



Practices on Using Earth Observation Resources for Disaster Risk Reduction in China

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- ❖ **Natural Disasters and Disaster Risk Management in China**
- ❖ **Earth Observation for Disaster Reduction**
- ❖ **Way Forward for Sendai Framework**





Natural Disasters in China



- ❖ Wide variety
- ❖ Wide area distribution
- ❖ High frequency
- ❖ Heavy losses
- ❖ Deep social impact
- ❖ Difficult for relief





Disaster Risk Management in China



- ❖ National Commission for Disaster Reduction is Responsible for disaster prevention and reduction coordination and plan at national level.
- ❖ Comprehensive National Disaster Prevention and Reduction Plan (2011-2015) with earth observation addressed as one of the main technical support tool.



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。

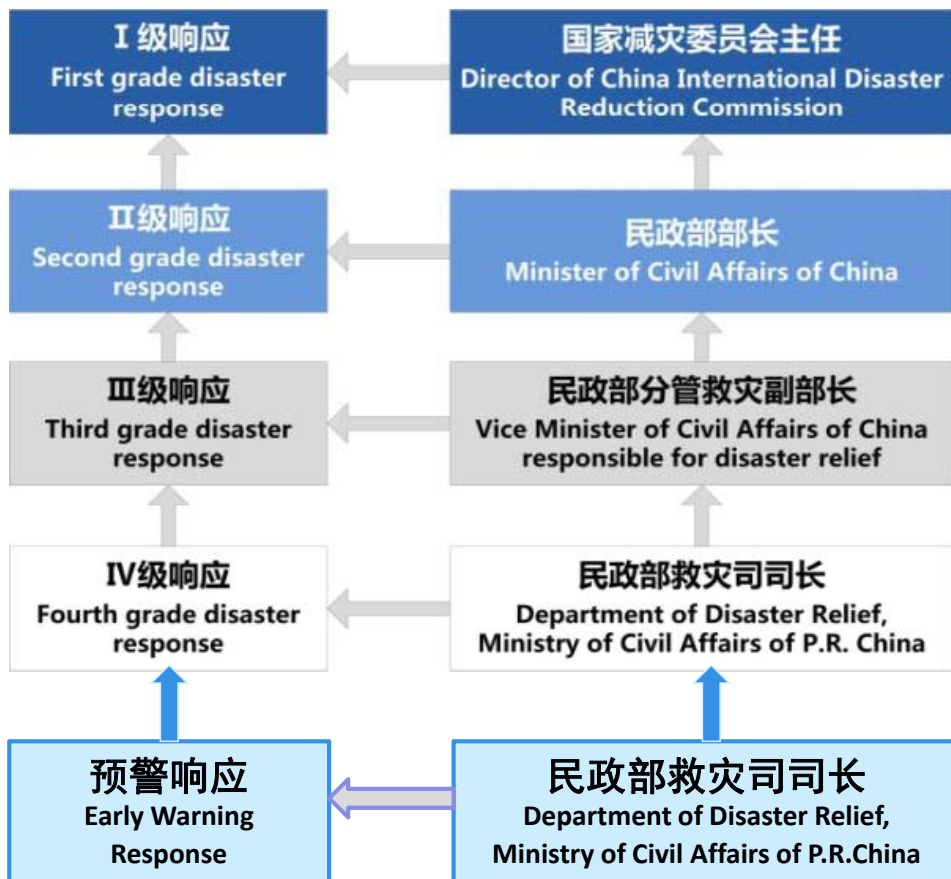
编制和实施《规划》，是贯彻落实党中央、国务院关于加强防灾减灾工作决策部署的重要举措，是推进综合防灾减灾事业发展、构建综合防灾减灾体系、全面增强综合防灾减灾能力的迫切需要，对切实维护人民群众生命财产安全、保



Disaster Risk Management in China



The State Council issued *Regulations on Natural Disaster Relief* and the *National Emergency Plan for Natural Disaster Relief*, set up the management system for disaster prevention, reduction and relief featuring the unified command, comprehensive coordination, level-to-level responsibility and territorial management, and established the disaster relief emergency command system at the central, provincial, municipal and county levels.



Response Level	Death Toll (×1 person)	Evacuated Population (×10000 persons)	Collapsed Houses (×10000 houses)	Drought	
				Hydroponic Population (%)	Relief Population (×10000 persons)
I - Level	> 200	> 100	> 20	30%	> 400
II -Level	100-200	80-100	15-20	25-30%	300-400
III -Level	50-100	30-80	10-15	20-25%	200-300
IV -Level	30-50	10-30	1-10	15-20%	100-200

Disaster related departments issue natural disaster early warning and forecasting information



Disaster Preparation Division of Disaster Relief Department of MoCA



Disaster Relief Division of Disaster Relief Department of MoCA



Deputy Director of Disaster Relief Department, MoCA



Director of Disaster Relief Department, MoCA



Active Early Warning Response

Cooperated by operational center, data center, satellite department, assessment and emergency departments:

- Hazard monitoring and risk status updating based on the information from disaster related departments and local government;
- Disaster risk analysis based on historical disaster data, space-based data and other data;
- Possible damage assessment on people and properties based on existing information;
- Evaluate the possible disaster damage and issue the disaster early warning information to related provinces

**Emergency Response Working Procedure-
Early warning response part**



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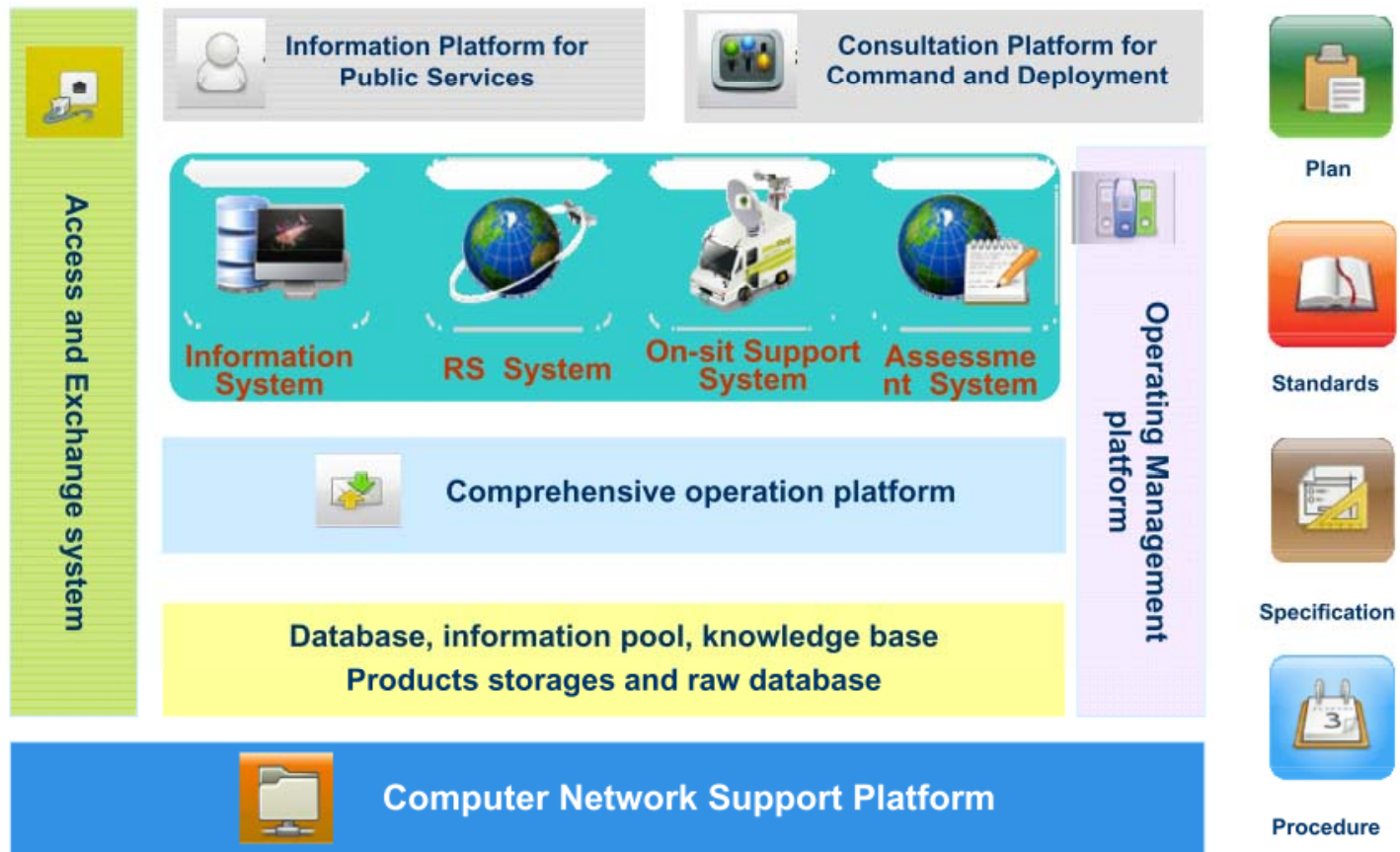




- ❖ **National Disaster Reduction Center of China(NDRCC) is one of leading scientific and technical centers to provide the support for government in addressing disaster-related issues by focusing on the whole cycle of disaster management by providing information, technical and consultation services.**



Comprehensive Operational Platform in NDRCC

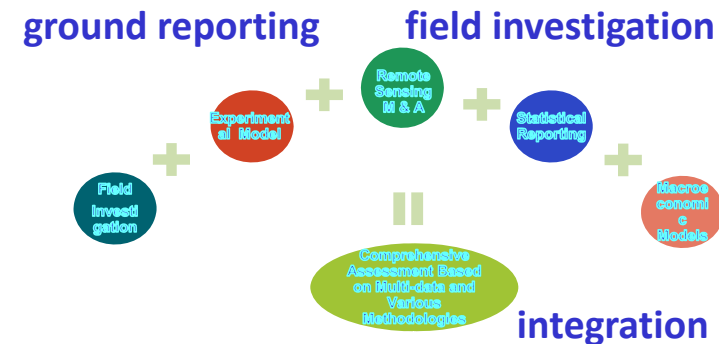
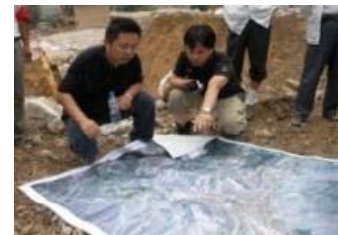
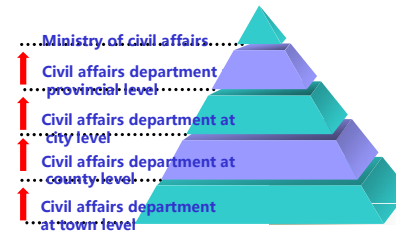
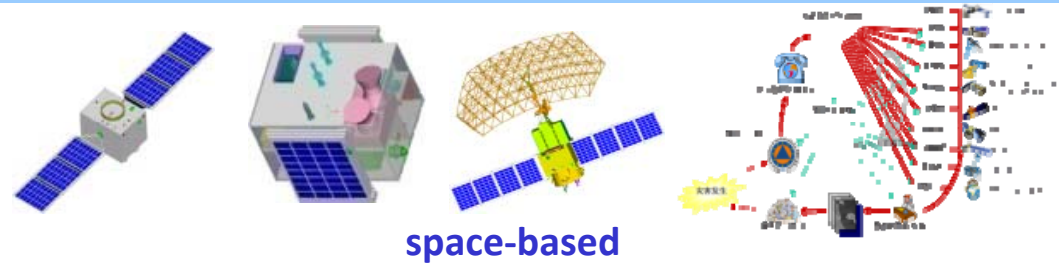




Space-ground integrated information service



Information accessing	Multi-source disaster information access and transmission
Information management	Distributed disaster information database management
Information analysis	Risk analysis, damage assessment and value-added product making
Information service	disaster information service based on traditional and new media



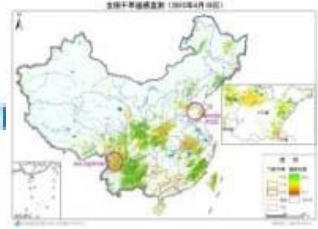
Normal Mode



R.S. data and GIS data

Open data sources

Exposure estimation
Hazard analysis
Vulnerability analysis




- Related Disaster agencies
- Disaster relief department, MCA
- Related civil departments
- Regional disaster reduction center

Emergency Mode

Start emergency response


Population, fundamental data, Archived Satellite data



CHARTER

Domestic mechanism

Commercial purchase



Satellites Data

Aerial remote sensing

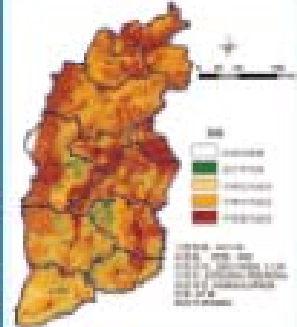
Unmanned aerial vehicle



Data process
Product-making



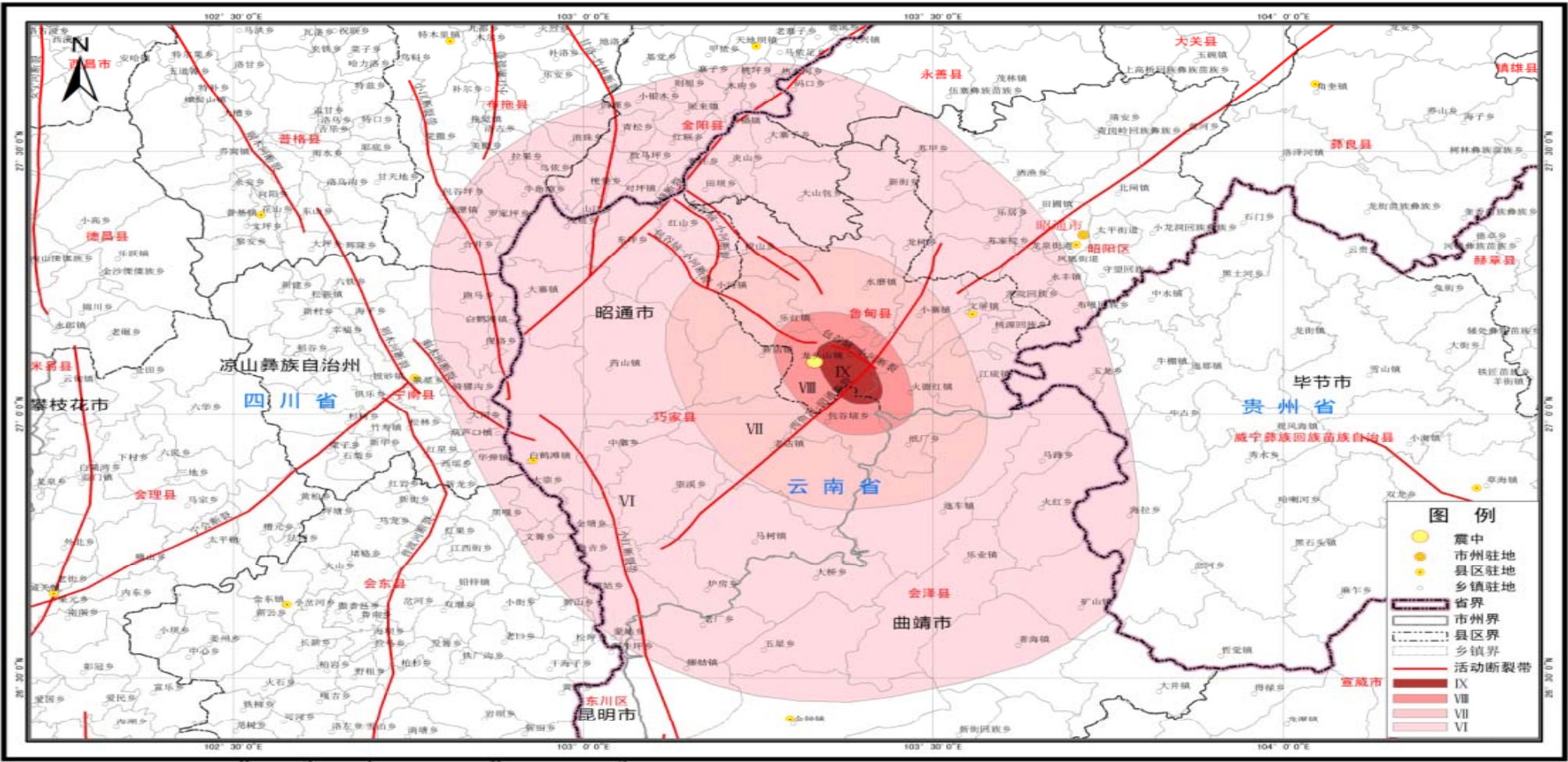
Disaster Report



Products

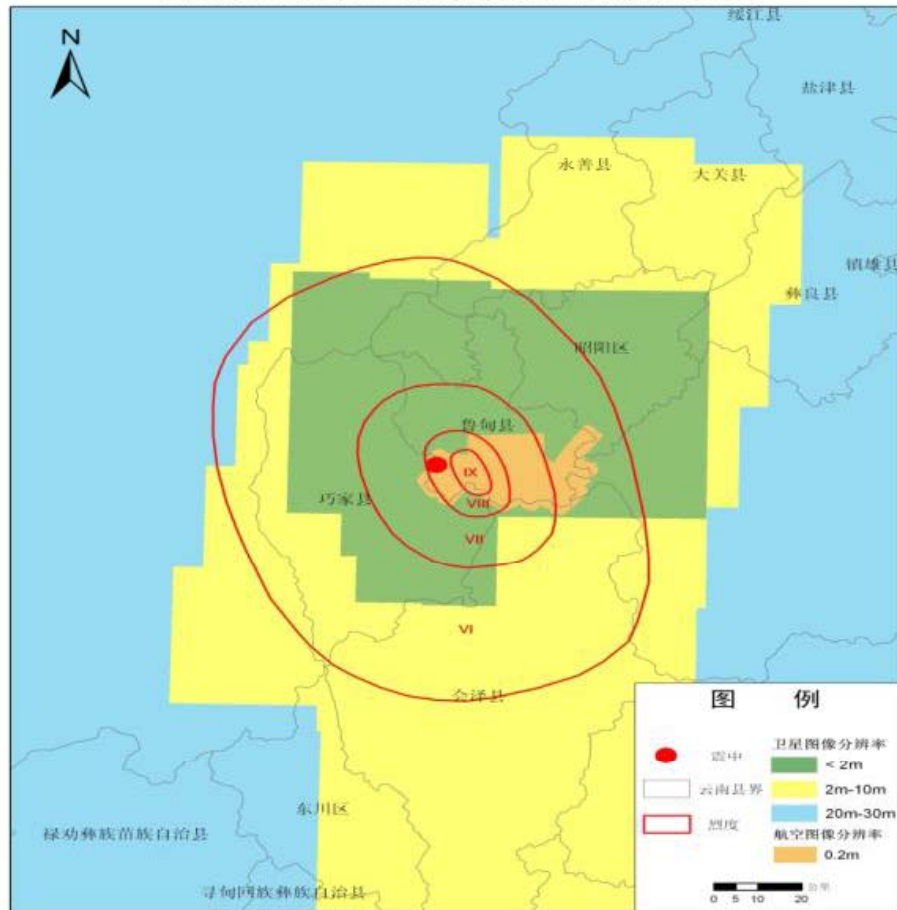
- Disaster area
- Command center
- Members of NCDR
- Regional Government
- Public

云南鲁甸6.5级地震烈度图

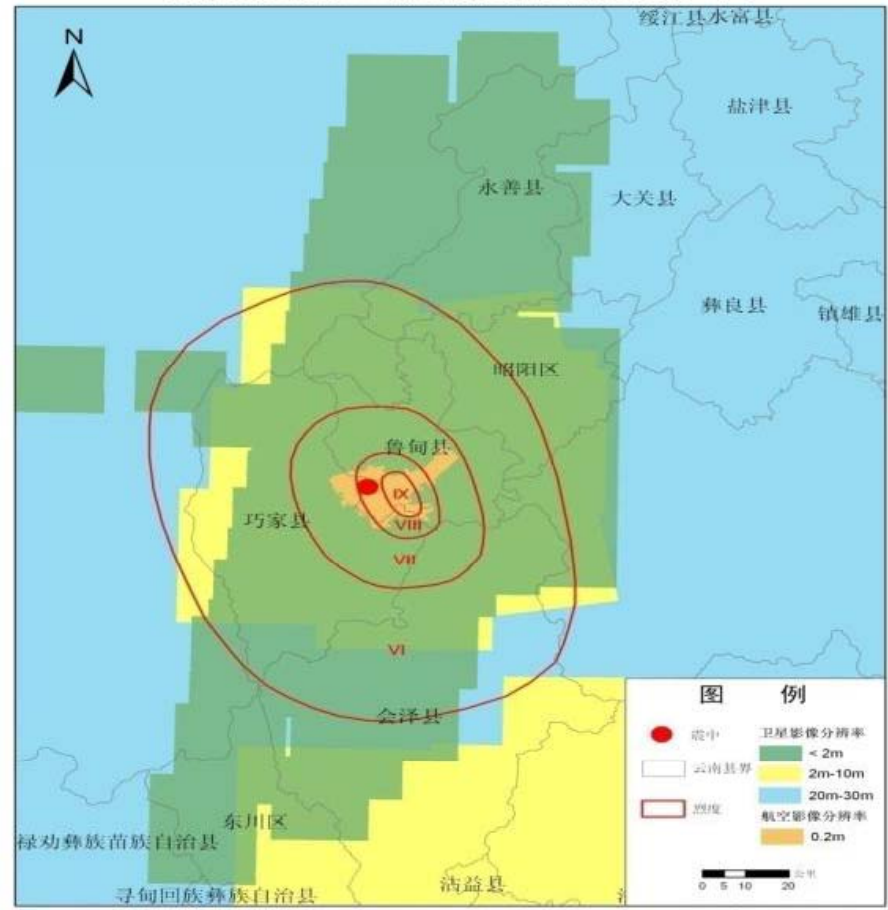


The 6.5-magnitude earthquake occurred at 16:30(local time) on August 3, 2014 in Ludian County, Yunan Province has caused massive damage and losses with 617 death toll left.

云南省鲁甸县6.5级地震灾前遥感数据覆盖图

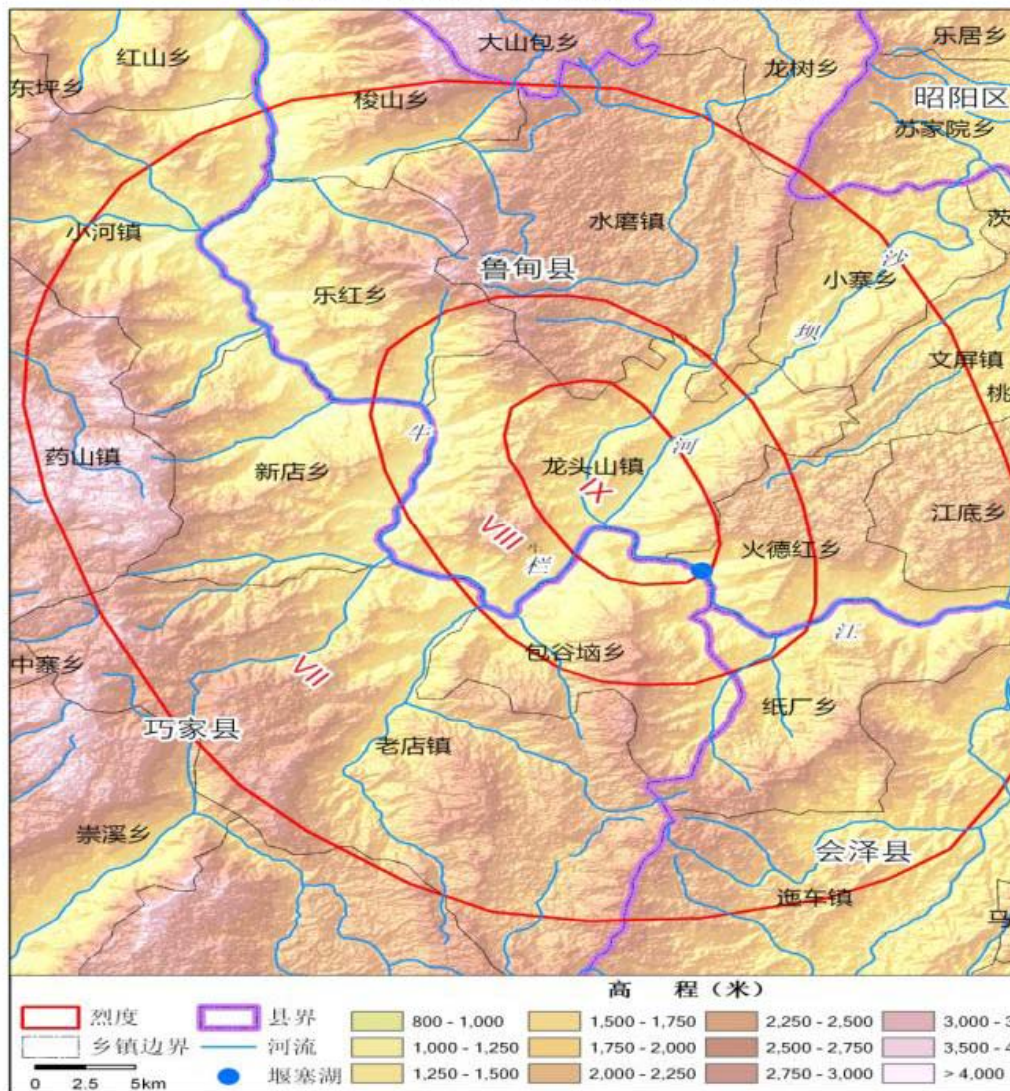


云南省鲁甸县6.5级地震灾后遥感数据覆盖图

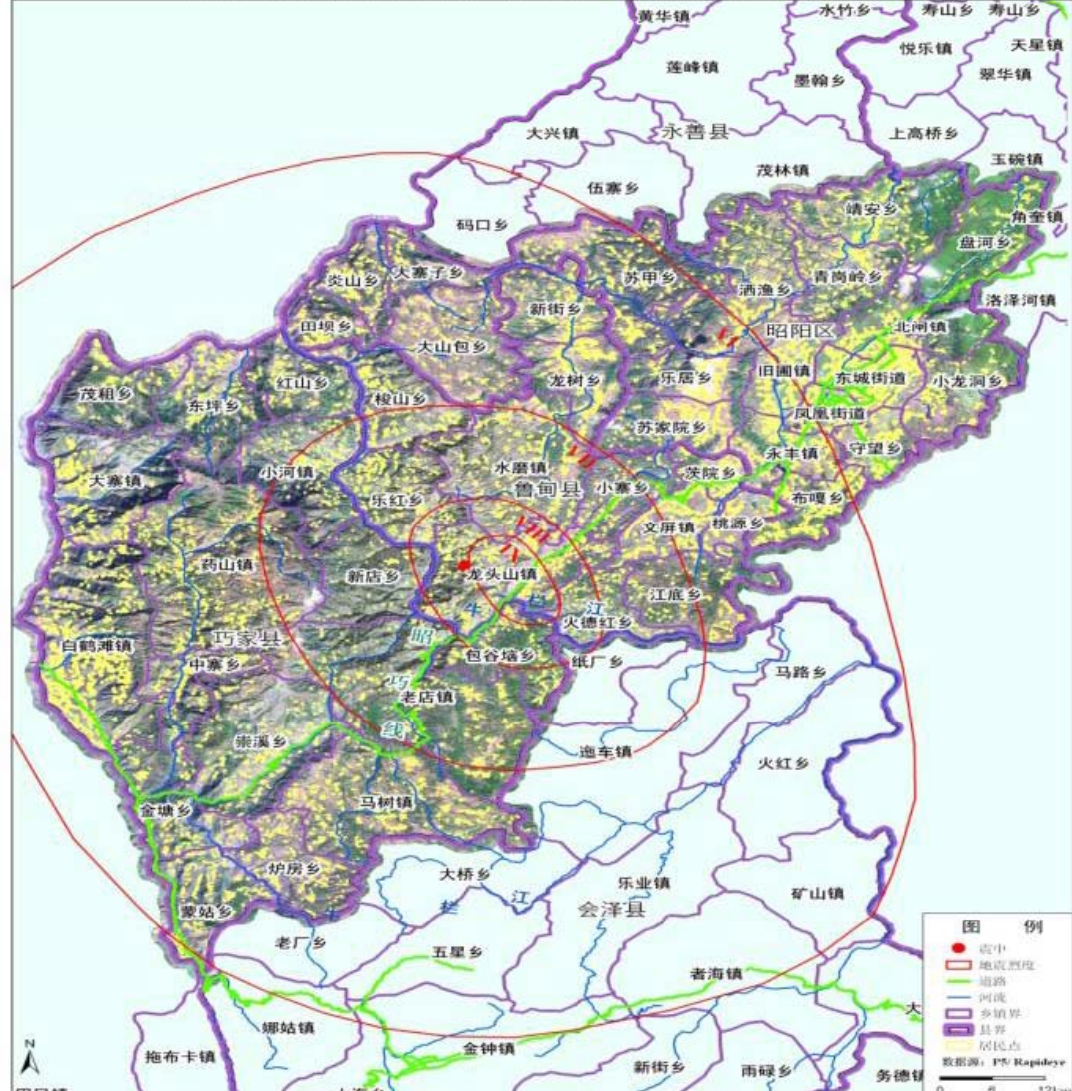


325frames of satellite images from 25 satellites 6 countries, and 179 frames of UAV and airborne remote sensing images. Totally 245 frame of images of pre earthquake and 279 frame of images of post earthquake.

云南省鲁甸县6.5级地震震区地形图

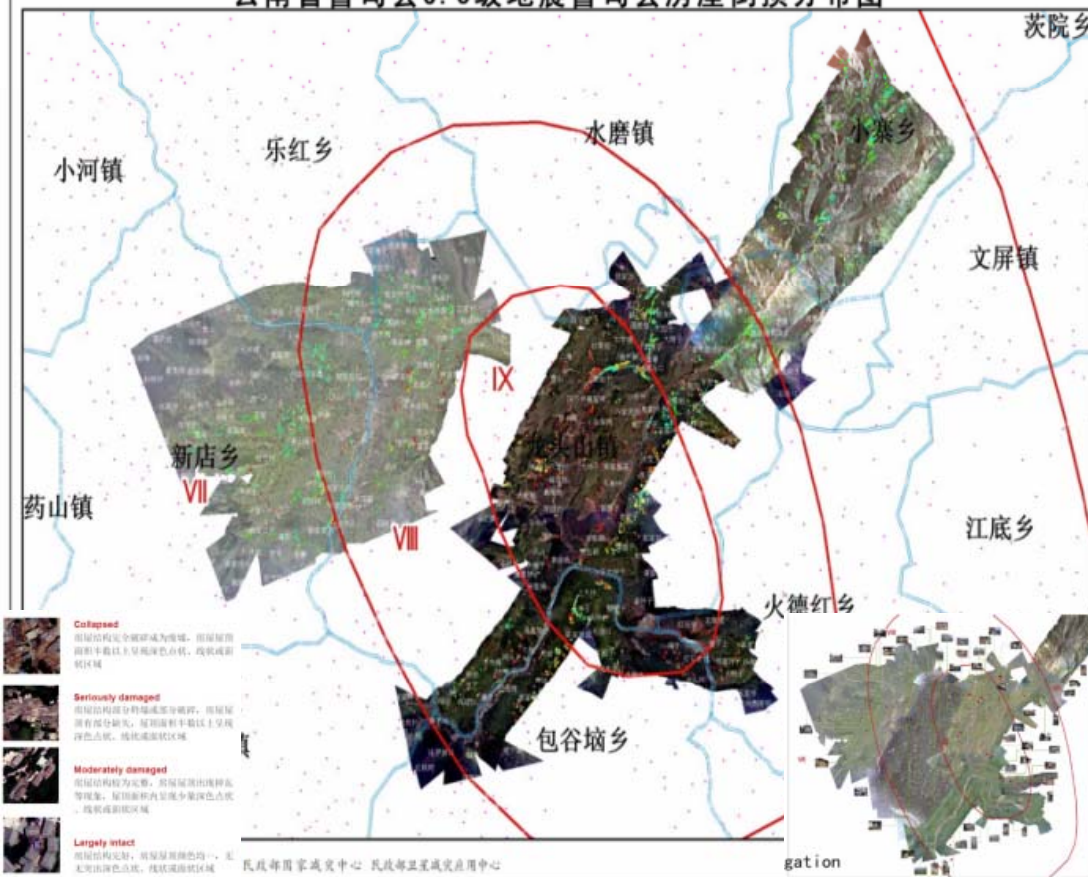


云南省鲁甸县、昭阳区、巧家县2013年居民点分布图

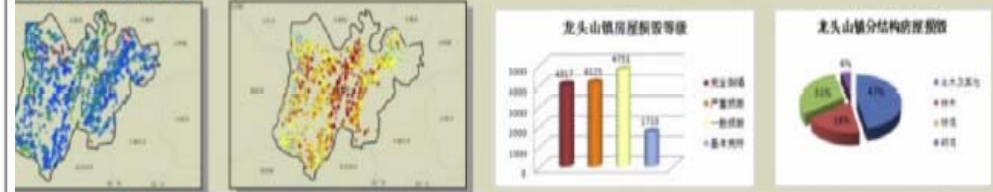




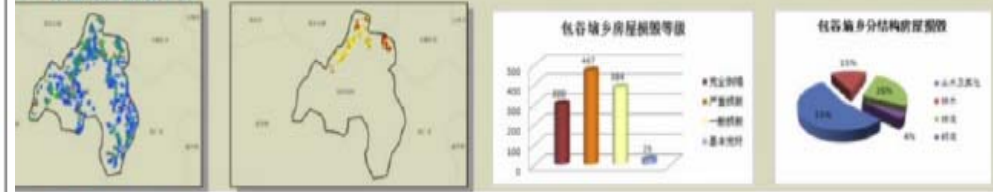
云南省鲁甸县6.5级地震鲁甸县房屋倒损分布图



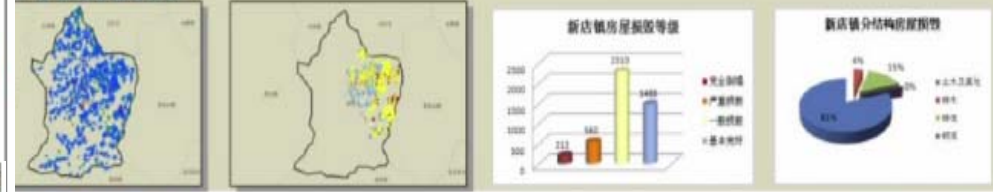
龙头山镇：存量房及损毁分析



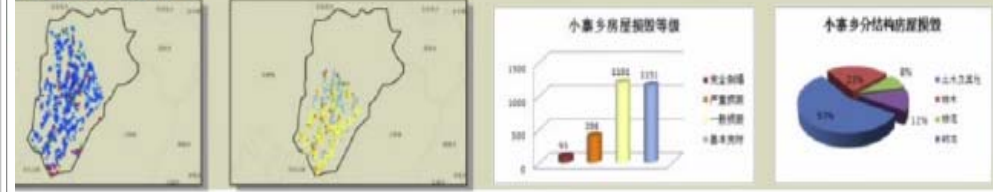
包谷埡乡：存量房及损毁分析



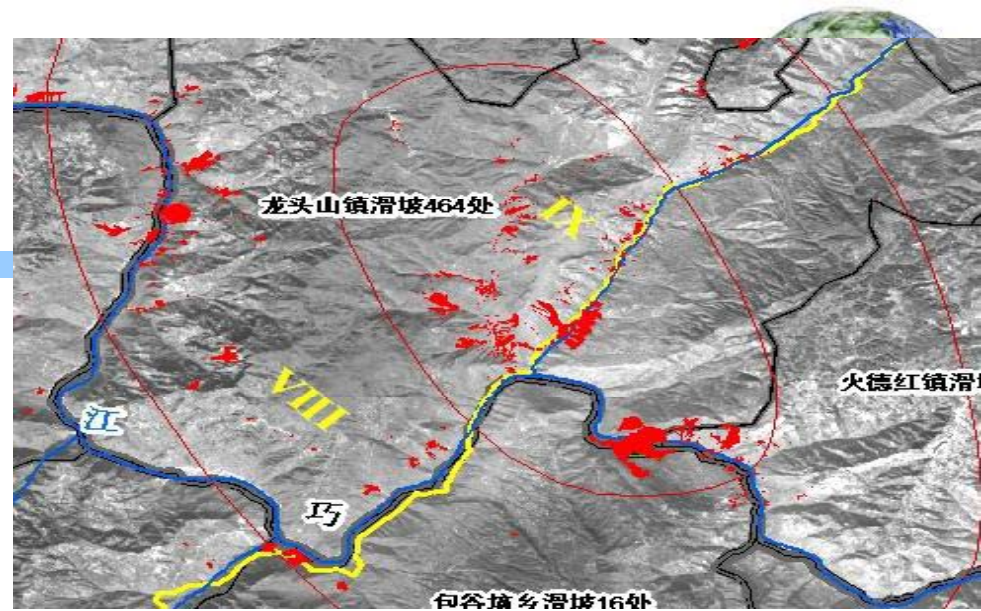
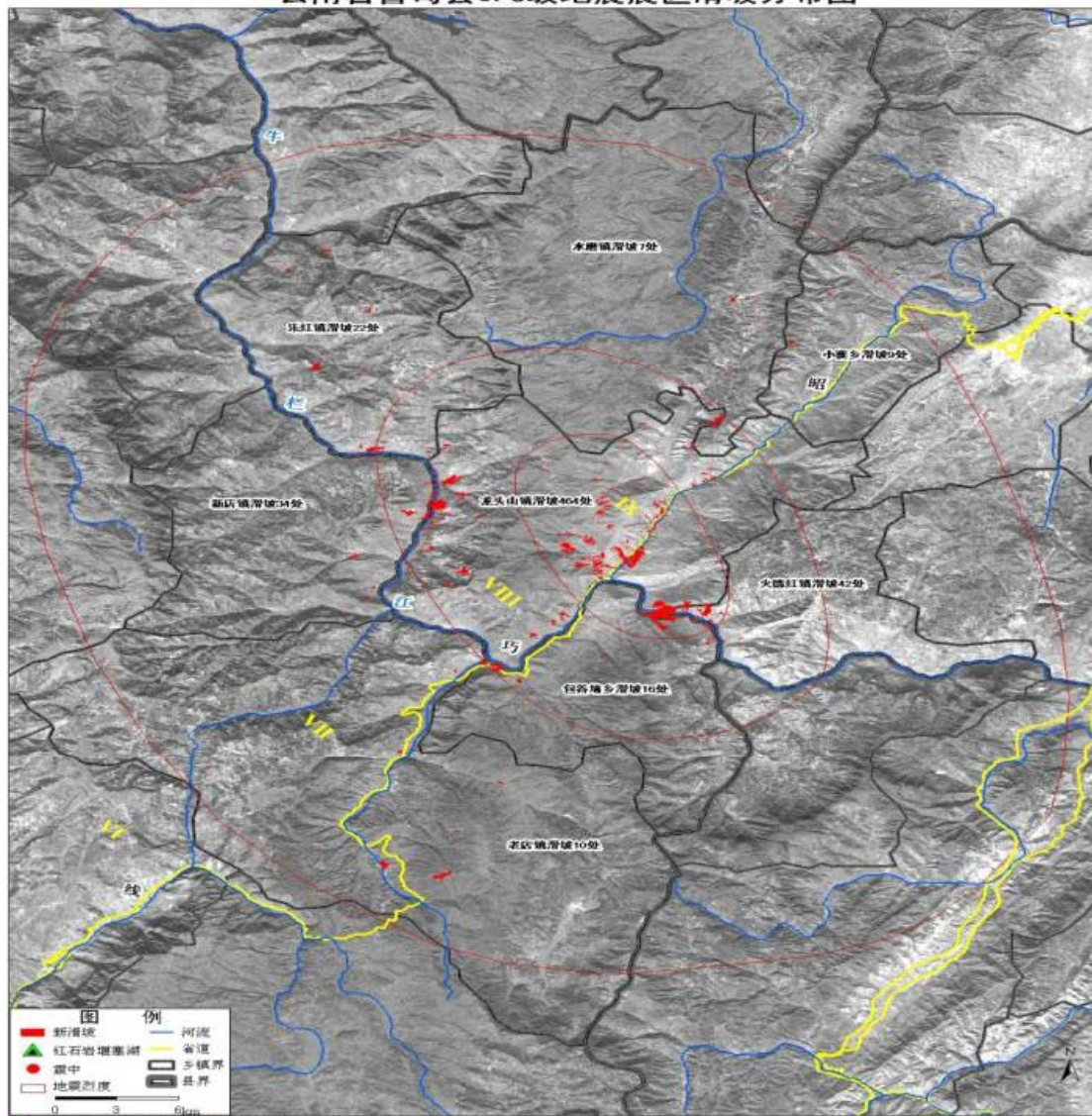
新店镇：存量房及损毁分析



小寨乡：存量房及损毁分析

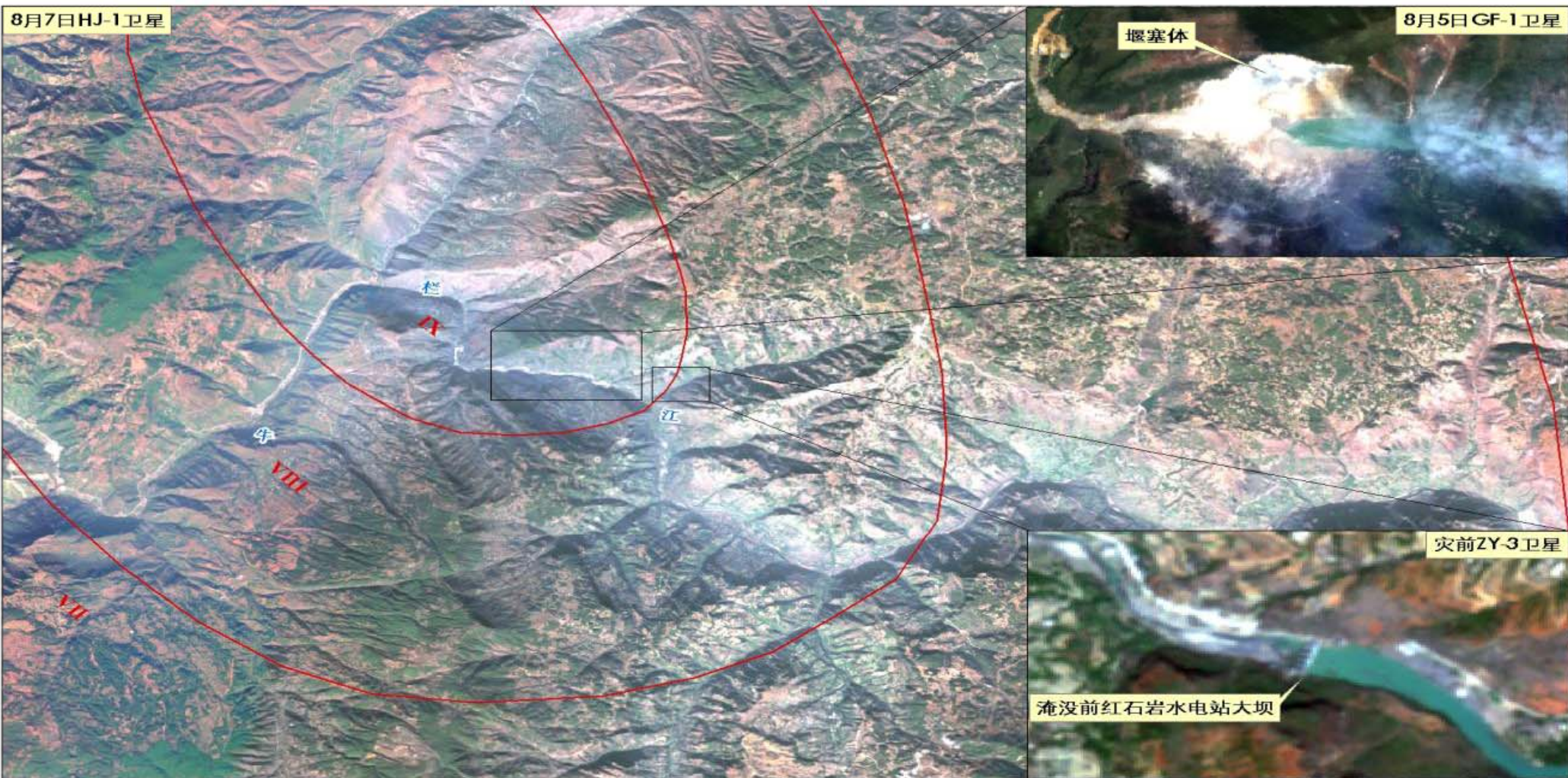


云南省鲁甸县6.5级地震震区滑坡分布图





云南省鲁甸县6.5级地震震区堰塞湖卫星影像图



Evacuated Resident Monitoring

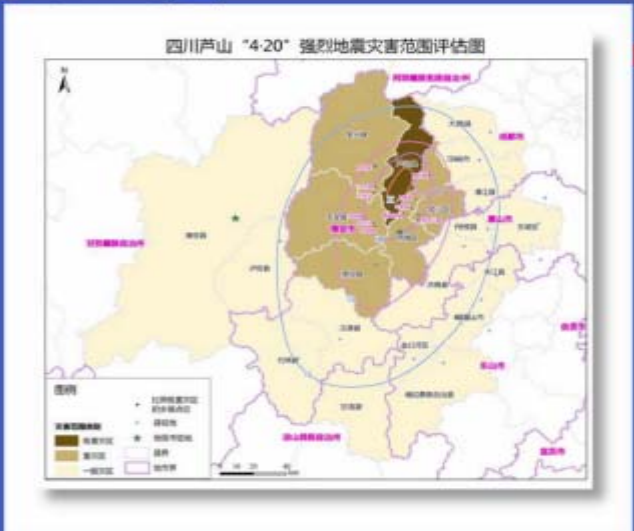
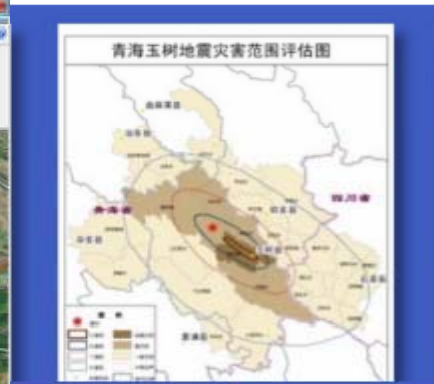
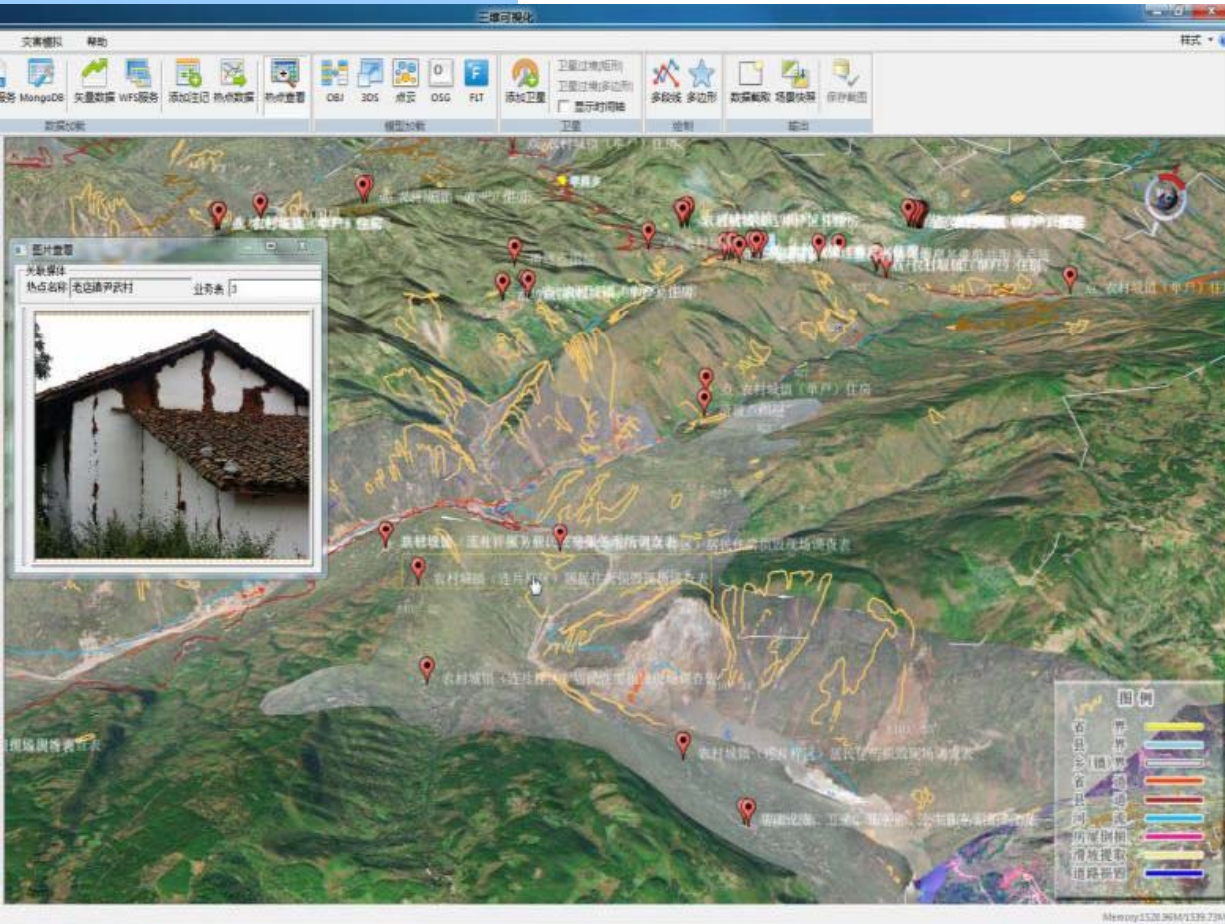


云南省鲁甸县6.5级地震集中安置区域图——龙头山镇政府所在地及周边地区





Integration and Comprehensive Damage Assessment





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Sendai Framework for Disaster Reduction 2015-2030



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Sendai Framework for Disaster Risk Reduction 2015-2030

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Space in Sendai Framework



Para 24 (f) Promote real-time access to reliable data, make use of space and in situ information, including geographic information systems (GIS), and use information and communications technology innovations to enhance measurement tools and the collection, analysis and dissemination of data;

(j) Strengthen technical and scientific capacity to capitalize on and consolidate existing knowledge and to develop and apply methodologies and models to assess disaster risks, vulnerabilities and exposure to all hazards;

Para 25 (c) Promote and enhance, through international cooperation, including technology transfer, access to and the sharing and use of non-sensitive data and information, as appropriate, communications and geospatial and space-based technologies and related services; maintain and strengthen in situ and remotely-sensed earth and climate observations; and strengthen the utilization of media, including social media, traditional media, big data and mobile phone networks, to support national measures for successful disaster risk communication, as appropriate and in accordance with national laws;



Way Forward



- ❖ From support to manage disaster to manage disaster risk: space-based disaster risk assessment (exposure, vulnerability, hazard) for better preparation;
- ❖ From information based on data to knowledge based on information: user requirement analysis and solution driven;
- ❖ From physical technology to social sciences involved: inclusive and innovative approaches;
- ❖ From separate to synergy: integration and standard on multi sourced data, information, mechanism;
- ❖ Long term strategy on main streaming space-based information for DRR under the Sendai Framework at different levels.

Thanks

