



United Nations/United Arab Emirates High Level Forum
“Space as a driver for socio-economic sustainable development”



Application of Space Information Technology in Disaster Mitigation and Disaster Relief

Xijin Feng

National Disaster Reduction Center of China(NDRCC)

Nov. 6 2017, Dubai



- ❖ **Natural Disasters and Risk Management**
- ❖ **Space-based Information for Disaster Risk Management**
- ❖ **Way Forward**





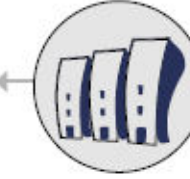
Natural Disasters in China

China is one of the countries most affected by natural disasters in the world.

- ❖ Various kinds
- ❖ Wide area distribution
- ❖ High frequency
- ❖ Enormous losses



310 million affected **1,500** dead or missing, **9** million relocated



700 thousand collapsed



27 million hectares damaged



380 billion RMB

Annual average disaster impact during 2011—2015 (the 12th Five-year)





Disaster Management System in China



China National Commission for Disaster Reduction is responsible for disaster prevention, reduction and relief coordination and plan at national level.

Comprehensive National Disaster Prevention and Reduction Plan was formulated with the aim to better implement the policy decisions of the CPC Central Committee and the State council regarding disaster prevention, reduction and relief work.



国务院办公厅文件

国办发〔2011〕55号

国务院办公厅关于印发国家综合防灾减灾规划（2011—2015年）的通知

各省、自治区、直辖市人民政府，国务院各部委、各直属机构：

《国家综合防灾减灾规划（2011—2015年）》（以下简称《规划》）已经国务院同意，现印发给你们，请认真贯彻执行。

《规划》已经国务院同意，现印发给你们，请认真贯彻执行。

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灾能力的

中华人民共和国中央人民政府
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首页 > 信息公开 > 国务院文件 > 民政、扶贫、救灾 > 减灾救灾

索引号: 000014349/2016-00276 主题分类: 民政、扶贫、救灾、减灾救灾
发文机关: 国务院办公厅 成文日期: 2016年12月29日
标 题: 国务院办公厅关于印发国家综合防灾减灾规划（2016—2020年）的通知
发文字号: 国办发〔2016〕104号 发布日期: 2017年01月13日
主 题 词:

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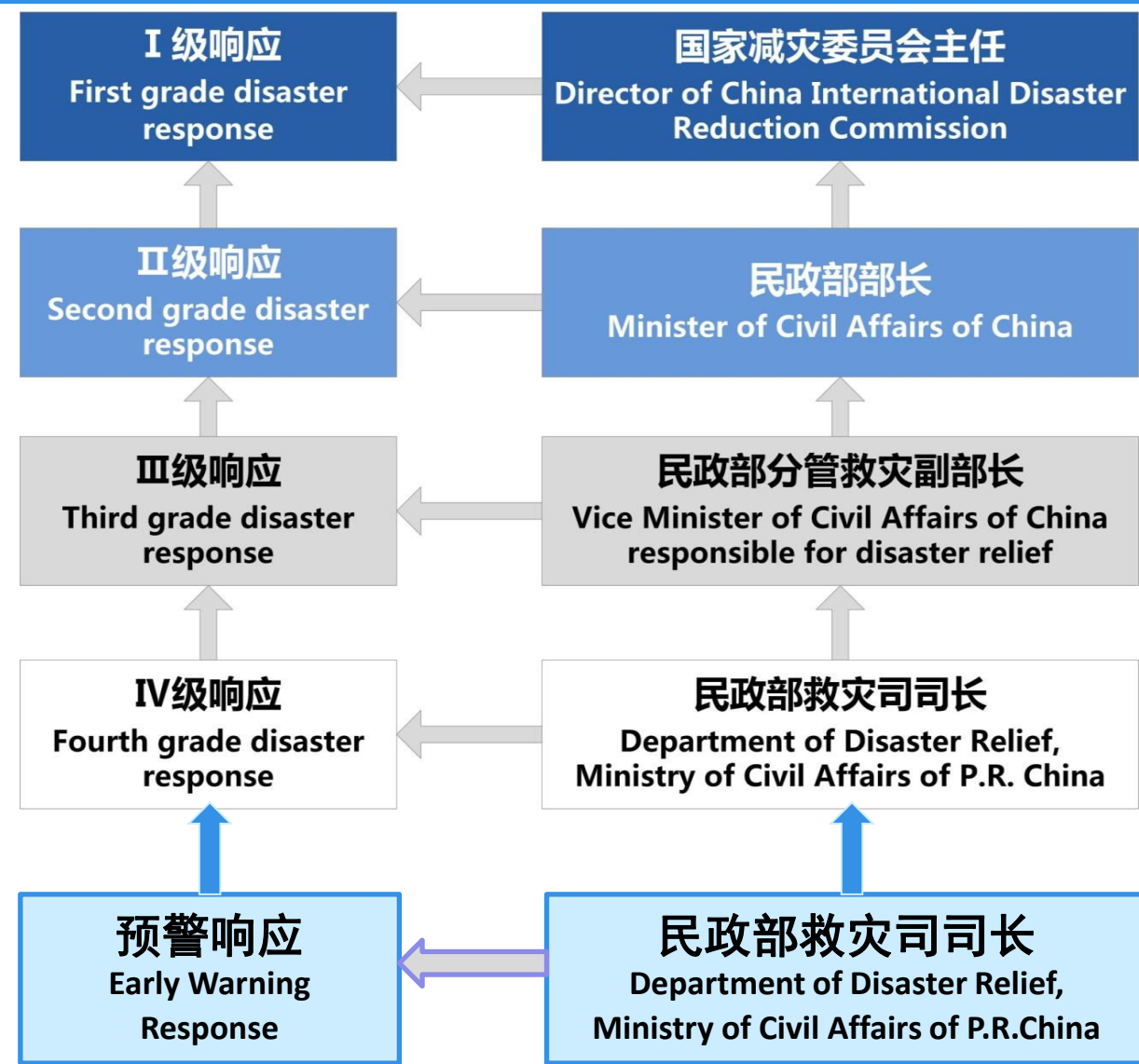
国务院办公厅
2016年12月29日
(此件公开发布)

国家综合防灾减灾规划（2016—2020年）

防灾减灾救灾工作事关人民群众生命财产安全，事关社会和谐稳定，是衡量执政党领导力、检验政府执行力、评判国家动员力、彰显民族凝聚力、为贯彻党中央中



Disaster Management System in China



The State Council issued *Regulations on Natural Disaster Relief and the National Emergency Plan for Natural Disaster Relief*.

1 Early warning response and **4** Emergency Response levels.

Work Procedures and mechanisms have been formed as working guidelines.

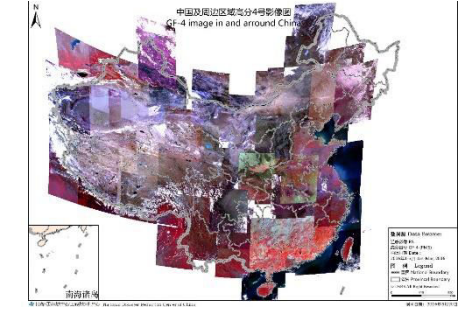
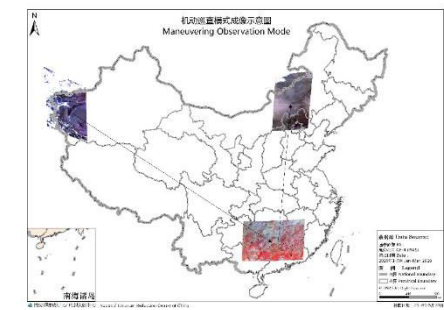
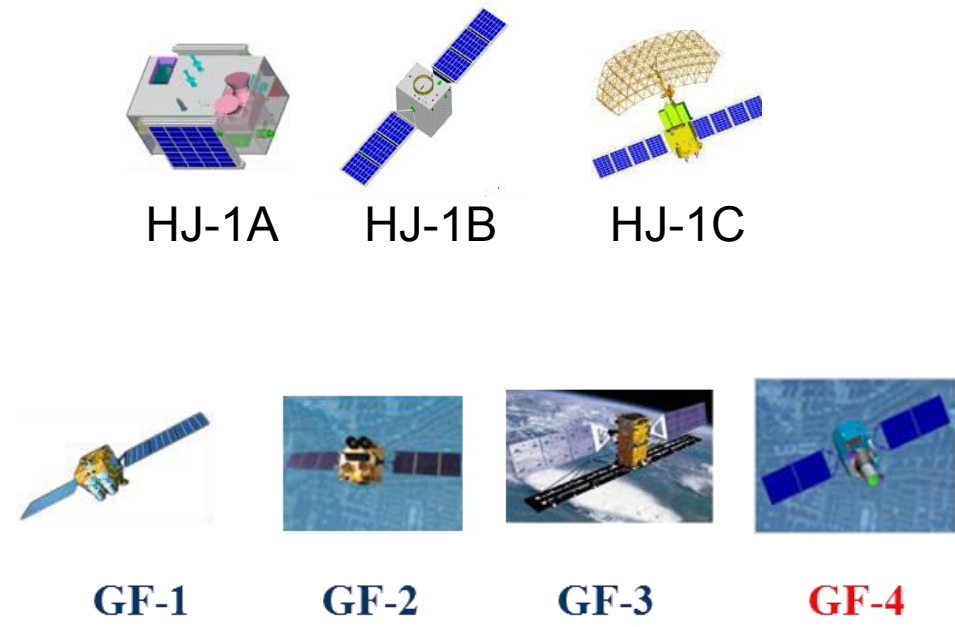
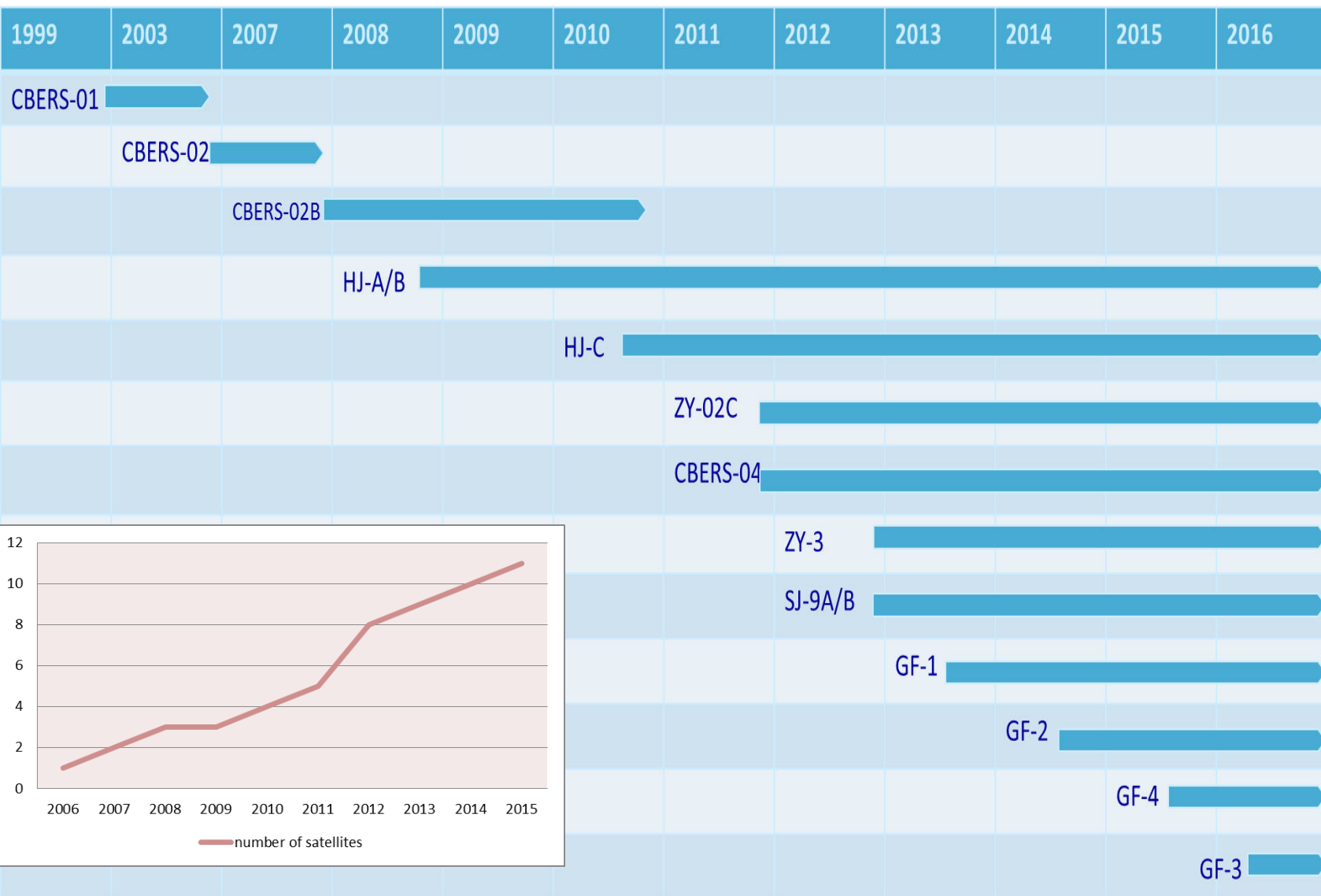
Space technology has been involved into national management system.



- ❖ **Natural Disasters and Disaster Risk Management in China**
- ❖ **Space-based Information for Disaster Risk Management**
- ❖ **Way Forward**



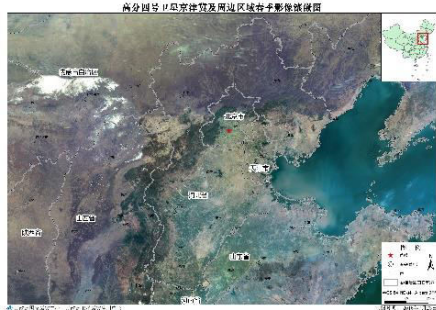
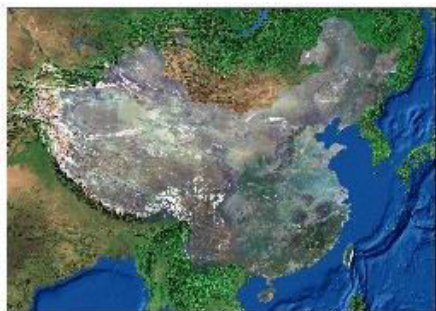
Earth Observation Satellites in China



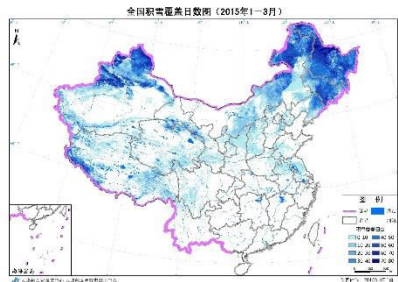
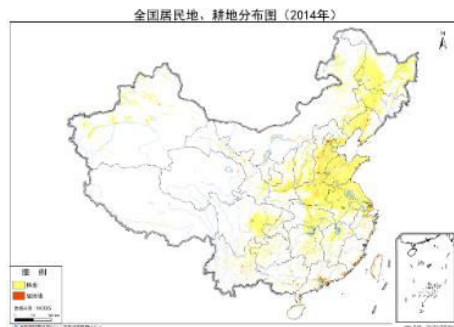


Space-based Information Products System for Disaster Risk Reduction

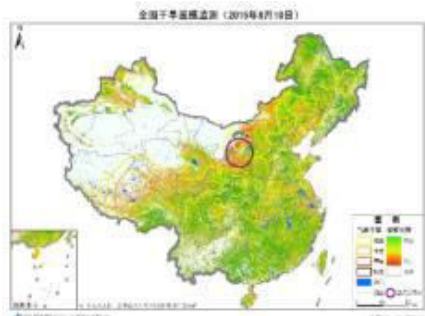
Satellite Imagery



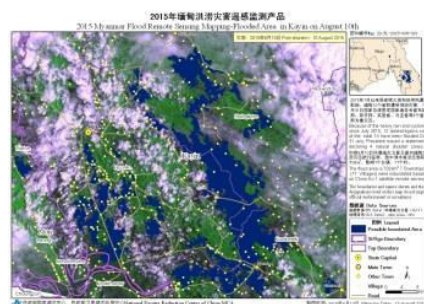
Risk Element Monitoring



Risk Assessment



Emergency Monitoring



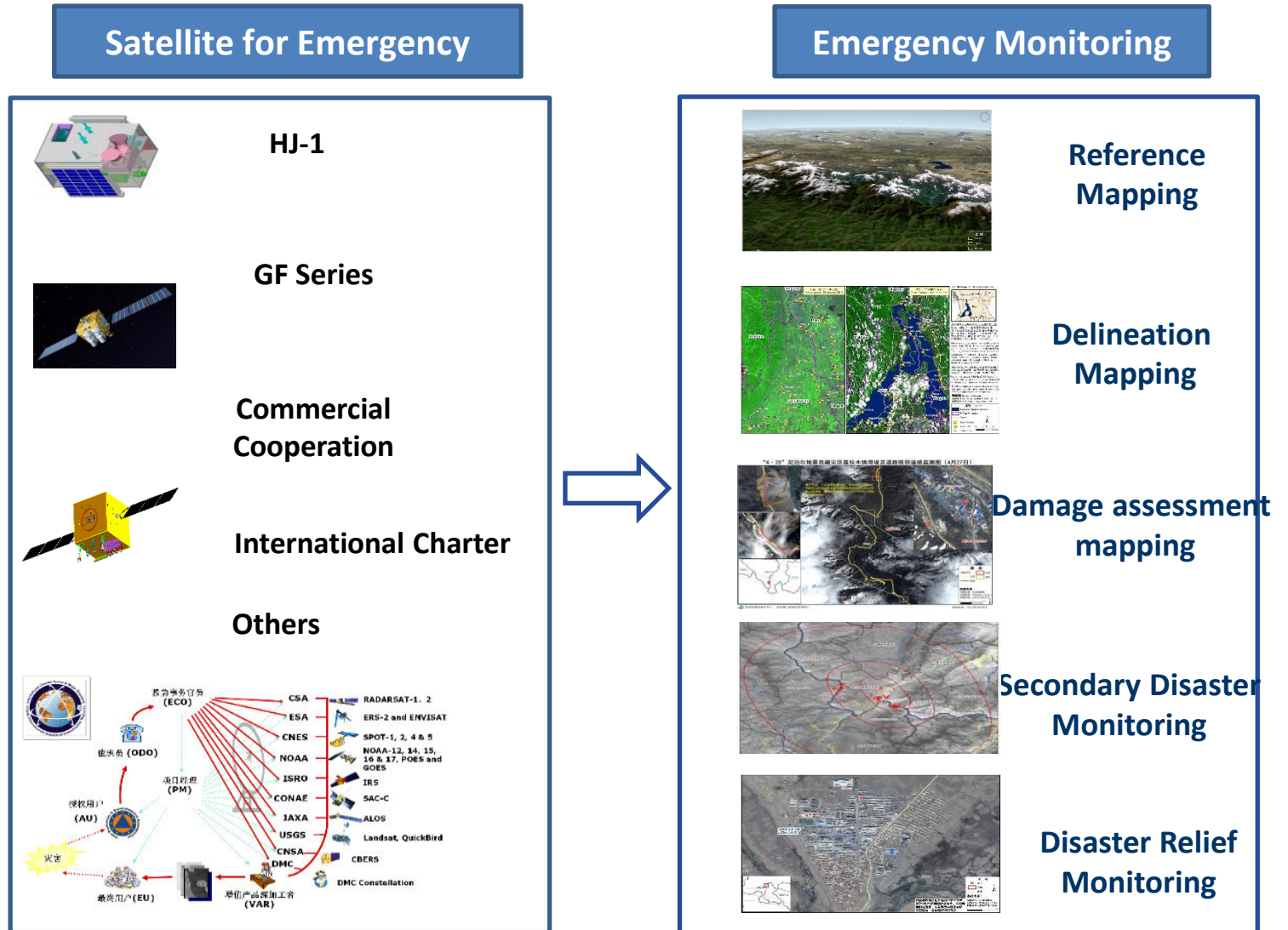
Recovery & Reconstruction



Emergency Monitoring



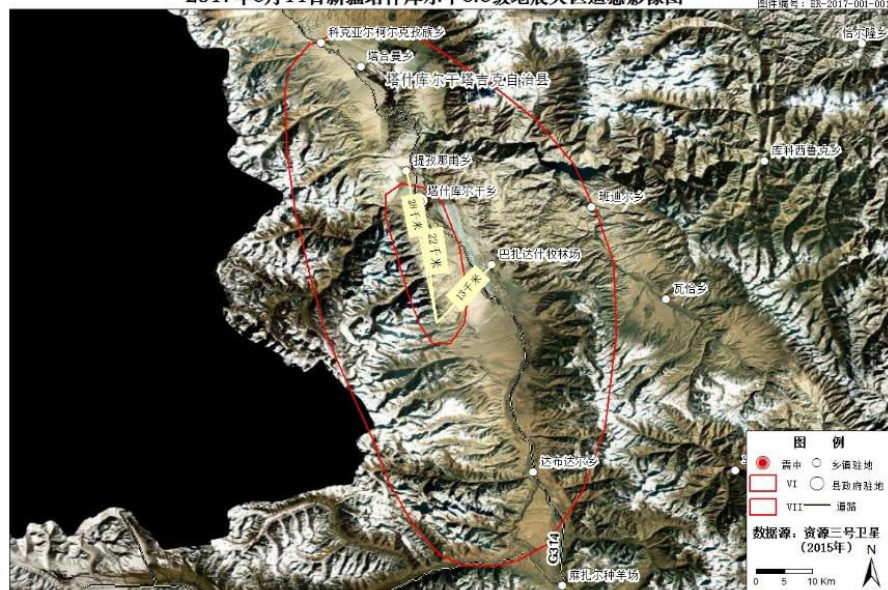
- Within **24** hours the **1st** post disaster EO imagery could be accessed;
- **5** kinds of mapping products will be developed for emergency response.





The 5.5-magnitude earthquake occurred in Xinjiang, China on 11 May 2017

2017年5月11日新疆喀什库尔干5.5级地震灾区遥感影像图

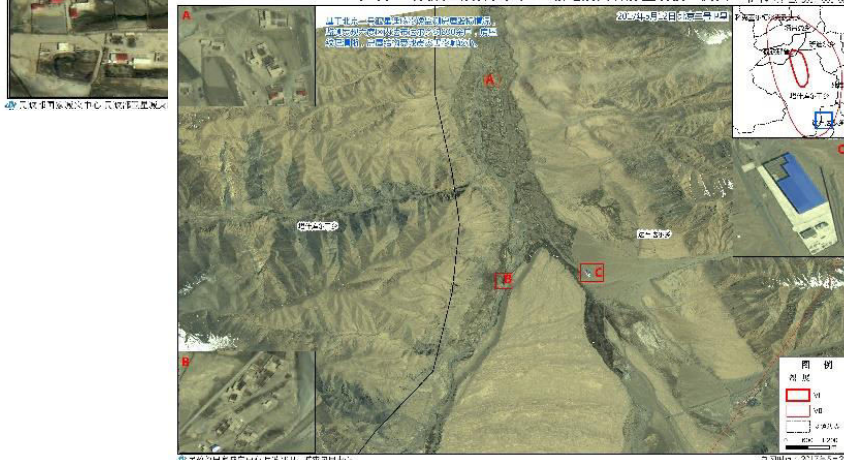


Residential area and cropland distribution

2017年5月11日新疆喀什库尔干5.5级地震灾房屋受损监测图

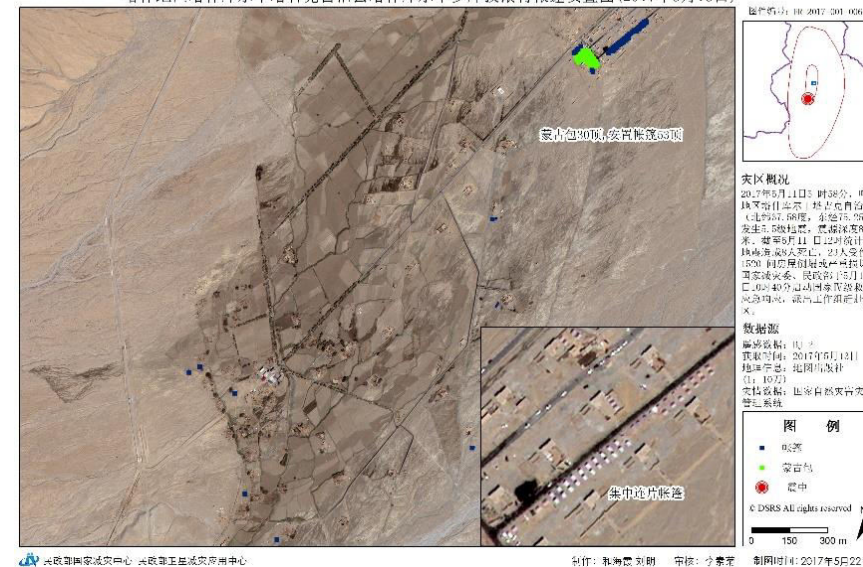


2017年5月11日新疆喀什库尔干5.5级地震灾房屋受损监测图



Damaged house monitoring

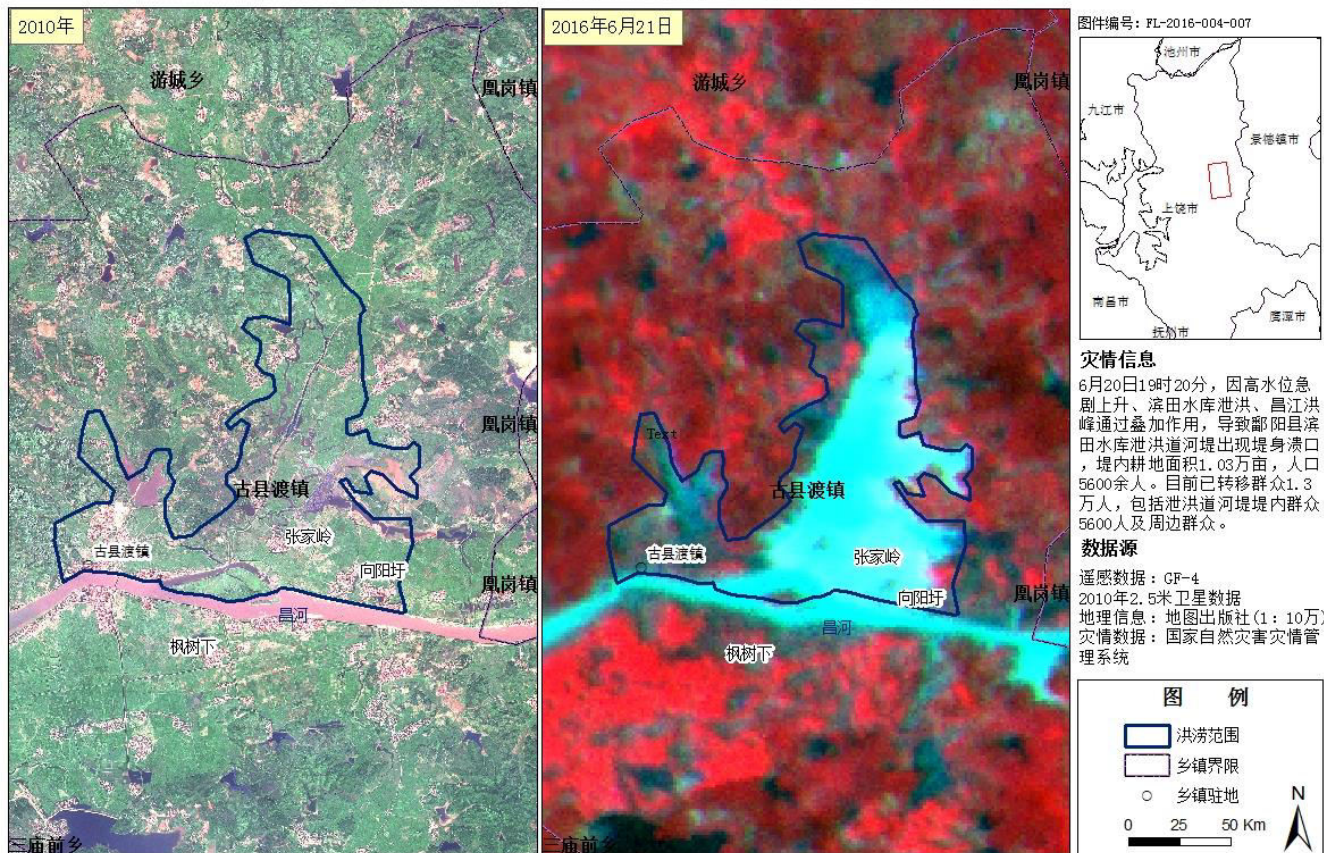
2017年5月11日新疆地震国家IV级救灾应急响应遥感信息监测产品
喀什地区喀什库尔干塔吉克自治县塔什库尔干乡库孜滚村帐篷安置图(2017年5月13日)



Emergency shelter monitoring



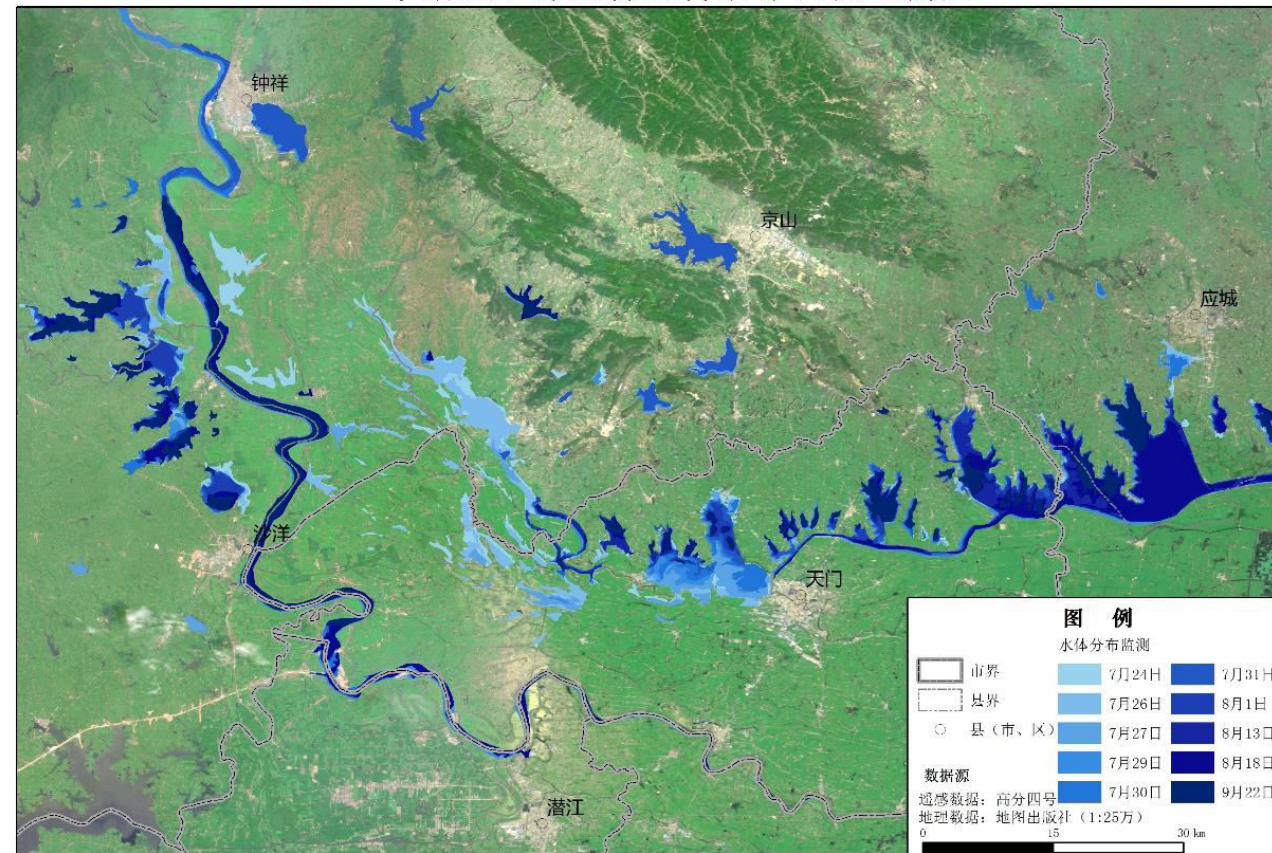
2016年6月21日江西省上饶市鄱阳县古县渡镇高分四号洪涝范围图



民政部国家减灾中心 民政部卫星减灾应用中心

制作: 和海震 舒阳 审核: 李素菊 制图时间: 2016年6月21日

2016年湖北中部洪涝灾害水体面积监测图



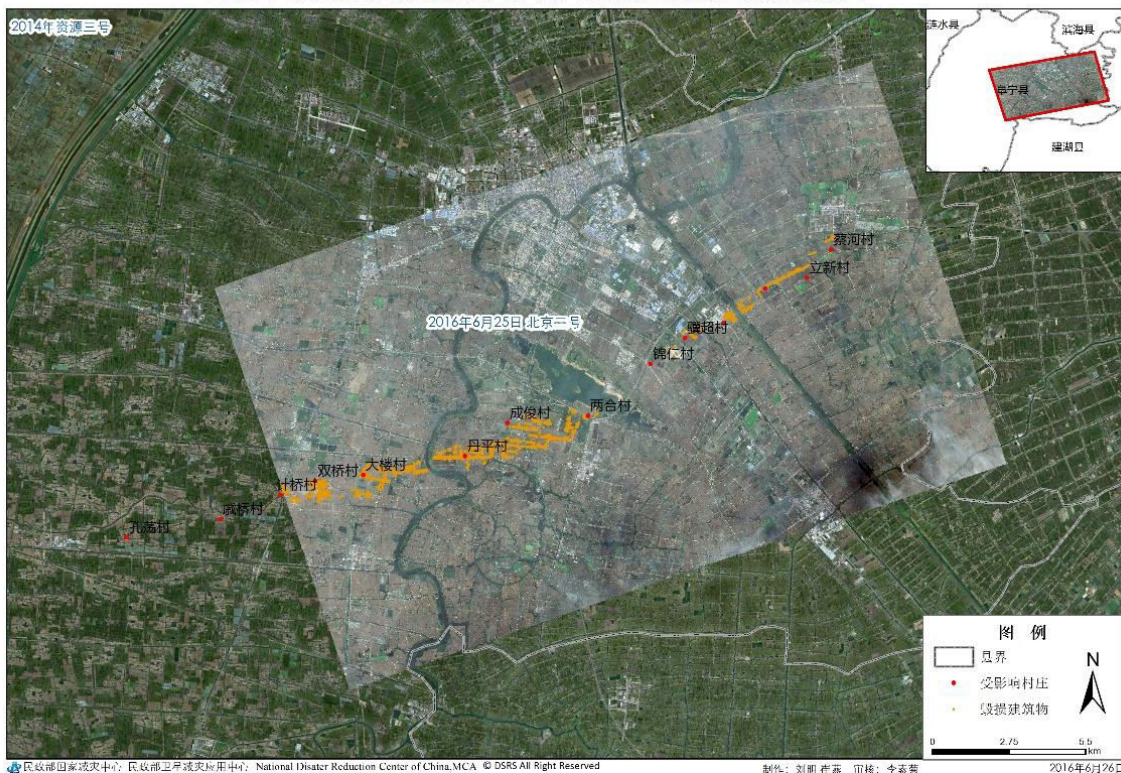
Rapid Flood Mapping Product Based on GF-4 Satellite

Flood Monitoring in Hubei Province in Summer of 2016



The Tornado Mapping in Jiangsu (23th June 2016)

2016年6月23日江苏盐城龙卷风冰雹特别重大灾害遥感监测图



Damage Route

Damage Monitoring

2016年6月23日江苏盐城龙卷风冰雹特别重大灾害遥感监测图
丹平村建筑物毁损监测图



2016年江苏盐城龙卷风冰雹特别重大灾害恢复重建遥感监测图
丹平村灾后重建监测图

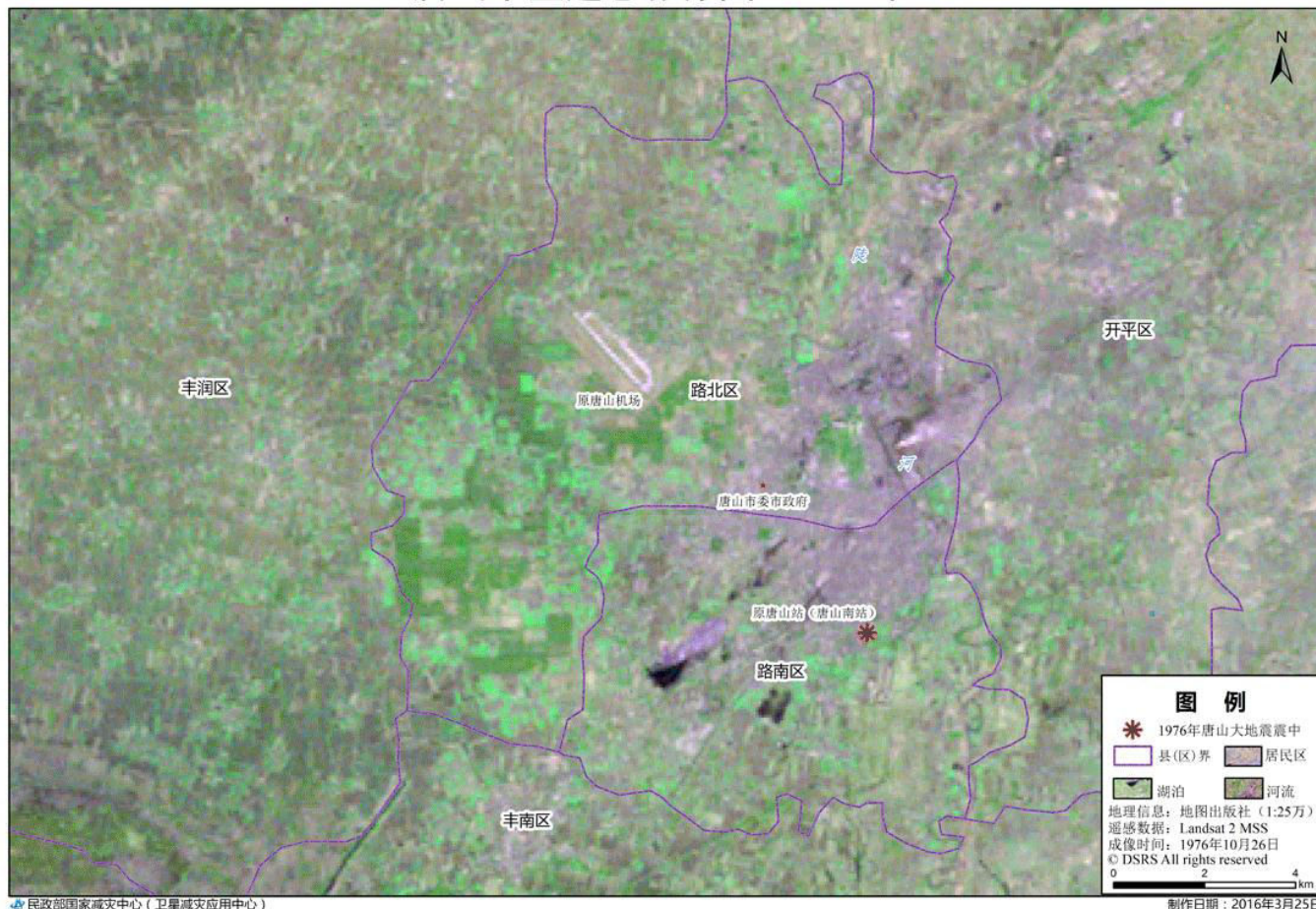


Reconstruction Monitoring

Earthquake Recovery & Reconstruction



唐山市区遥感影像图（1976年）



Recovery monitoring of 1976 Tangshan Earthquake

四川北川老县城地震遗址高分二号遥感影像图



Recovery monitoring of 2008 Wenchuan Earthquake

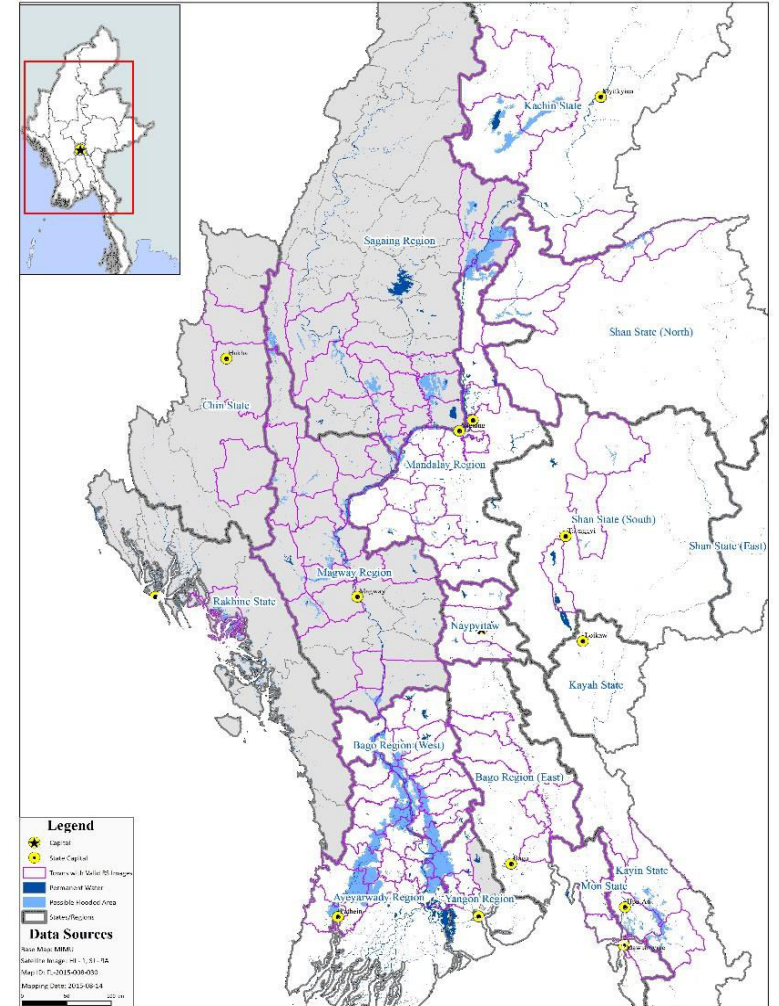
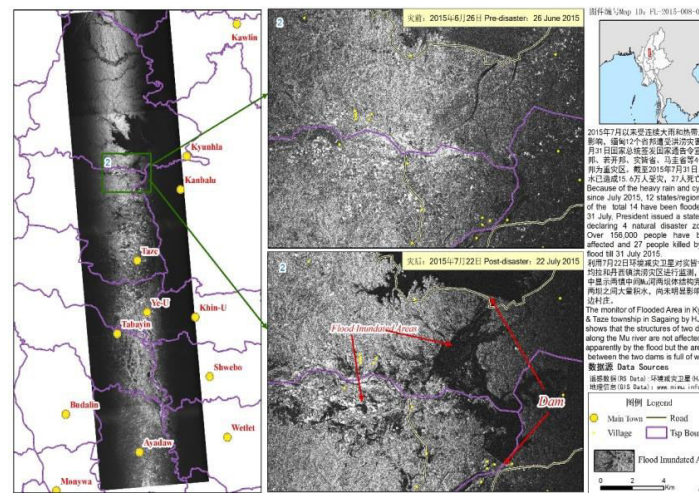
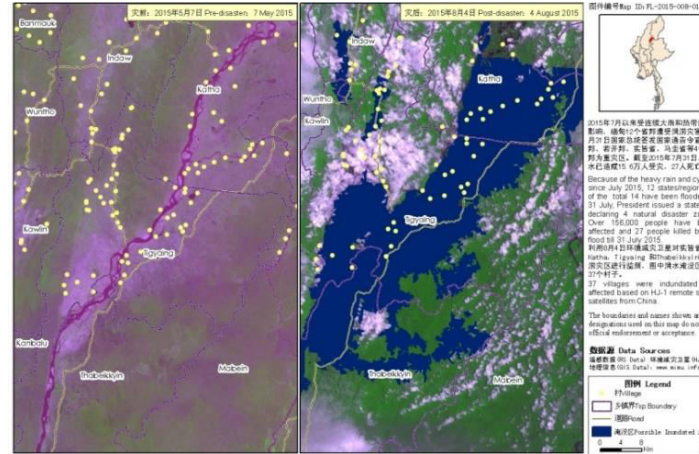
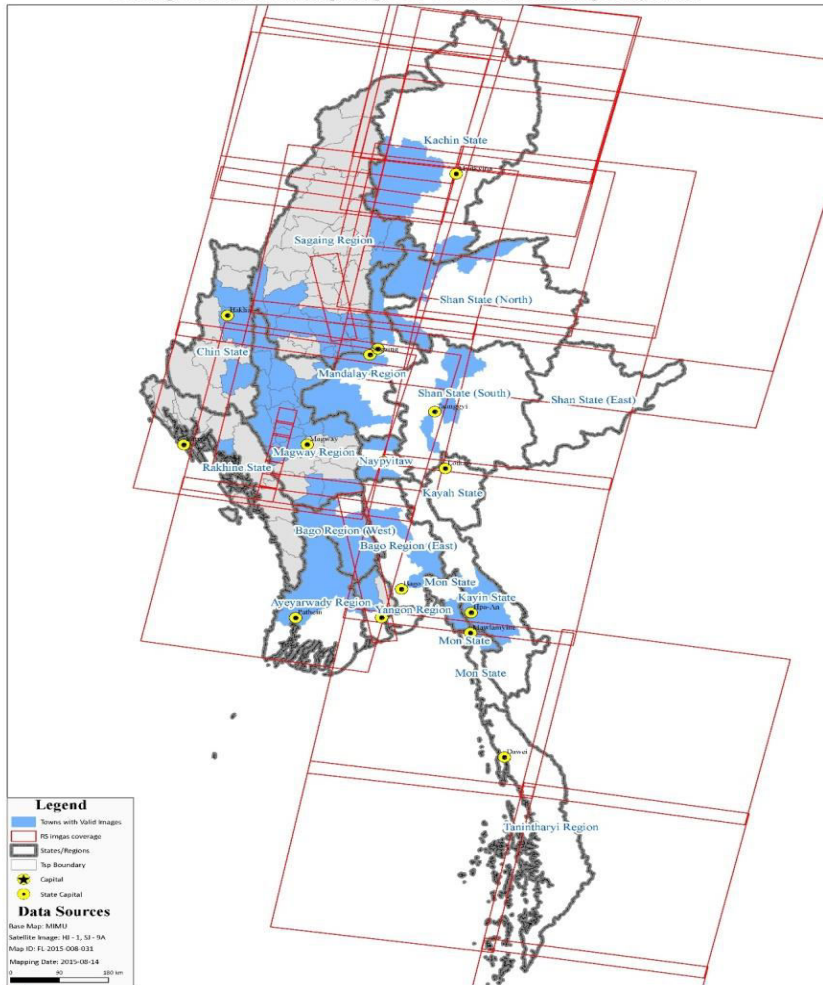
四川北川羌族自治县新城高分二号遥感影像图





Flood Monitoring from July to August in 2015 and April to May in 2016

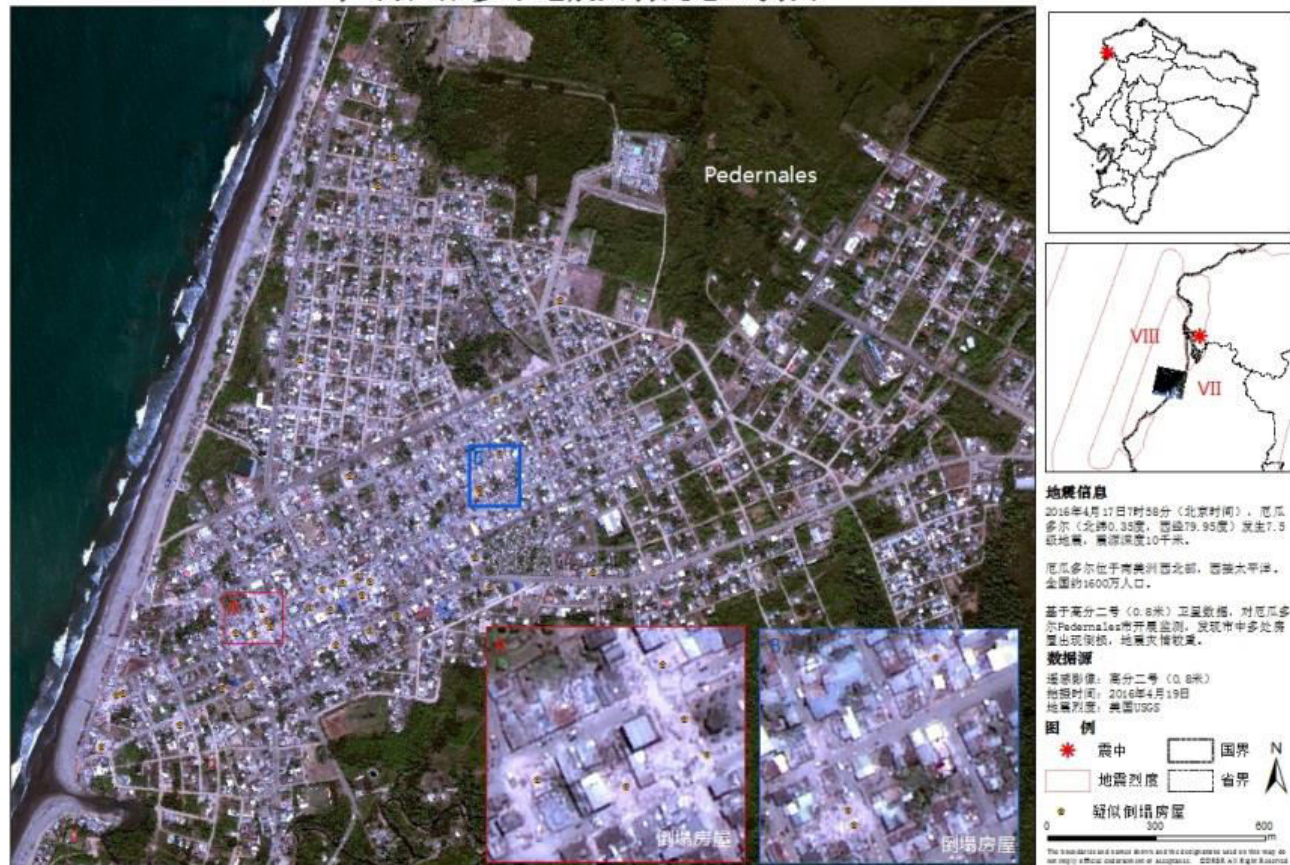
缅甸洪涝灾害遥感监测数据覆盖图
Coverage of Remote Sensing Images for the Flood Monitoring in Myanmar





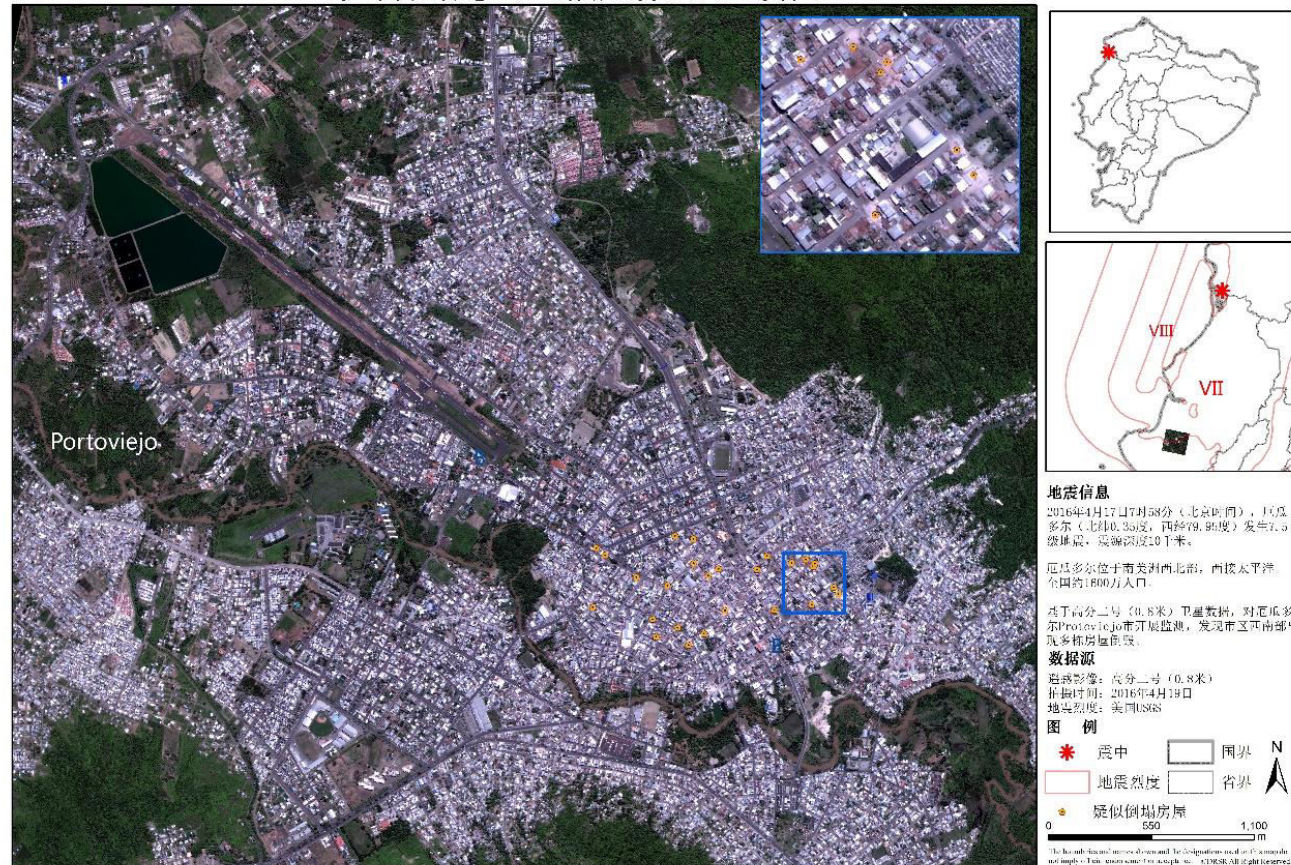
Earthquake in Ecuador (April, 2016)

2016年4月厄瓜多尔地震灾害遥感监测图



制图人: 刘明 舒阳 徐丰 审核人: 李素素 签发人: 甄一天 制图时间: 2016年4月20日

2016年4月厄瓜多尔地震灾害遥感监测图

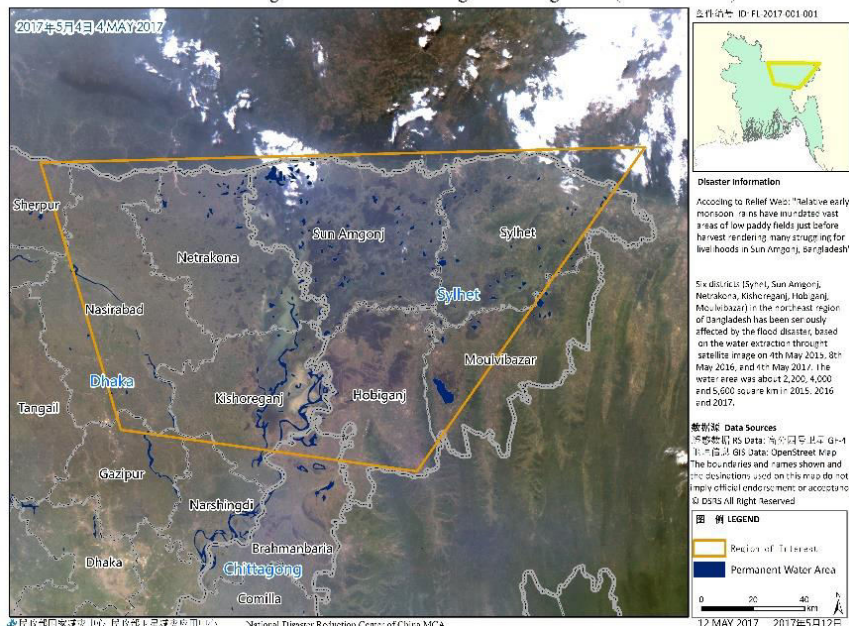


制图人: 刘明 舒阳 徐丰 审核人: 李素素 签发人: 甄一天 制图时间: 2016年4月20日

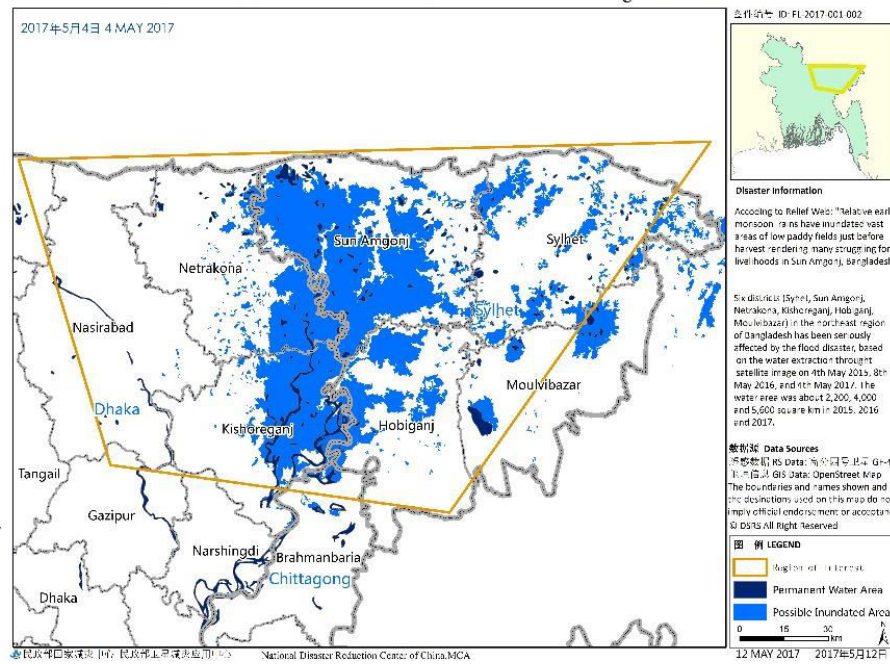


Flood Monitoring in Early May from 2015 to 2017

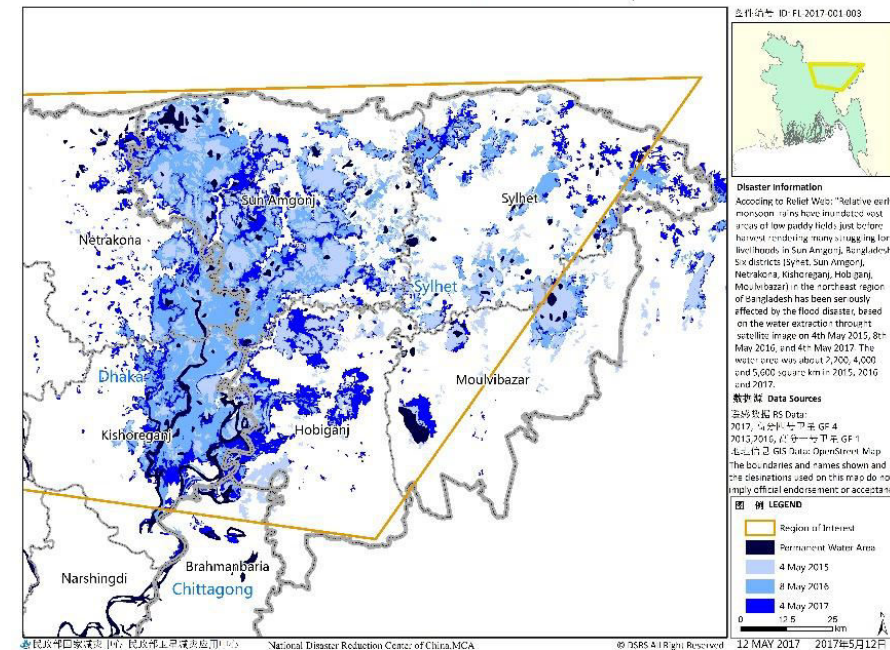
2017年5月4日孟加拉东北部高分四号卫星遥感影像图
GF-4 Satellite image of the northeastern region of Bangladesh (04 MAY 2017)



2017年5月4日孟加拉东北部洪涝遥感监测图
Possible Inundated Extent Extracted from GF-4 Satellite Image on 04 MAY 2017



孟加拉东北部2015 - 2017年5月上旬水体范围遥感监测图
Possible Inundated Extent Extracted from GF Satellites on 04/05/2015, 08/05/2016 and 04/05/2017



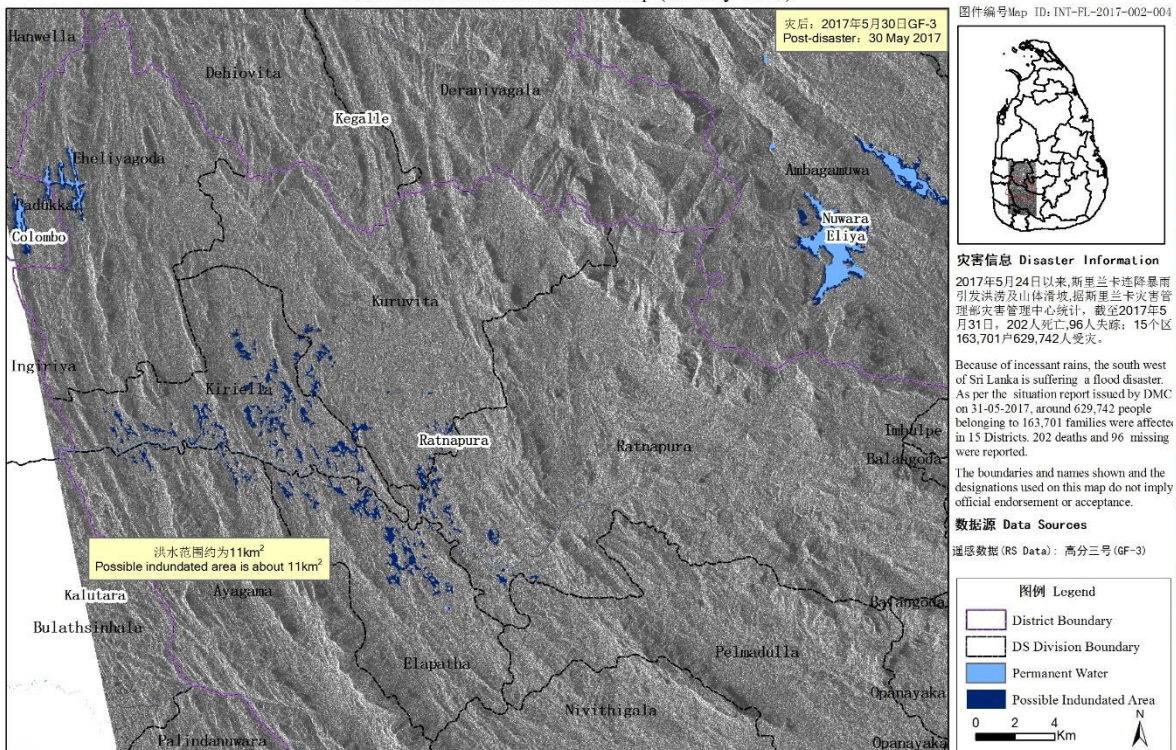
Imagery Product

Possible Inundated Extent
Extraction by GF-4

Water Area Extraction during the
some period from 2015 to 2017

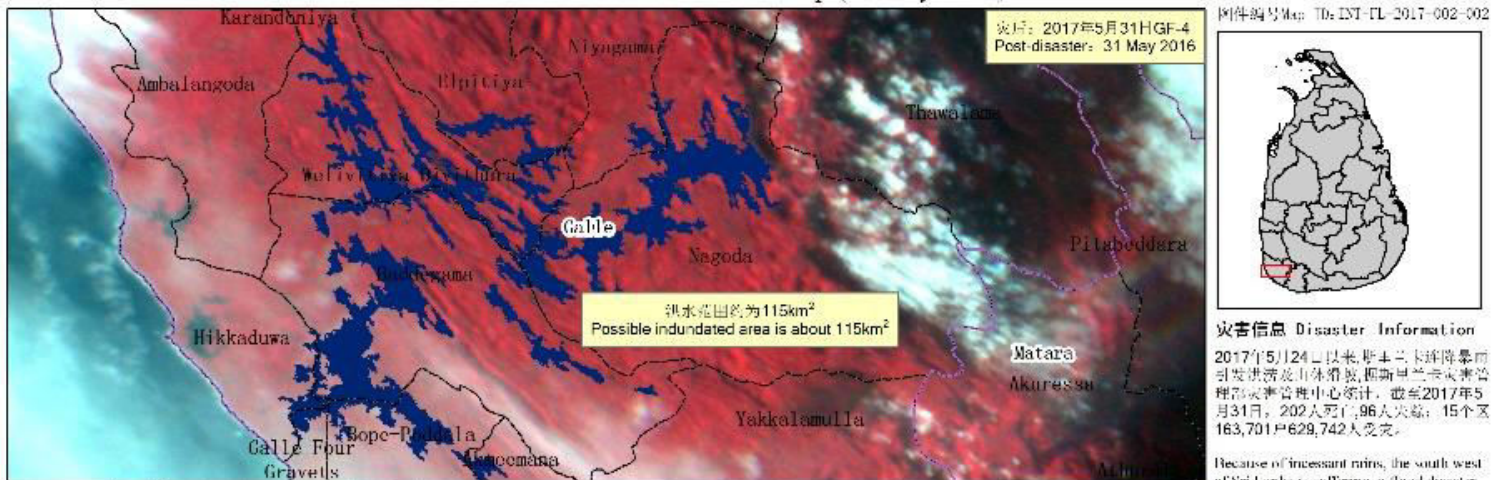


2017年斯里兰卡洪涝灾害遥感监测图 (2017年5月30日)
2017 Sri Lanka Flood Extent Map (30 May 2017)



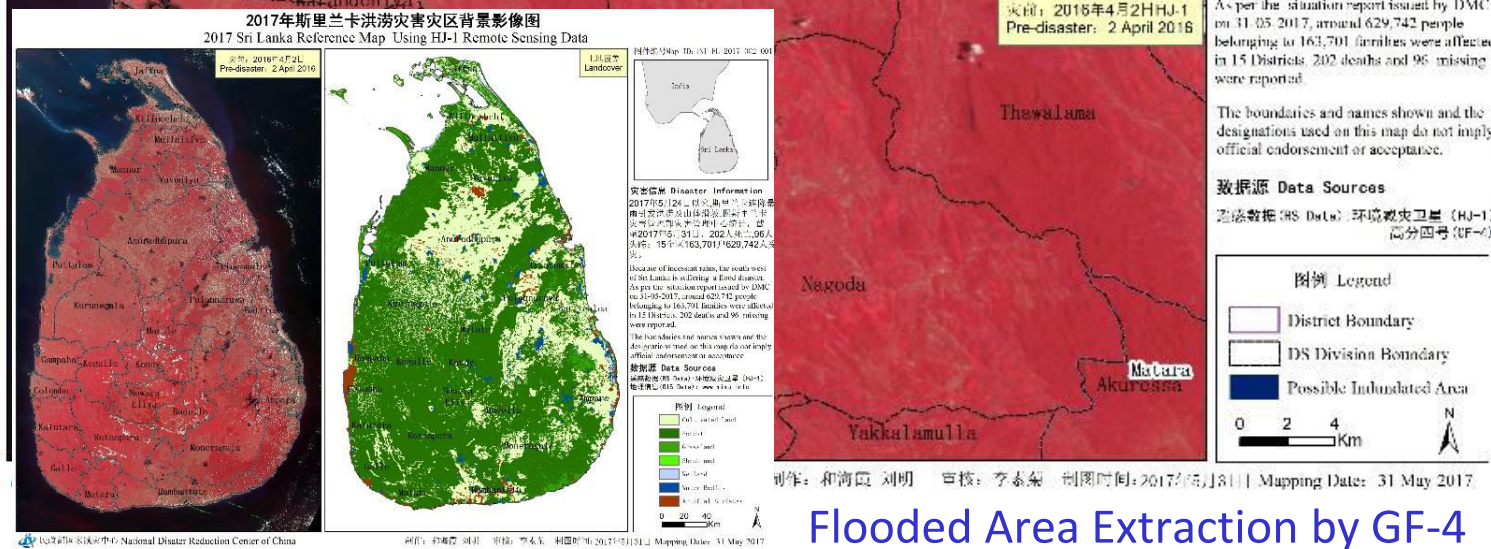
Flooded Area Extraction by GF-3 (SAR)

2017年斯里兰卡洪涝灾害遥感监测图 (2017年5月31日)
2017 Sri Lanka Flood Extent Map (31 May 2017)



Flooded Area Extraction by GF-4

2017年斯里兰卡洪涝灾害灾区背景影像图
2017 Sri Lanka Reference Map Using HJ-1 Remote Sensing Data





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Comprehensive National Plan on Disaster Prevention and Reduction (2016-2020)



- ❖ Firmly set up and carry out the *new development concept*, focusing on **people-centered** development, accurately deal with the relation between disaster prevention, reduction and relief with social-economic development. Take the **prevention as major priority** combining the rescue work with relief together. Normal disaster reduction and abnormal disaster rescue work should be linked to **transfer the priority** from post- disaster rescue **to pre-disaster prevention**, from single-type disaster **to comprehensive disaster reduction**, from disaster losses reduction **to disaster risk reduction**.
- ❖ 5 Basic Rules; 9 Projected Objectives; 10 Major Tasks; **5 Major Projects**; 4 Implementation Measures.



Major Project 2: Disaster Reduction Application System of Civil Space Infrastructure



Observation

- ❖ Build disaster reduction application system of the satellites constellation . Develop the capacity of comprehensive monitoring and analysis covering total factors of disasters and whole process of disaster management.

Application

- ❖ Undertake the “space-ground” integrated comprehensive application demonstration work in key areas to drive the satellite application for disaster reduction at the provincial and regional levels.

Service

- ❖ Set up comprehensive information service platform which provides space-based information service for neighboring countries and countries along the Belt and Road.



International Cooperation



Thanks

