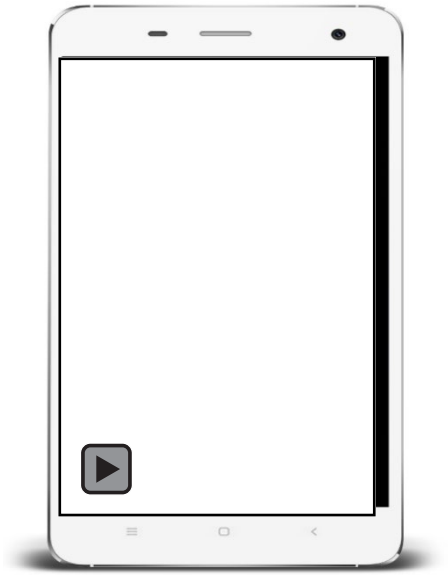
2. Software service

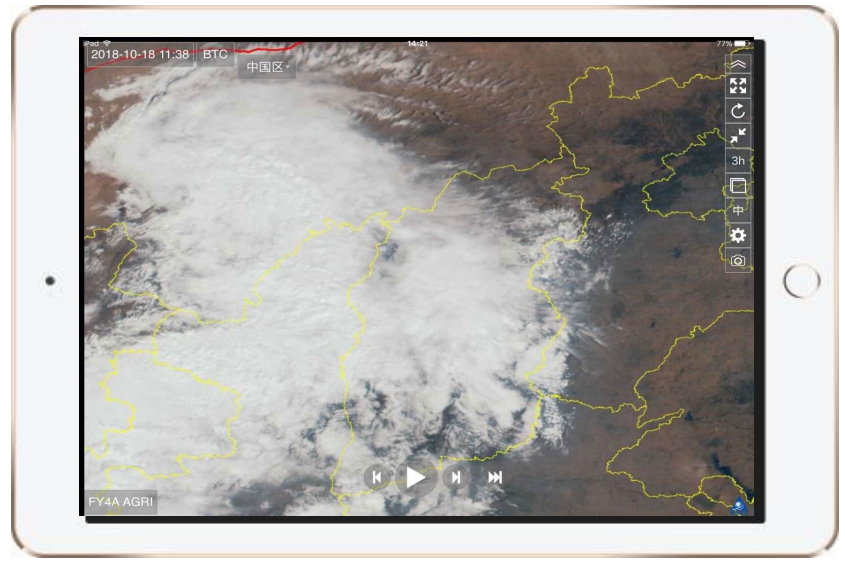
Satellite Weather Application Platform -SWAP

Provide versions for different terminals, users can browse the latest cloud images anytime and anywhere (within 10 minutes)



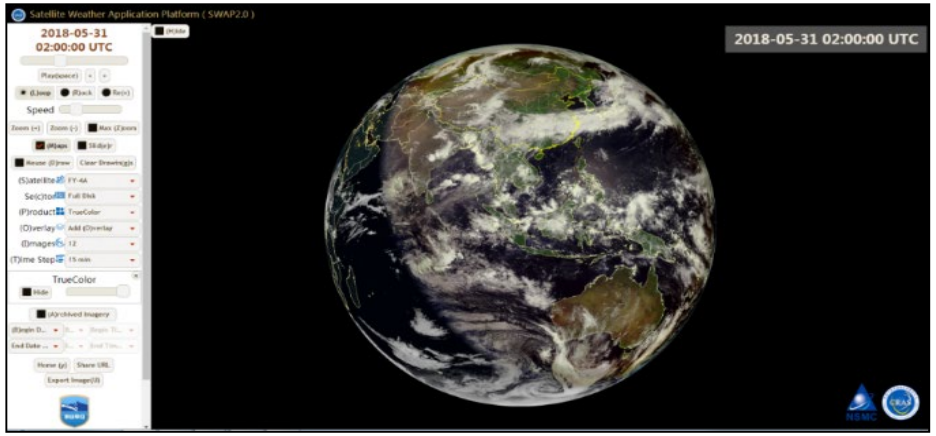




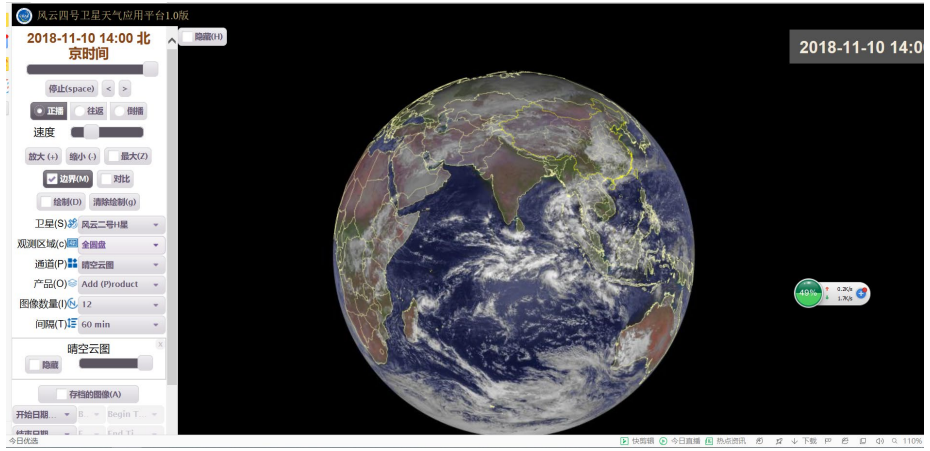


2. Software service

Provide Chinese, English and Russian versions



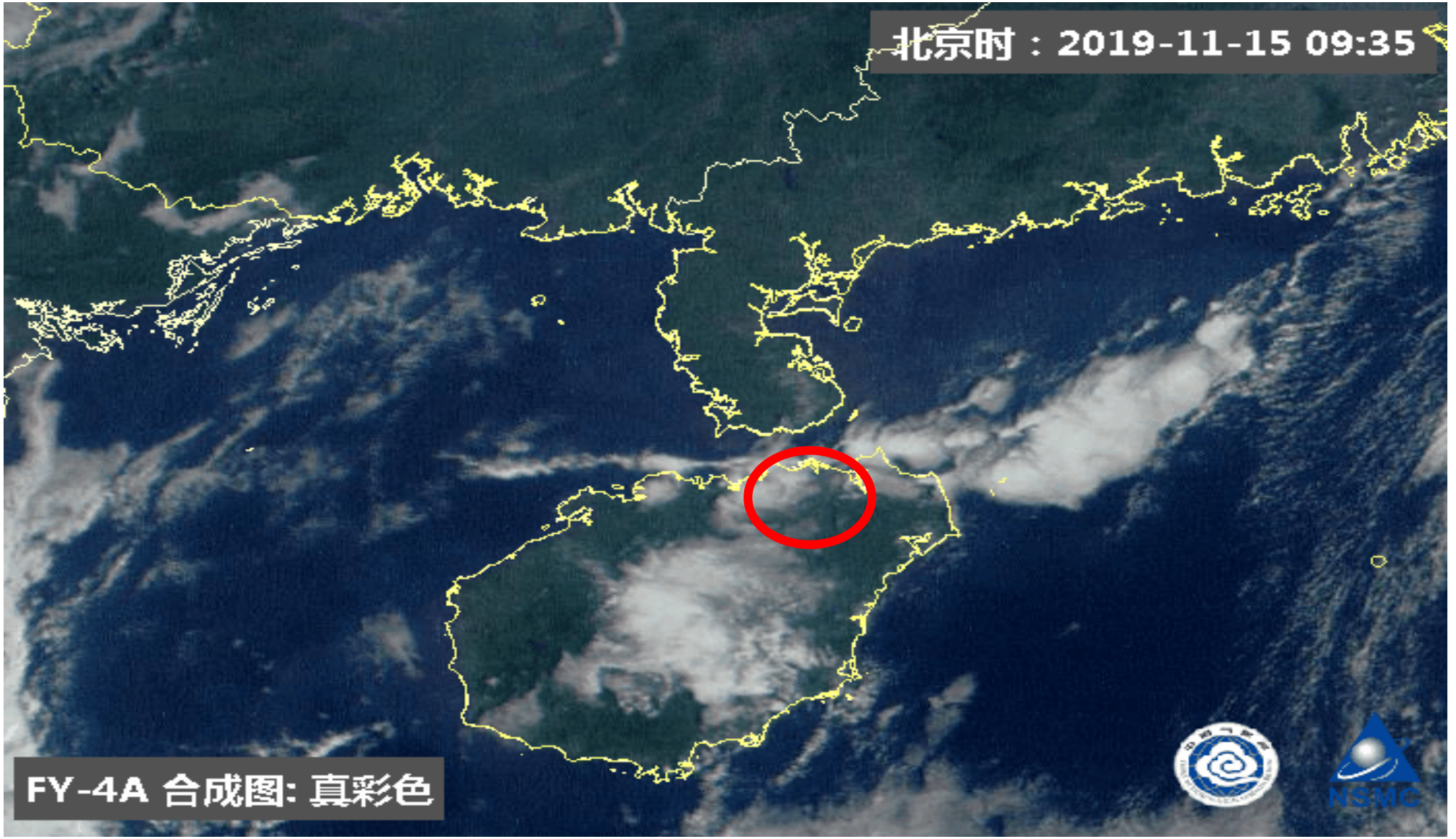
http://rsapp.nsmc.org.cn/geofy/en



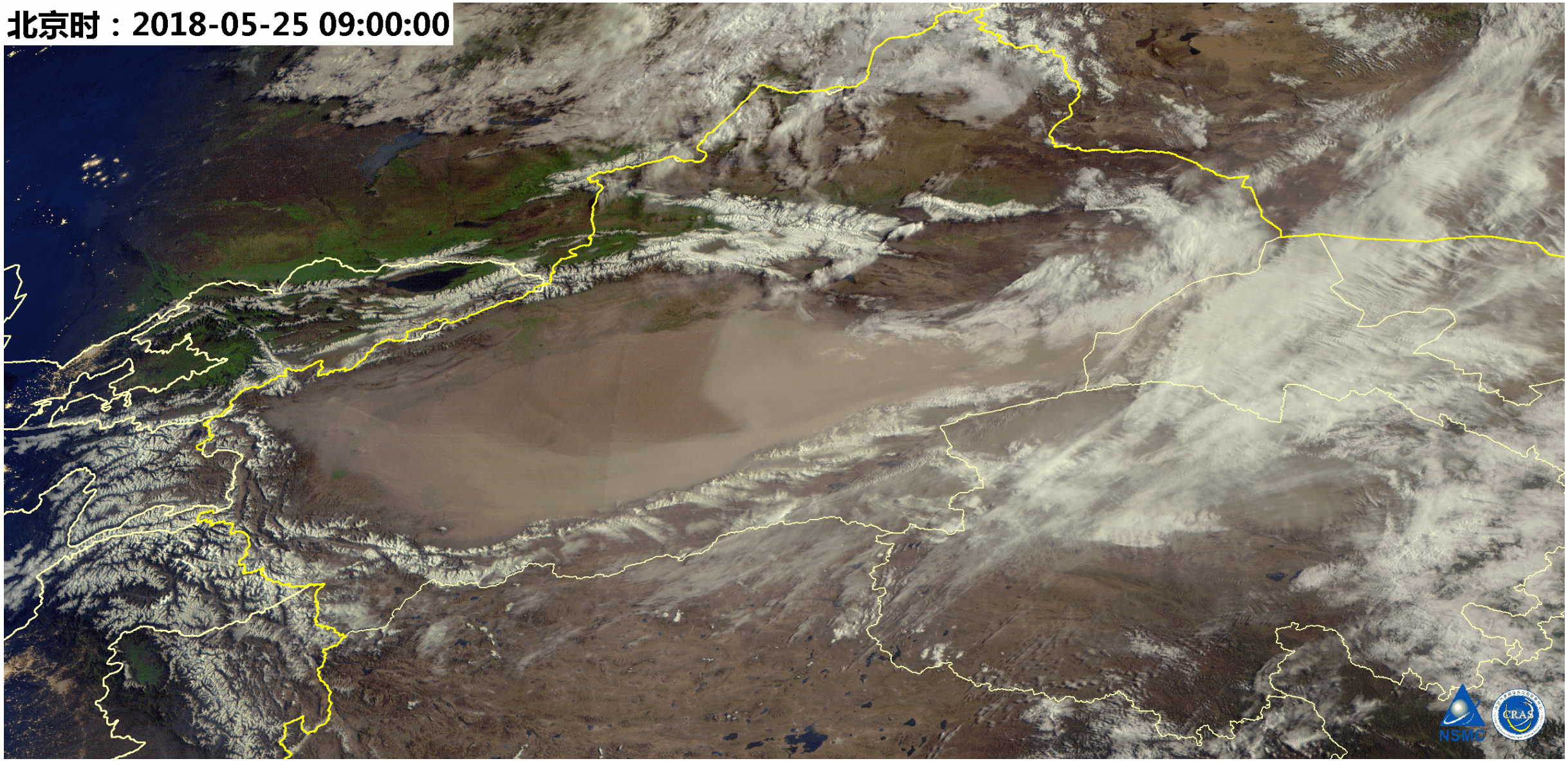
http://rsapp.nsmc.org.cn/geofy

http://rsapp.nsmc.org.cn/geofy/ru

2. Software service

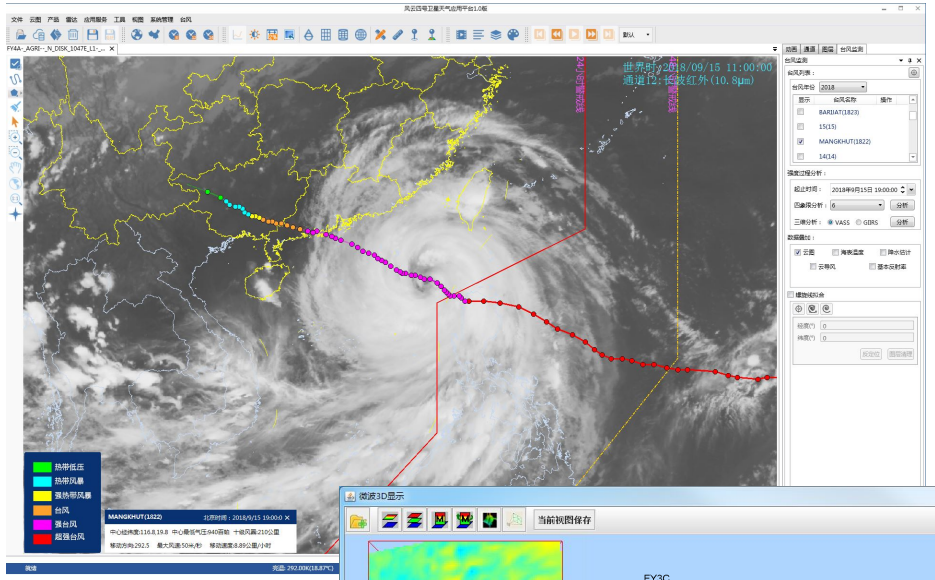


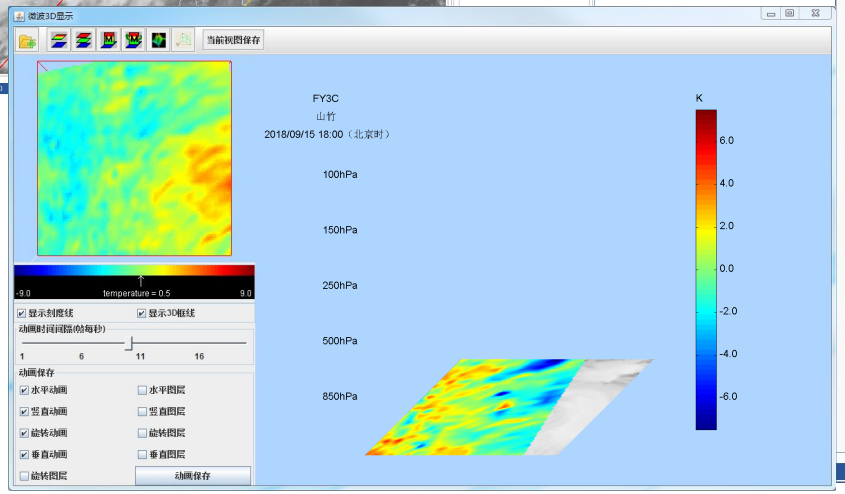
2. Software service

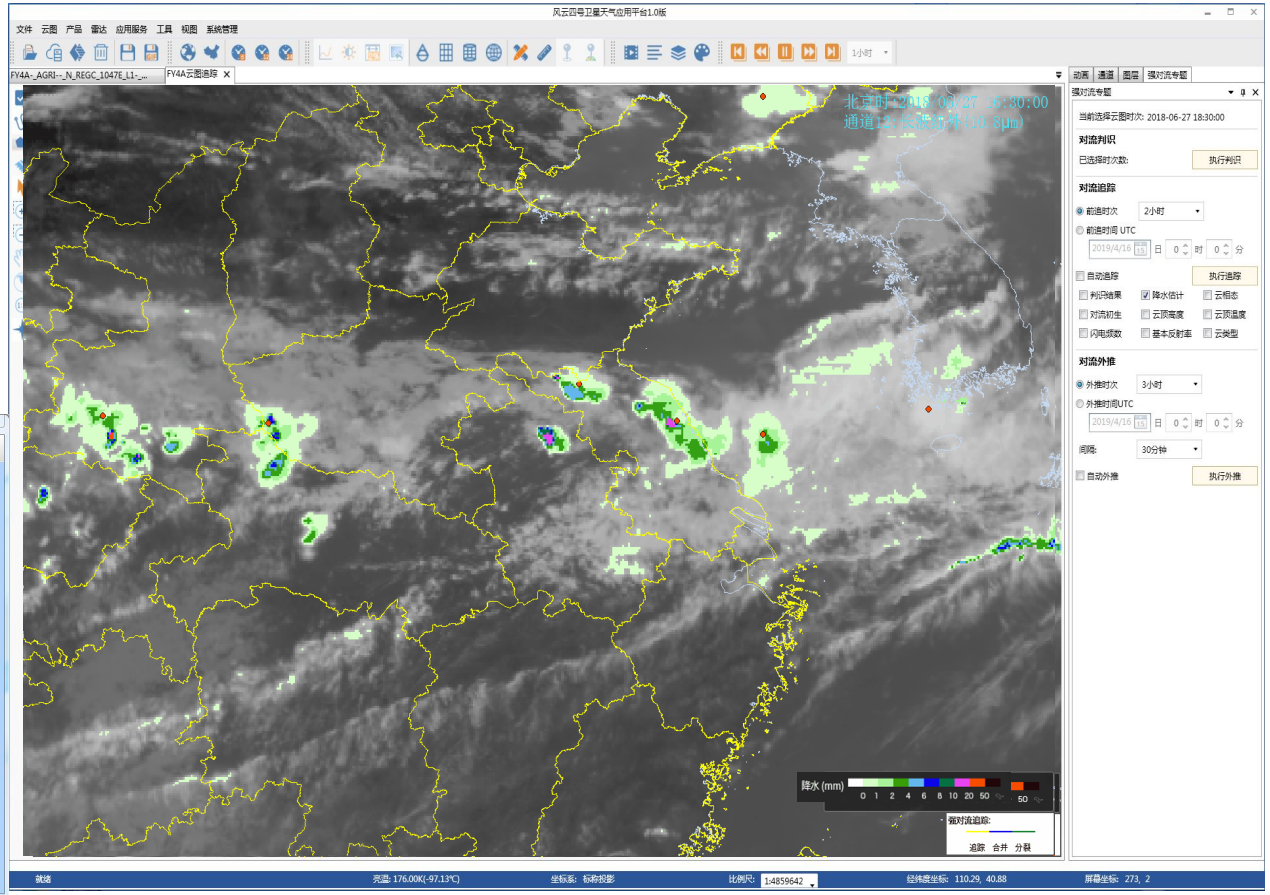


2. Software service

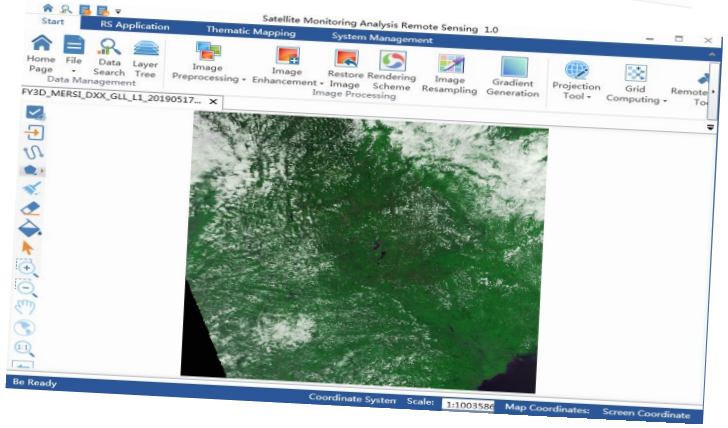
Realize the overlay of cloud animation and different quantative products







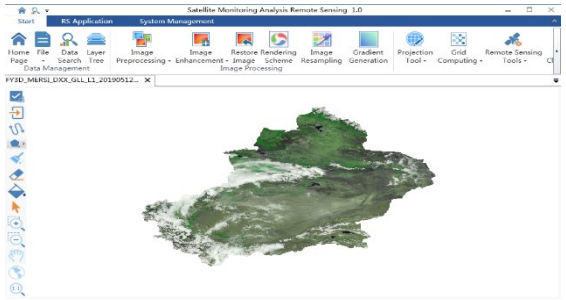
2. Software service



Satellite Monitoring and Analyzing Remote-sensing Toolkit (SMART) is a comprehensive application platform for remote sensing monitoring and application using FY-3 and other meteorological satellite Data.

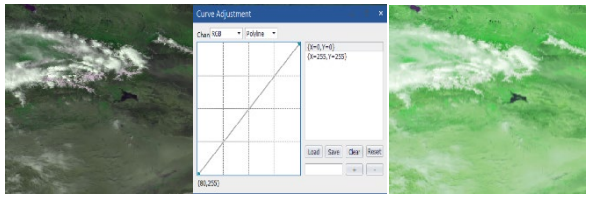
2. Software service

Main Functions



- Reading and displaying Satellite data
- Reading and displaying GIS data
- Customizable color palette for data displaying

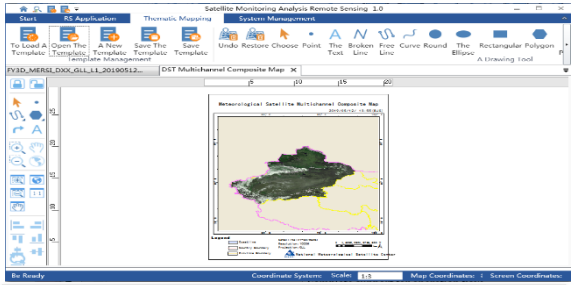
……



Source image | Image adjustment | Adjusted image

- Multiple functions of color adjustment
- Multiple image adjustment functions
- Multiple auxiliary tools including magnetic lasso etc.

……



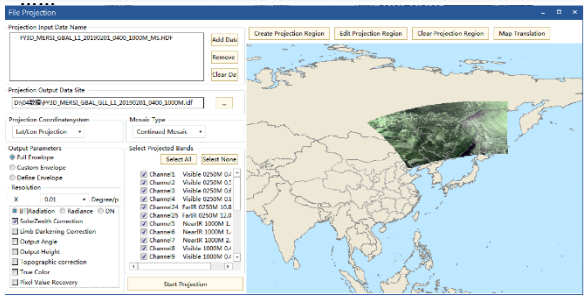
- Customization of thematic map templates
- Label for thematic map

……

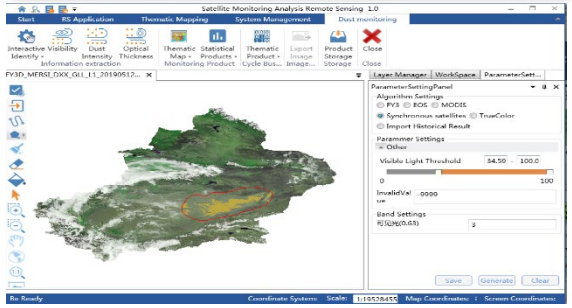
Multi-source data Reading and displaying | **Remote secsing Processing tools** | **Image processing Tools** | **Monitoring product analysis function** | **Thematic map of Monitoring product function** | **Product Services**

- Multiple projections which are fast processing
- Image geometrical correction functions
- Image split or mosaic

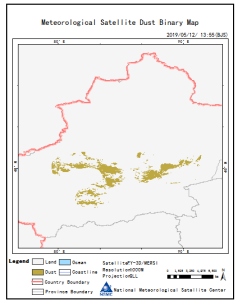
……

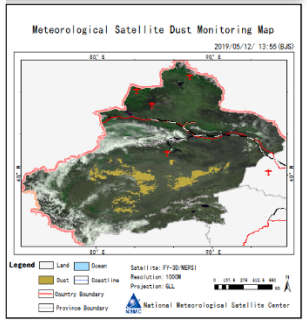


- Analyzing and processing of environmental change monitoring
- Temporal analysis function of monitoring products



- Thematic map of monitoring product
- Statistic table

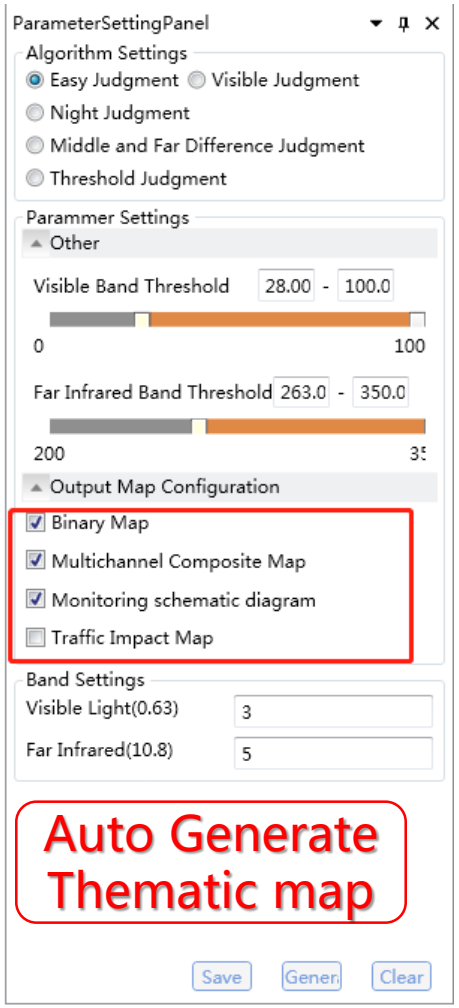


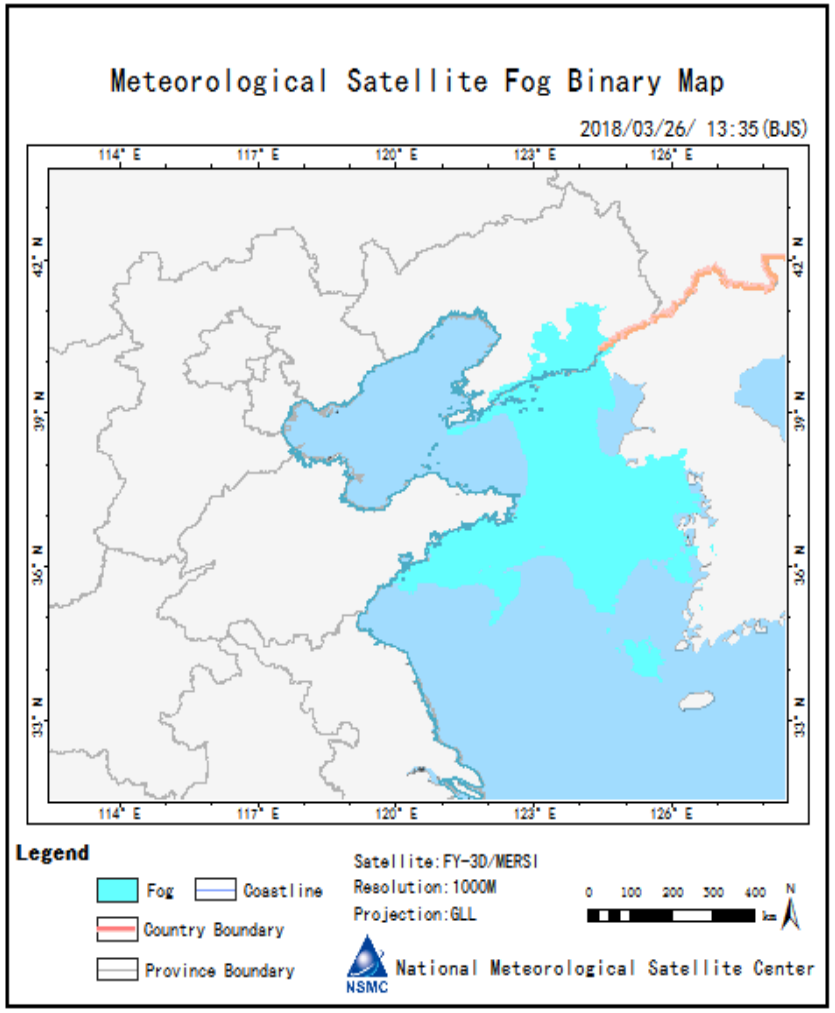


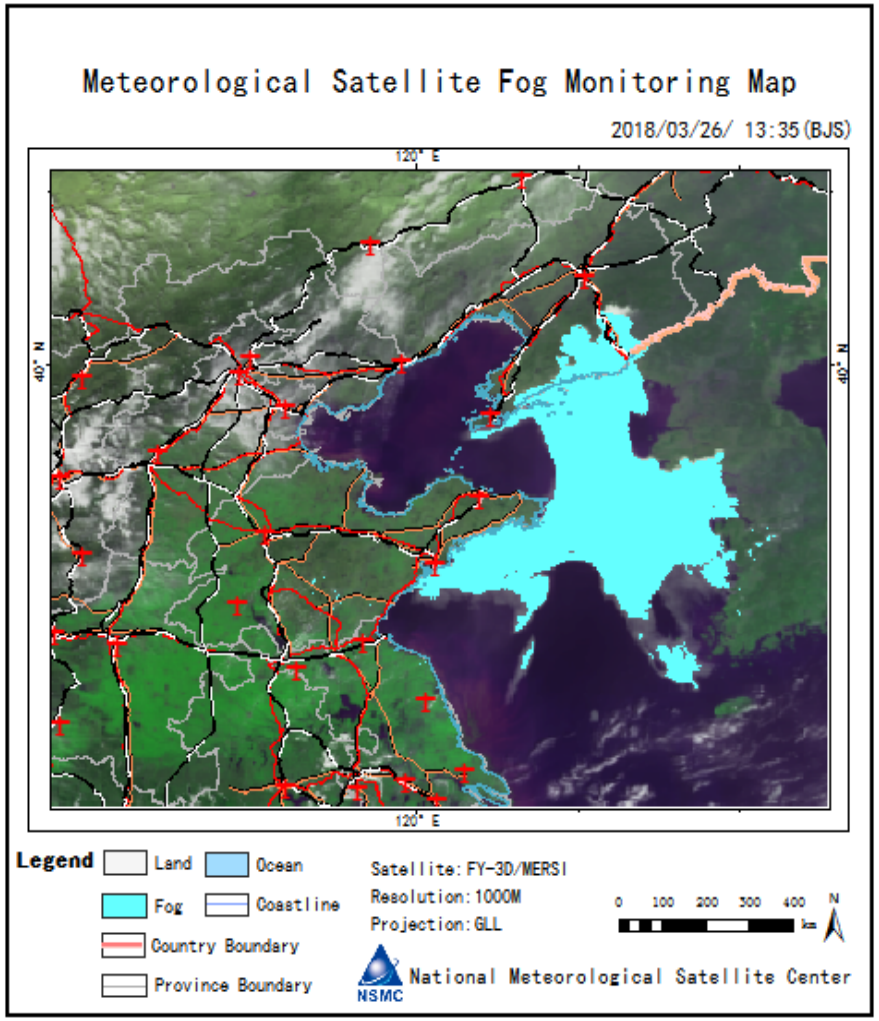
2. Software service

To simplify operational application, SMART provide some special features, such as

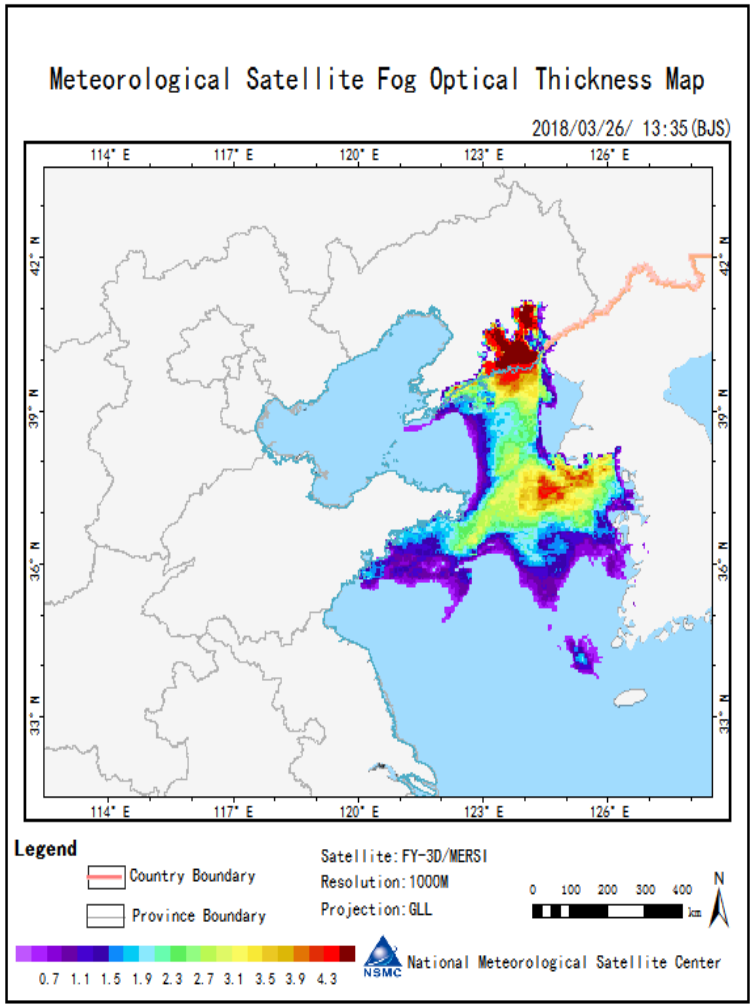
One-Key Generation of Thematic Maps

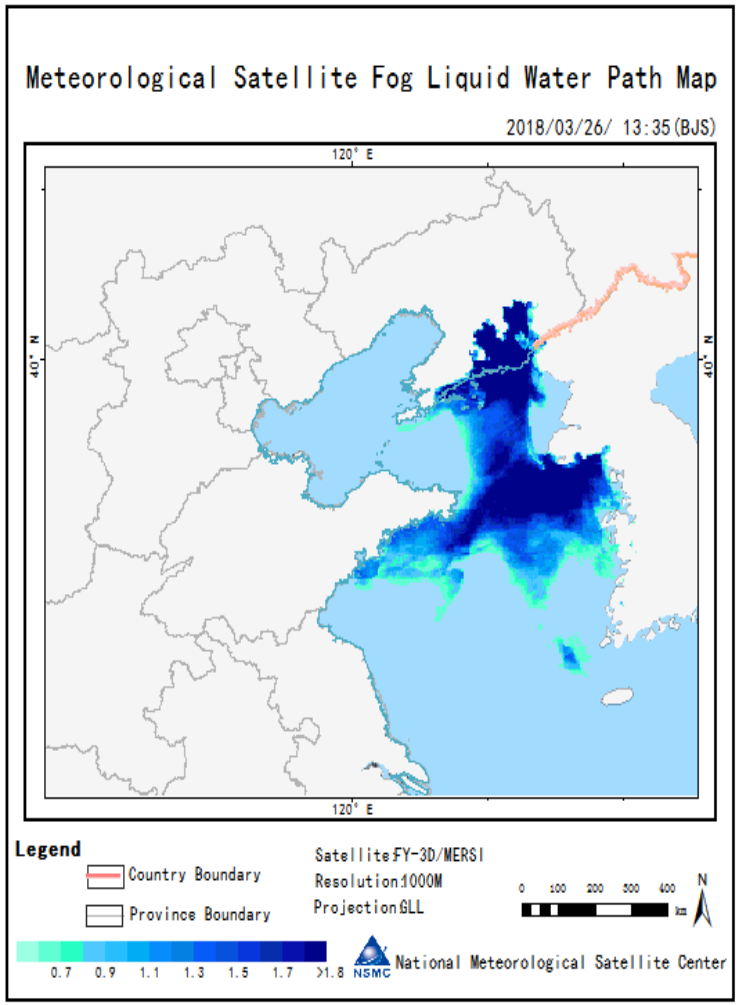


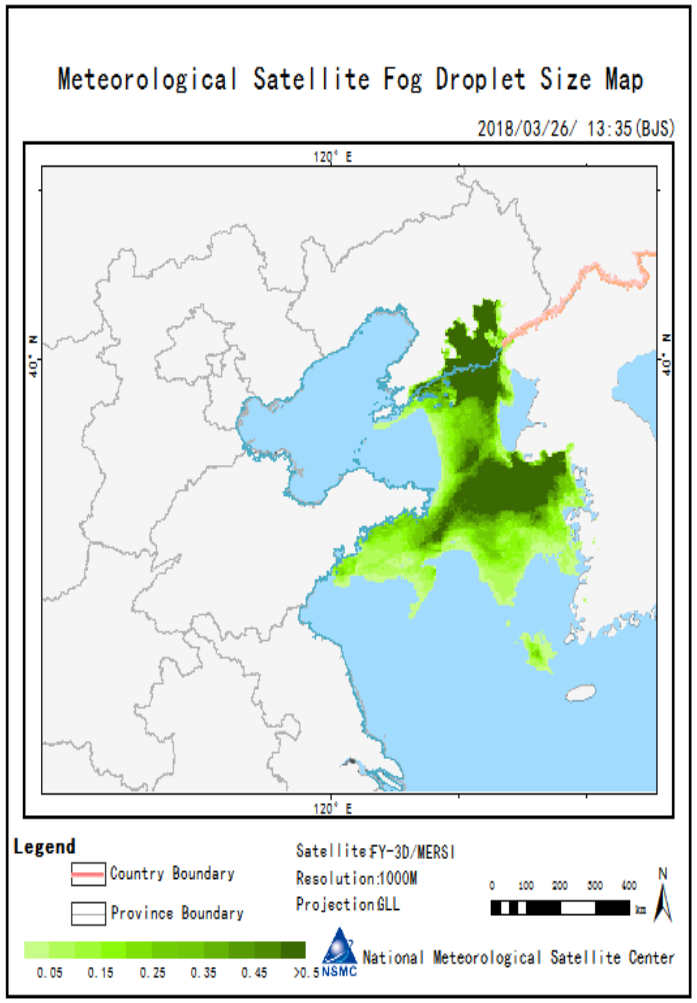




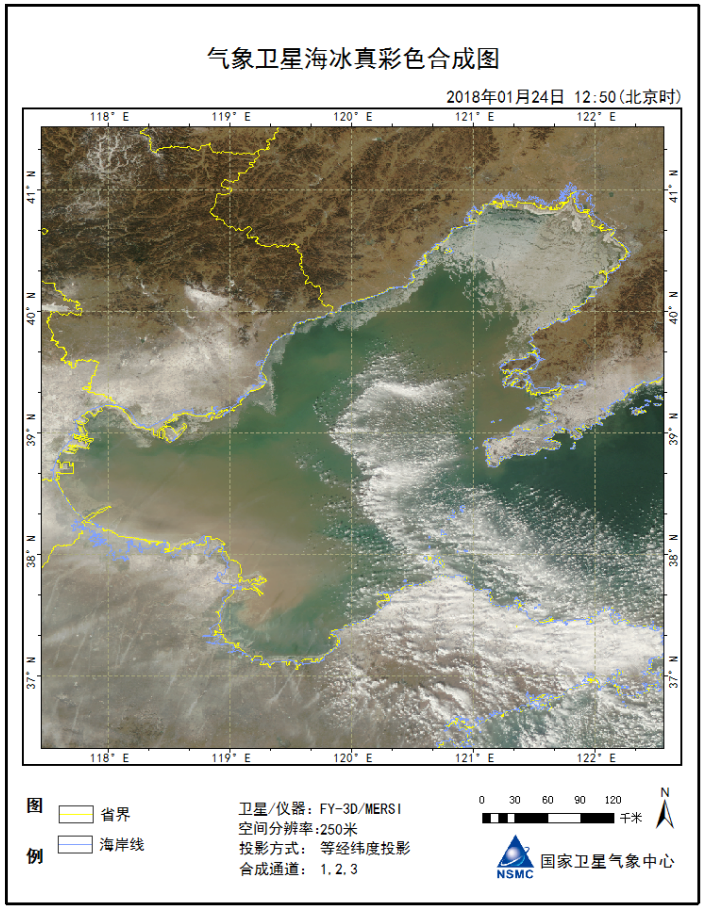
2. Software service

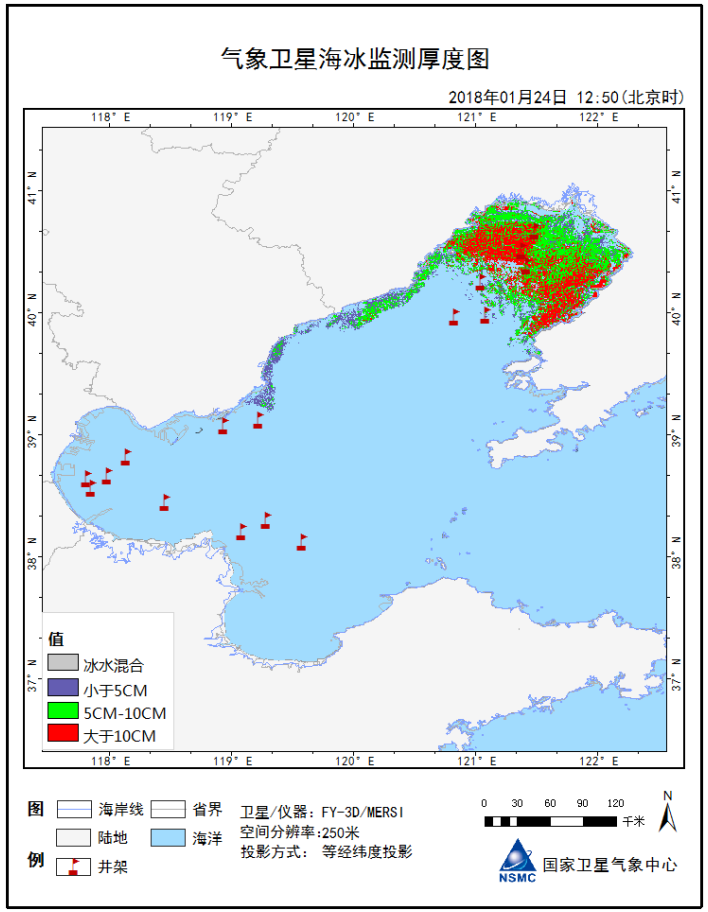


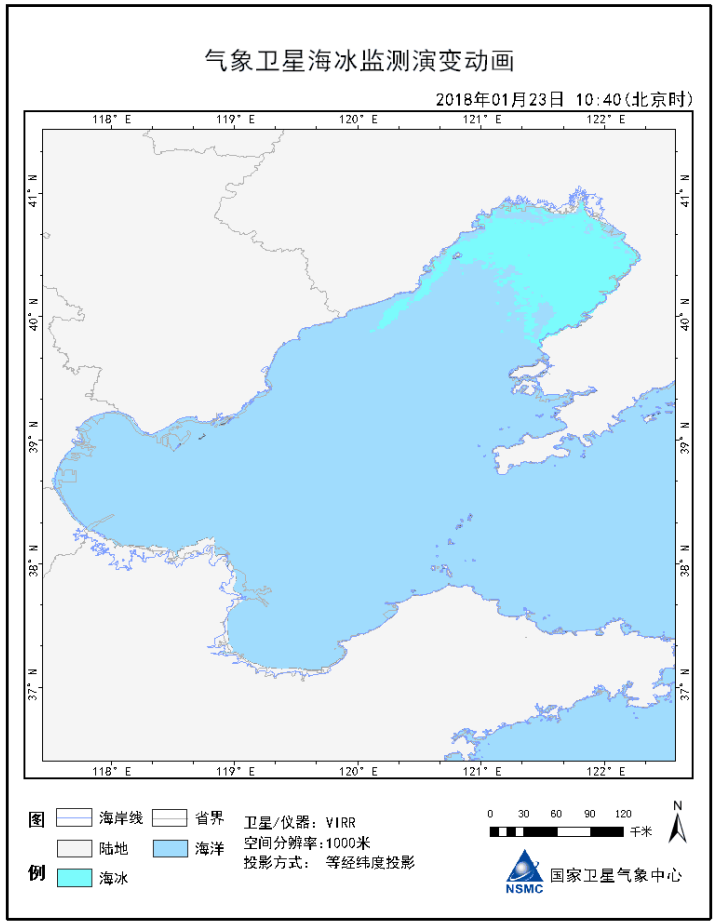




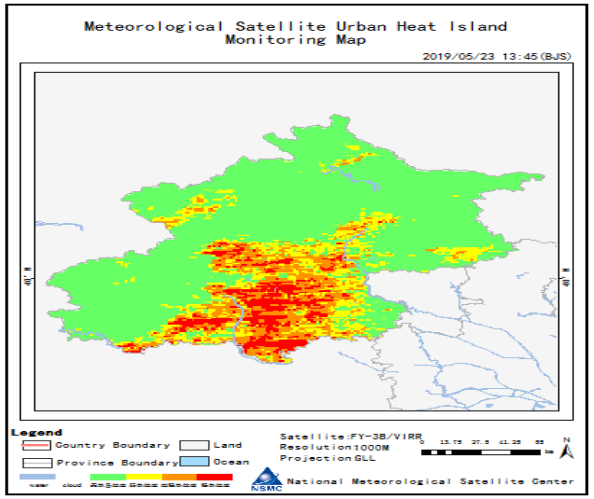
2. Software service

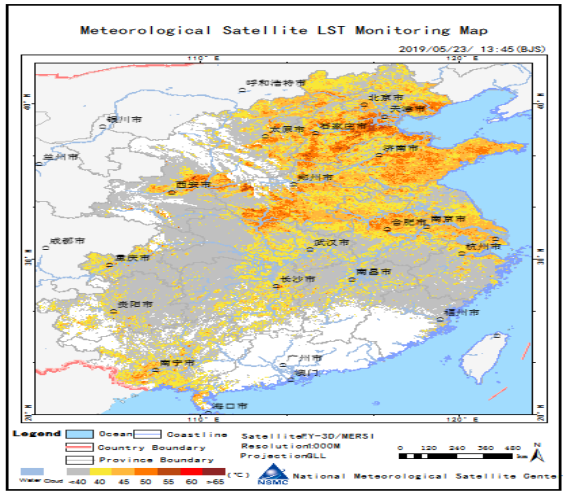


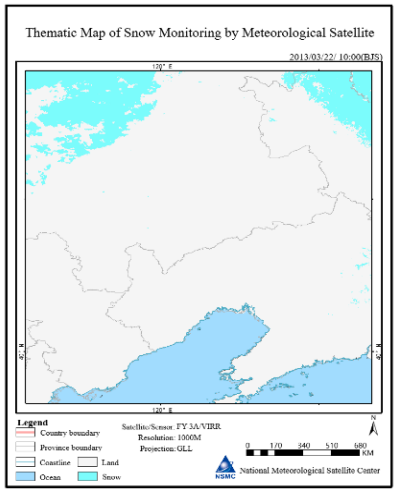


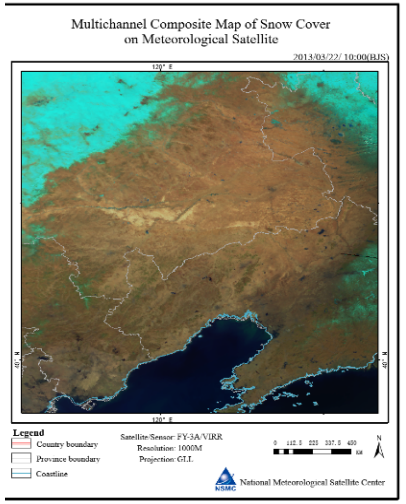


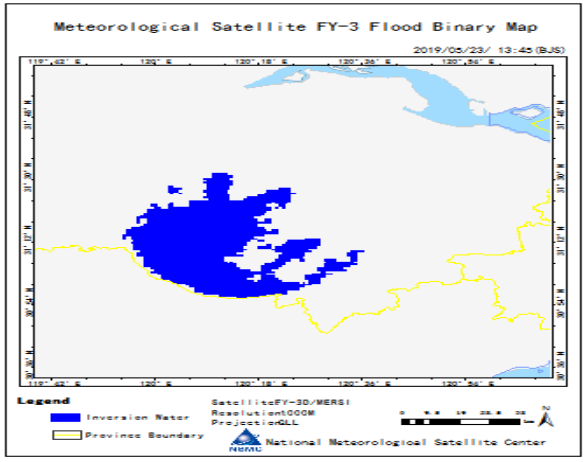
2. Software service

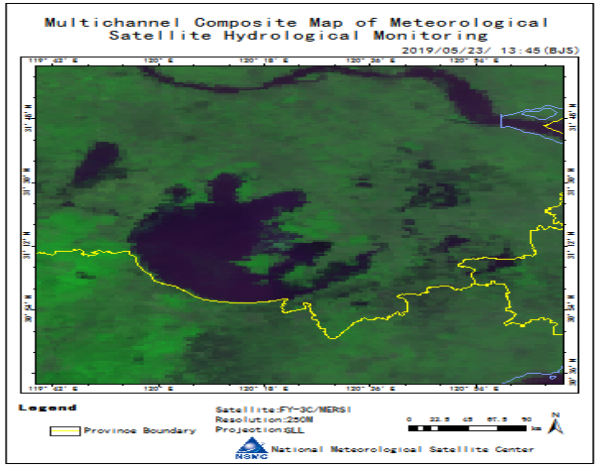


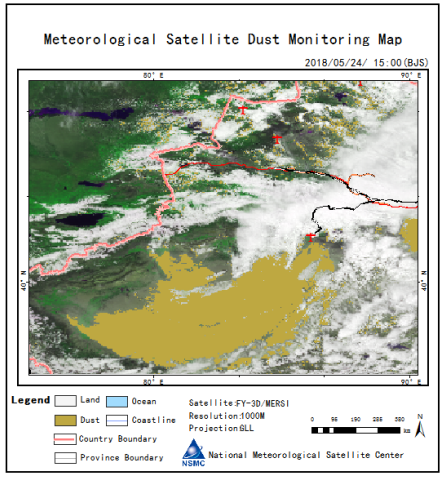


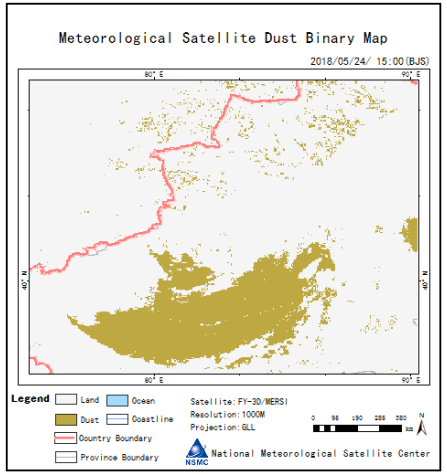








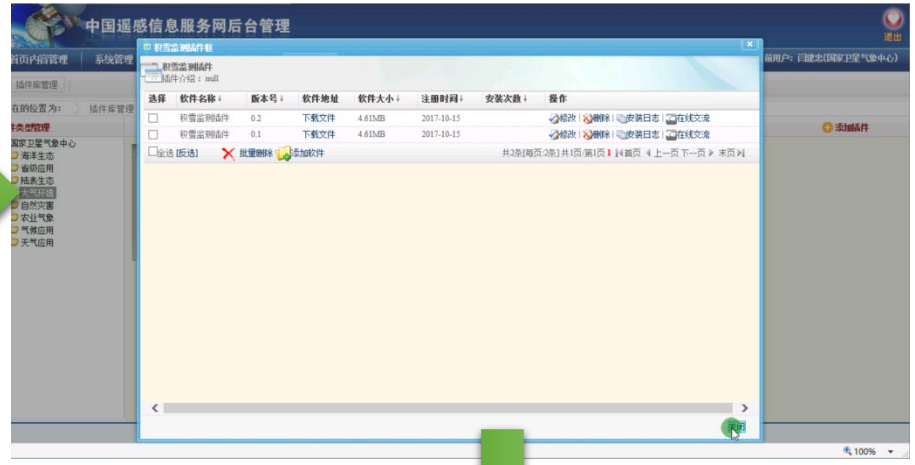




2. Software service

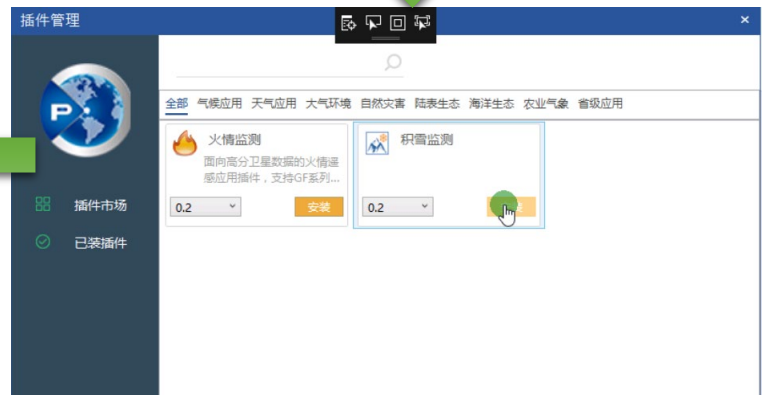
Both SWAP and SMART use **open architecture**, and **provide secondary development function**. All thematic modules in the systems are plug-ins. For every plug-in, the system provides unified registration management, version control, upgrade and installation service.

Plug-in market management on the server side



Plug-in version management

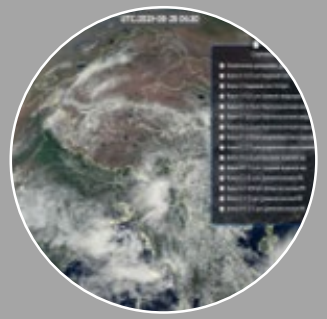
New plug-in entry for the client



Plug-in installation/upgrade/uninstall

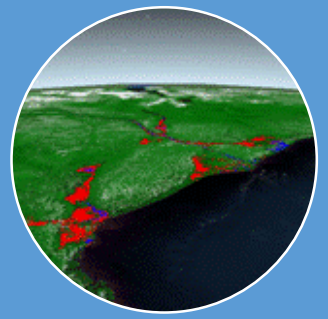
Open architecture

1. Data service



2.Software service

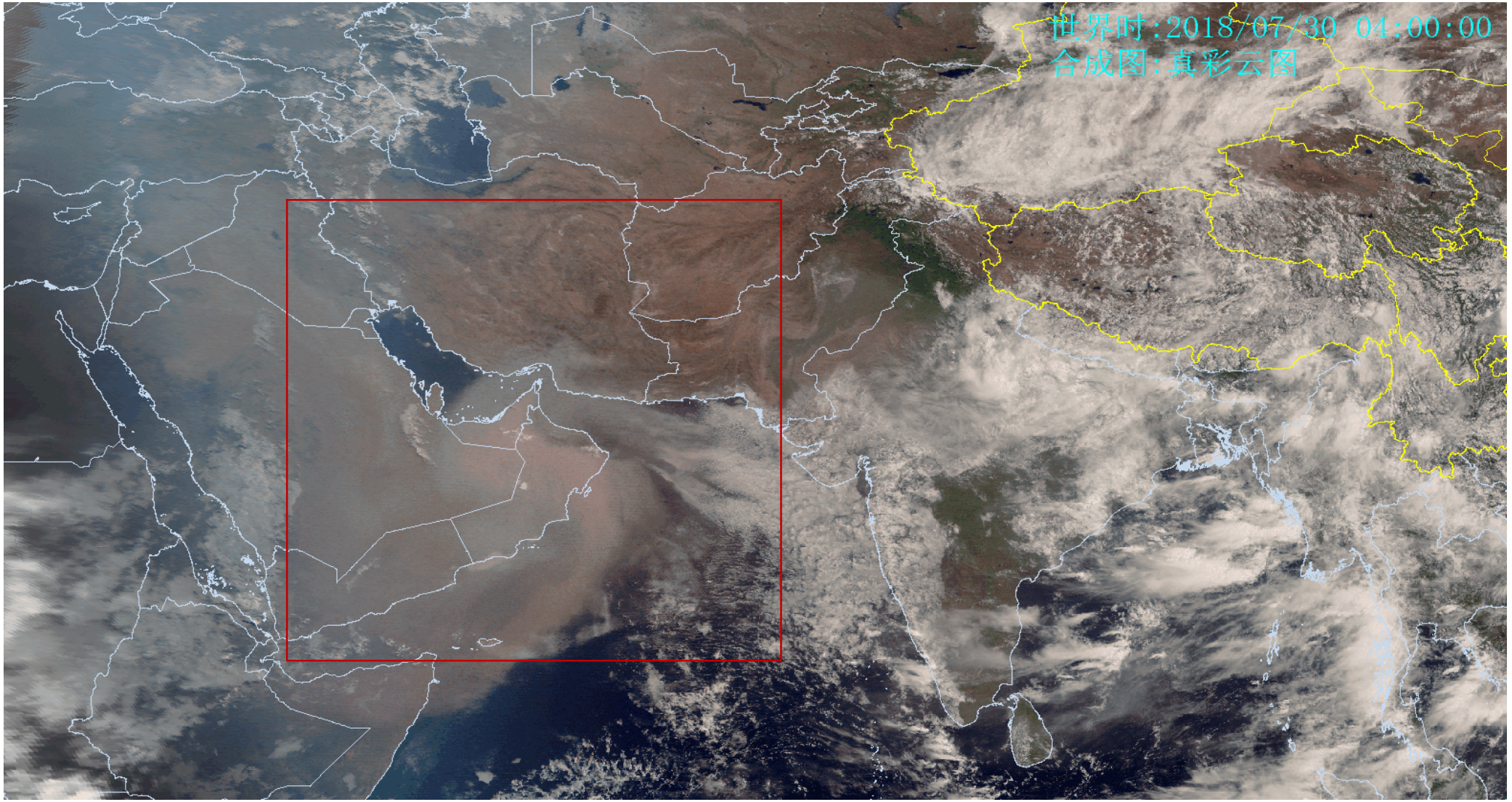
3.application service



4. Communication and training service

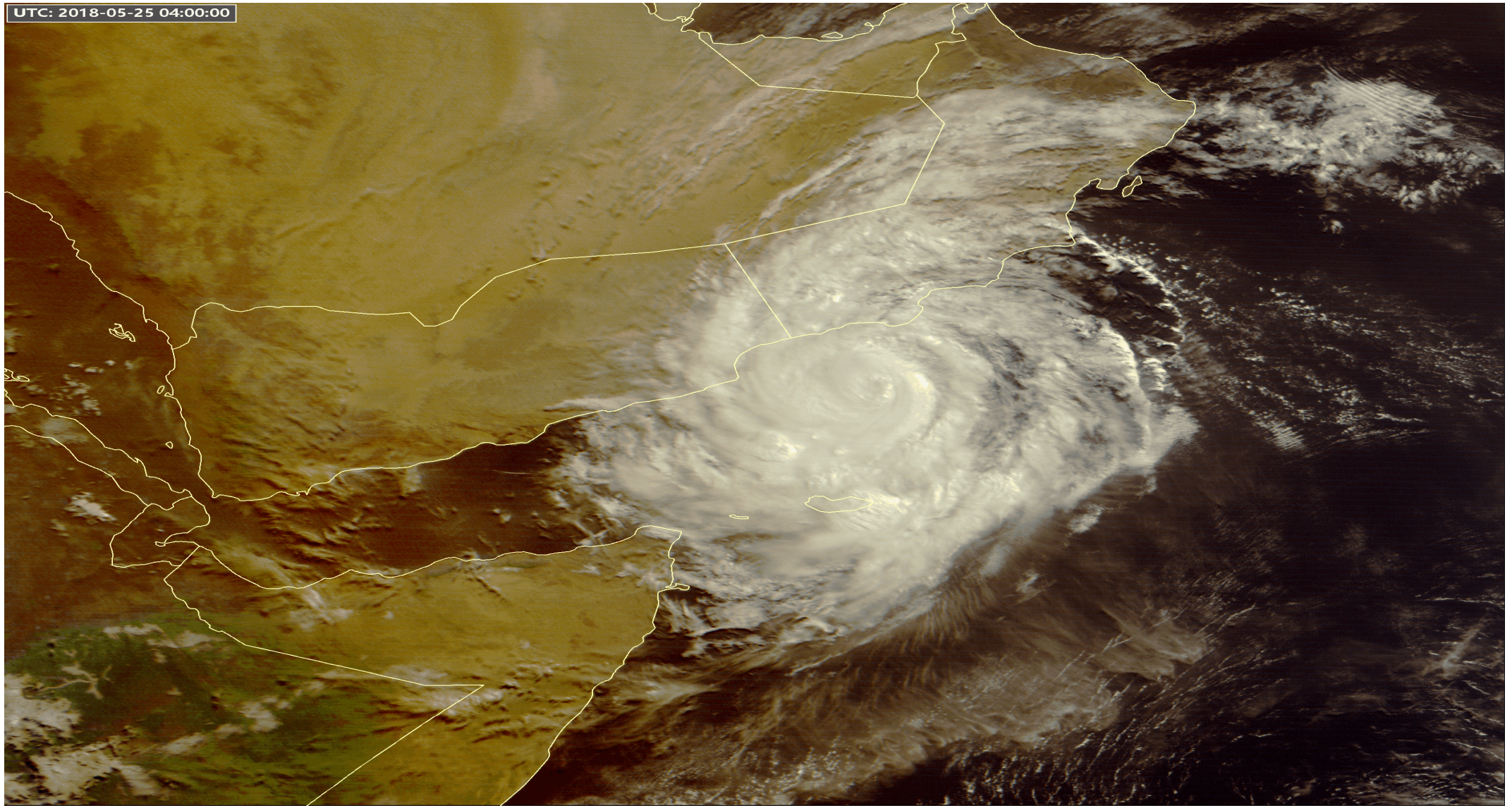
3. Application service

On July 30, 2018, an extremely strong sand dust storm occurred in the Arab region

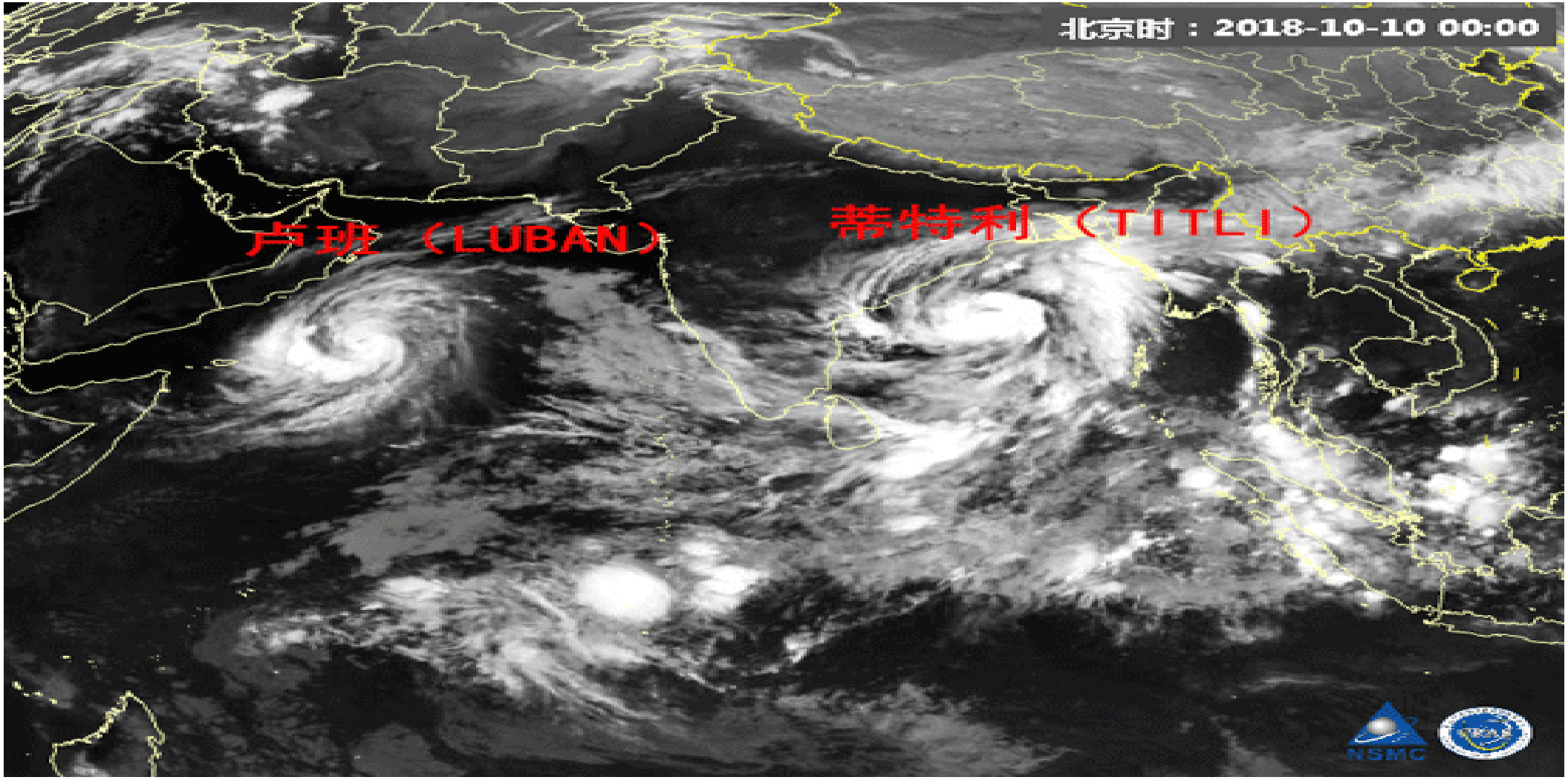


3. Application service

Cyclone in Arabian peninsula

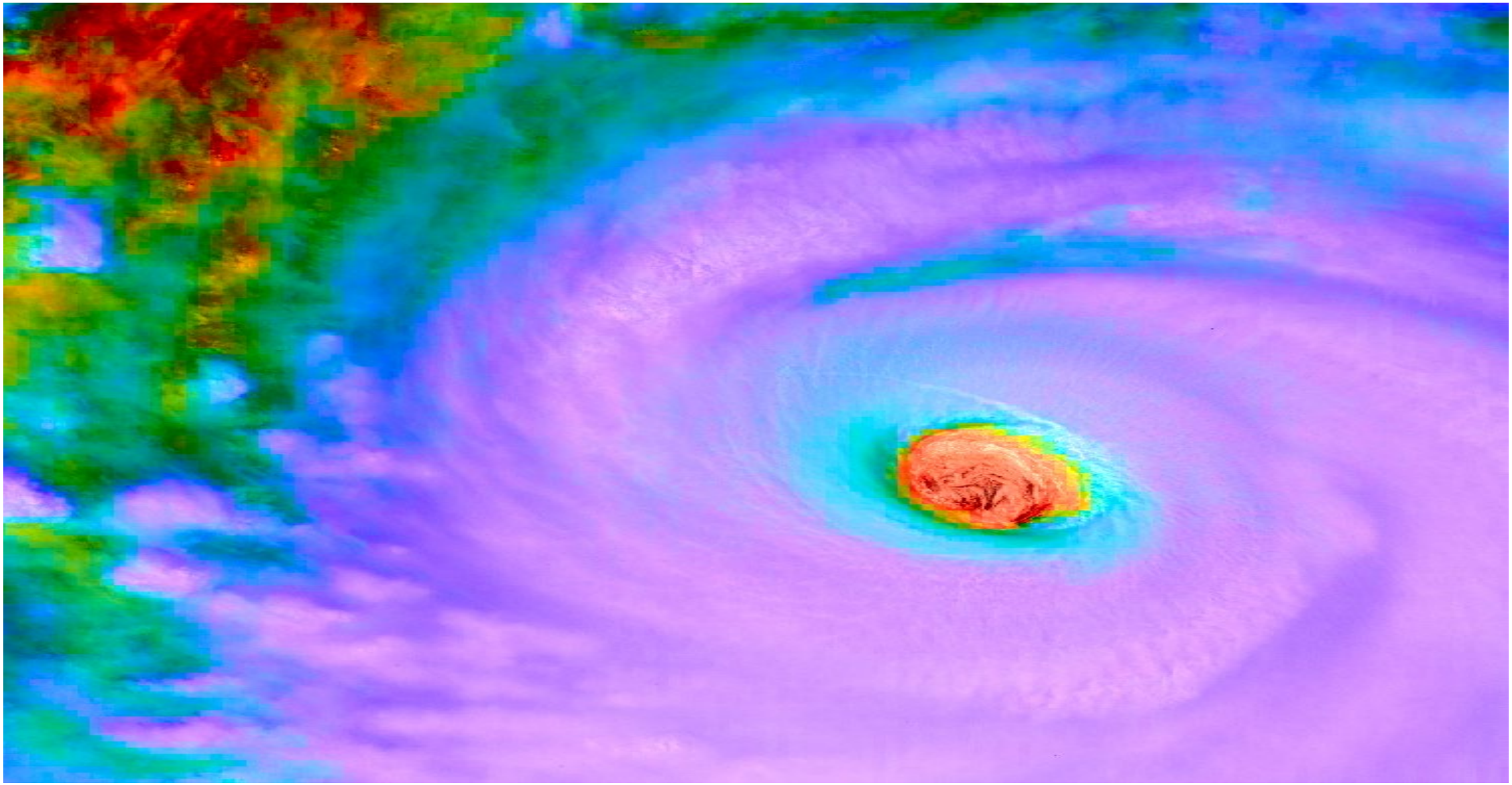


3. Application service



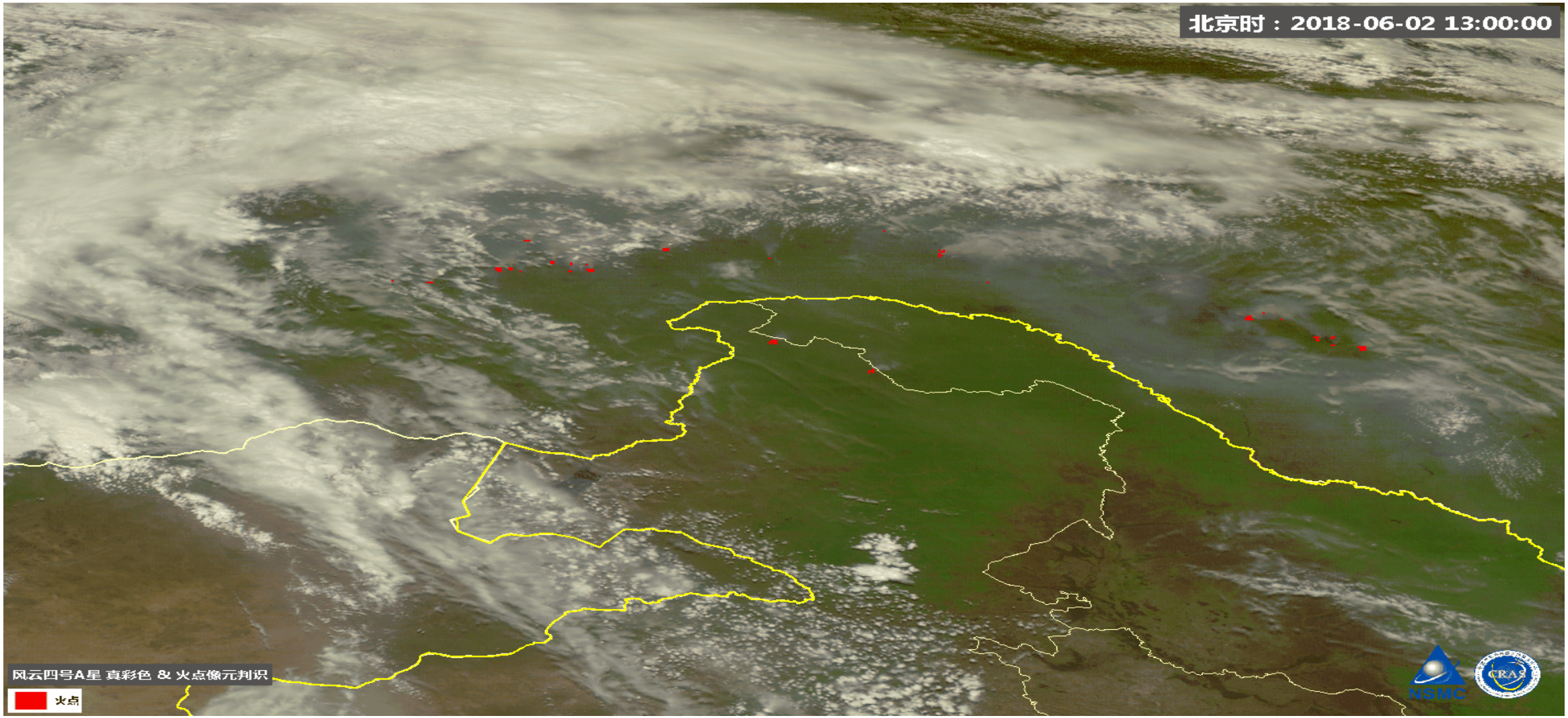
Cyclone storm in the west Arabian sea (05A- “LUBAN“)　cyclone storm in the bay of Bengal (06B- "TITLI")

3. Application service

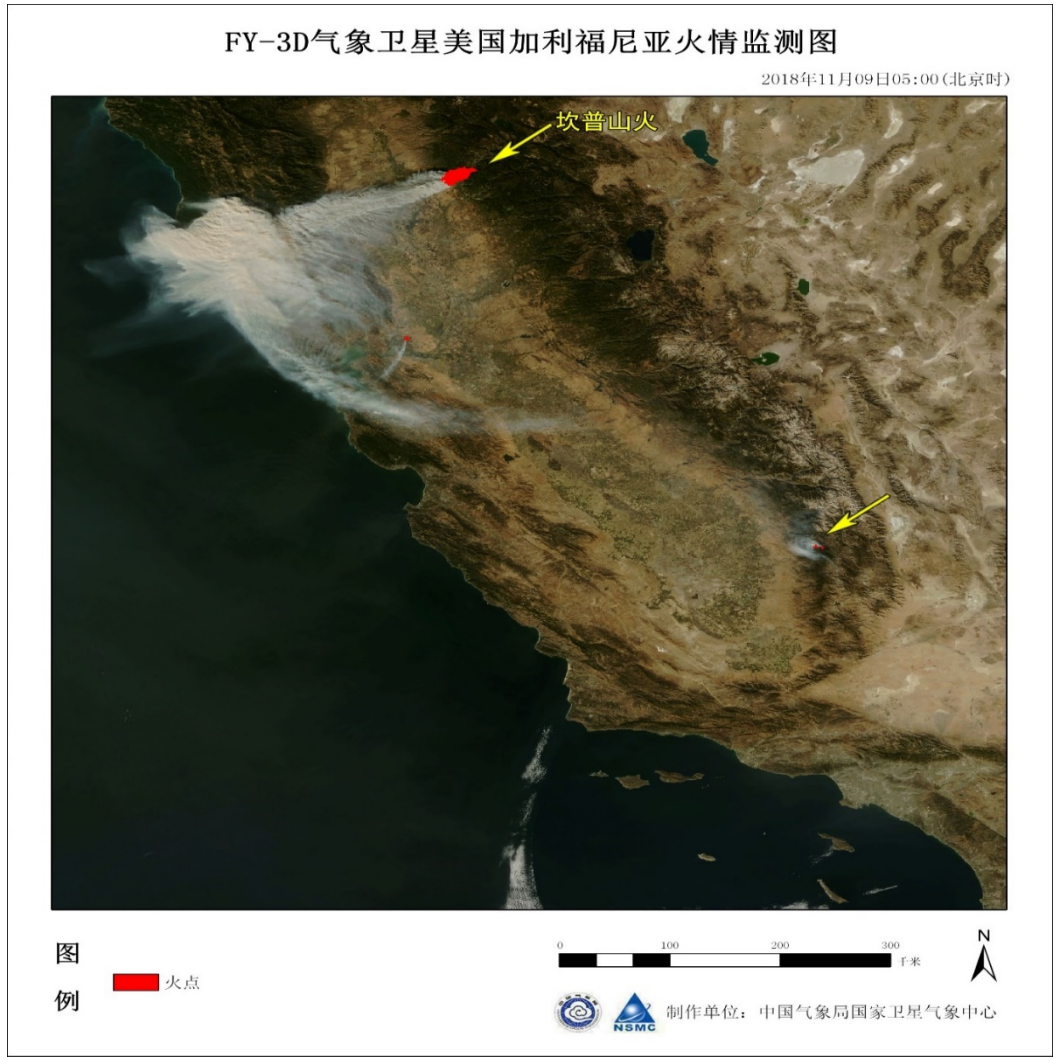


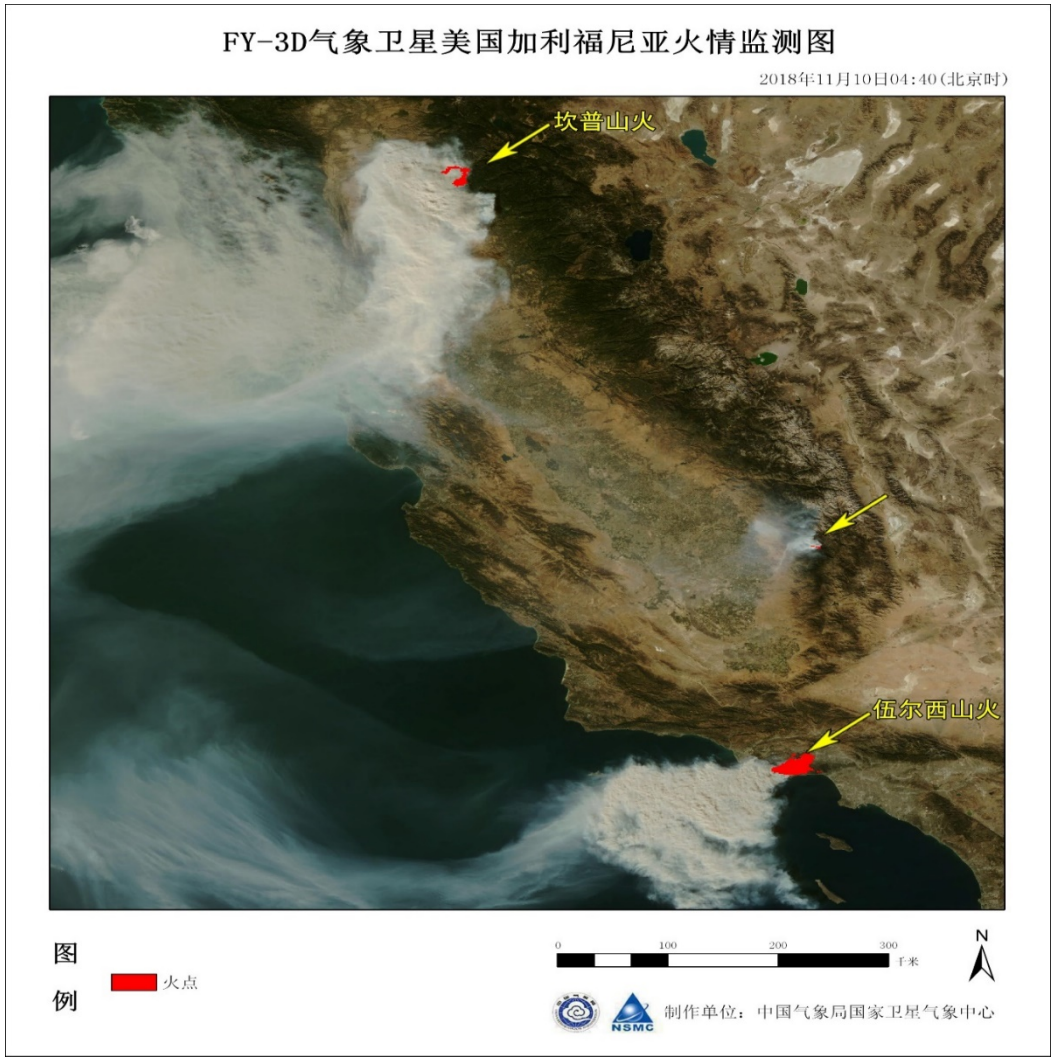
3. Application service

Fire monitoring



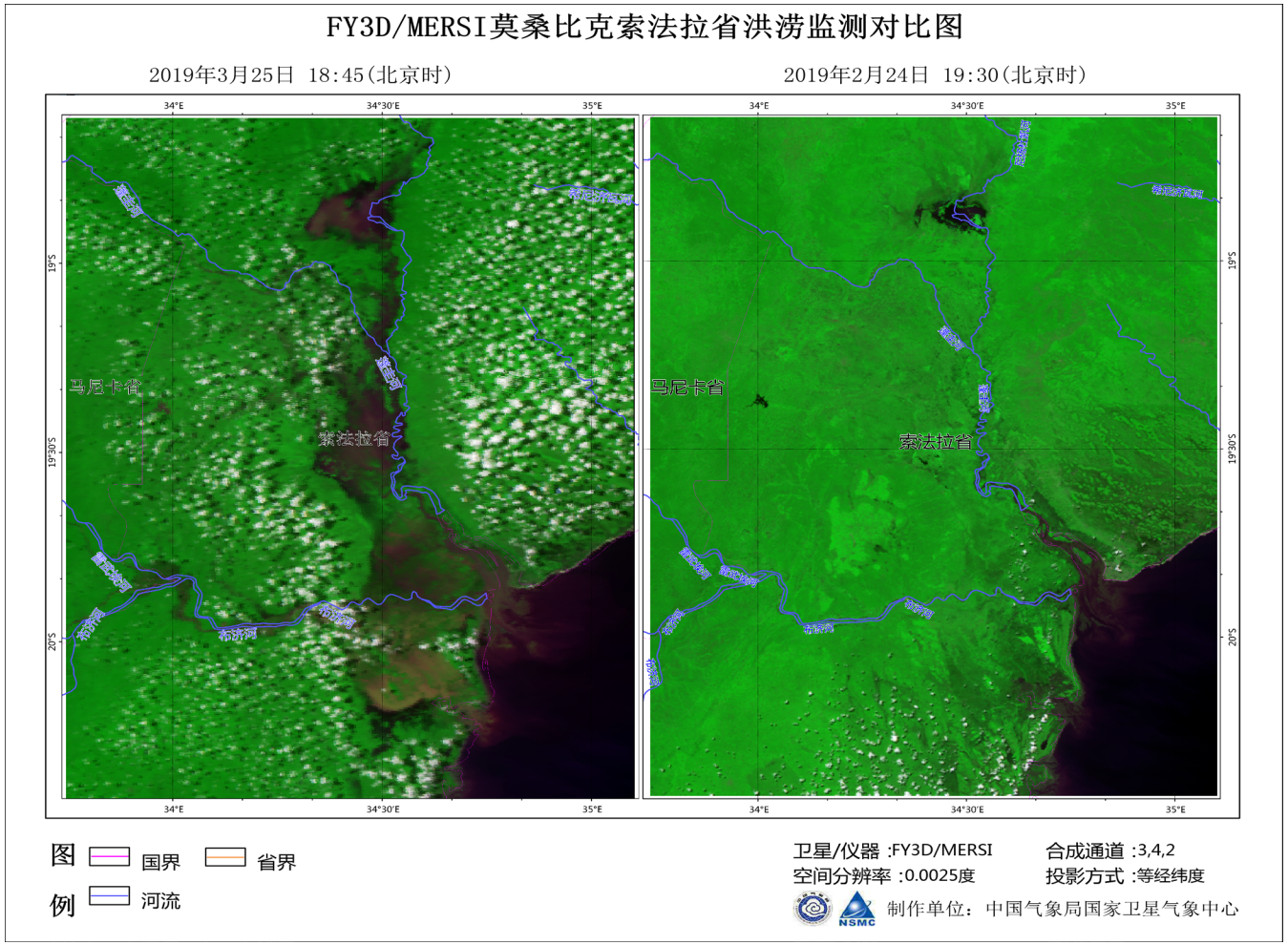
3. Application service

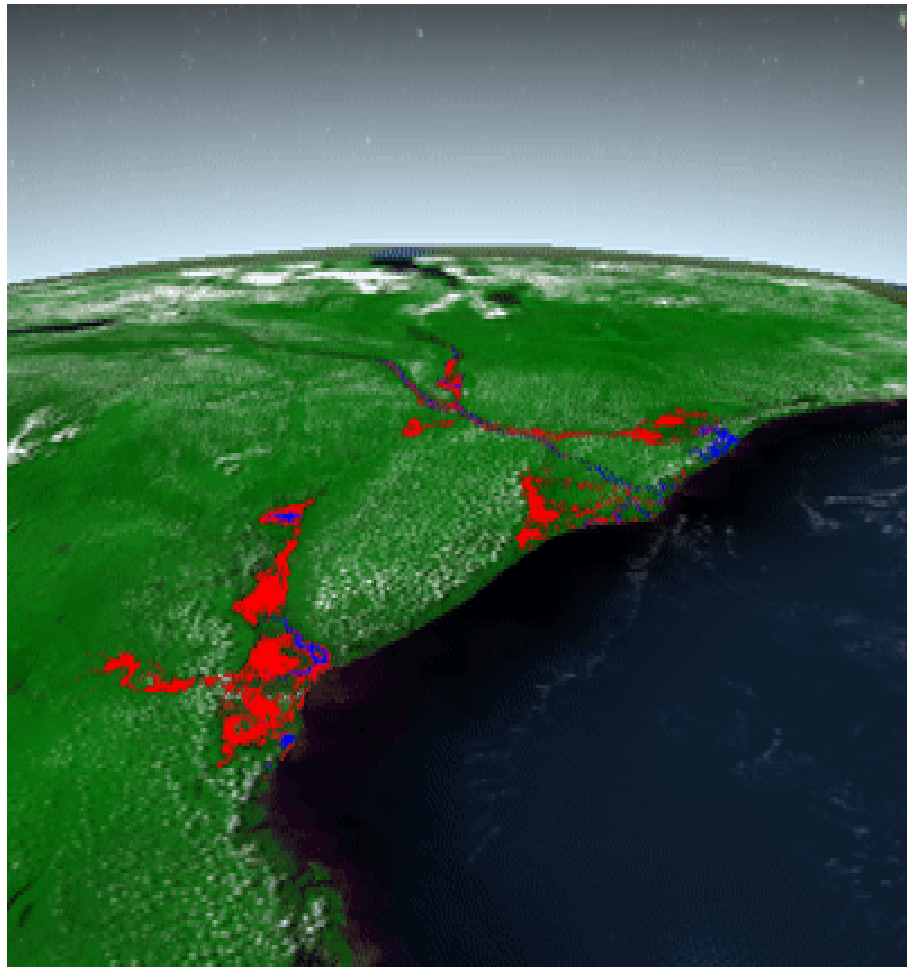




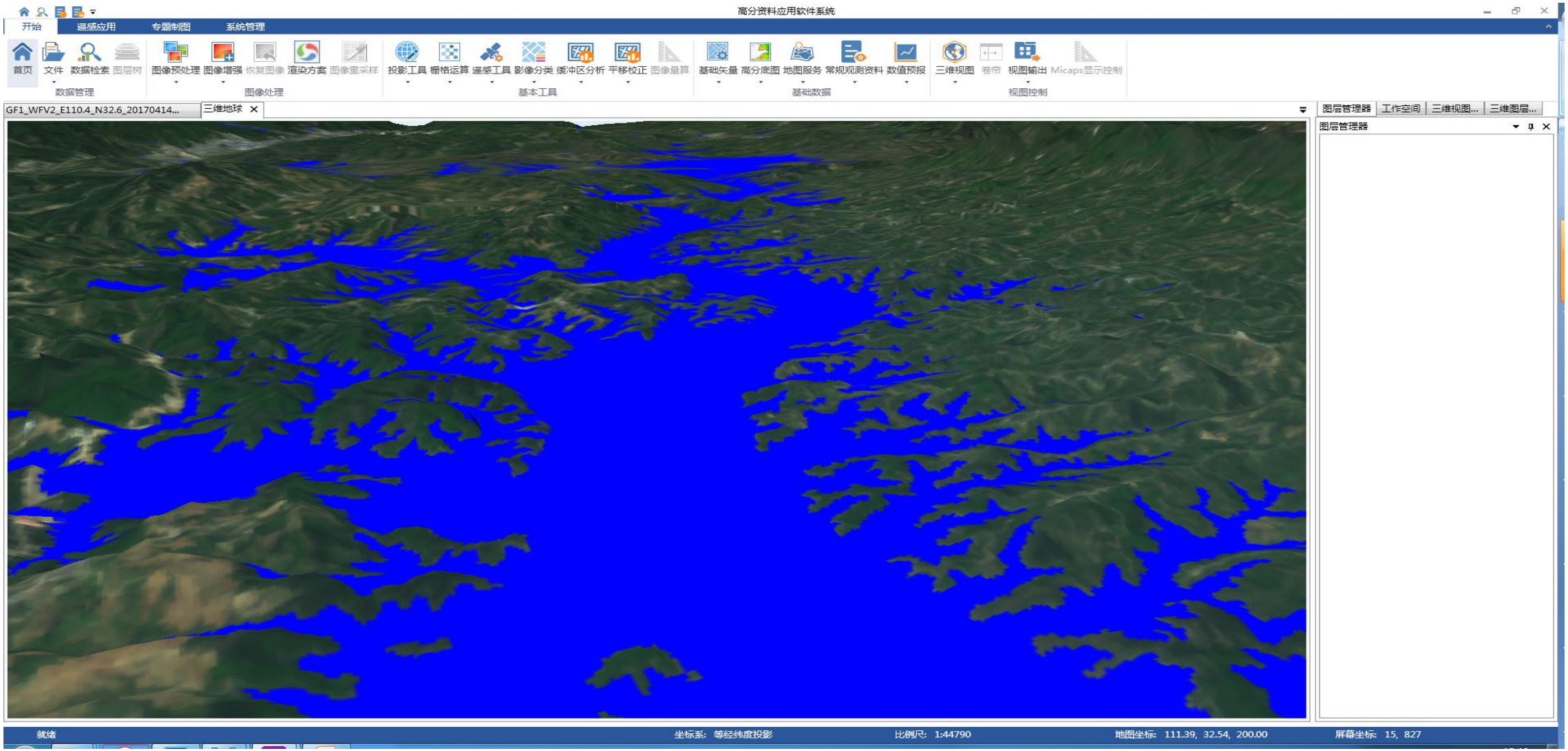
3. Application service

Flood monitoring





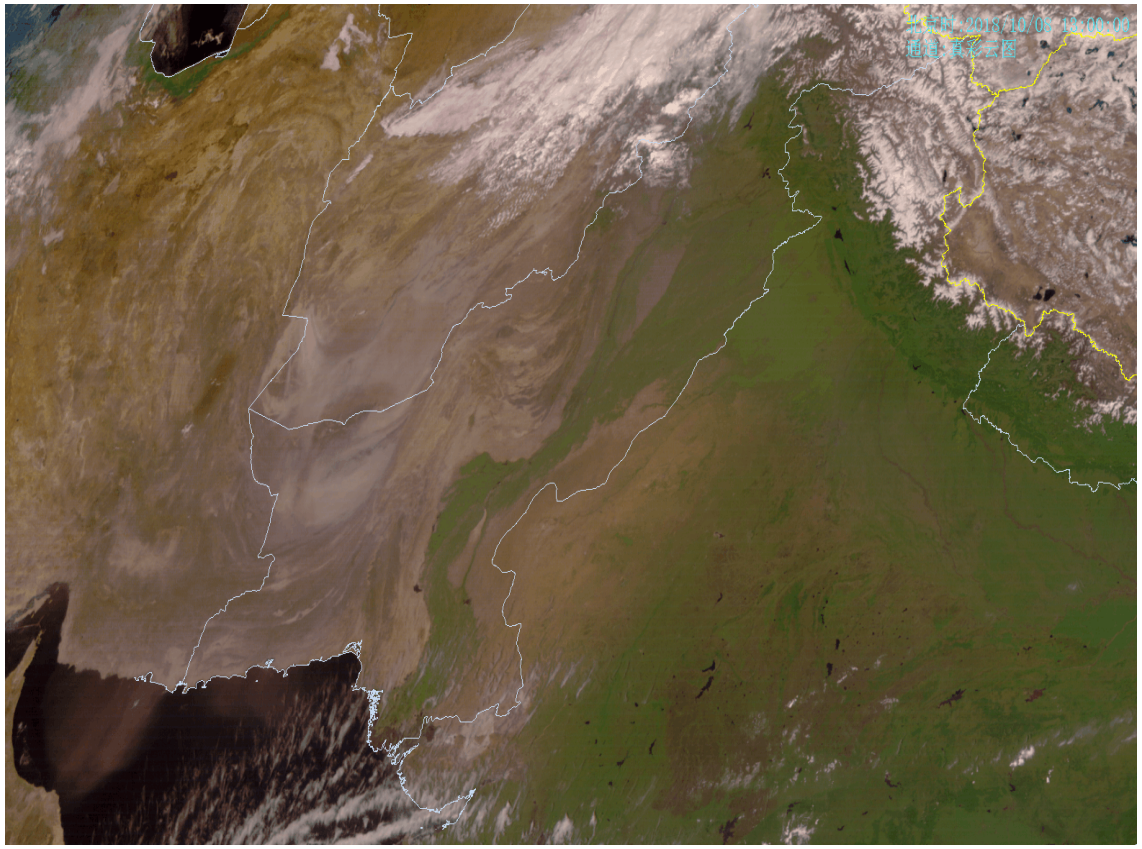
3. Application service



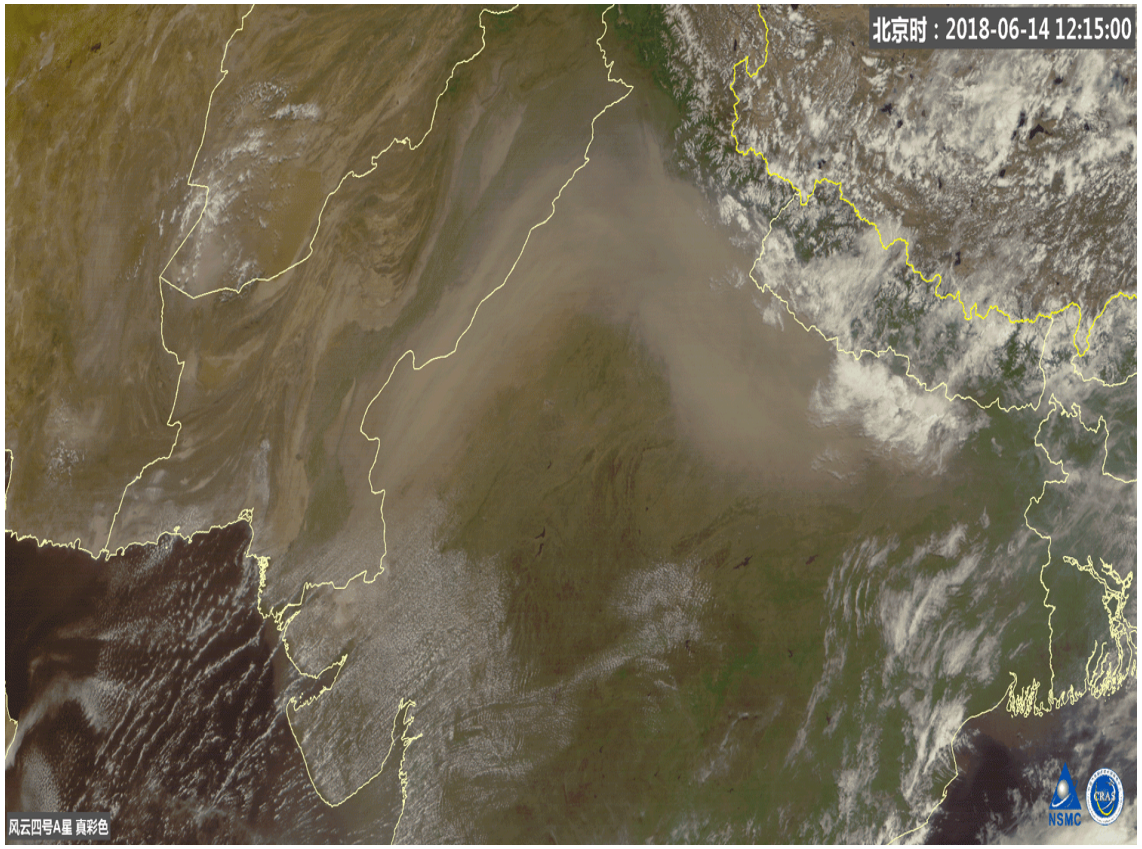
3. Application service

Sandstorm monitoring

Sandstorm monitoring in Afghanistan on October 8, 2018

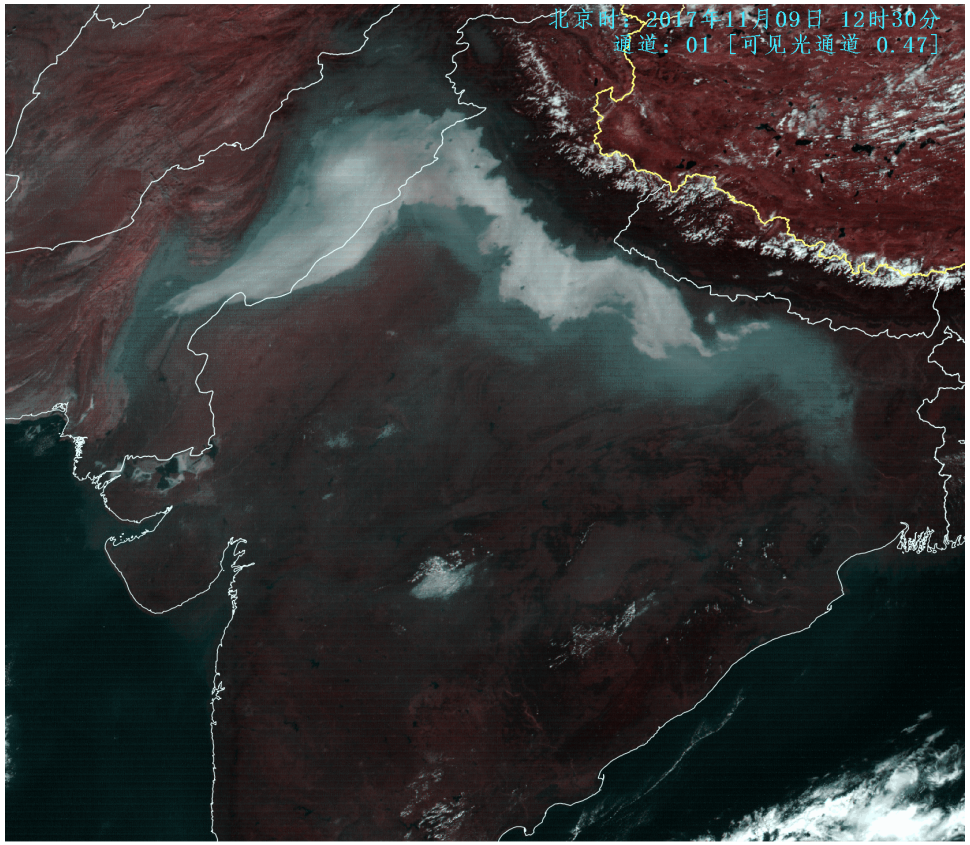


•Sandstorm monitoring in India on June 14, 2018

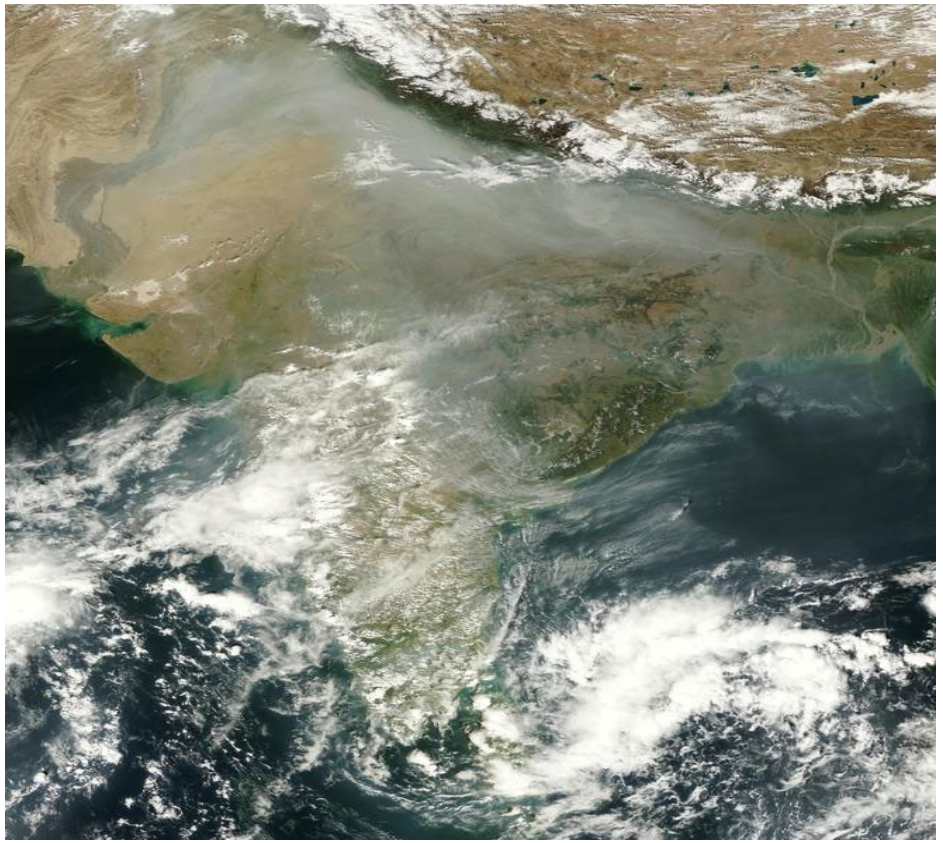


3. Application service

Haze monitoring



FY-4A haze monitor （09/11/2017）

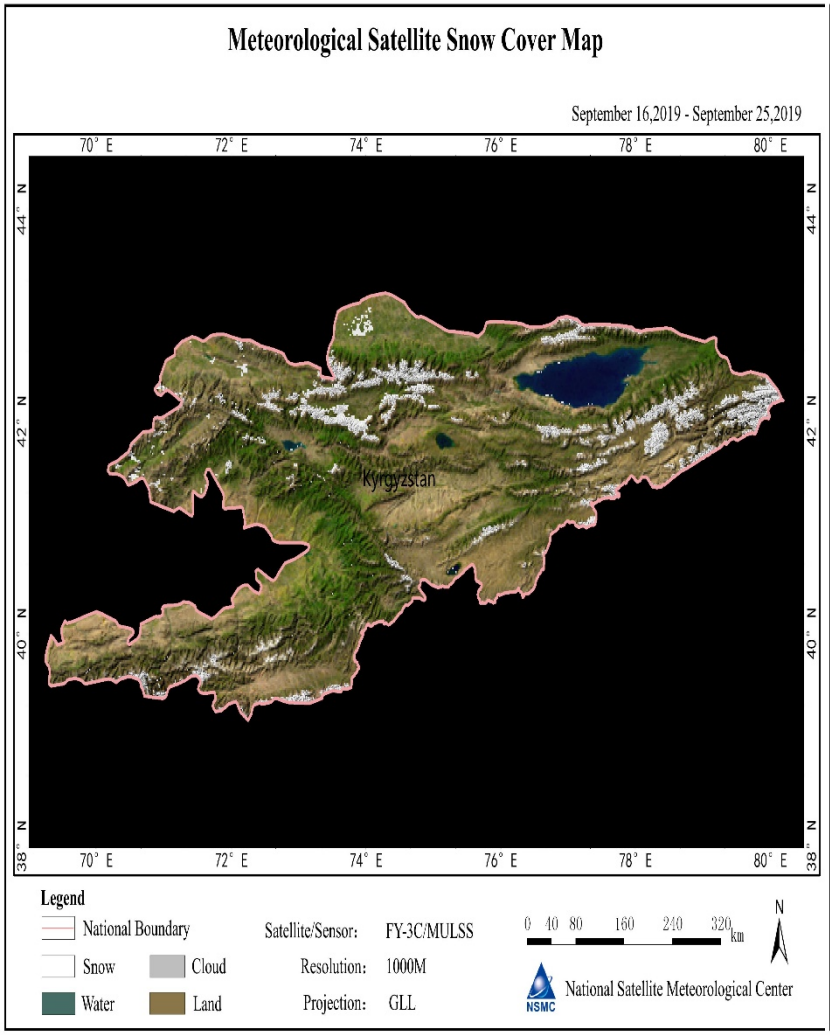


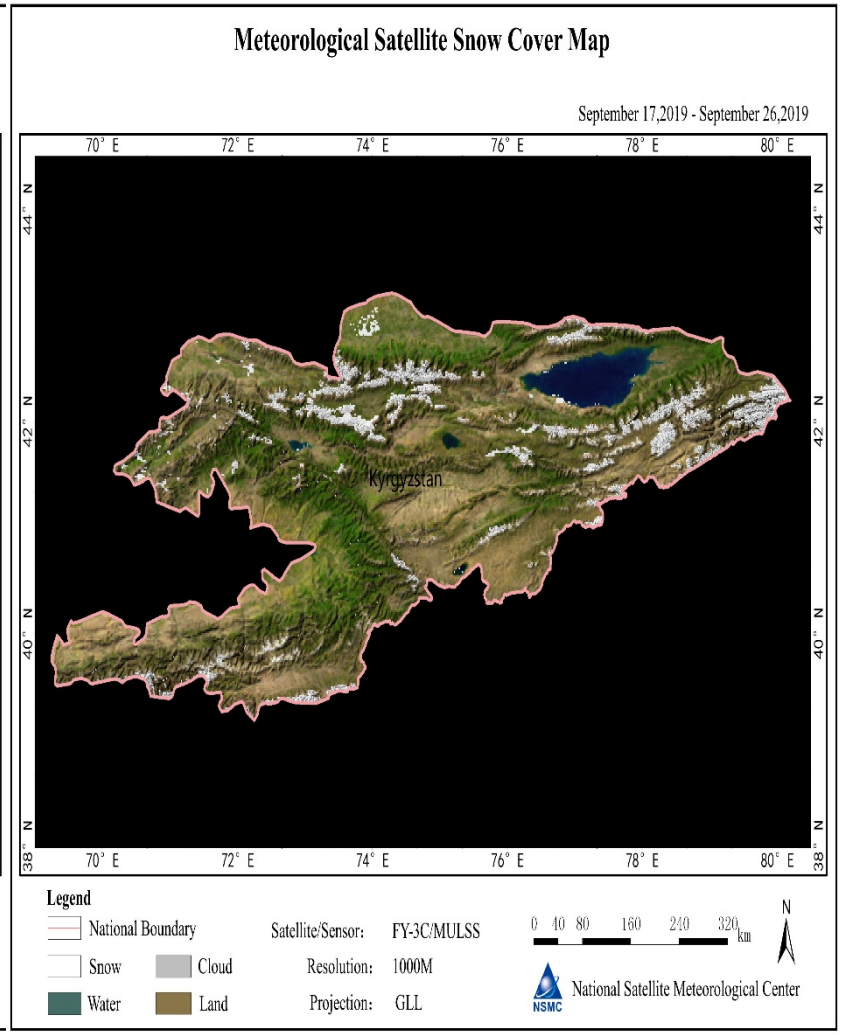
FY-3D haze monitor(19/11/2018)

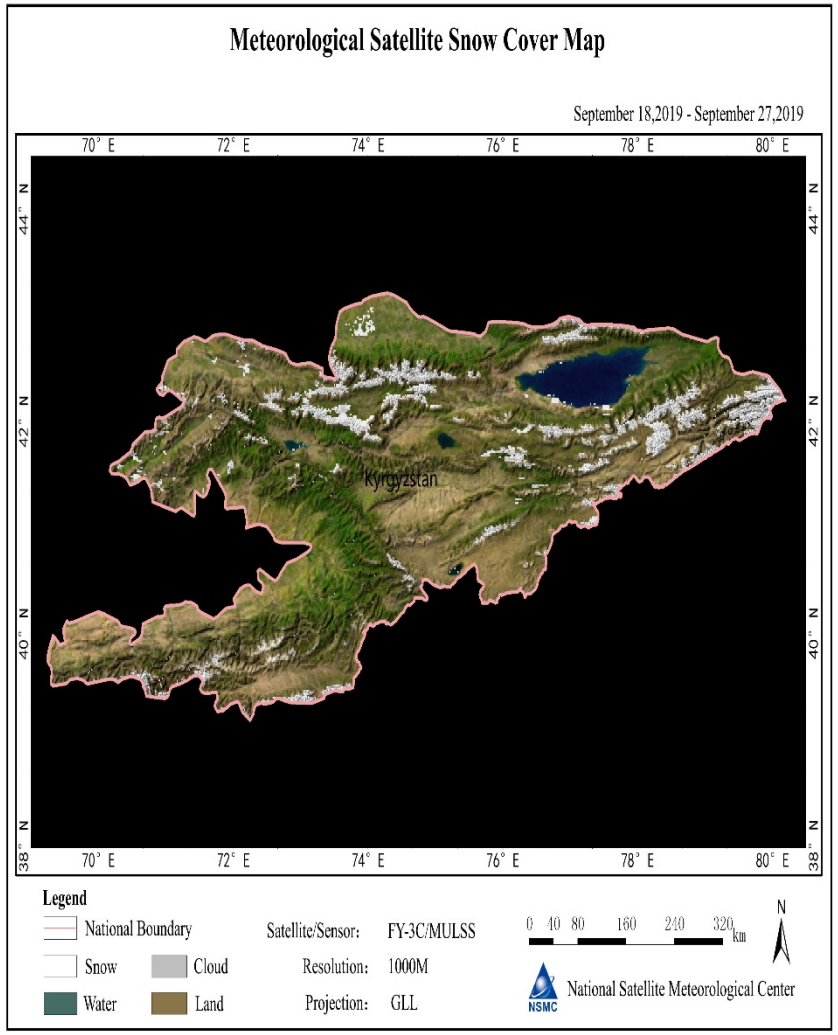
MERSI2/FY3D

3. Application service

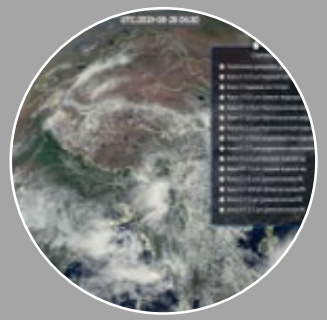
Provide customized product for International users





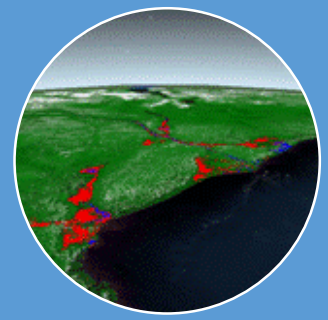


1. Data service



2.Software service

3.application service

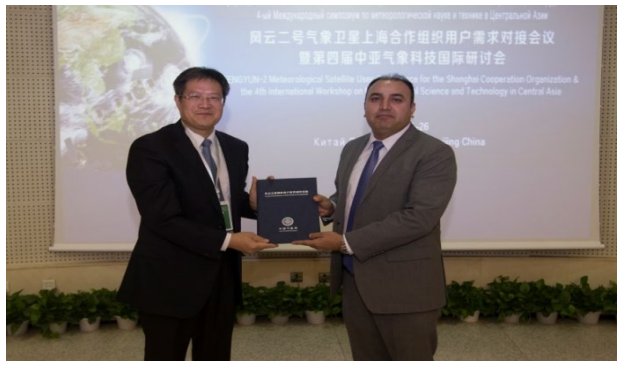


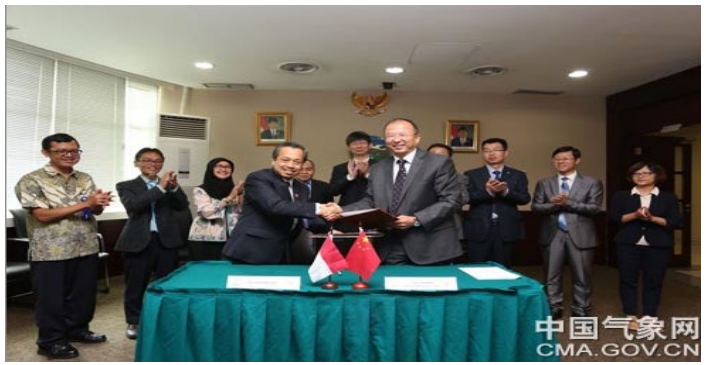
4. Communication and training service

4. Communication and training service

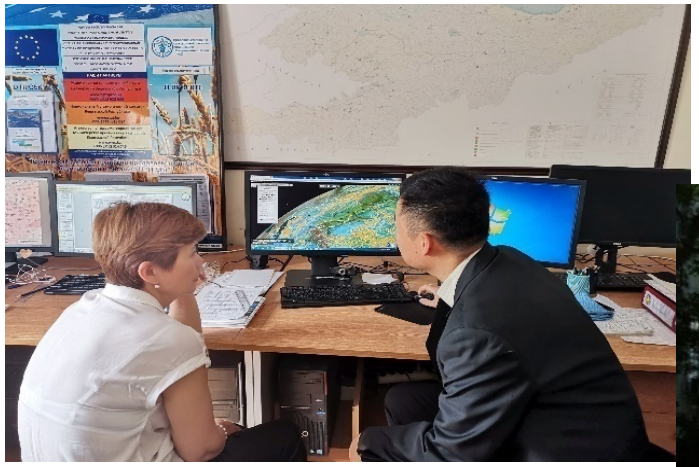
International Cooperation

CMA has conducted close cooperations with WMO, APSCO, GCC and other international organizations to jointly promote meteorological satellites application for international users in B&R countries including aribic





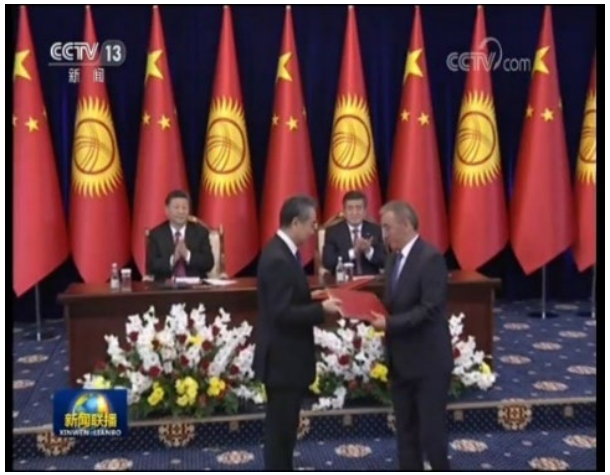
4. Communication and training service



4. Communication and training service

Cooperative Agreements on Met. Satellite

International cooperation agreements on meteorological satellites have been signed with **Oman, mozambique, kyrgyzstan** and other countries. According to the cooperation agreement, the two sides will carry out practical cooperation in fengyun meteorological satellite data transmission, reception and sharing, satellite remote sensing application platform construction, satellite product development and application, satellite disaster prevention and reduction and emergency support services, personnel training and technical exchange.

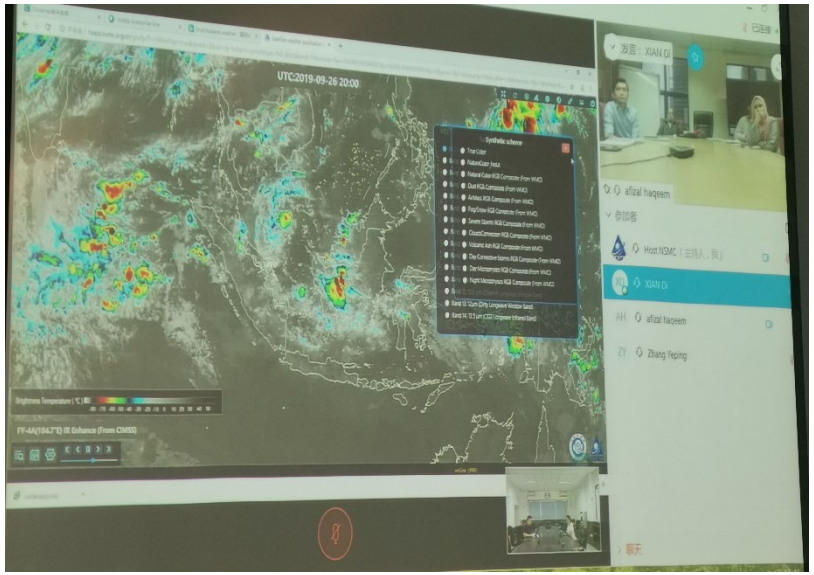


4. Communication and training service

- Organize training courses on remote sensing applications for B&R countries
- Organize Video conference
- Held Fengyun Satellite User Conference

FENGYUN Satellite User Forum

HaiNan China · 2019



4. Communication and training service

Fengyun meteorological satellite has become an important infrastructure for the construction of "one belt and one road".

Former Secretary-General of the World Meteorological Organization, Michel Yarrow

China's work in the WMO space program is one of the most important contributions. At present, Fengyun satellite data has been freely available to all WMO members, providing valuable information for global numerical prediction, disaster prevention and mitigation, climate research and many other fields.

Secretary-General of the World Meteorological Organization, Petteri Talas

Future Plan

Future plan of Fengyun meteorological satellite serving for Belt and Road initiative

- Satellite direct receiving station
- CMACast
- Public Cloud
- Green Data service Channel
- Emergency service

Enhancing Data Dissemination Capability

- Provide application supporting platform
- Developing adaptive products
- **Equipped with mobile terminal**
- Open up the path from data receiving to TV showing

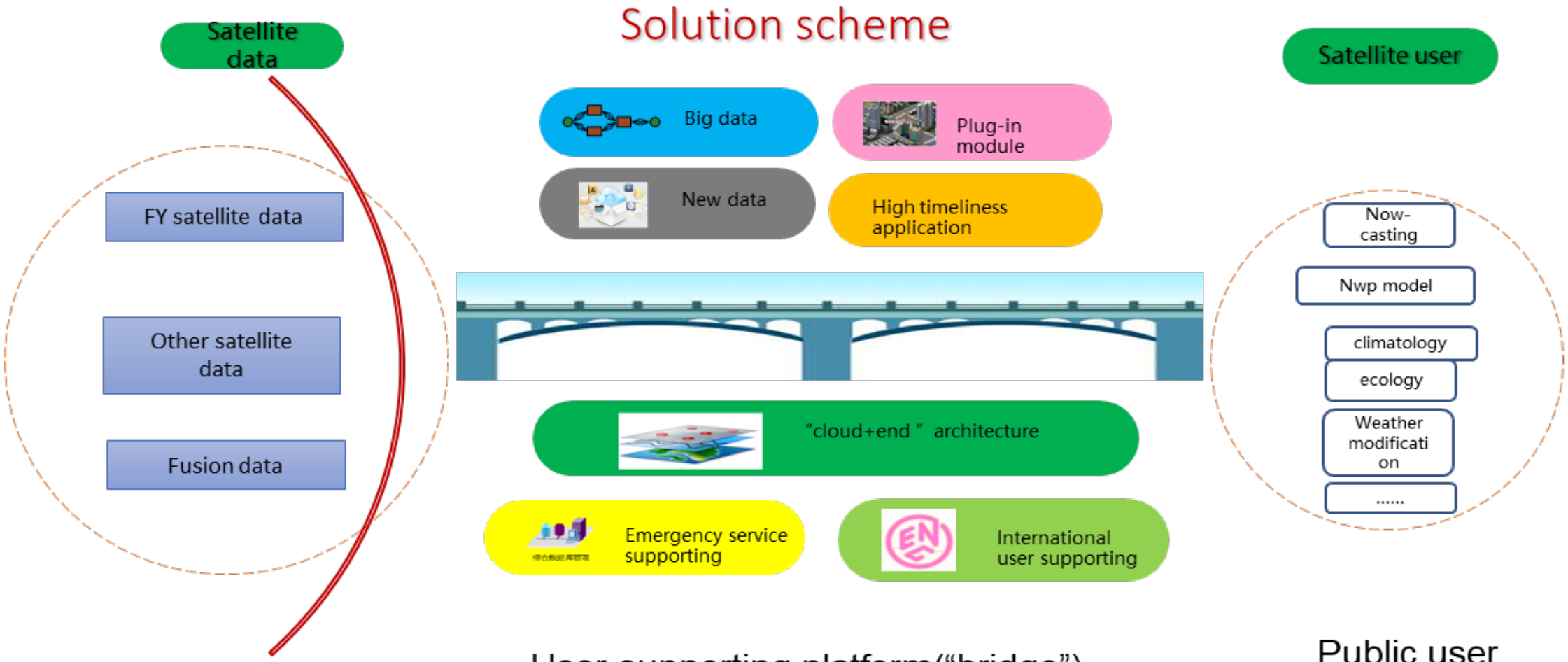
Improving Data Application Capability

- International Training
- Scholars exchange visits
- **Routine Video Conference**
- **Establishment of Fengyun Satellite International Cooperation Fund(TBD)**

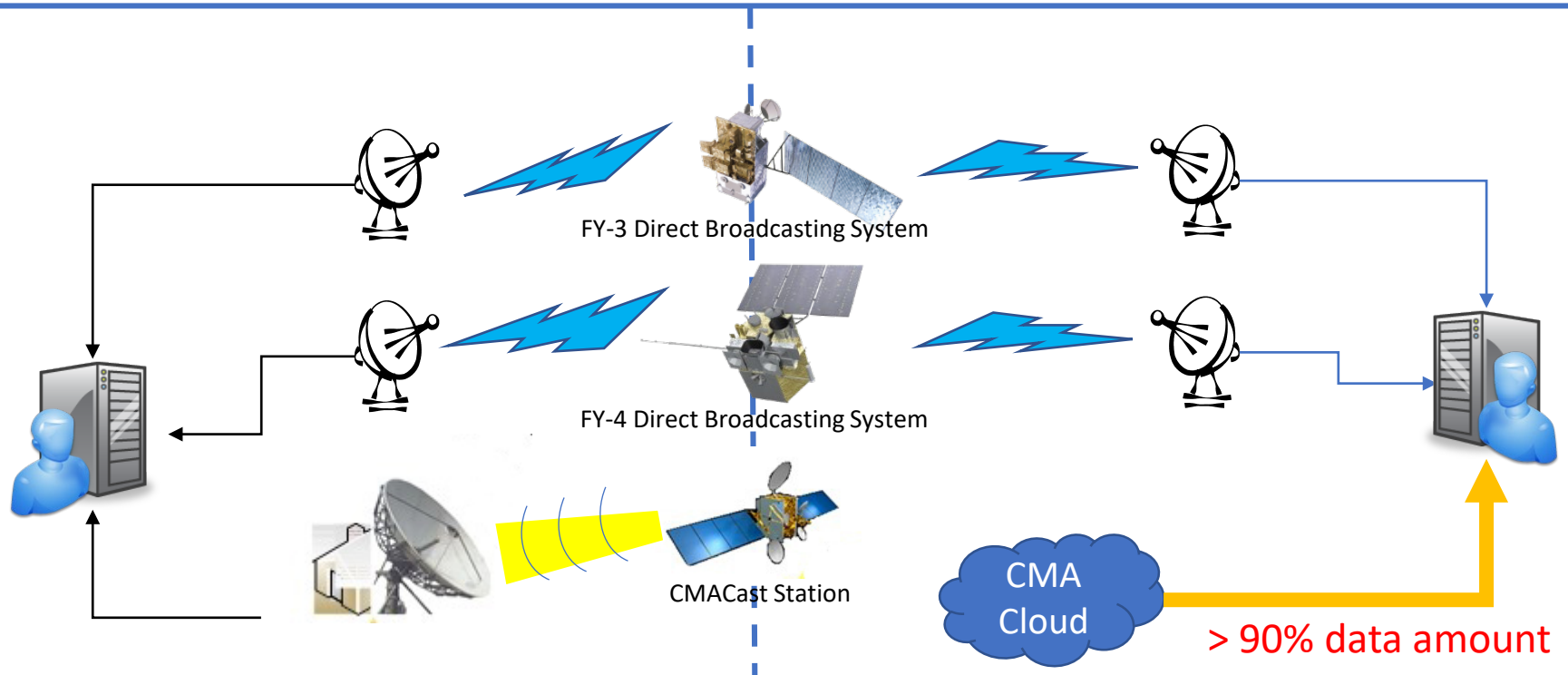
Encouraging scientific and technological cooperation

Future Plan

Cloud-based Community user supporting system

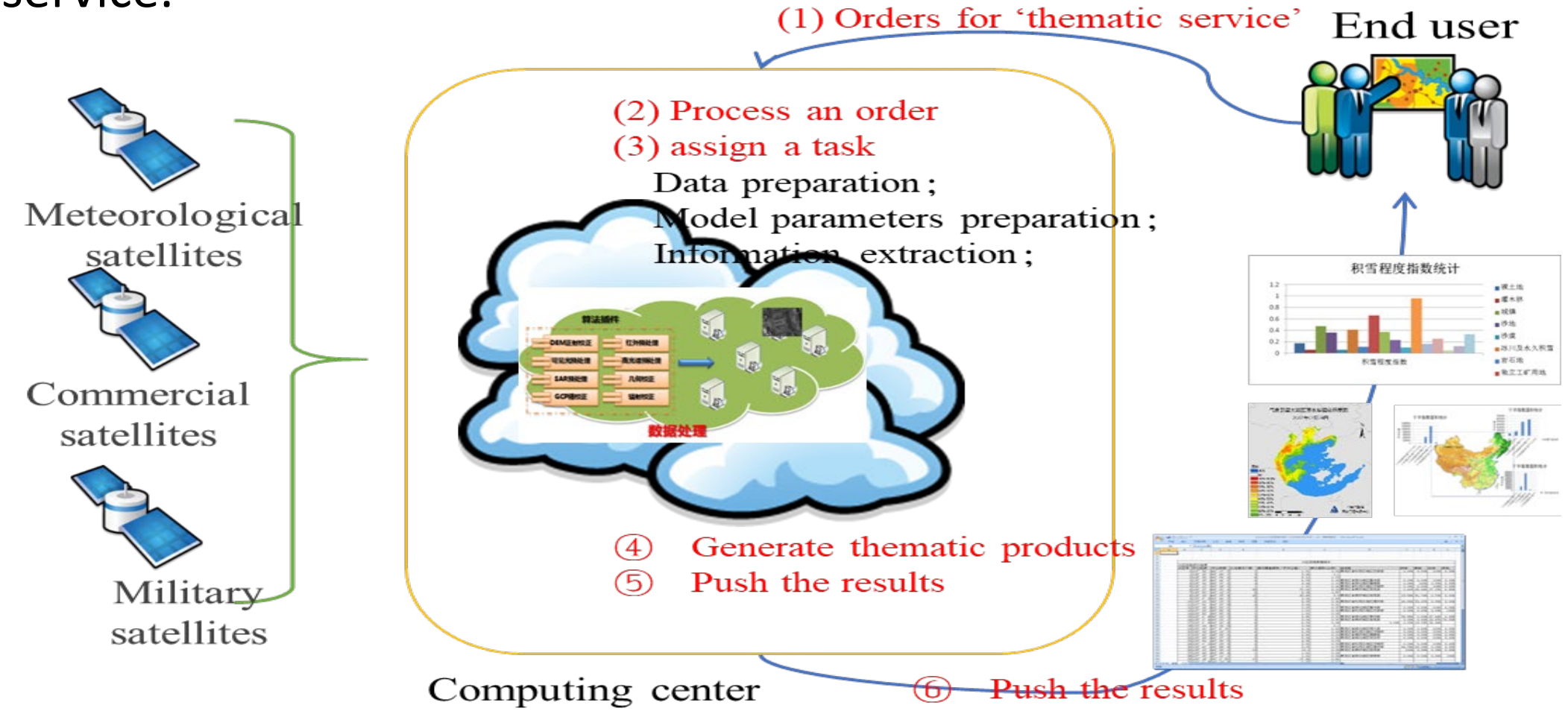


Future Plan


FY-3 Direct Broadcasting System
FY-4 Direct Broadcasting System
CMACast Station
CMA
Cloud
> 90% data amount
TODAY(2018)
FUTURE(2030)

Future Plan

Not only satellite data service, but also compute and decision-making service.



Thanks for your attention

欢迎访问下列网址获取更多信息：

http://rsapp.nsmc.org.cn/geofy

http://satellite.nsmc.org.cn