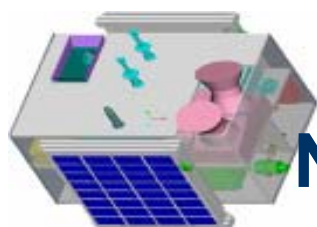




Space-Tech Application in DM In China



Siquan Yang
NDRCC, MCA, China
23th, Nov, 2011







NCDR

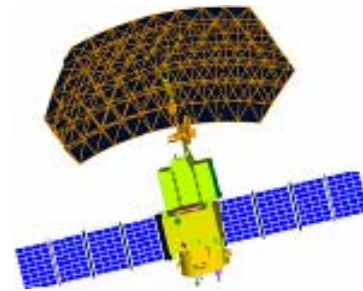


NDRCC

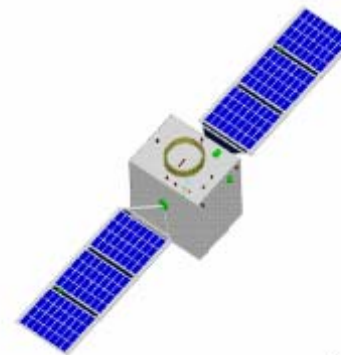
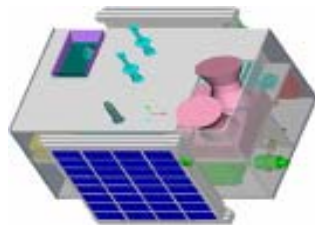
Content

-  **1 Disaster and Management in China**
-  **2 HJ small satellite constellation**
-  **3 Space technology product and service**
-  **4 International cooperation**





1. Disaster and Management in China



NCDR

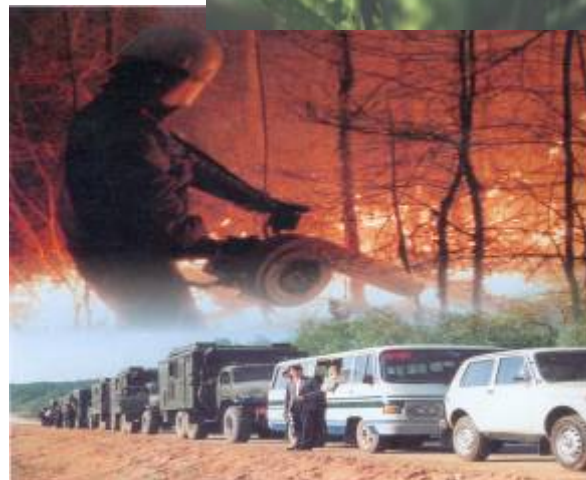
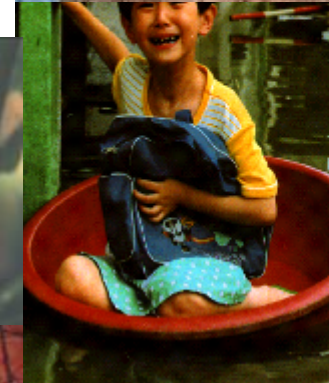
NDRCC



1.1 Disaster Situation

❖ Due to the varied and unsteady climate, China has almost all kinds of natural disasters except volcano.

- Flood;
- Earthquake;
- Typhoon
- Drought;
- Snow disaster
- Landslide
- Sea disasters
- Fire



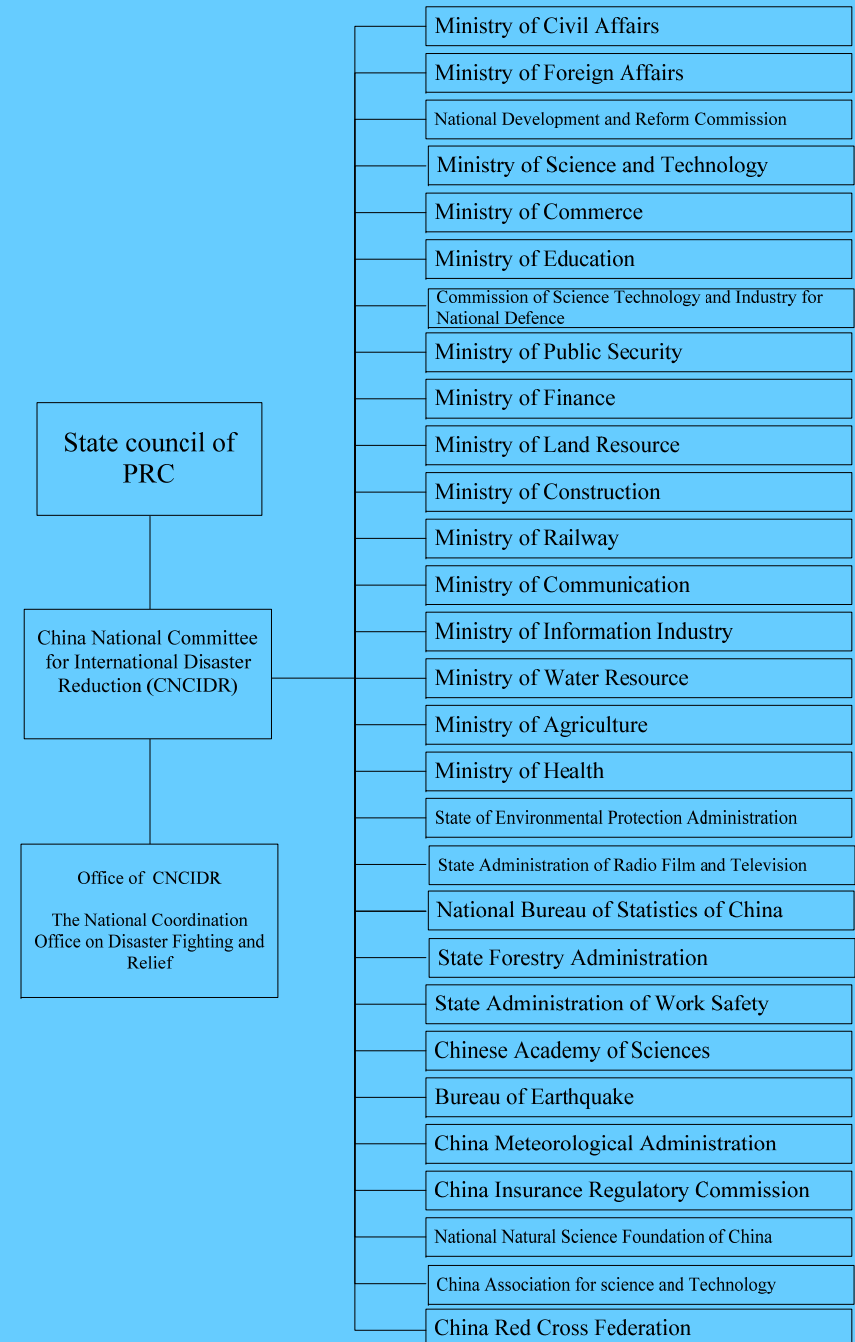
Drought in China



1.2 The Disaster Man

Principles: Uniform leadership of the cen
have different responsibilities; Governmen
China National Committee for Internat

- to formulate and implement of the national plan on disaster reduction
- to form the guidelines and policies as well as activities
- to propel international exchange and cooperation in disaster reduction
- to supervise the relevant works in the provincial levels
- Organizing and coordinating the disaster relief work



1.3 Technology Support-NDRCC

Function:

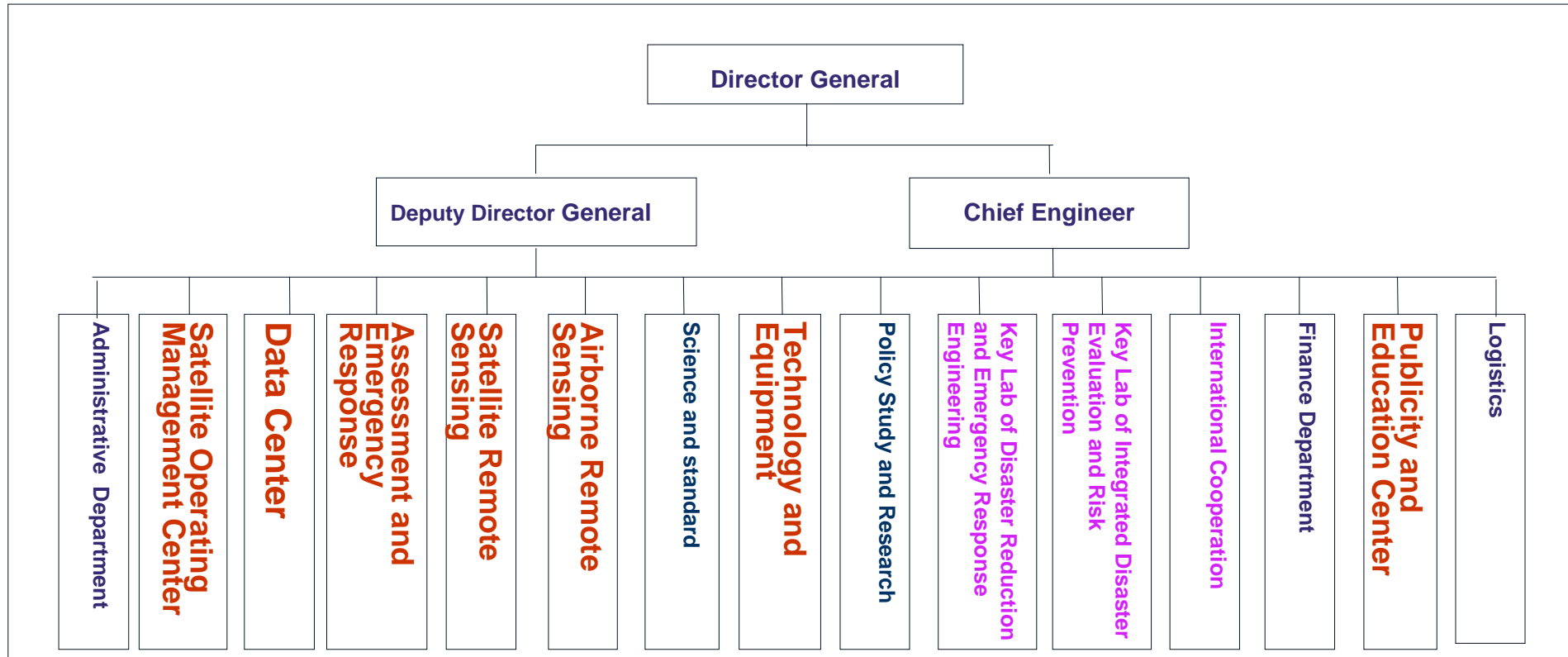
Responsibility of disaster reduction such as information management, disaster risk assessment and product service, **space technology application**, research on scientific technology and policies, research and development of technical equipment and disaster relief materials, publicity and education, training, and international cooperation..

Objective:

- Information exchange Center
- Technology service Center
- Decision-making support Center
- Exchange and Cooperation Windows
- Propagate and education Windows



1.4 Organization Structure

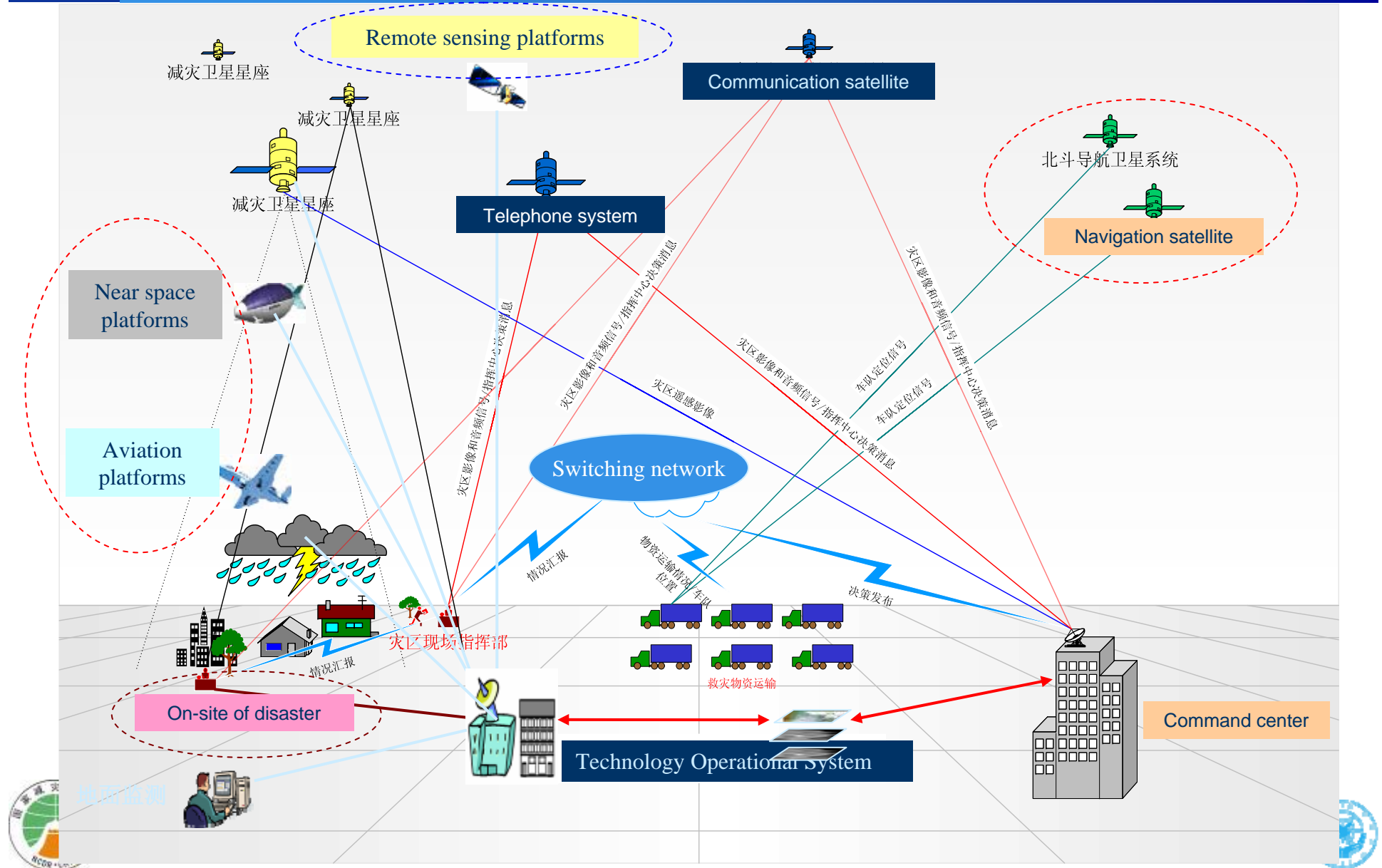


Secretariat of Expert Committee NCDR	China Disaster Reduction Magazine Company	Academy of Disaster Reduction and Emergency Management	International Center for Drought Risk Reduction
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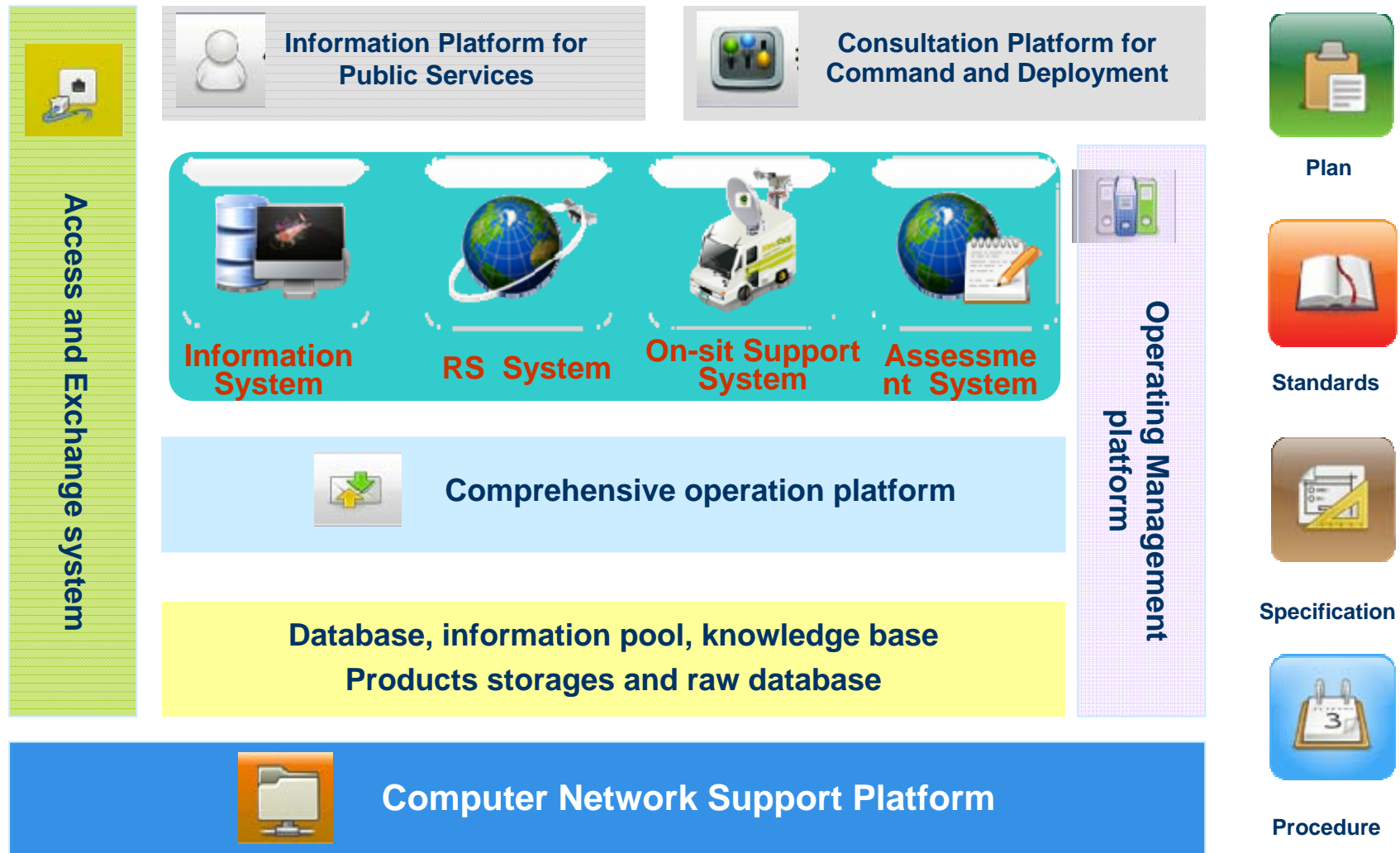
Secretariat of National Committee on Technical Standardization of Disaster Reduction and Relief	International Center for Drought Risk Reduction	Application and Research Center of National Space Technology for DR	UN-SPIDER Beijing Office
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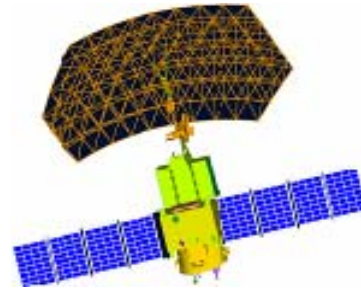


1.5 Monitoring System Based on 3D

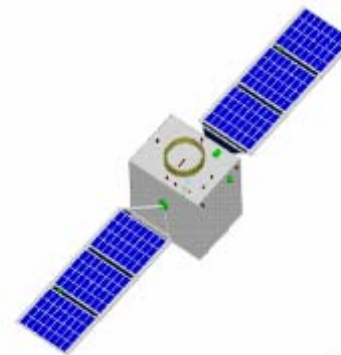
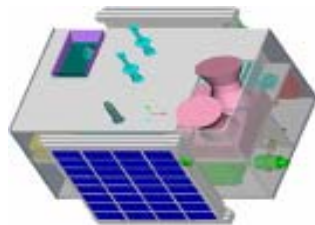


1.6 Comprehensive Operation System





2. HJ Small Satellite Constellation



NCDR

NDRCC



2.1 Small Constellation of HJ

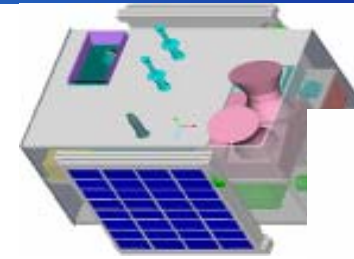
According to the development plan, HJ constellation includes Launching four optical satellites and four radar satellites.

In 6th Sep, 2008,

HJ-1-A and HJ-1-B were launched, this is the first step of HJ constellation construction.

The following table lists the indicators of HJ-1-A and HJ-1-B.

Satellite	Payload	Resolution (m)	Swath (km)	Band
HJ-1-A	CCD	30	360	4 bands
	HSI	100	50	115bands
HJ-1-B	CCD	30	360	4 bands
	IRS	B1、B2、B3 : 150 B4: 300	720	4 bands



HJ-1-A



HJ-1-B



HJ-1-C



2.2 Management of HJ

HJ-1 is operated by SDR (Satellite Disaster Reduction Center, MCA), and SDR is responsible for:

- ◆ Receive and process telemetry data, monitor the working condition of the satellites and payloads.
- ◆ Program the observing plan and data receiving plan.
- ◆ Satellites conventional and emergent operational management.
- ◆ Program and transmit satellites control commands.

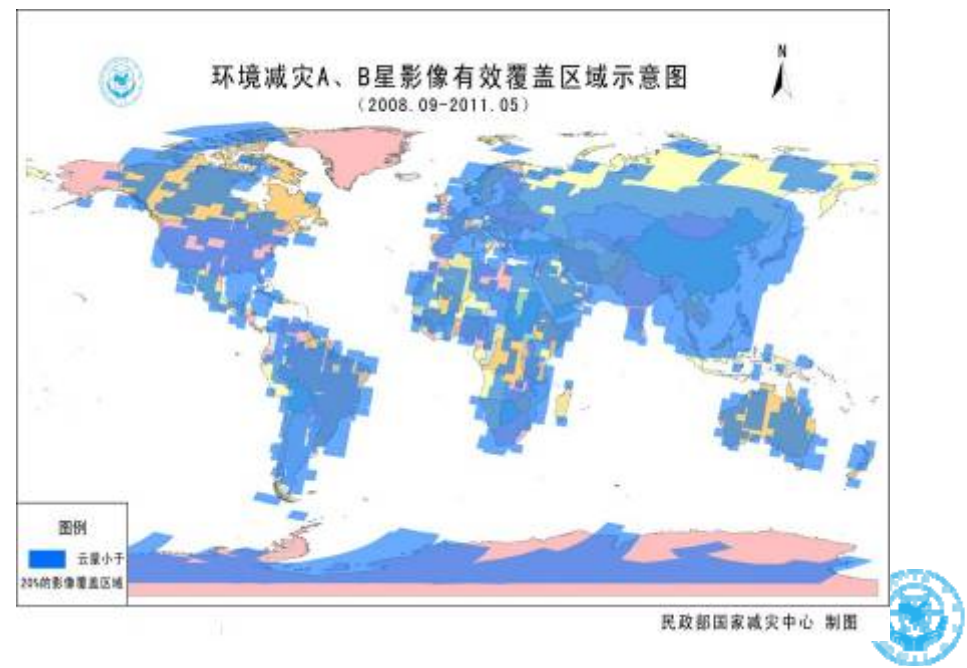


2.3 Observation Model

Emergent observation for major disasters at home and abroad

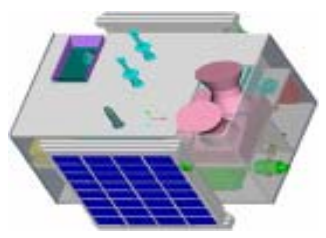
- **Major disasters in 2009: Australian forest fire**
 - **Major disasters in 2010: Chile Earthquake, Haiti Earthquake, Pakistan Floods;**
 - **Major disasters in 2010: Japan Earthquake, Horn-Africa Drought, Venezuela Floods.**
- Global observation**

Since the global observation made in 2009, CCD image of HJ Satellite has covered global land surface, among them, the valid date with cloud cover less than 20% covered more than 70% area of global land surface.





3. *Space Technology Products and Service*



NCDR

NDRCC

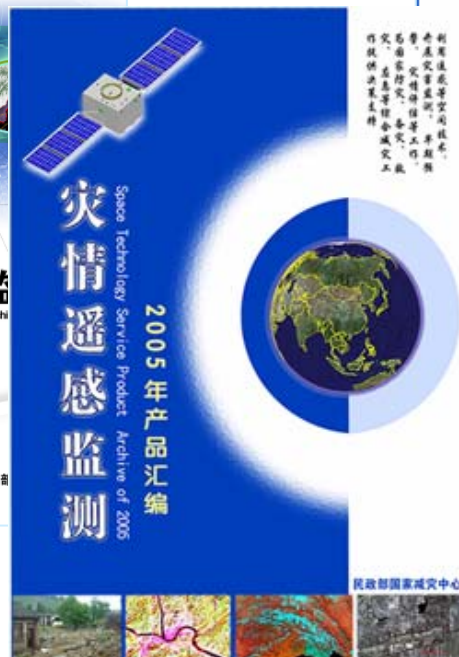
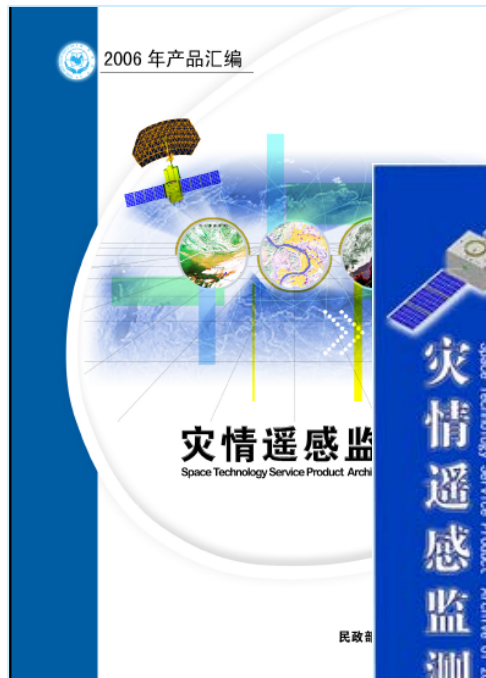
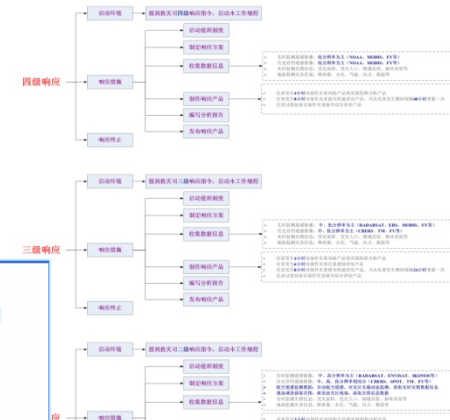


3.1 Work Model

- ❖ Normal Model: keep watch daily
- ❖ Emergent Model: startup emergent regulations

应对突发性自然灾害
响应工作规程

遥感部应对突发性自然灾害响应工作规程



灾情遥感监测
(2005 年第 95 期 总第 100 期)

民政部减灾中心卫星遥感部 2005 年 12 月 23 日

全国雪情监测分析
——内蒙古积雪面积大，东部牧区存在发生雪灾低风险
——辽宁半岛暴雪引发次生灾害
(2005 年 12 月 16 日 - 12 月 23 日)

利用 2005 年 12 月 16 日—12 月 23 日 MODIS/AVHRR 影像监测分析结果，并结合气象信息情况，本周全国雪情具有如下特点和趋势：

1. 全国积雪面积略有增加

本周全国积雪区主要集中在内蒙古中东部牧区、新疆北部大部分牧区和部分林区、青海南部部分牧区、西藏东部部分牧区和高山、黑龙江东西部大部分林区和中东部部分林区、吉林东部大部分林区、山东胶东半岛大部分林区和山区。与上周相比，本周积雪面积略有增加，增加区域主要集中在东北三省的东部林区、新疆北部牧区和内蒙古东部牧区。

1. 内蒙古牧区积雪面积大，并略有增加，存在发生雪灾风险

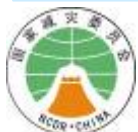
新疆北部牧区、内蒙古牧区的积雪面积分别占内蒙古牧区总面积的 20%、93%，积雪覆盖了大部分牧区，尤其是内蒙古几乎覆盖整个牧区。

灾情遥感监测
产品标准

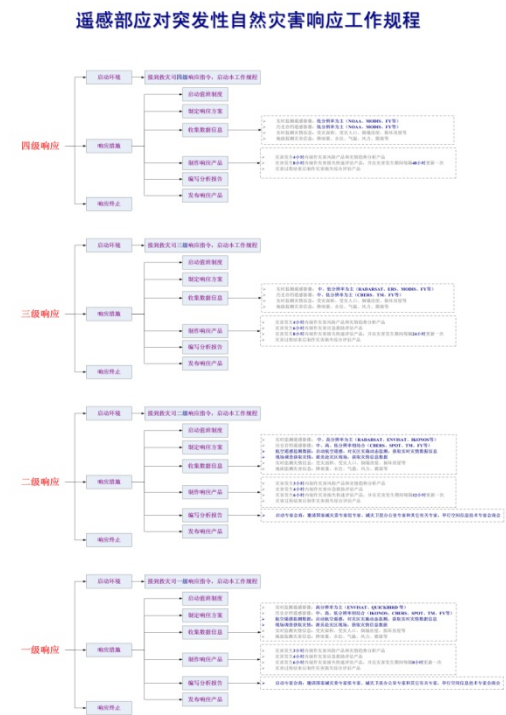
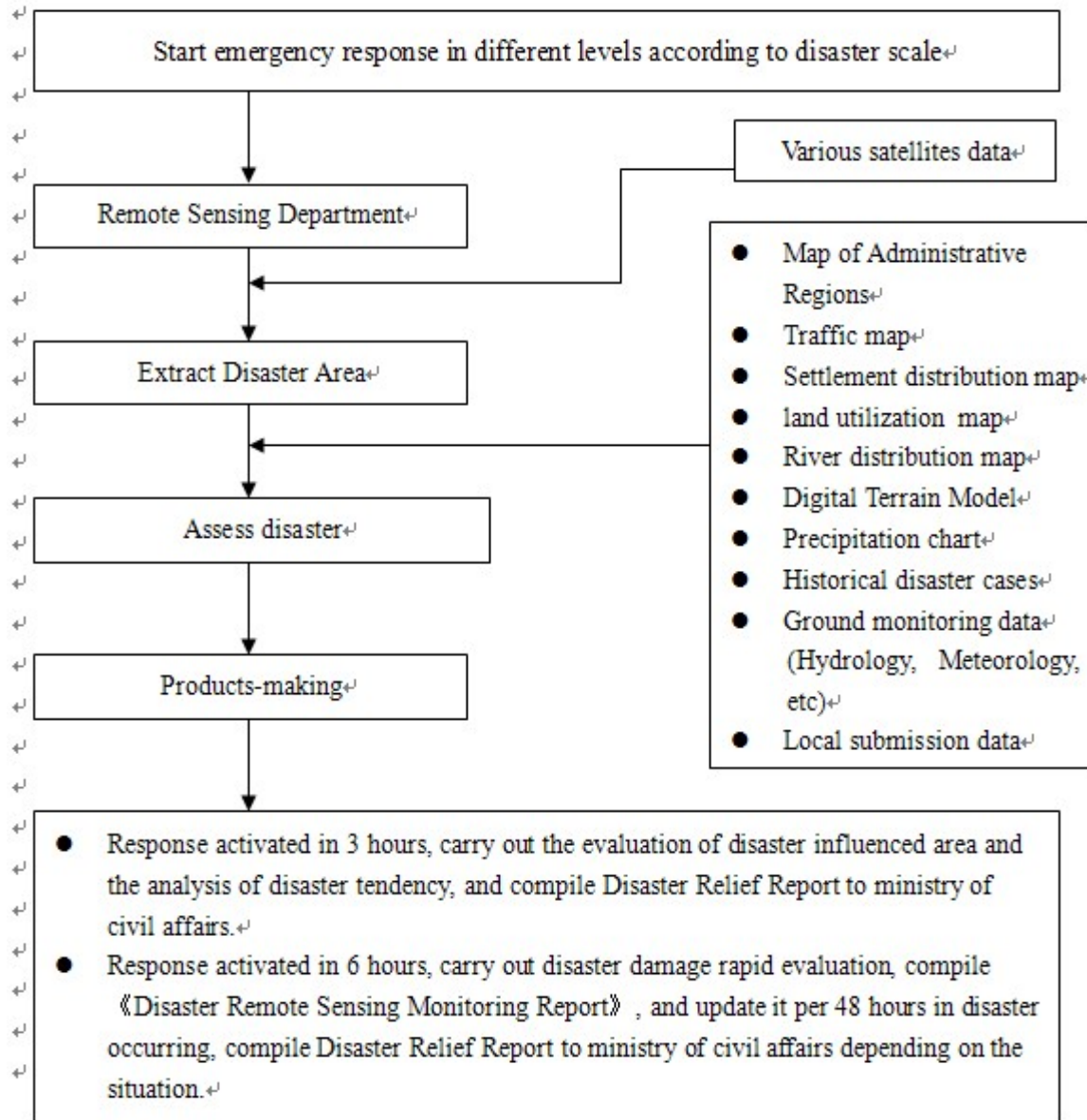
(试行)

民政部国家减灾中心卫星遥感部

二〇〇五年一月



3.2 Operational Regulation



3.3 Operational Regulation

Satellite	Spatial Resolution	Country	Data source
HJ-1	30m	China	Free download
FY-1	1100m		
FY-2	1250m		
FY-3	1100m		
HY-1A	1100m		
HY-1B	1100m		
TERRA-MODIS	250m, 500m, 1000m	America	Free download
Aqua-MODIS	250m, 500m, 1000m		
NOAA	1100m		
Landsat-5	30m	America	CHARTER/Commercial
Landsat-7	30m, 15m		CHARTER/Commercial
QuickBird	0.61m, 2.44m		CHARTER/Commercial
WorldView-1	0.5		Commercial
WorldView-2	0.5		Commercial
IKONOS	1m, 4m		Commercial
OrbView-3	1m, 4m		Commercial
ERS-1	30m		ESA
ENVISAT	30m, 150m, 1000m, 10m		
ALOS	2.5m, 10m	Japan	CHARTER/Commercial
JERS-1	18m		
Spot	2.5m, 10m	France	CHARTER/Commercial
TanDEM-X	12m	German	CHARTER/Commercial
Cosmo-SkyMed	1m	Italy	Commercial
RADARSAT-1	10m, 30m, 100m	Canada	CHARTER/Commercial
RADARSAT-2	3m		



3.4 Application Capacity

Space technology

Risk assessment

Early warning

Monitoring

Damage assessment

Support

Disaster management

prevention

preparation

Emergency response

Reconstruction



3.5 Application Products



Products for disaster parameters

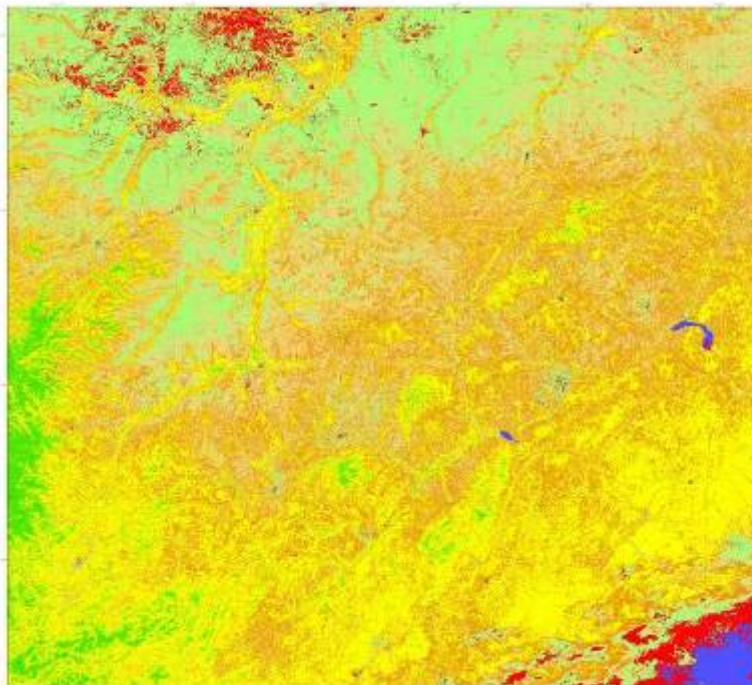
Products on Disaster monitoring

Products on Disaster assessment

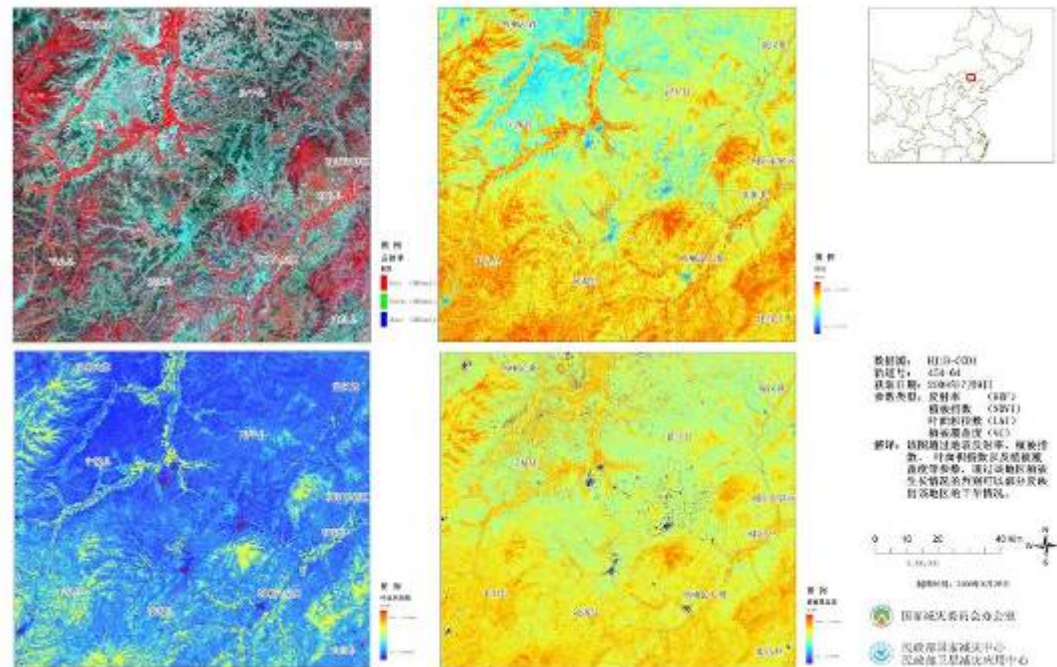
Products on Disaster recovery assessment

Products for decision-making support

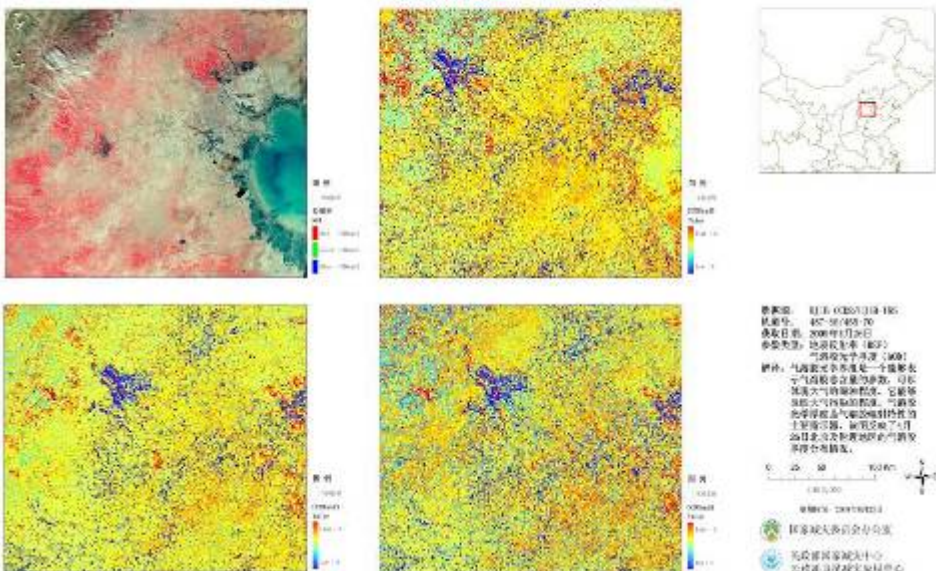
Land-use and Land-cover



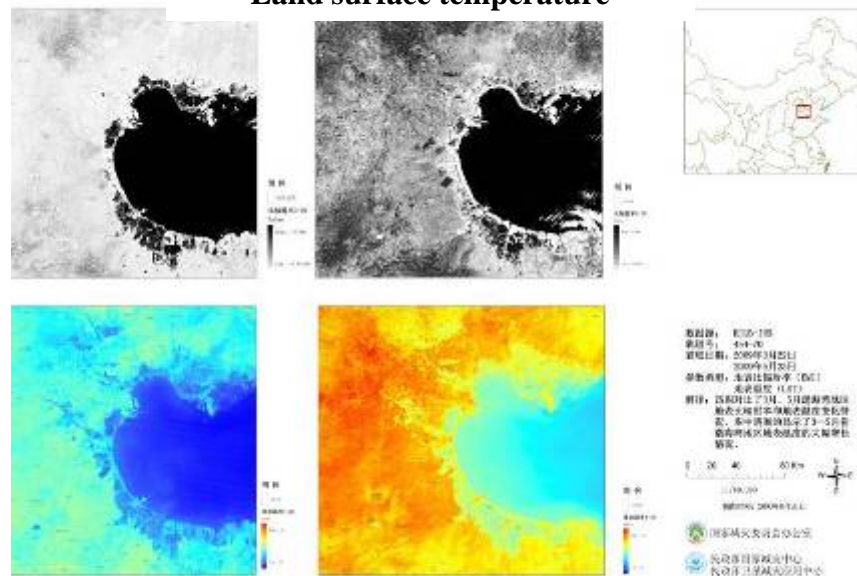
Vegetation characteristics parameters



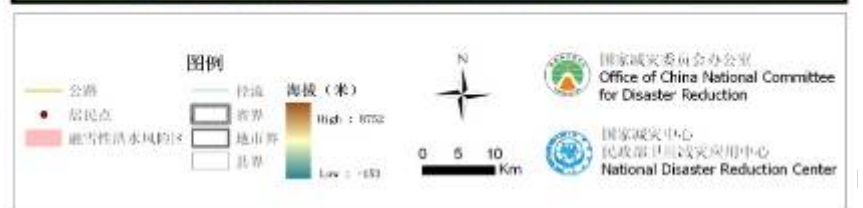
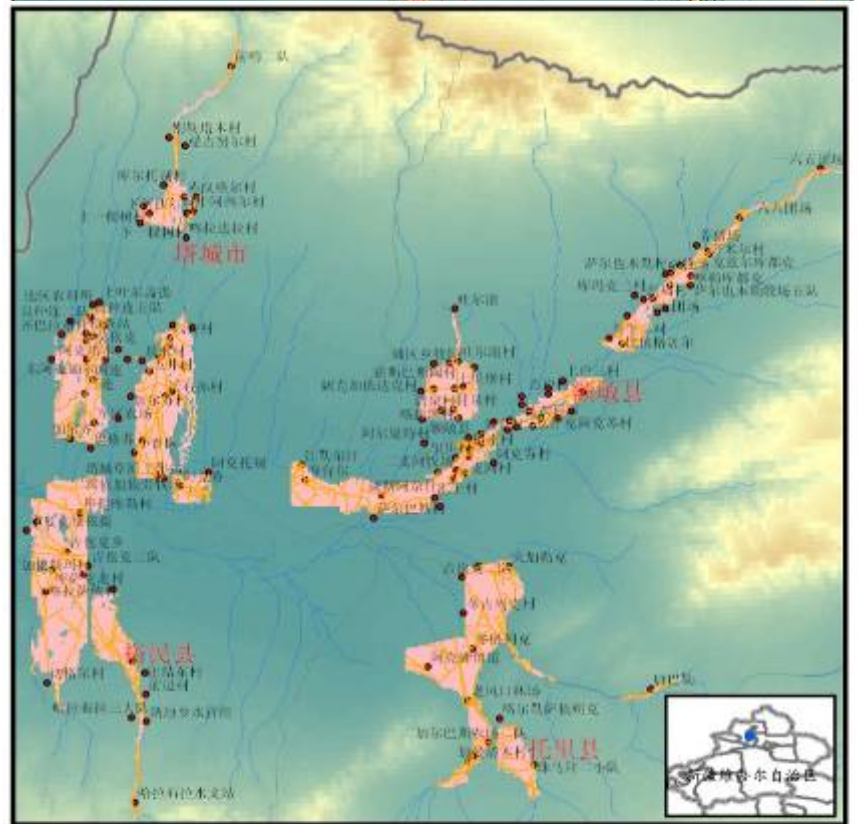
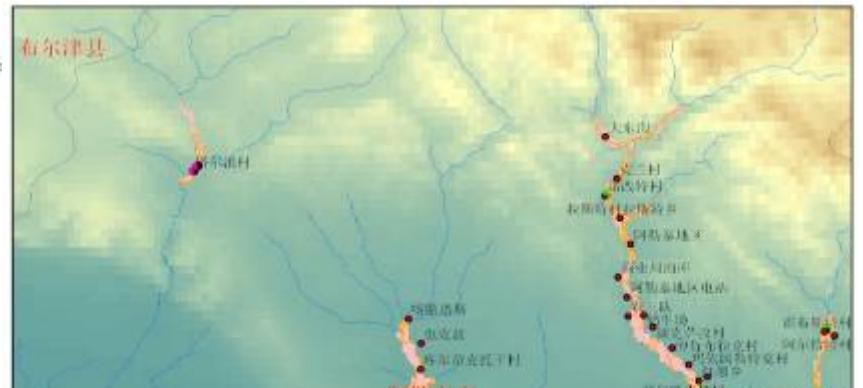
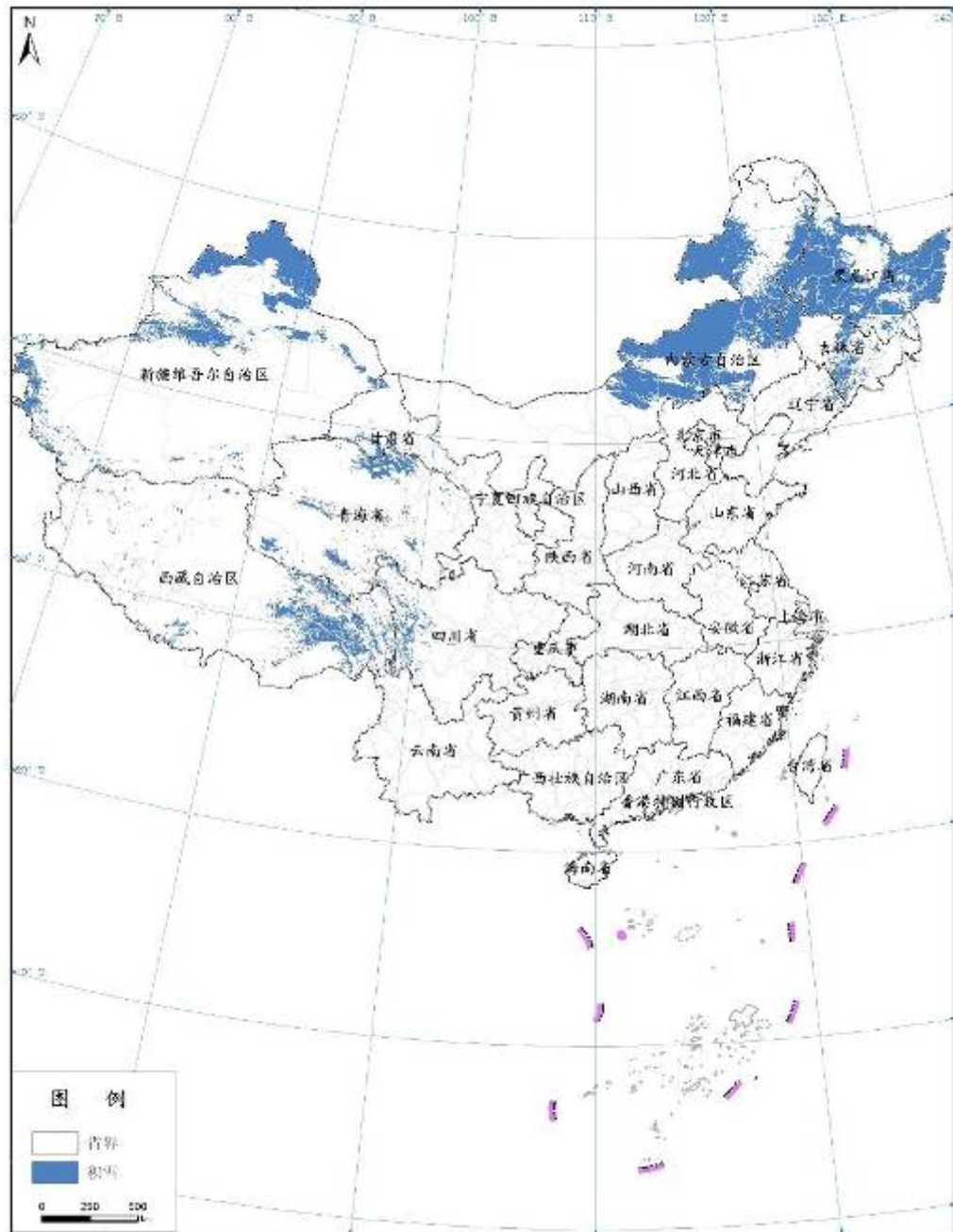
Aerosol



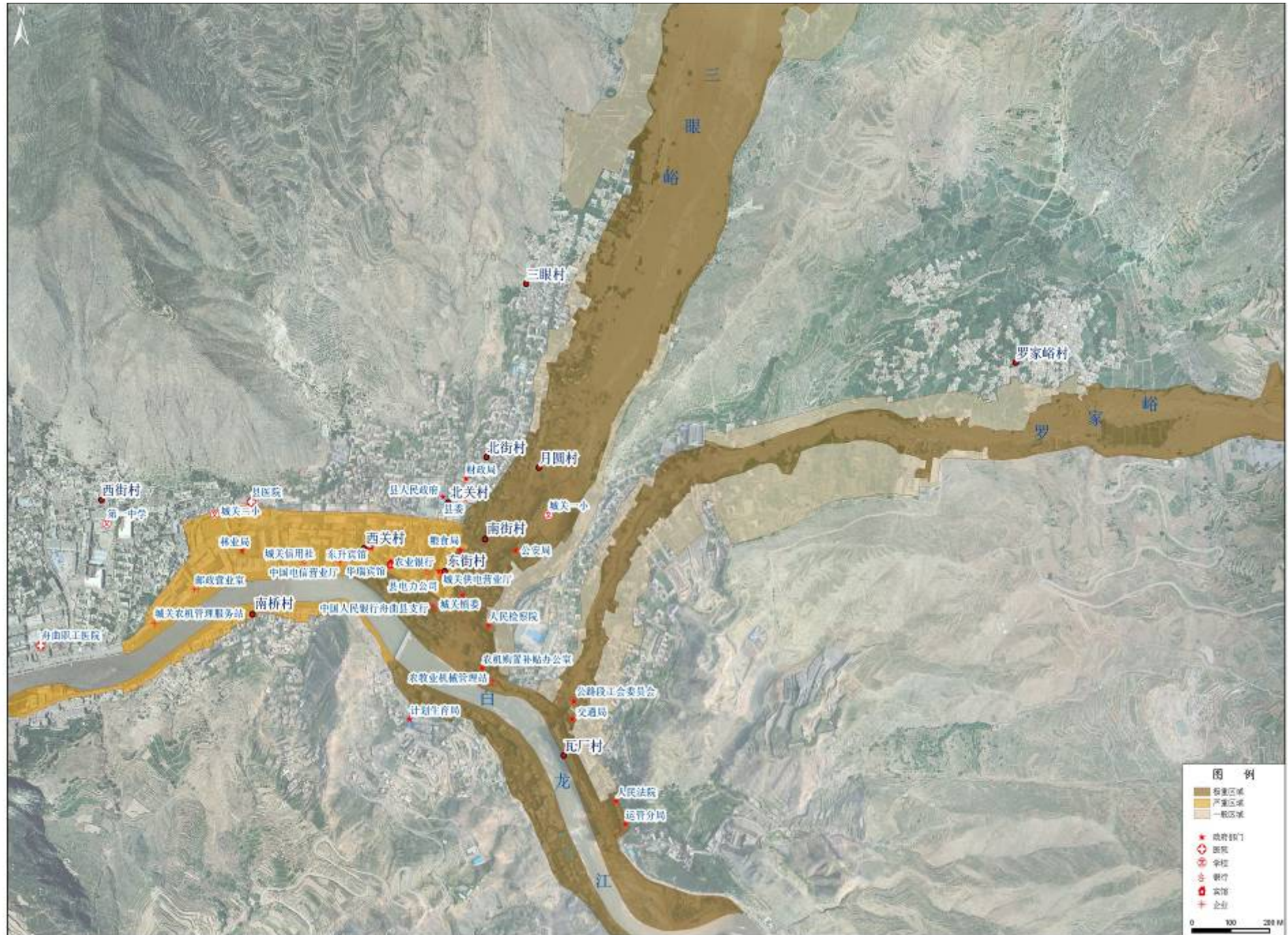
Land surface temperature



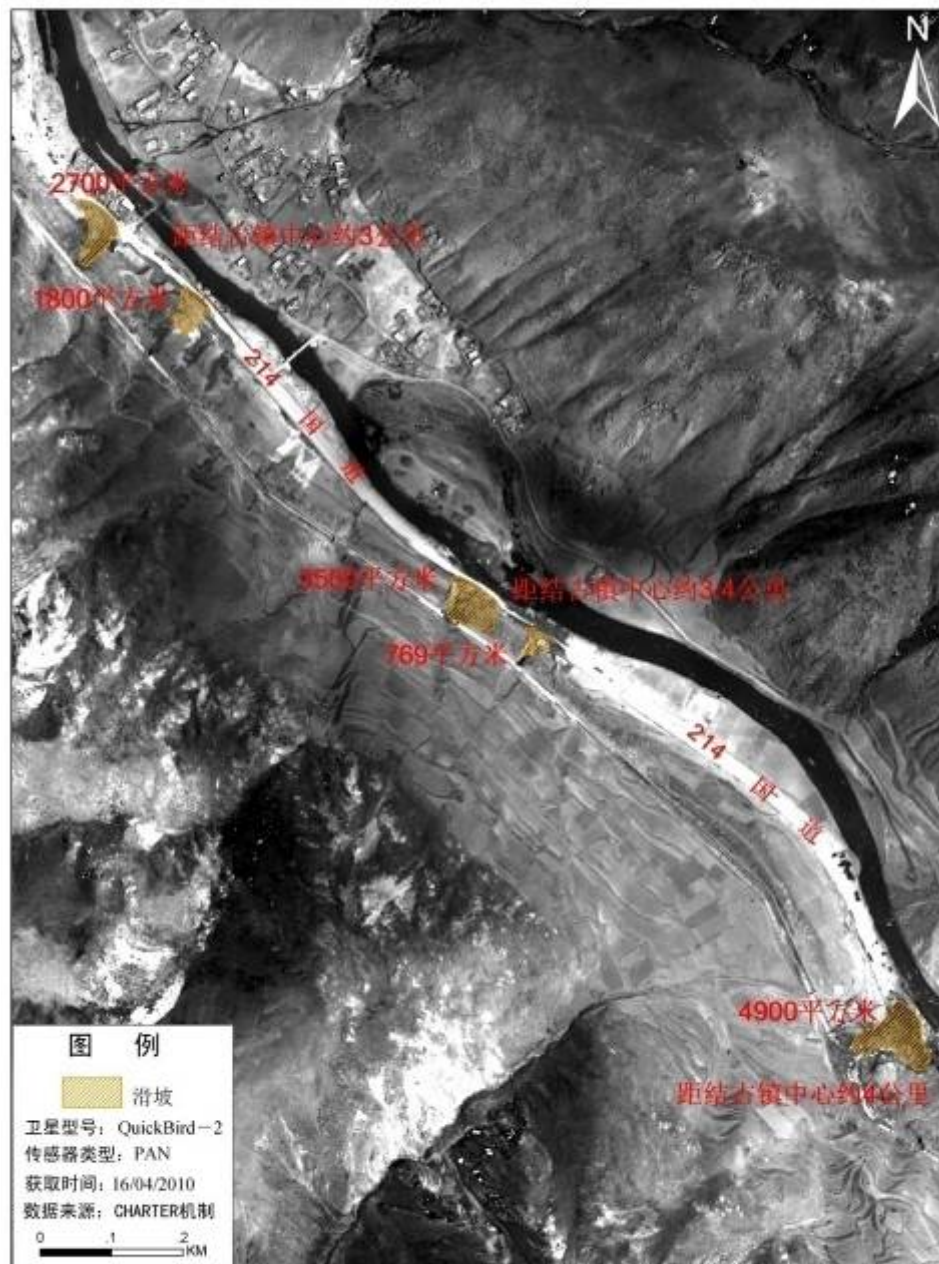
全国积雪覆盖图（2010年11月28日）



Scope Assessment of ZhouQu Debris Flow



滑坡点堵塞交通情况监测评估



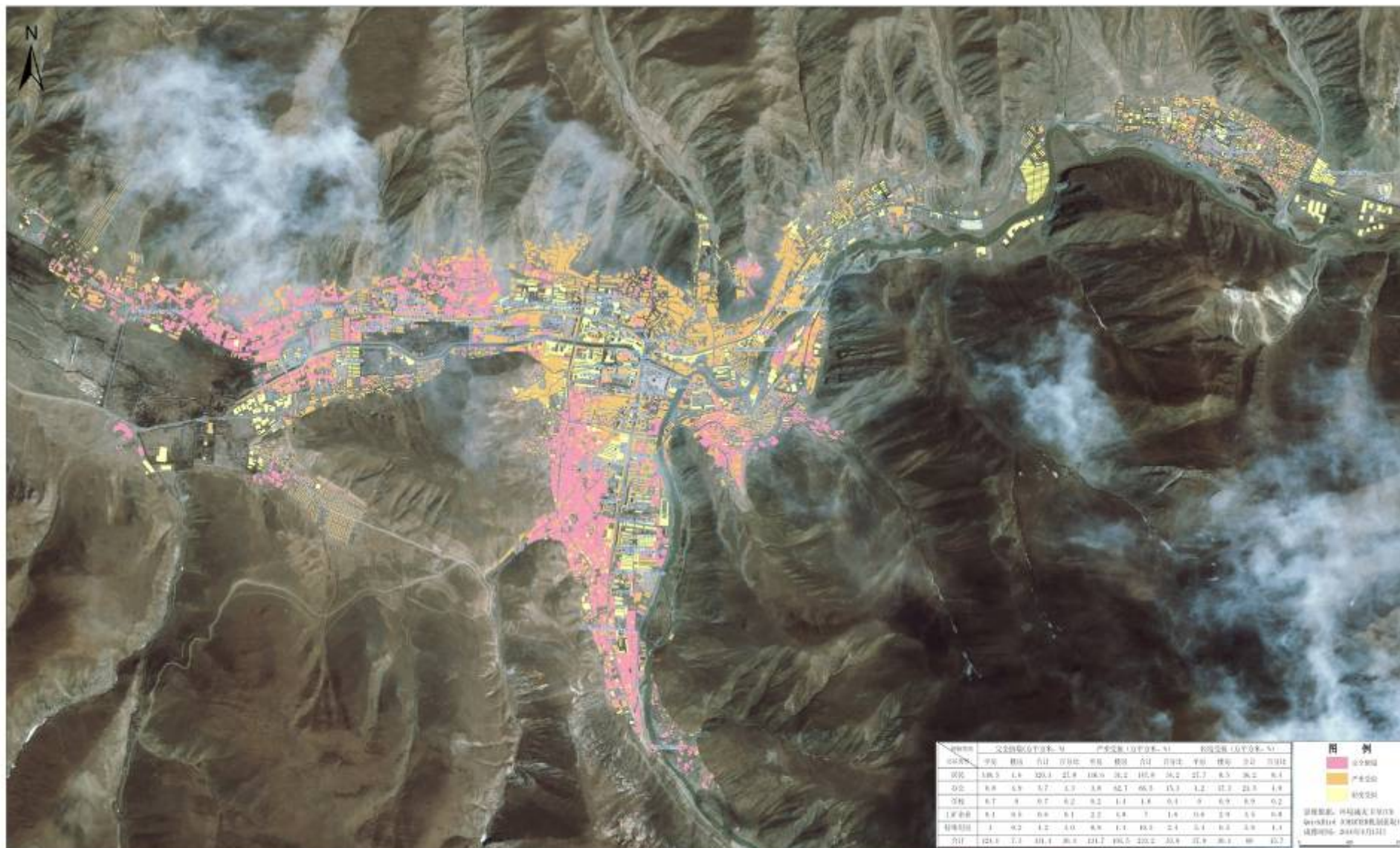
结古镇交通拥堵情况监测评估(4)



Tents Monitoring in Yushu Earthquake

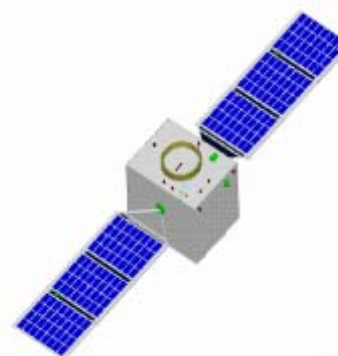
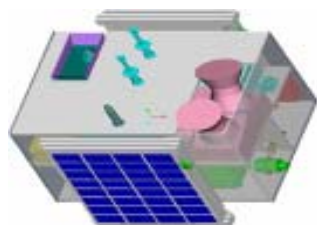


Houses Damaged Assessment in Yushu Earthquake





4. International Cooperation



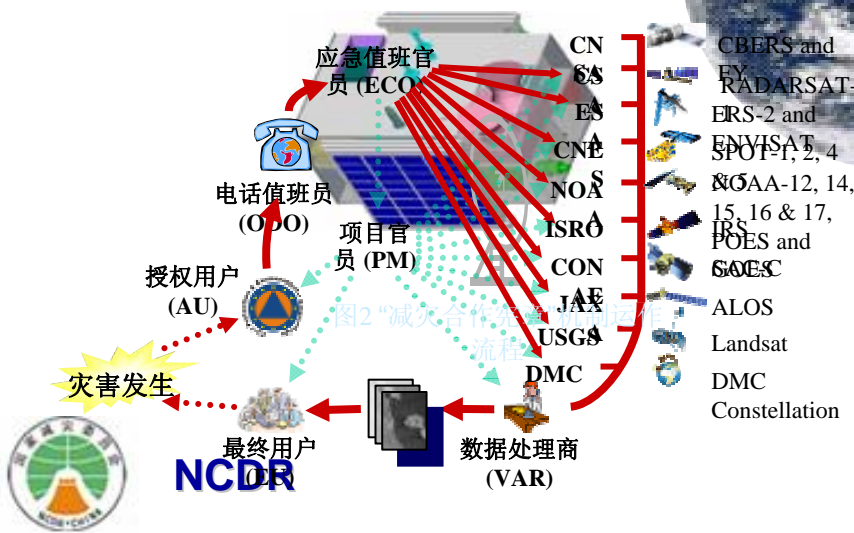
NCDR

NDRCC





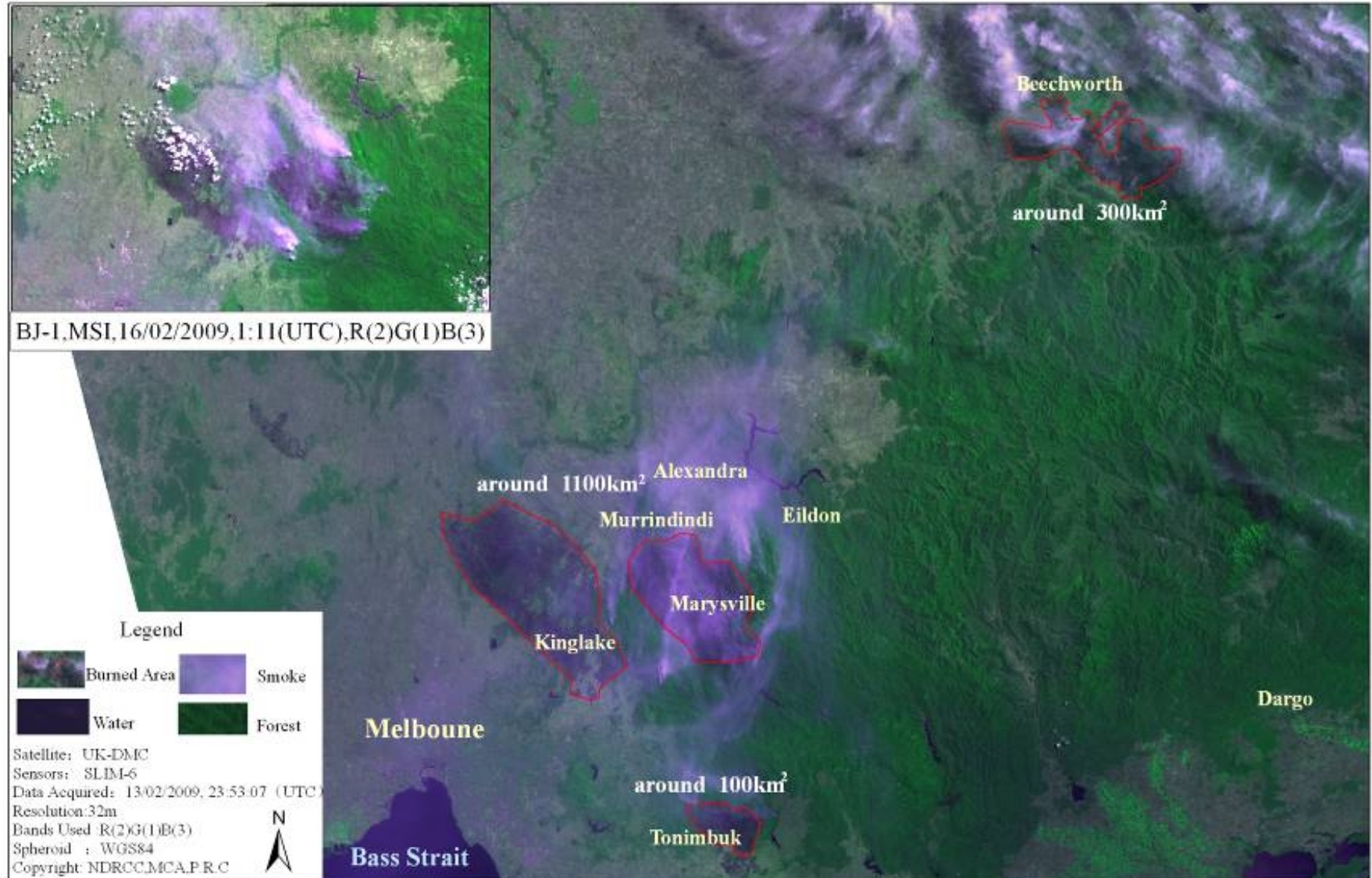
- ❖ NDRCC has established the Strategic Relationship with UNISDR, UNESCAP, ASEAN, SCO, ICDO;
- ❖ Take on technology training for Asia-Pacific Countries;
- ❖ Take on PM and AU of CHARTER, and take on the preparation and technology support to UN-SPIDER



Feb.16,2009-Fires Assessment in Southeast Australia Using BJ-1 Satellite Data



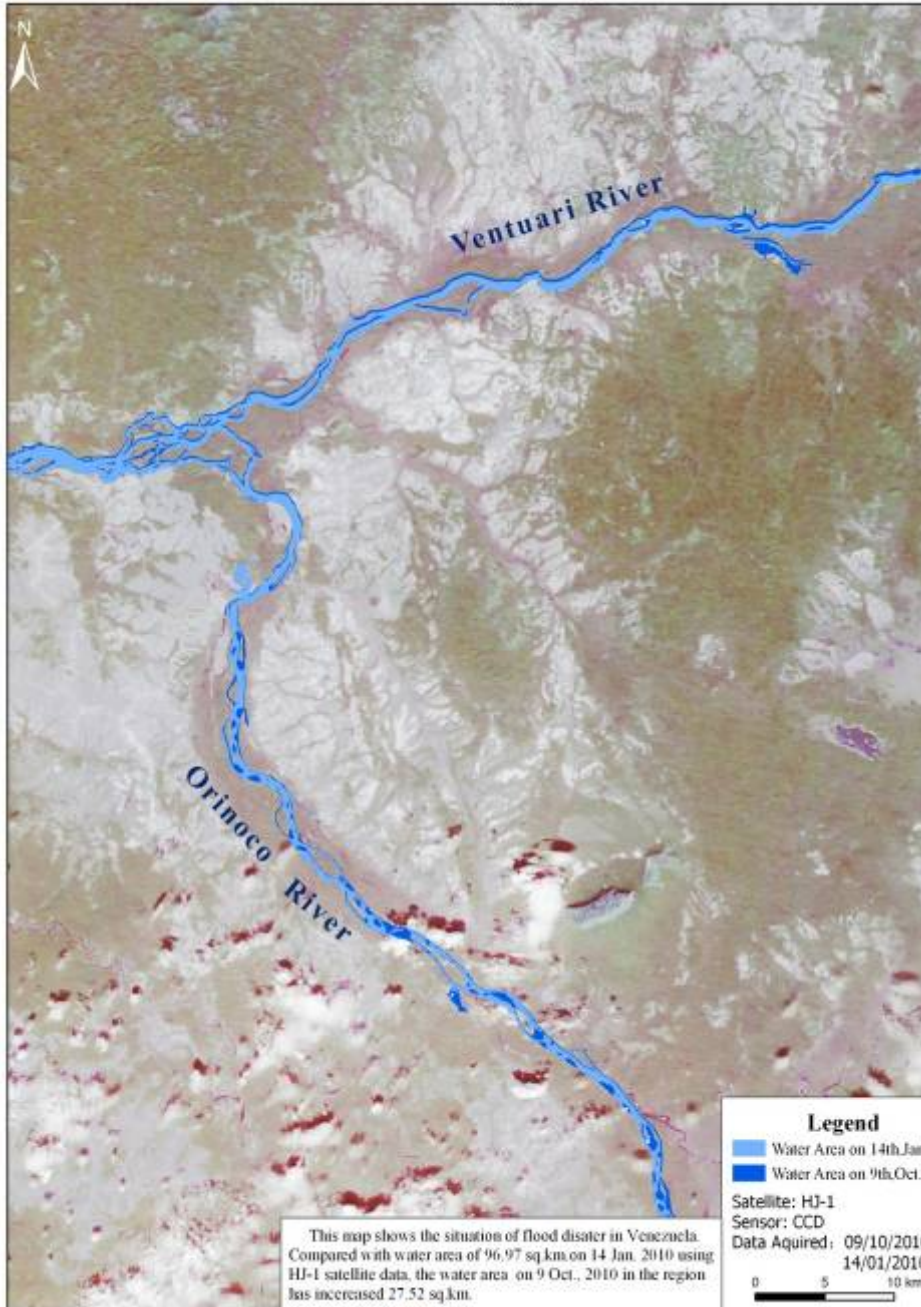
Feb.13,2009-Fires Assessment in Southeast Australia Using UK-DMC Satellite Data



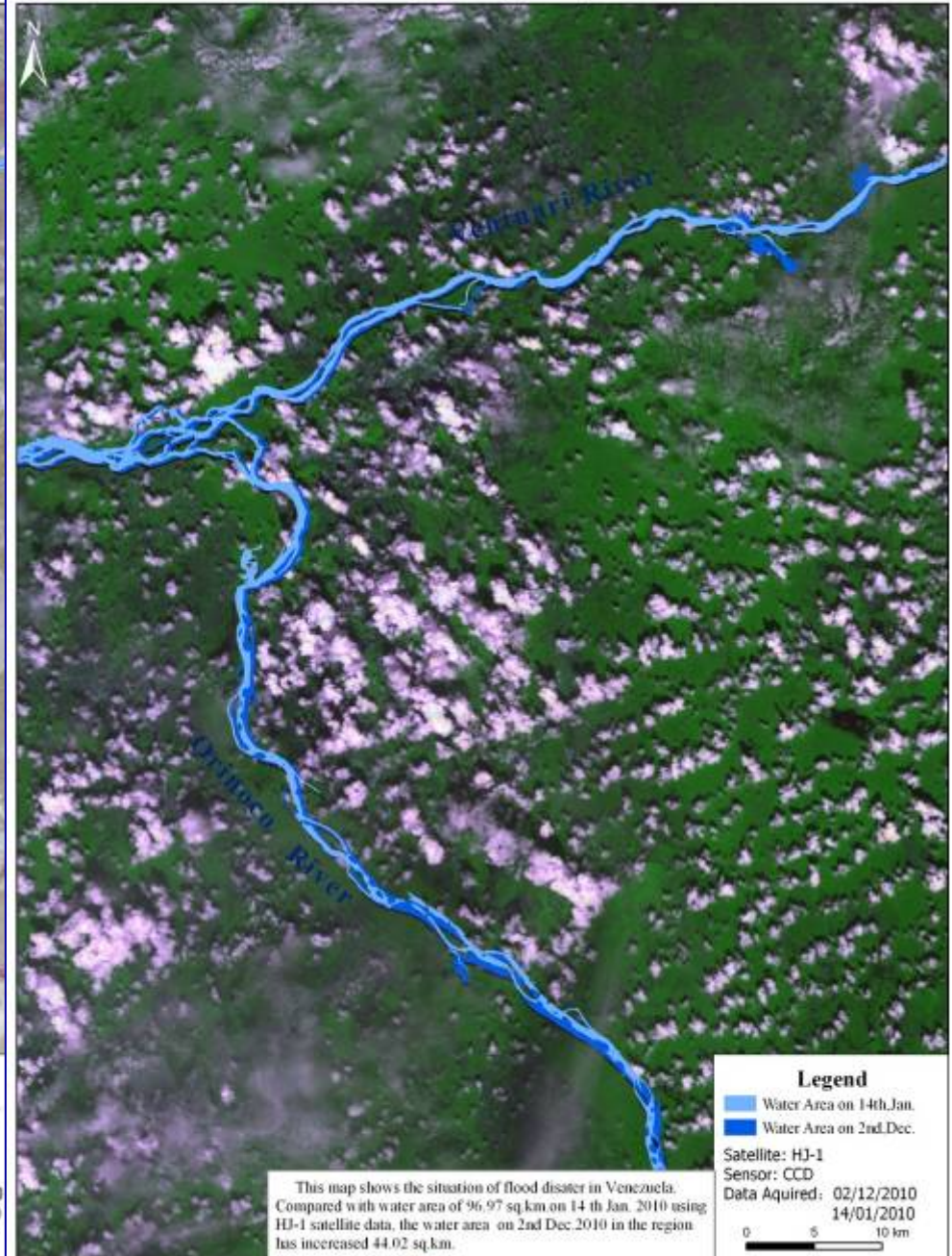
B
 B
 Satellite: B
 Sensors: M
 Data Acquir
 Resolution: 3
 Bands Used
 Projection :
 Spheroid :
 Copyright: 1



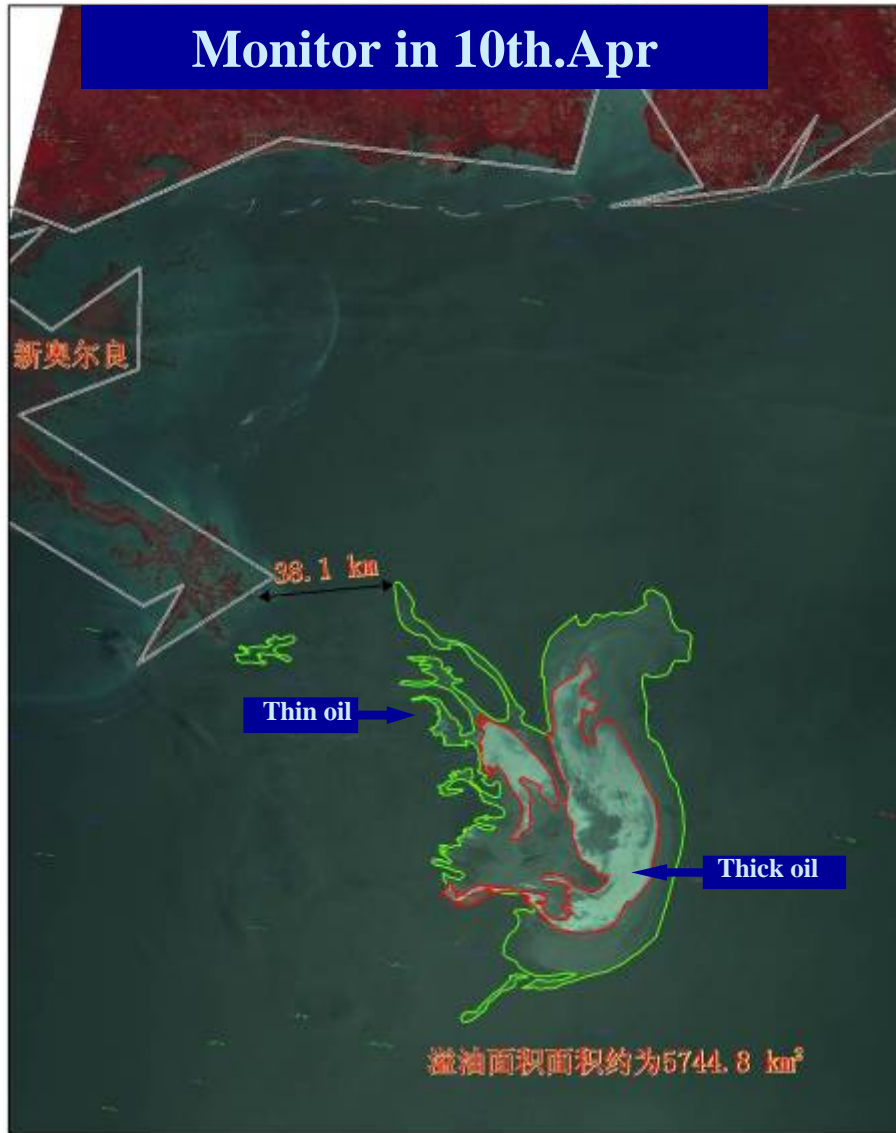
Flood Area Monitoring Map in Venezuela



Flood Area Monitoring Map in Venezuela



Monitor in 10th.Apr



卫星型号：环境减灾B星
 遥感影像：2010/05/10
 分辨率：30m
 波段使用：R(4)G(3)B(2)
 投影：UTM
 椭球体：WGS84

图例

- 洲界
- 厚油层区
- 薄油层区



0 15 30
km

E-mail: remotesensing@ndrcc.gov.cn
 Phone: (86-10) 8354 5980

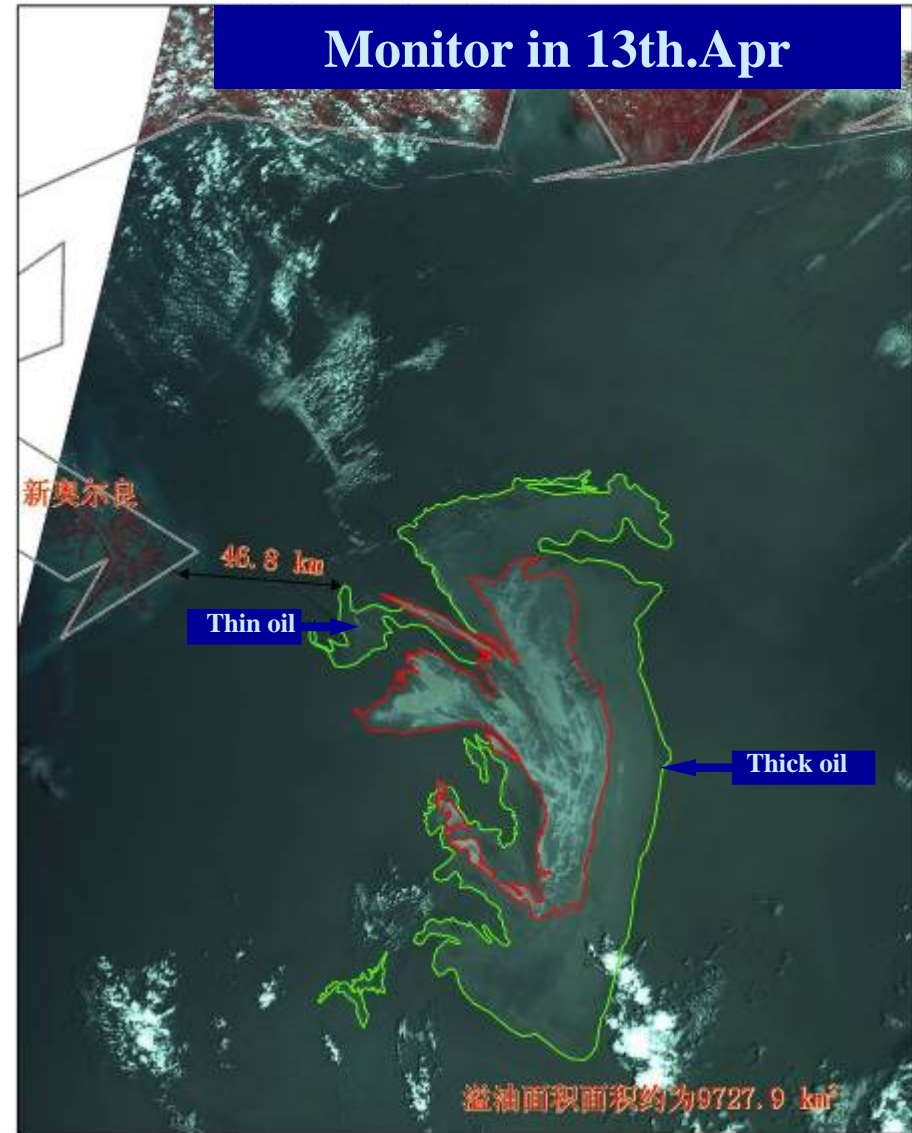


国家减灾委员会办公室
 Office of National Committee for Disaster Reduction



民政部国家减灾中心 / 民政部卫星减灾应用中心
 National Disaster Reduction Center of China

Monitor in 13th.Apr



卫星型号：环境减灾A星
 遥感影像：2010/05/13
 分辨率：30m
 波段使用：R(4)G(3)B(2)
 投影：UTM
 椭球体：WGS84

图例

- 洲界
- 厚油层区
- 薄油层区



0 15 30
km

E-mail: remotesensing@ndrcc.gov.cn
 Phone: (86-10) 8354 5980

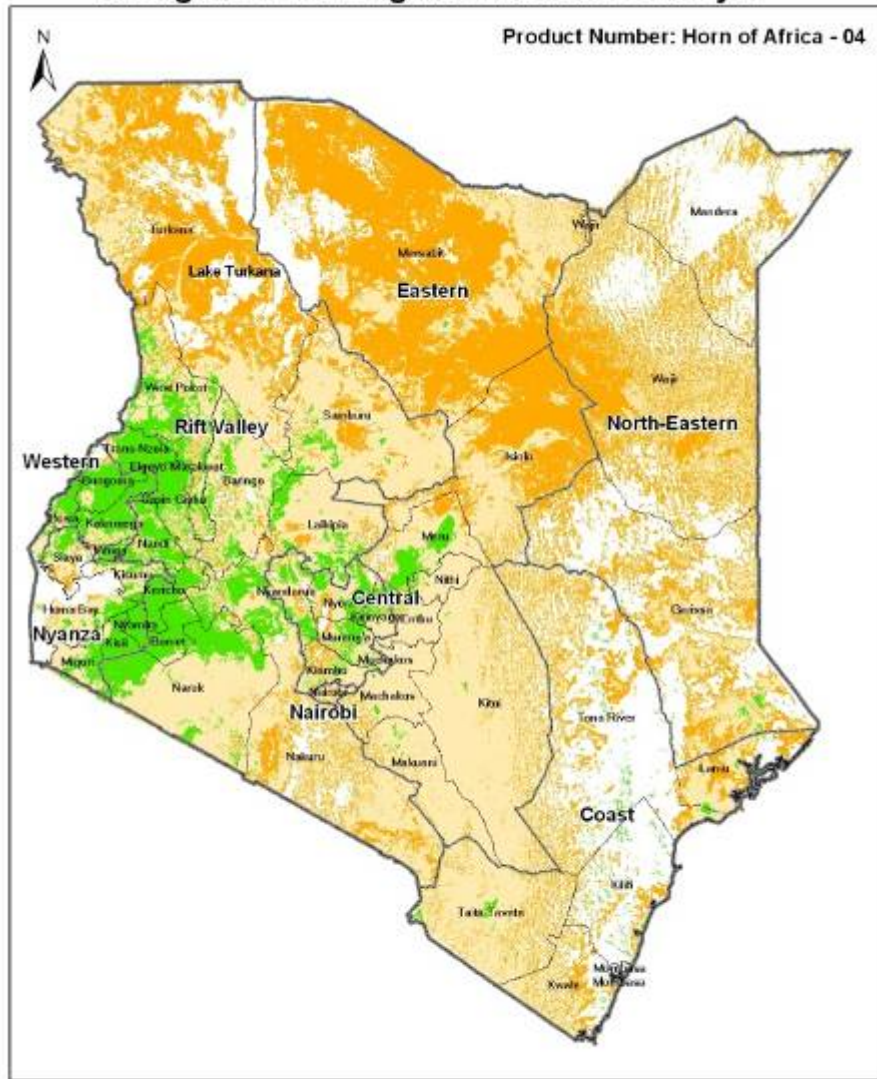


国家减灾委员会办公室
 Office of National Committee for Disaster Reduction



民政部国家减灾中心 / 民政部卫星减灾应用中心
 National Disaster Reduction Center of China

Drought Monitoring with MODIS in Kenya

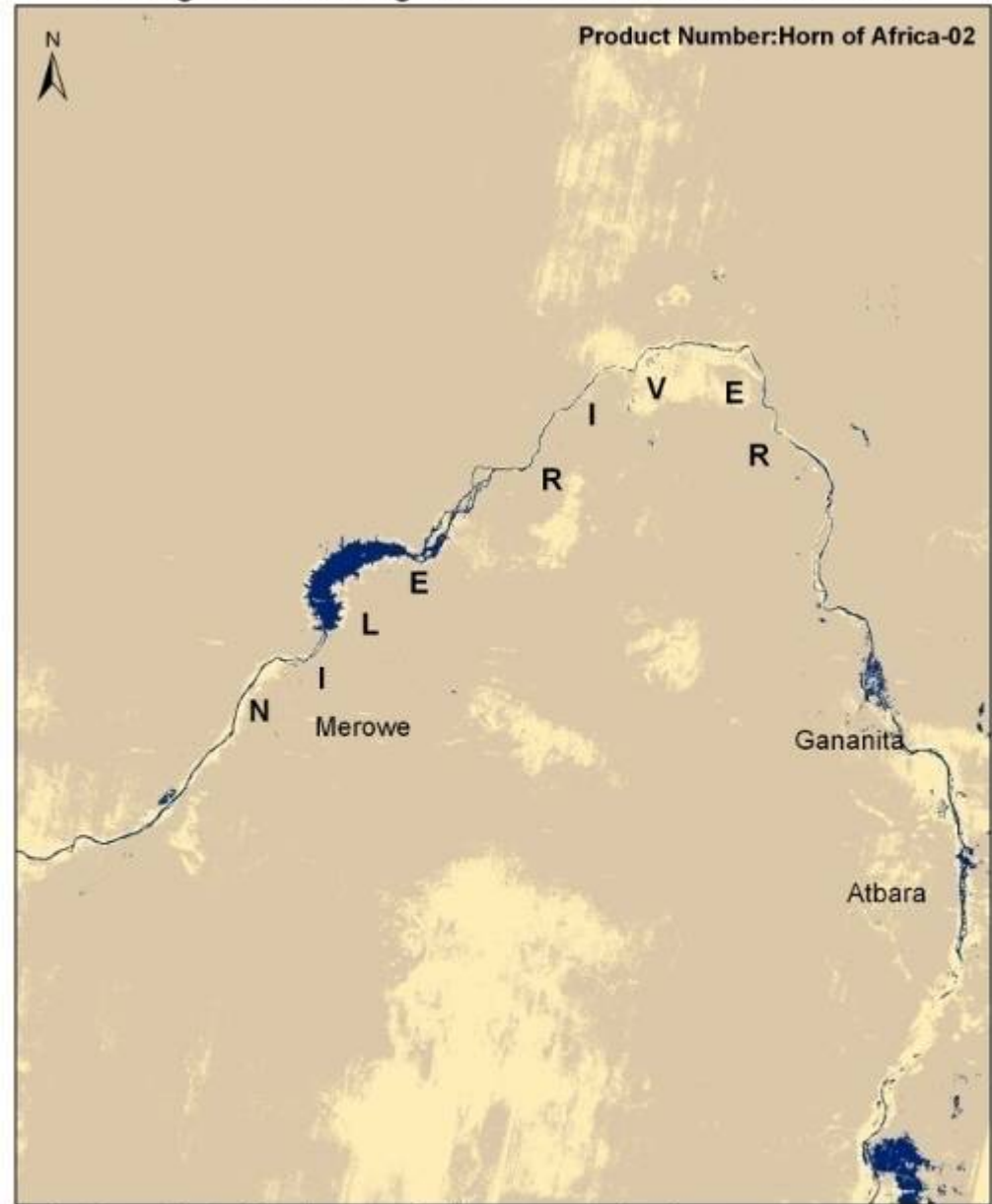


Product Number: Horn of Africa - 04

Location	Disaster Information	Results	Legend
	Since July, 2011, Drought occurred in Kenya. Most part of the country has been affected by the disaster.	Based on the NDVI analysis, it shows about 20.4 percent of Kenya is in Severe Drought, 27.9 percent is in Moderate Drought, 8.3 percent is in Light Drought, and the rest part is covered by drought.	<ul style="list-style-type: none"> National Boundary Province Boundary District Boundary Water Body Light Drought Moderate Drought Severe Drought Dead

The Office of China National Committee for Disaster Reduction
 National Disaster Reduction Center of China, MCA
 UNOOSA/UN-SPIDER, Beijing
 Mapping Date: 02-09-2011

Drought Monitoring with HJ-1 in the north of Sudan



Product Number: Horn of Africa-02

Location	Disaster Information	Results	Legend
	Since July, 2011, Drought occurred in the north part of Sudan. Most part of the region has been affected by the disaster.	Based on the NDVI analysis, it shows most part of the region is in drought. About 25 percent of the region is in Severe Drought, and 75 percent of the region is in Moderate Drought.	<ul style="list-style-type: none"> Water Severe Drought Moderate Drought

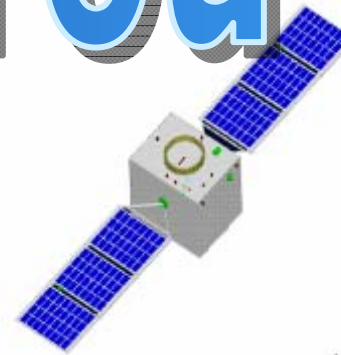
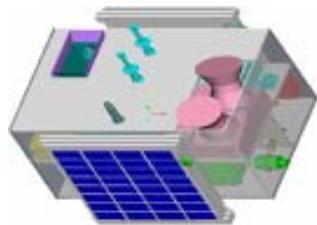
The Office of China National Committee for Disaster Reduction
 National Disaster Reduction Center of China, MCA
 UNOOSA/UN-SPIDER, Beijing
 Mapping Date: 19-07-2011



NCDR



Thank You!



NCDR



NDRCC