Progress of Space Technology Application for Disaster Management in China

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Background

黑龙江省, Heilongjiang
吉林省, Jilin
新疆维吾尔自治区, Xinjiang
内蒙古自治区, Inner Mongolia
辽宁省, Liaoning
甘肃省, Gansu
北京市, Beijing
宁夏回族自治区
Ningxia
山西省, Shanxi
山东省, Shandong
青海省, Qinghai
陕西省, Shaanxi
河南省, Henan
江苏省, Jiangsu
Tibet
安徽省, Anhui
四川省, Sichuan
湖北省, Hubei
重庆市
浙江省, Zhejiang
湖南省, Hunan
贵州省, Guizhou
江西省, Jiangxi
福建省, Fujian
云南省, Yunnan
广西壮族自治区, Guangxi
台湾省, Taiwan
广东省, Guangdong
香港特别行政区, Hong Kong
澳门特别行政区, Macao
海南省, Hainan
drought
flood
typhoon
earthquake

Progress

disaster monitoring

disaster early-warning

risk assessment

emergency relief

loss assessment

reconstruction decision

Disaster Monitoring and Assessment

Snow Cover Monitoring

Based on HJ and NOAA satellites, the nationwide snow coverage was monitored every week.

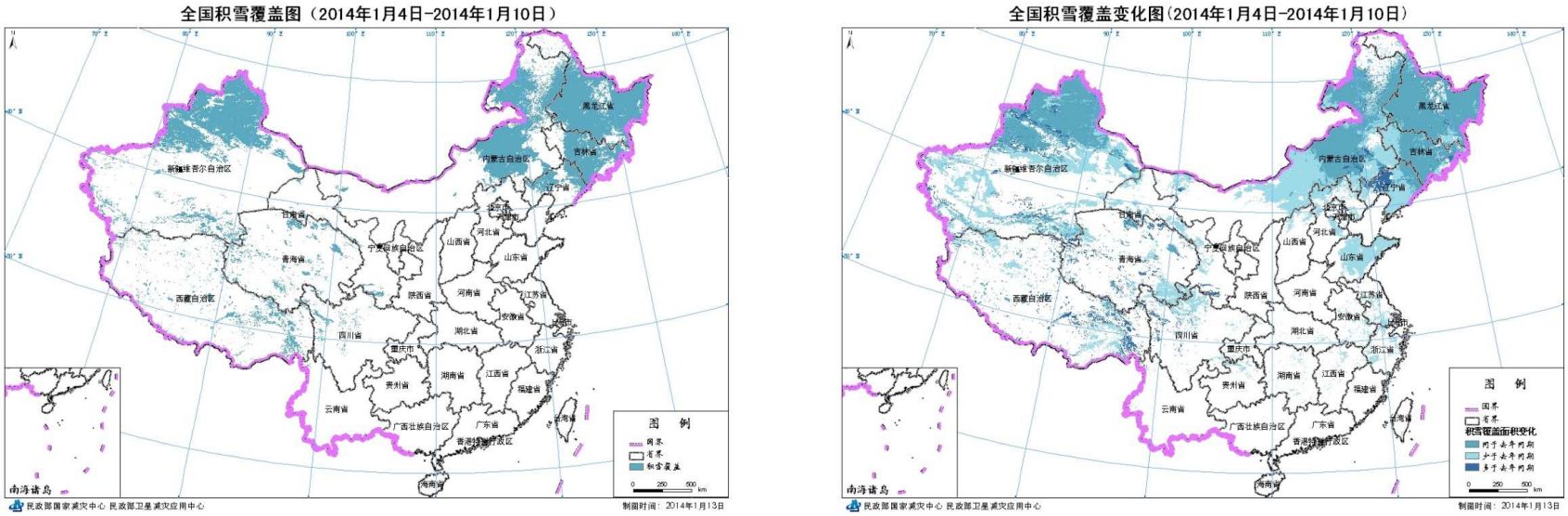

Fig 1 Nationwide snow coverage

HJ：Huangjing-Jianzai（Chinese: 环境减灾, literally: "Environment and Disaster Reduction"，abbreviated "HJ"）
NOAA: National Oceanic and Atmospheric Administration satellites.

Disaster Monitoring and Assessment

Drought Monitoring

- Using multi-scale domestic and international remote sensing data such as HJ and MODIS, carry out continuous of drought monitoring based on vegetation condition index, water index and other methods

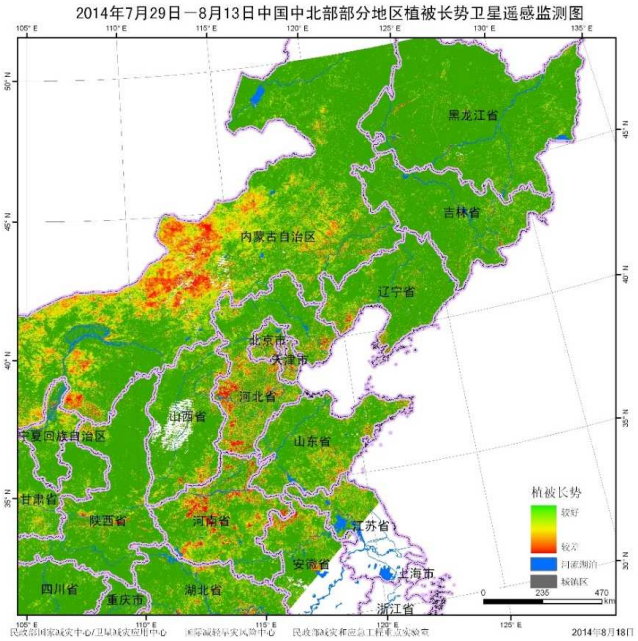

Fig 2 Vegetation growth condition in northern China

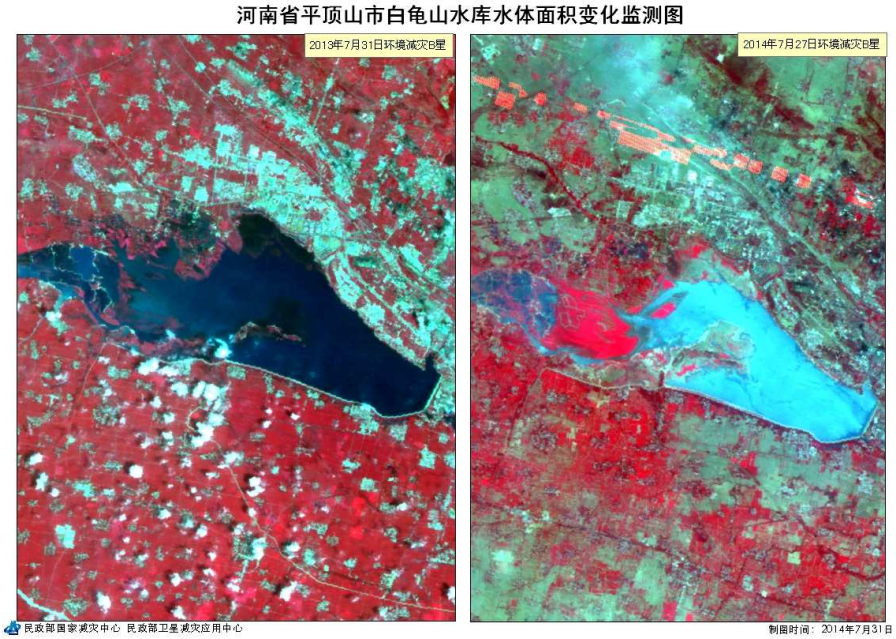

Fig 3 The change of water area of Baiguishan Reservoir in Pingdingshan, Henan.

MODIS：Moderate-resolution imaging spectroradiometer中分辨率成像光谱仪

Disaster Monitoring and Assessment

drought & flood Risk Assessment

- Based on HJ, FY satellites data, combined with land use, population distribution, observed and predicted rainfall data, nationwide drought and flood risk were assessed every week.

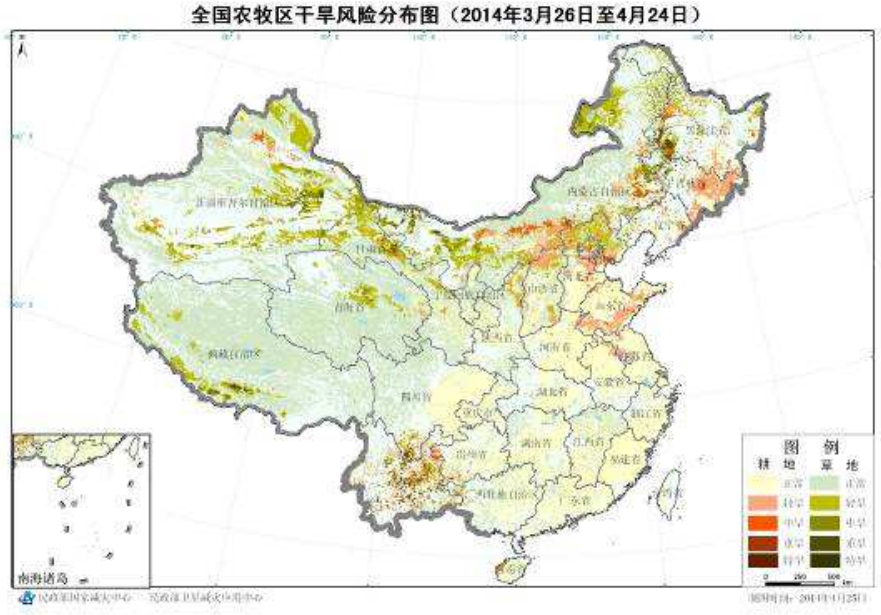

Fig 4 Drought Risk Assessment

Fig 5 Flood Risk Assessment

FY：FengYun satellite（Chinese: 风云, literally: "wind cloud"，abbreviated "FY"）

Space Technology Application in Major Disaster Events

Flood in Southern China (May 21st-26th)

Southern China has experienced heavy rainfall in late May, which has resulted in flash flood in the northern part of Guangdong province. Based on HJ satellite image, the flood impact area and loss was assessed by the water area monitoring.

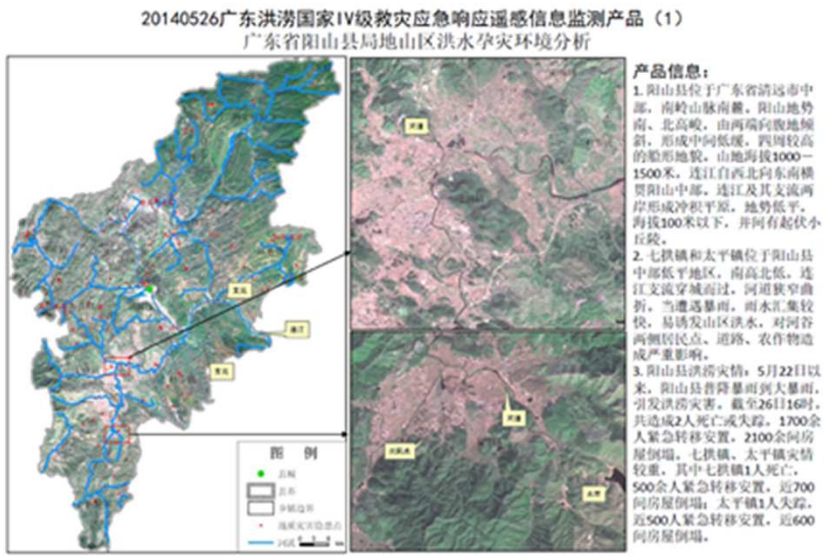

Fig 6 Disaster Environment Analysis in northern Guangdong

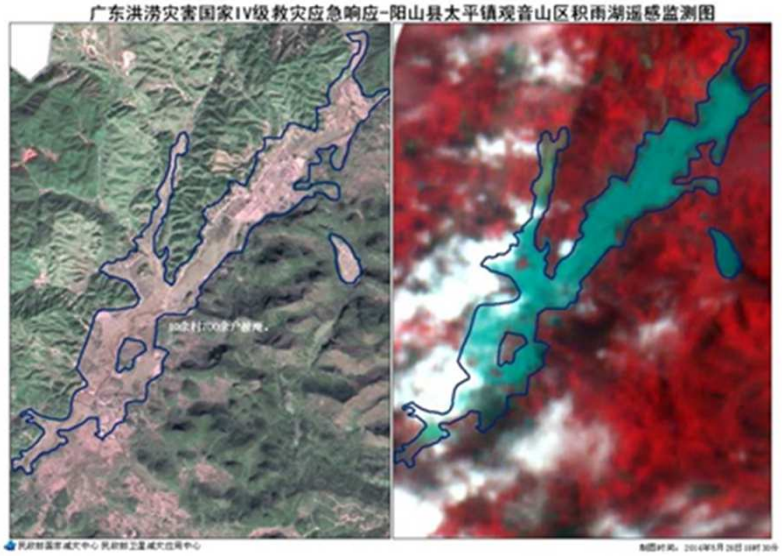

Fig 7 The flood area monitored by HJ-1 satellite

Space Technology Application in Major Disaster Events

Typhoon Rammasun

- On July 17, Typhoon Rammasun raked Wenchang City on the island province of Hainan with strong winds and heavy rains, which is the strongest typhoon affected southern China since 1973.

- In order to assess the impact of Typhoon Rammasun, 90 frames of image from domestic and international satellites (by CHARTER) were acquired to monitor the change of water area and impact on vegetation.

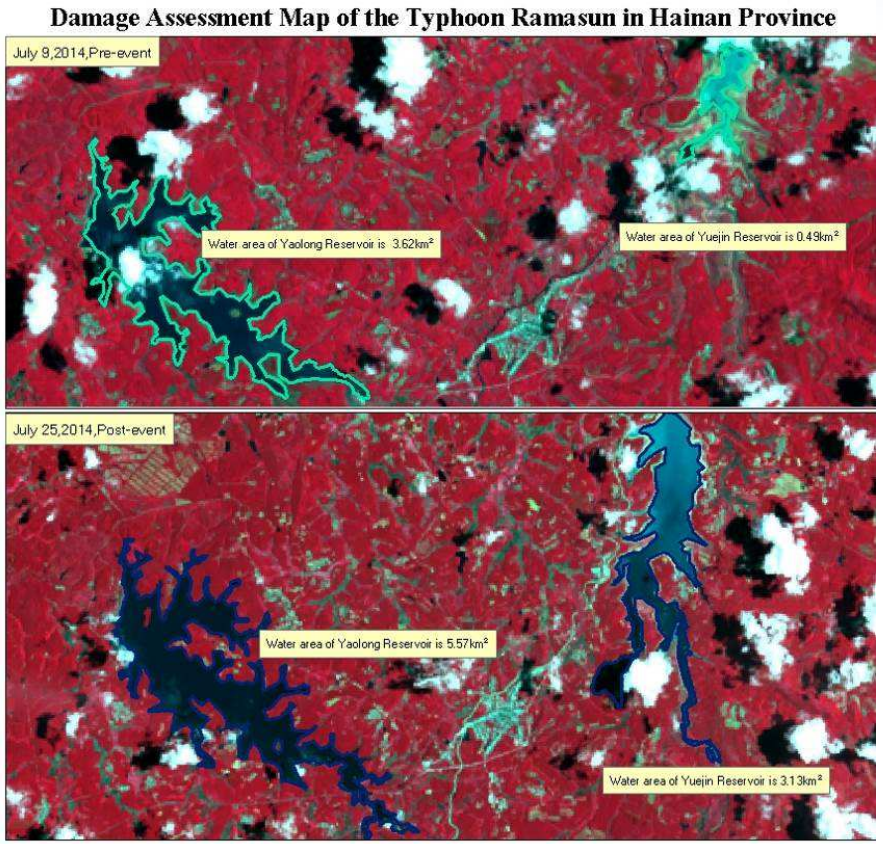

Fig 8 The change of water area by Typhoon Ranmasun

CHARTER: An international cooperation between space agencies, making their resources available to emergency and rescue operations.

Space Technology Application in Major Disaster Events

Ludian Earthquake in Yunnan Province

- The Ludian earthquake with a magnitude of 6.5 occurred at 16:03 (Beijing time) on 3 August, 2014, which killed at least 600 people.

- 167 frames of image (including 71 frames of pre-disaster and 96 frames of post-disaster) have been acquired from CHARTER for disaster loss assessment.

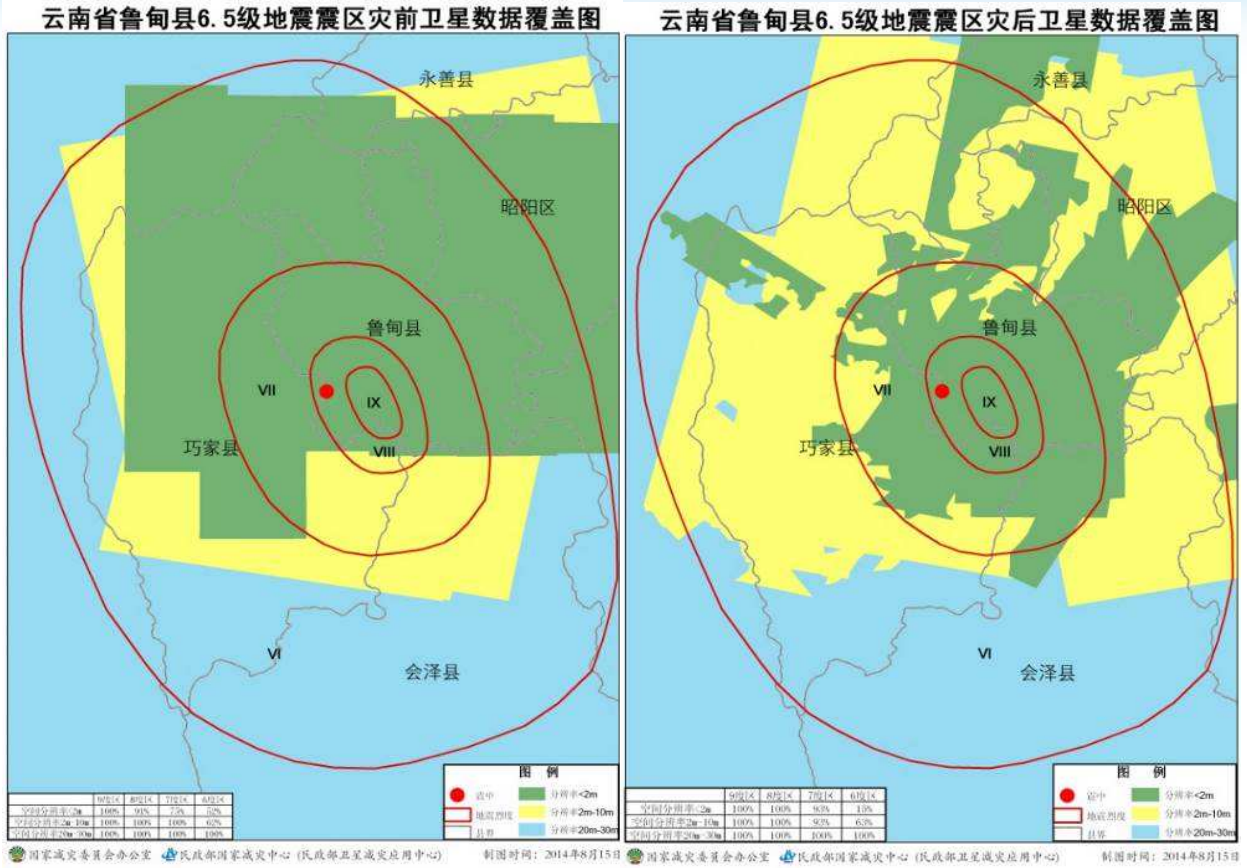

Fig 9 Coverage of RS images(left: Pre-disaster; Right: Post-disaster)

CHARTER: An international cooperation between space agencies, making their resources available to emergency and rescue operations.

Space Technology Application in Major Disaster Events

Ludian Earthquake in Yunnan Province

- Secondary disasters such as landslide and barrier lake and their impact on traffic lines were monitored by remote sensing.

Fig 10 Barrier Lake monitored by RS

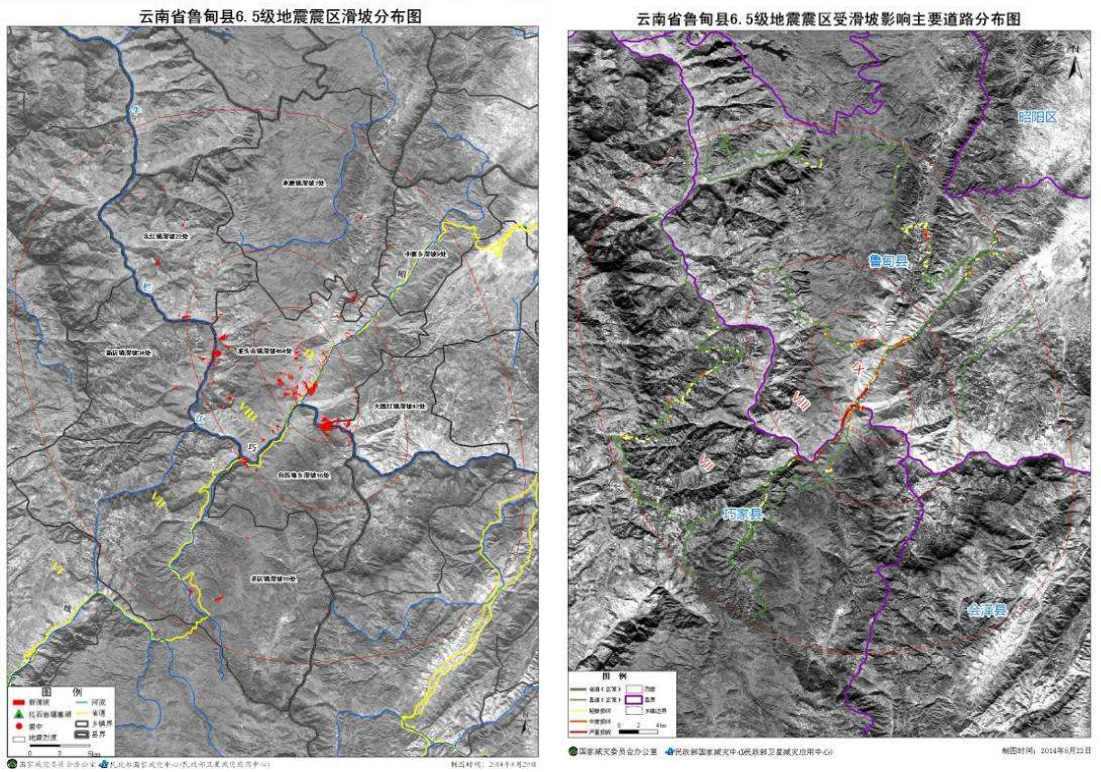

Fig 11 Landslides and their impacts on traffic lines

Space Technology Application in Major Disaster Events

Ludian Earthquake in Yunnan Province

- The images were also used to monitor the tent distribution so as to evaluate emergency evacuation and settlement in the disaster area.

Fig 12 Tent distribution monitored by RS in the disaster area

THANK YOU!

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