Natural Disaster Loss Assessment and Post-disaster Reconstruction in China

中国自然灾害损失评估与灾后恢复重建

东盟论坛救灾会间会（2014·中国成都）

Yuan Yi

National Disaster Reduction of China

Feb. 27, 2014

Aggravation of natural disaster risks

Complication and diversification of disaster losses and impacts

Increasing demands of disaster relief and reduction

Emergency Response Law of the People's Republic of China
(Implemented in Nov. 1, 2007)

Regulations of Nature Disaster Relief
(Implemented in Sep. 1, 2010)

Working Mechanism Development

Technology Development

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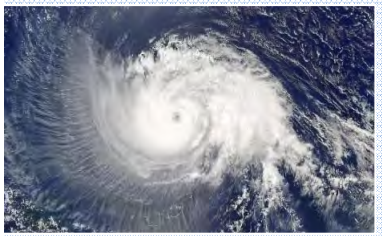
02 Catastrophic disaster loss assessment

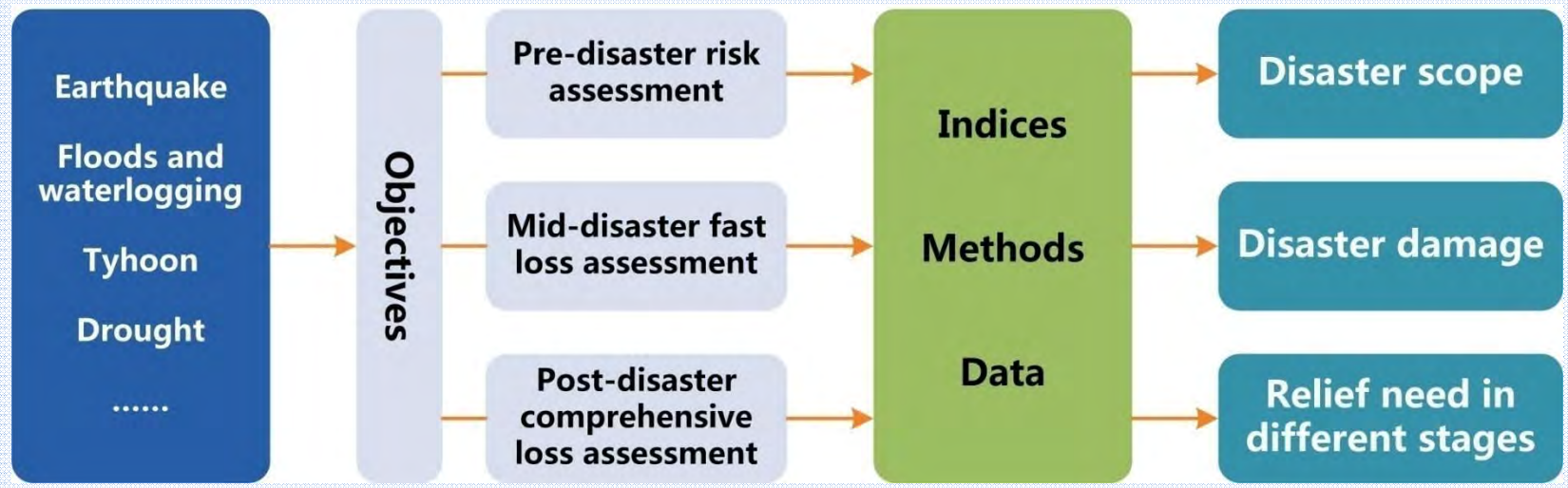
03 Post-disaster reconstruction



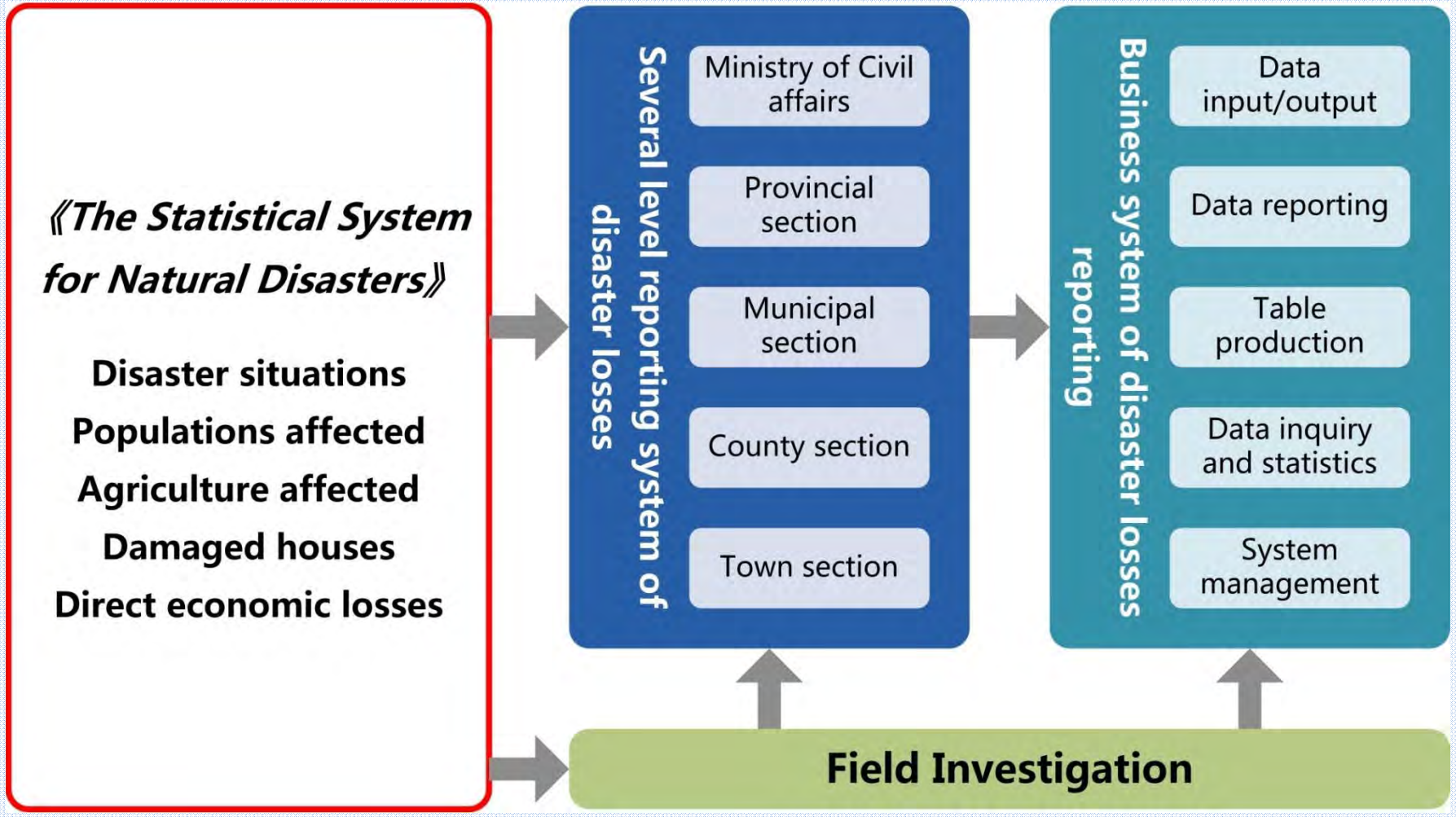
Major disaster loss assessment

The objectives of loss assessment:

- Objectively and timely learn about the damages and economic losses caused by disasters.
- Timely launch national and local emergency plans, and take emergency relief measures.
- Formulate the plans for recovery and reconstruction.



On-the-spot Investigation and Grassroots Statistics and Reporting of Natural Disaster Losses



On-the-spot Investigation and Grassroots Statistics and Reporting of Natural Disaster Losses


GB

中华人民共和国国家标准

GB/T 28225—2011

灾区农户住房倒塌或损坏数量抽样核查方法

Sampling & verifying method on the number of collapsed or damaged rural dwellings in natural disaster-affected areas

2011-12-30 发布　　2012-04-01 实施

国家质量监督检验检疫总局
国家标准化管理委员会


MZ

中华人民共和国民政行业标准

MZ/T ×××—201×

房屋受灾损坏程度现场识别

Field identification of buildings damage induced by natural disasters

（报批稿）

201×-××-×× 发布　　201×-××-×× 实施

中华人民共和国民政部 发布


MZ

中华人民共和国民政行业标准

MZ/T ×××—201×

自然灾害损失现场调查规范

Rules for field survey on loss induced by natural disasters

（报批稿）

201×-××-×× 发布　　201×-××-×× 实施

中华人民共和国民政部 发布


MZ

中华人民共和国民政行业标准

MZ/T ×××—201×

冬小麦旱灾程度现场识别

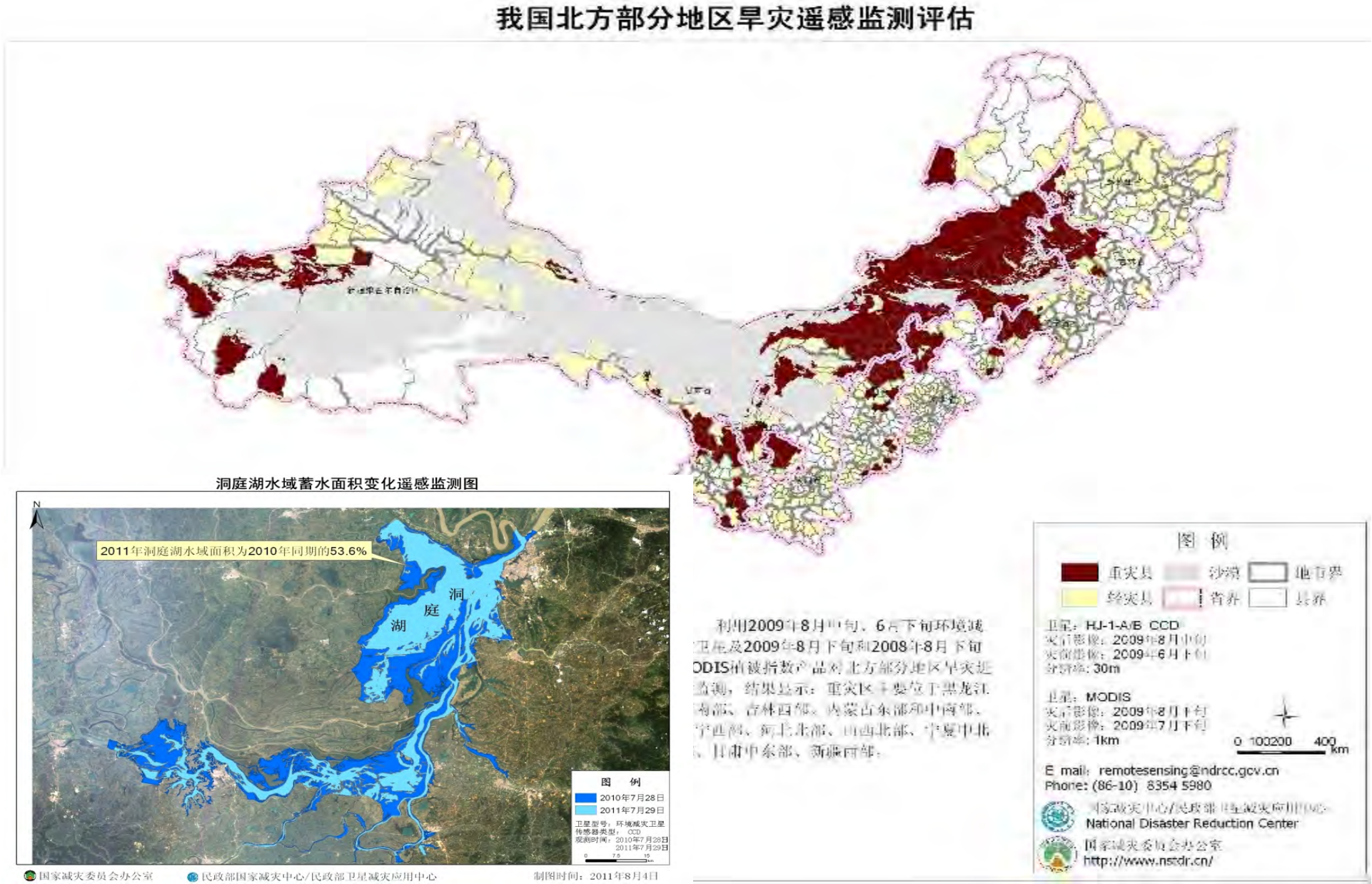
Field identification of winter wheat damage induced by drought disaster

（报批稿）

201×-××-×× 发布　　201×-××-×× 实施

中华人民共和国民政部 发布

Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment



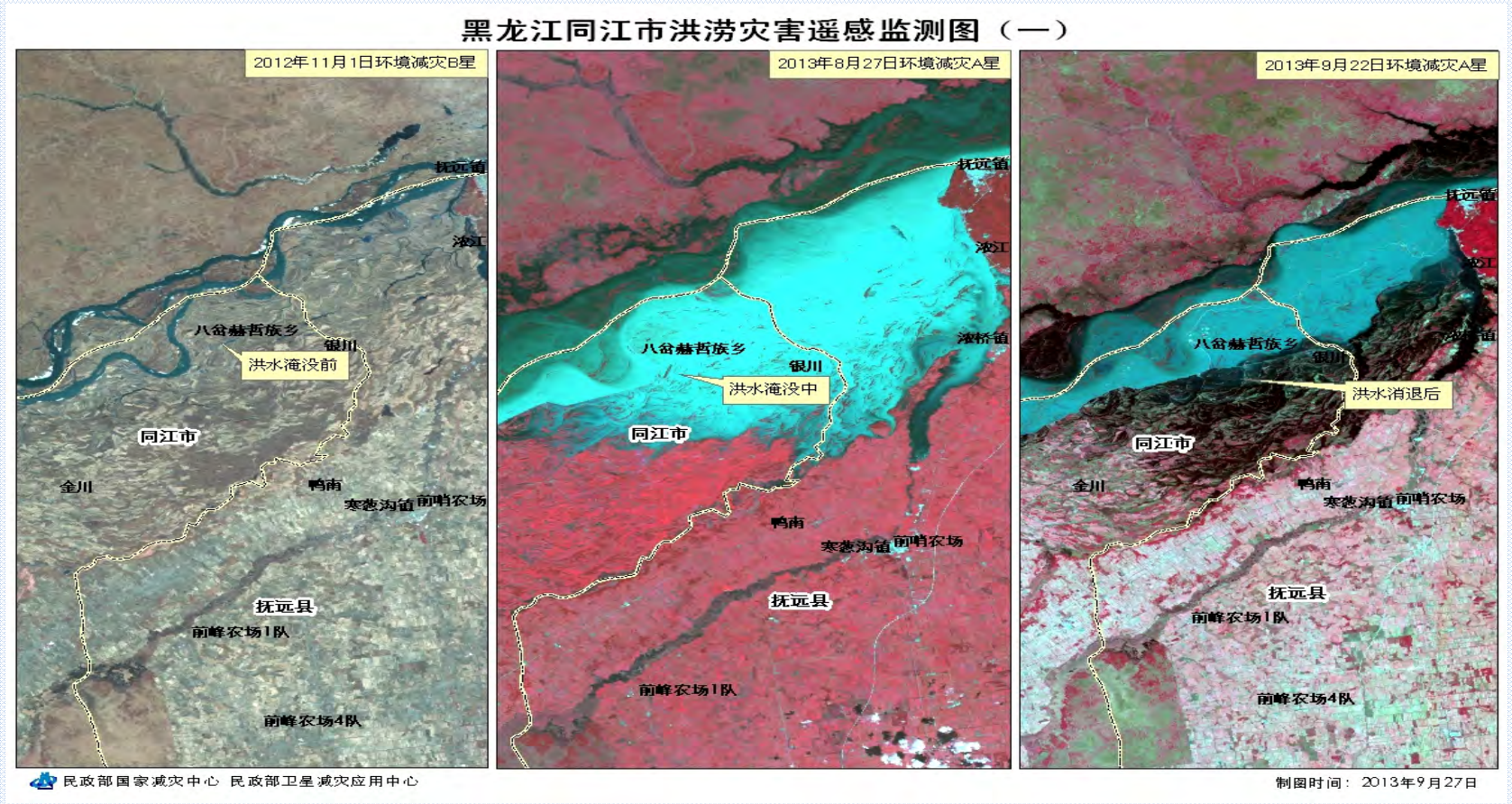
Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment

Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment

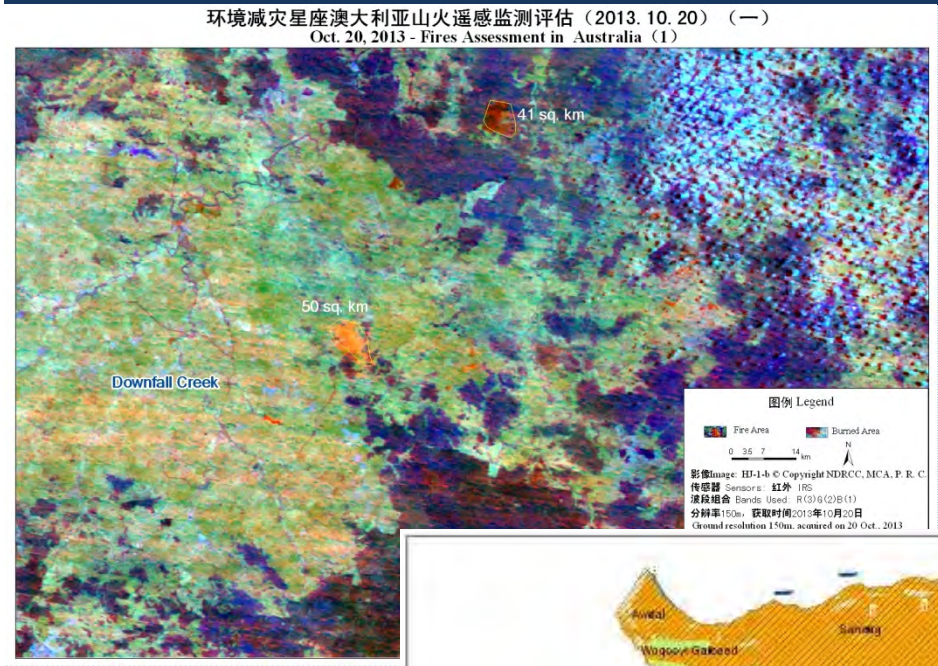
- Since 2008, China has successively launched three satellites A, B, and C for environmental monitoring and disaster reduction. This constellation provides important space data support for China's natural disaster monitoring and assessment, remarkably enhancing the timeliness and scope of remote-sensing monitoring.
- In 2007, China participated in the CHARTER for international disaster reduction cooperation. Through this mechanism, in a disaster emergency relief, China can timely obtain the remote-sensing data resources of 26 satellites of 14 countries or organizations. NDRCC is responsible for empowering users for access to these data.
- NDRCC has actively established a mechanism for domestic data cooperation, realizing the data sharing of satellites for meteorology, oceans, resources, mapping and remote-sensing.
- In 2010, NDRCC cooperated with eight unmanned aircraft operating agencies in China in establishing a cooperation mechanism for unmanned aircraft major natural disaster emergency monitoring, forming a preliminary unmanned aircraft monitoring network covering the whole country.

Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment

- **In recent years, remote-sensing technologies have played important roles in the disaster loss assessment of major earthquakes such as the Wenchuan Earthquake, and major floods and waterlogging such as the collapse of a dam in Wuzhou City, Jiangxi Province, and the flood of the Heilongjiang River Basin in 2013.**



Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment




AMBASSADOR
AUSTRALIAN EMBASSY
BEIJING

9 December 2013

Mr Pang Chenmin
Director General
National Disaster Reduction Centre of China
Ministry of Civil Affairs
147 Beiheyan Street
Dongcheng 100721

Dear Mr Pang

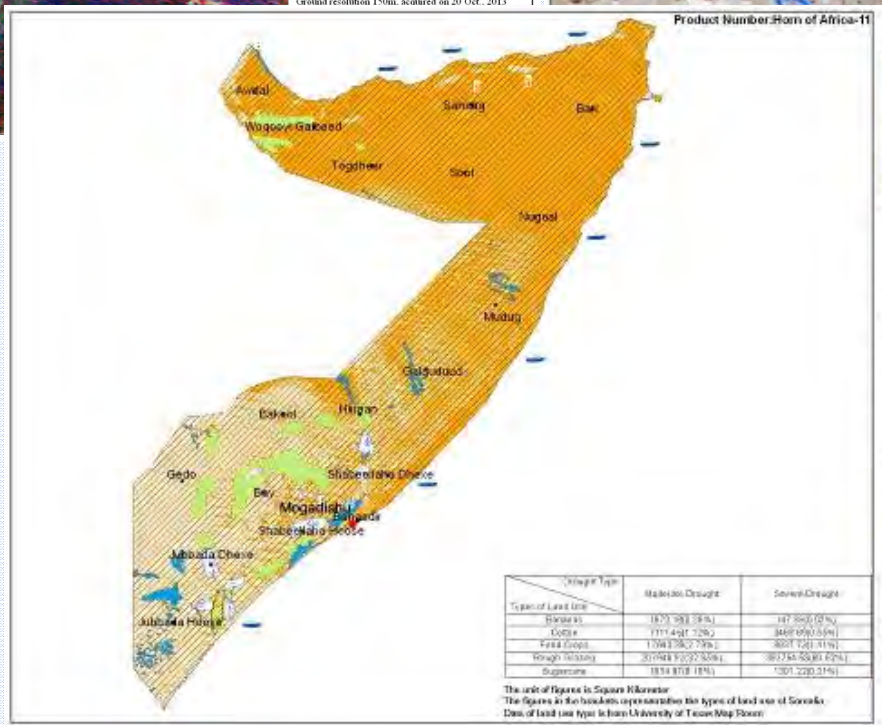
On behalf of the Australian Government and the Australian community, I would like to express our gratitude for the assistance provided to us during the recent bushfire emergency in the State of New South Wales.

The National Disaster Reduction Centre of China tasked satellites, generated fire perimeter maps and distributed satellite data of the bushfires across New South Wales. The quality and timeliness of the products you provided was commented on by senior government decision makers and emergency services personnel. Staff from Geoscience Australia have also commented on the courtesy, professionalism and expertise demonstrated by your staff.

The Australian Government is committed to increasing its contribution to the international Earth observation from space community, especially with key partners in the region. I know that our agencies, including Geoscience Australia, look forward to enhancing our relationship with NDRCC in areas of mutual benefit such as collaboration on emergency management.

Yours sincerely

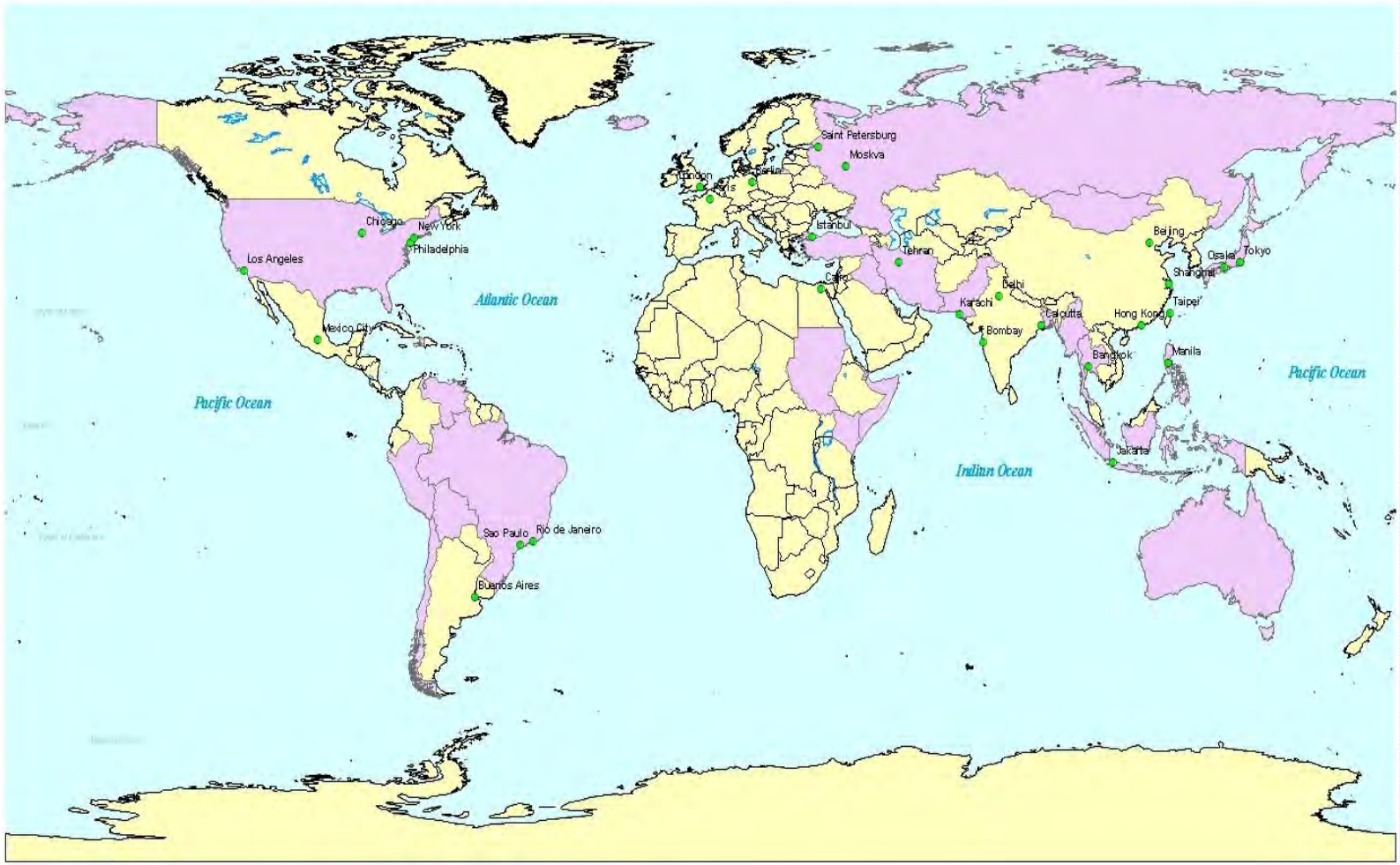
Frances Adamson
孙芳安



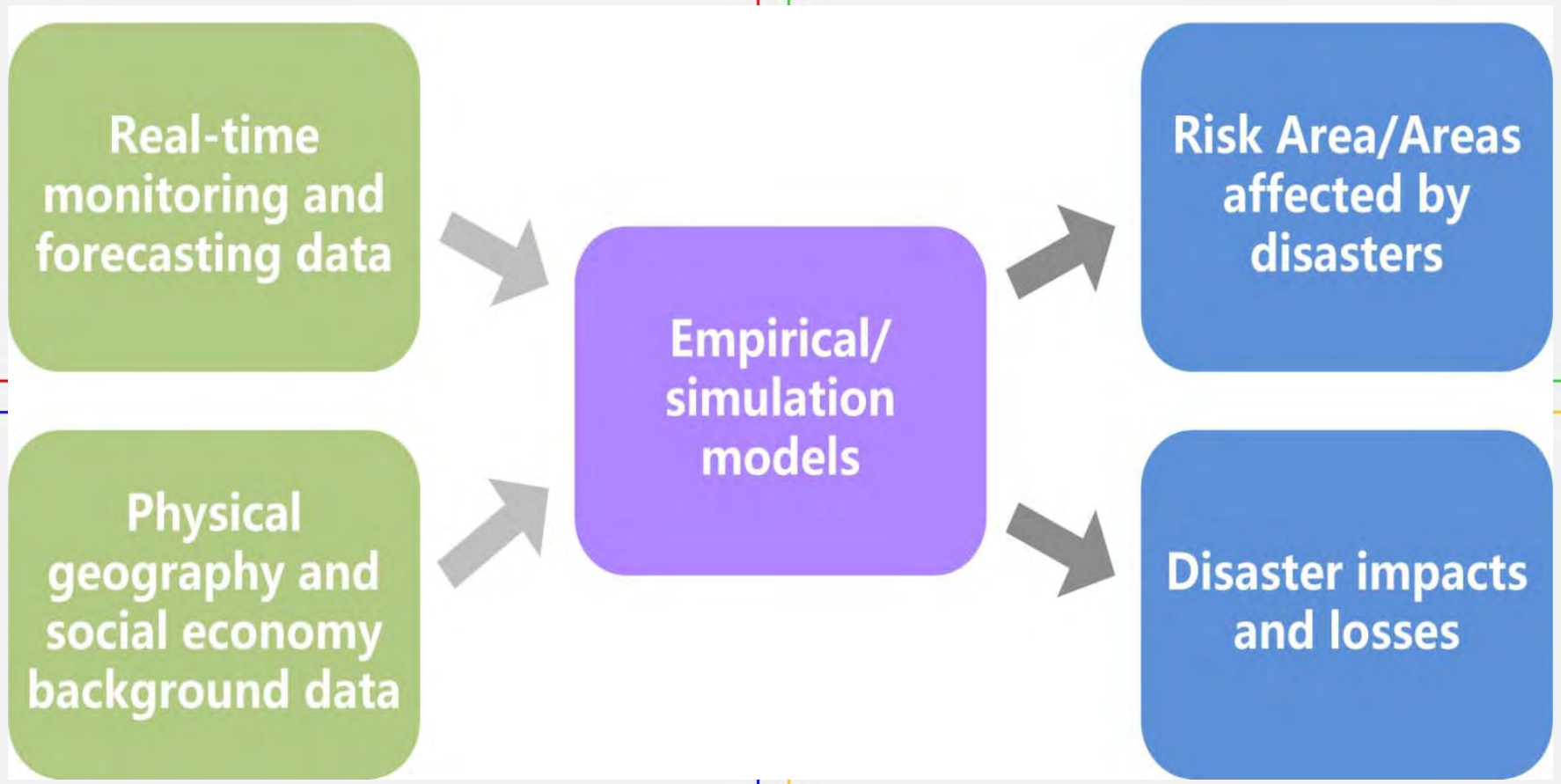
NDRCC has successively carried out monitoring and assessment for over 20 major disasters occurring in foreign countries, such as fires in Australia, a fire in Bolivia, the Haiti Earthquake, the Chile Earthquake, the Japan Earthquake, the Pakistan Flood, the Venezuelan Flood, the drought in the Horn of Africa, the Pakistan earthquake, the Iraqi flood, etc.

Make Use of Remote-Sensing Technology in Disaster Monitoring and Assessment

- **Over 20 countries in six continents have received NDRCC's service, in terms of such natural disaster types as fires, earthquakes, droughts, typhoons, floods and waterlogging, etc.**



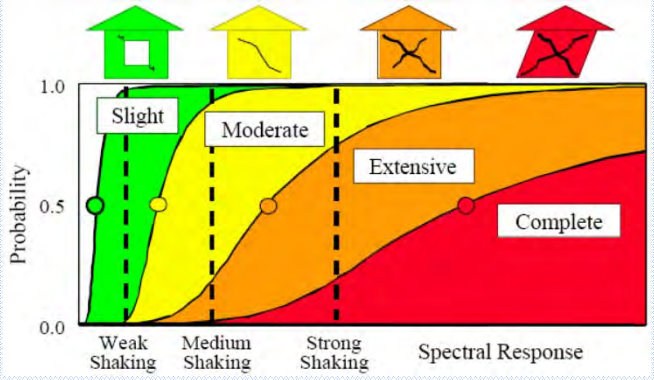
Carry out fast assessment using empirical/simulation models



Carry out fast assessment using empirical/simulation models

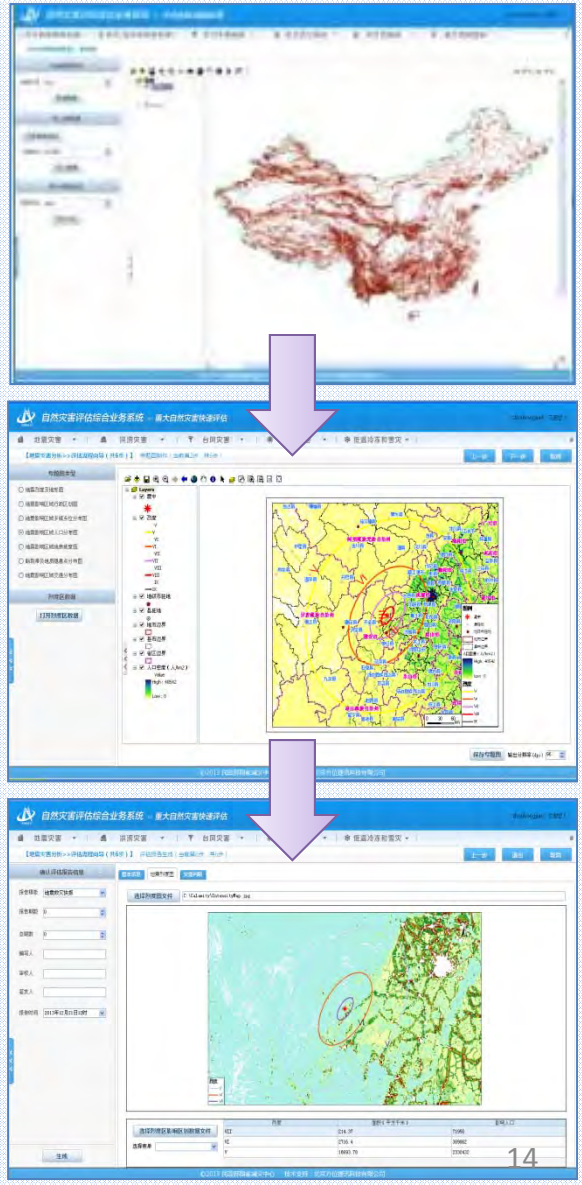
Earthquake

Vulnerability curve indicating damaged status slight ~ severe



Earthquake damage matrix(%) for houses of steel and cement in areas with a basic intensity of IX

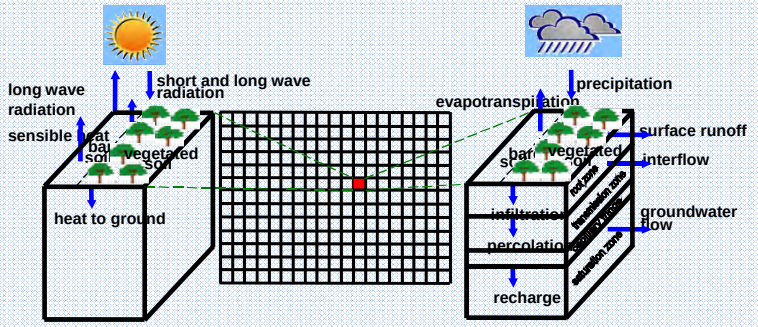
Intensity	Intact	Slightly damaged	Moderately damaged	Severely damaged	Completely destroyed
VI	95.0	5.0	0.0	0.0	0.0
VII	90.0	10.0	0.0	0.0	0.0
VIII	80.0	15.0	5.0	0.0	0.0
IX	55.0	35.5	8.5	1.0	0.0
X	30.0	35.0	27.0	5.5	2.5

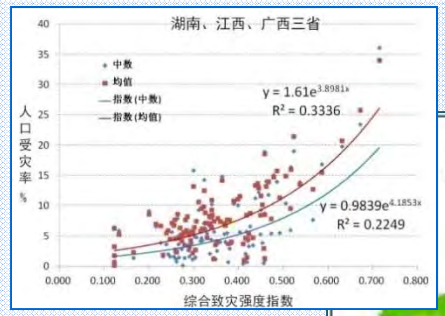


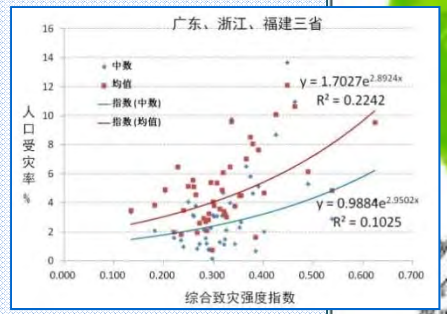
Carry out fast assessment using empirical/simulation models

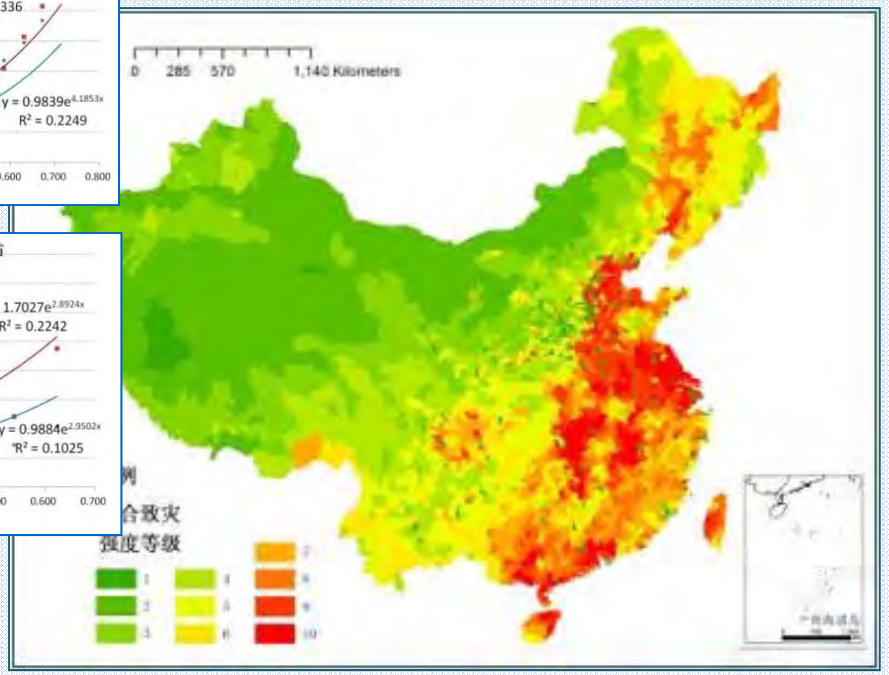
Flood and waterlogging

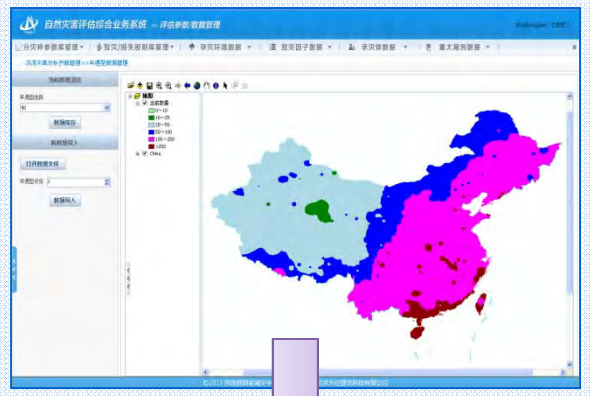
WetSpa distributed hydrological model

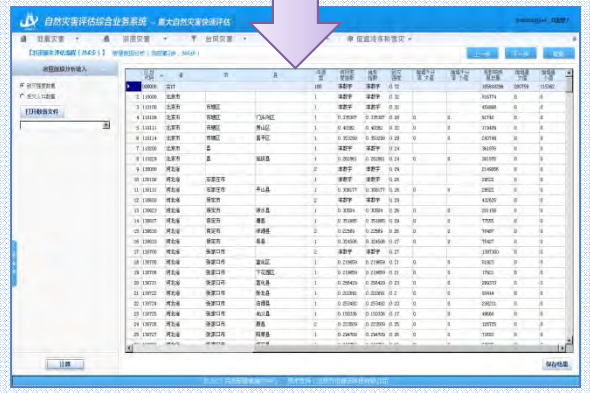












Carry out fast assessment using empirical/simulation models

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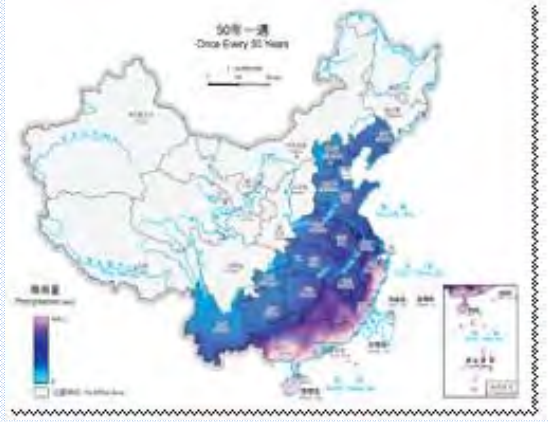
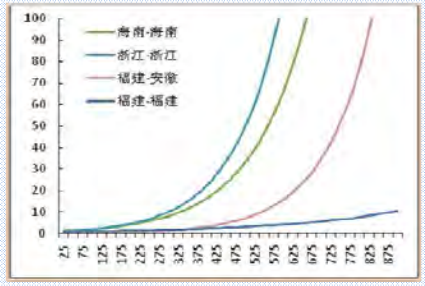
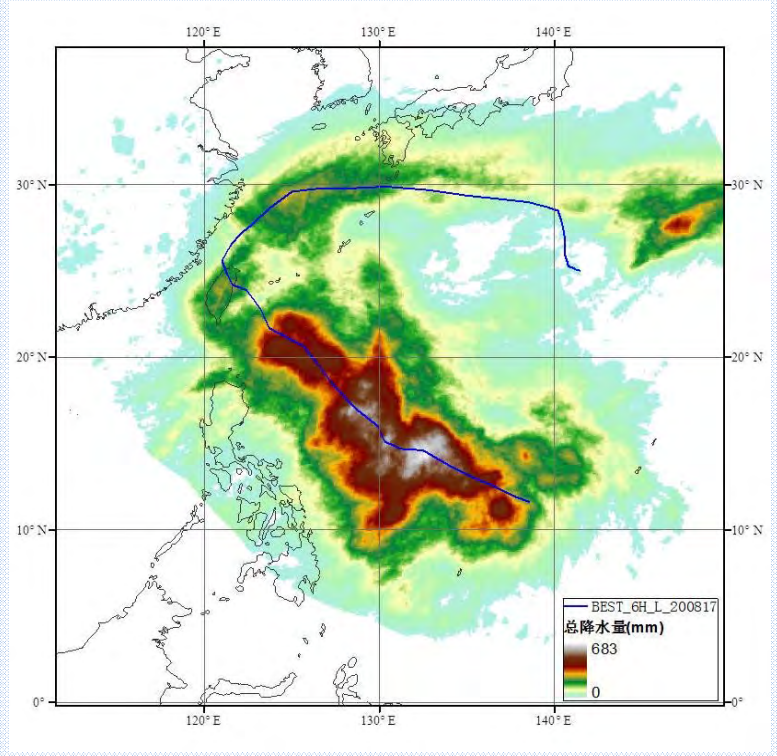
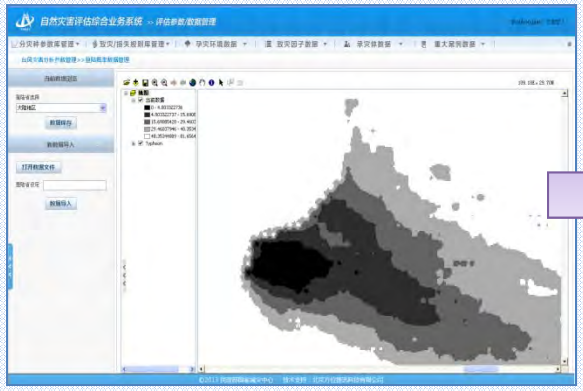
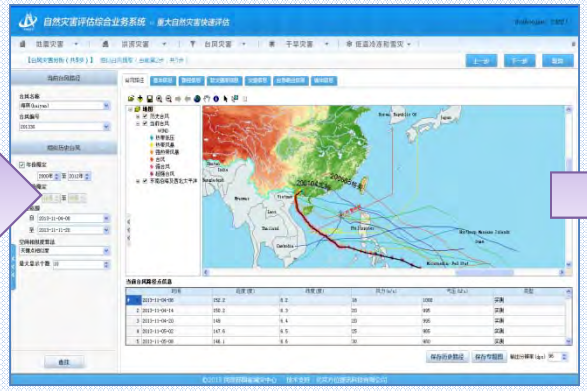
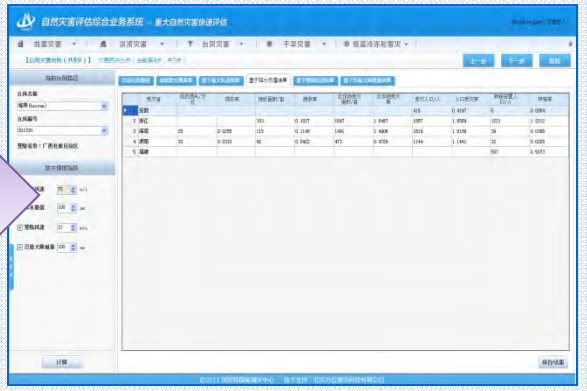






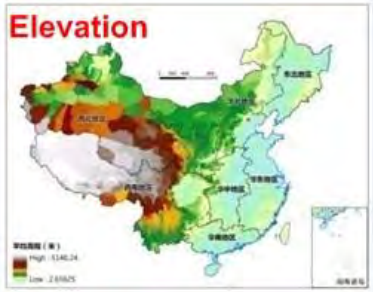


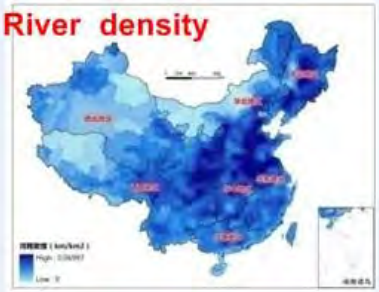


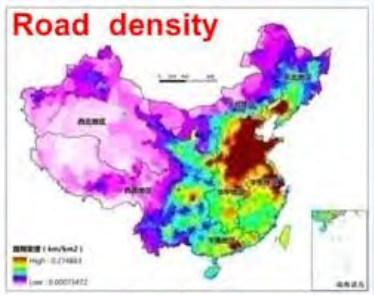


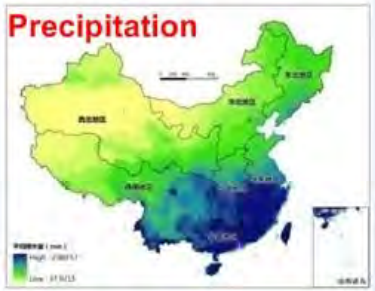
Carry out fast assessment using empirical/simulation models

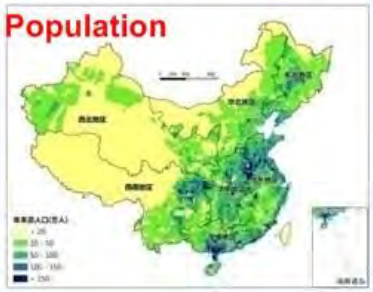
Drought

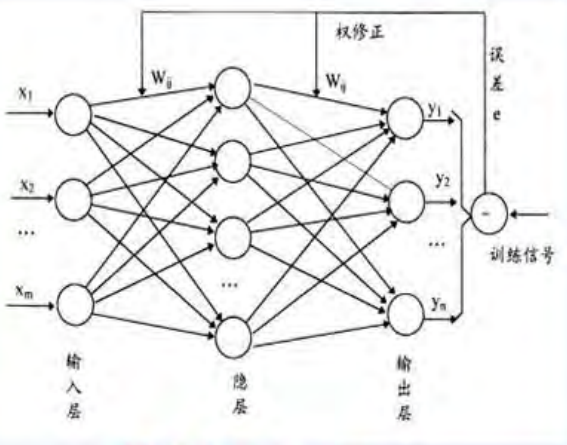




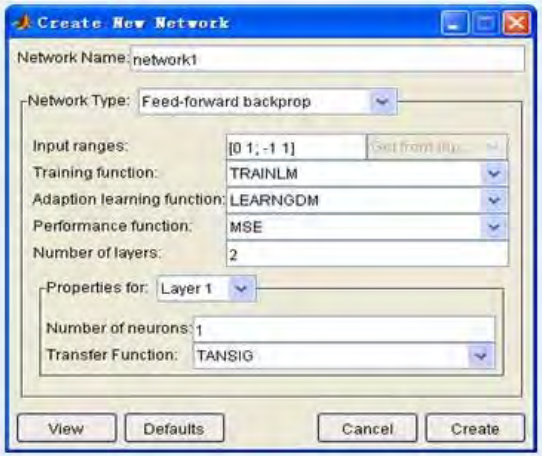




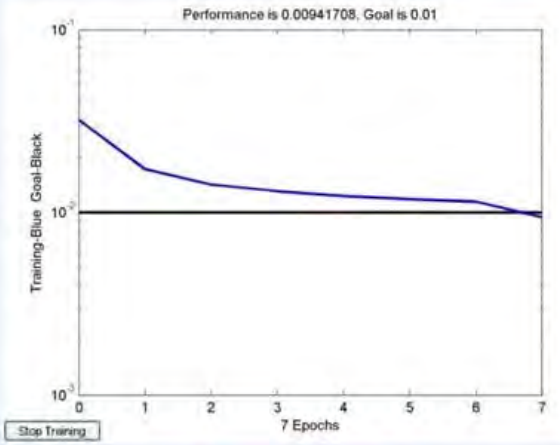




Model structure

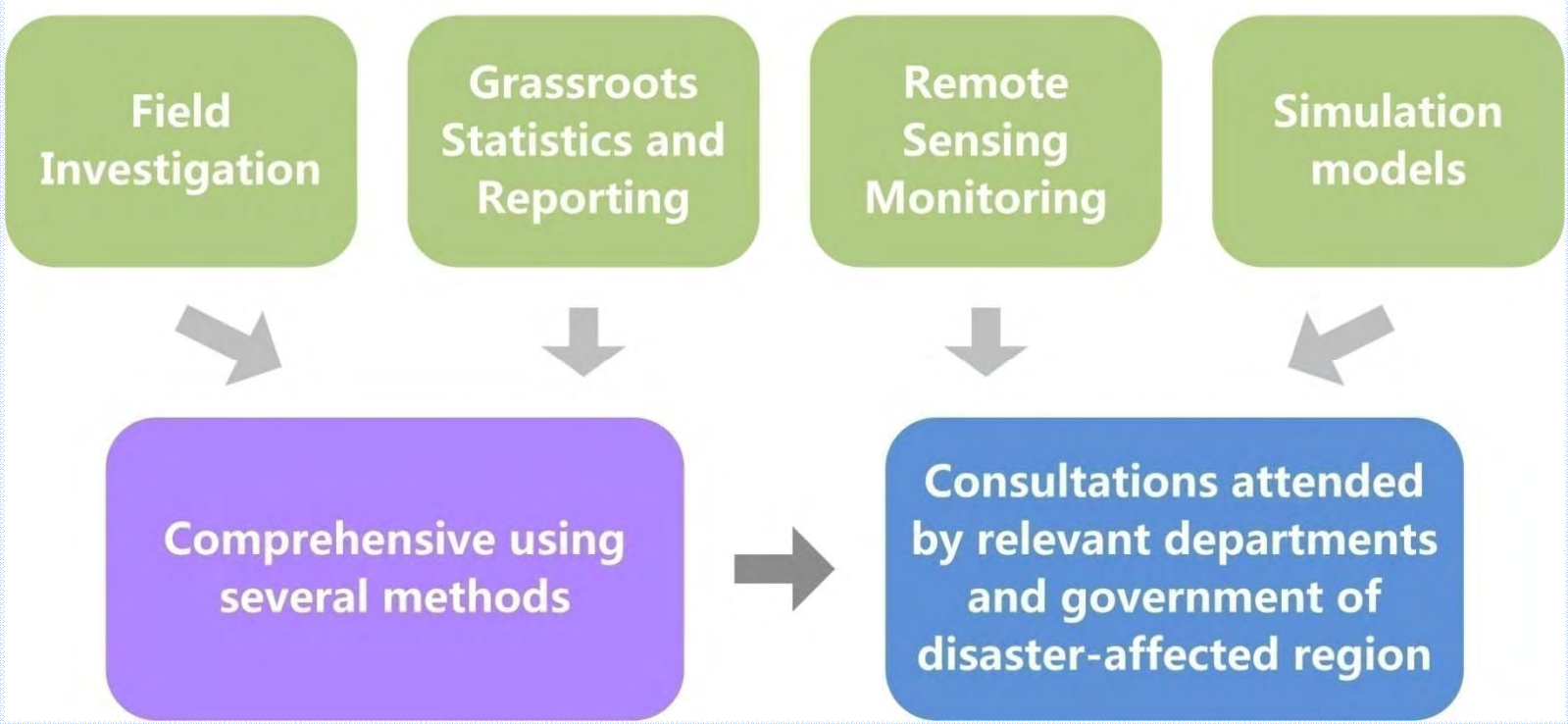


Model parameters



Model Precision

Carry out comprehensive assessment making use of the several methods



In recent years, using the mentioned-above methods, China central government carried out the losses assessment for about 50 major natural disasters every year to support the decision-making of the disaster emergency and relief.

Formulate the working mechanism of disaster assessment

***The Instruction of Enhancing Natural Disaster Relief Assessment*,** introduced by Ministry of Civil Affair in 2012, based on relief needs, is aimed to actively push the formulation of mechanism of natural disaster relief assessment, standardize assessment program, improve workflow, complete the indices system, explore working approaches.

Assessment of natural disaster relief mainly includes 4 major categories, which are relief preparedness assessment, emergency relief assessment, post-disaster relief assessment and annual comprehensive assessment, and 12 subcategories focusing on specific fields.

Relief Preparedness Assessment	Disaster risk assessment	Needs assessment of disaster relief	Capabilities assessment of disaster relief	
Emergency Relief Assessment	Disaster losses assessment	Needs assessment of emergency relief	Effects assessment of emergency relief	
Post-Disaster Relief Assessment	Needs assessment of disaster relief for rebuilding damaged rural houses	Needs assessment of disaster relief in transition	Needs assessment of disaster relief for winter and spring livehood	Effects assessment of post-disaster relief
Annual Comprehensive Assessment	Annual disaster losses assessment	Annual effects assessment of disaster relief		

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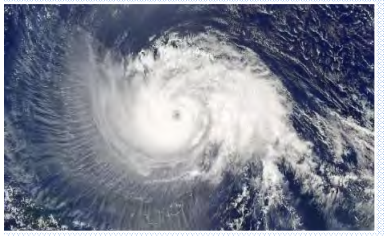
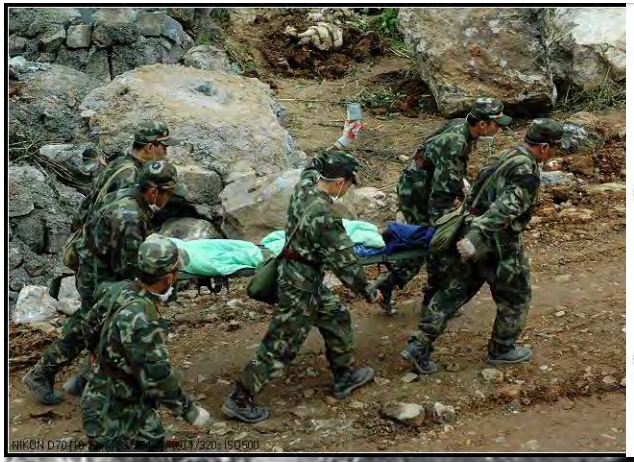
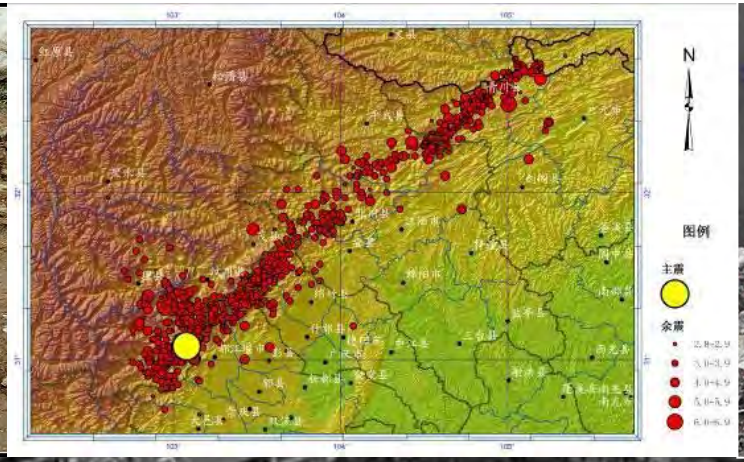


The low temperature, snow and freezing disaste r in South China in the beginning of 2008



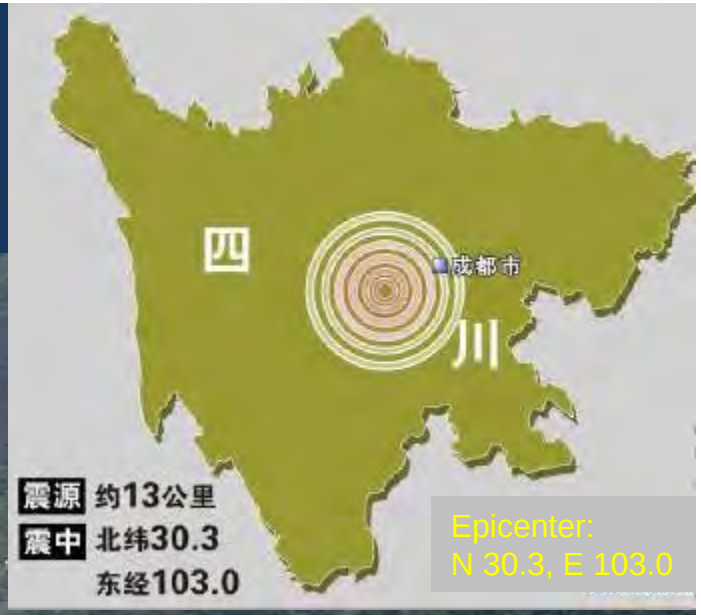


The Great Wenchuan Earthquake on May 12th, 2008

Yushu Earthquake on April 14th, 2010

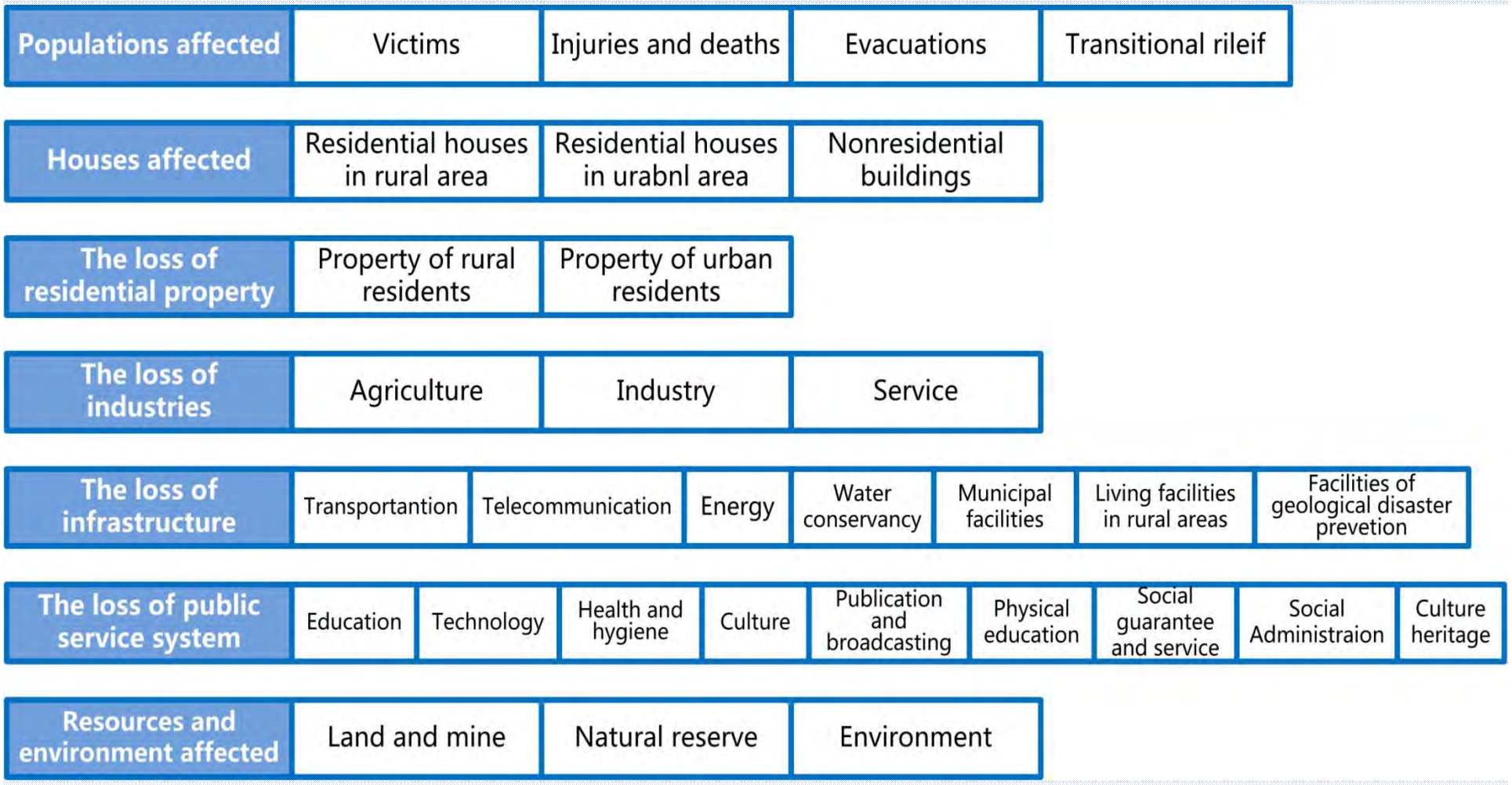
The Great Zhouqu mud-rock flow on August 8th, 2010

Lushan earthquake with magnitude 7.0 in Sichuan province on 20 April 2013

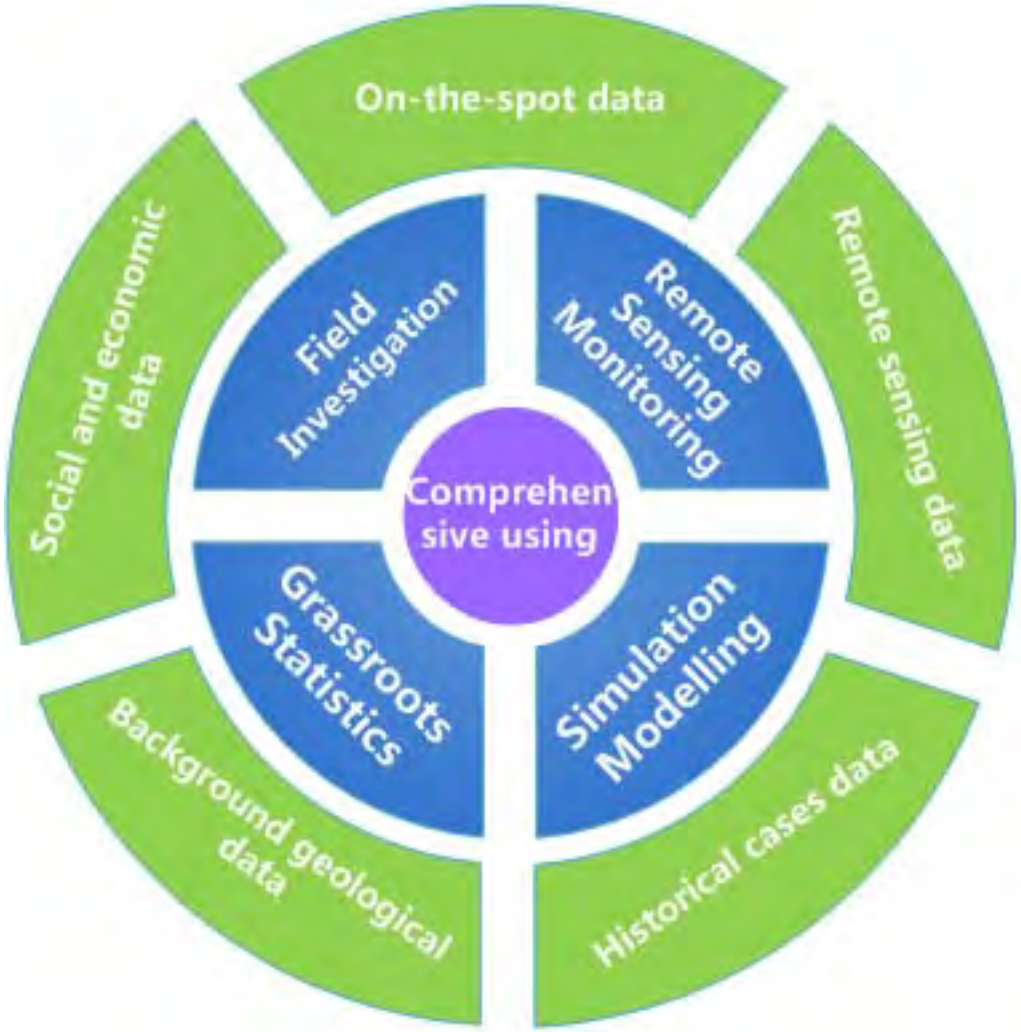


- 1,919 towns and villages in 117 counties and 2.84 million people affected
- 832000 people evacuated an replaced
- 196 dead, 21 missing, 14000 injured

Statistical System for Catastrophic Natural Disaster Losses



Multiple-method comprehensive assessment technology for catastrophic disasters



Working mechanism participated by multiple departments for catastrophic disaster comprehensive assessment

Coordination	National Committee for Disaster Reduction (Ministry of Civil Affairs)	National Development and Reform Commission	Ministry of Finance	Professional Ministries
Organization	Office of National Committee for Disaster Reduction	Department of Disaster Relief of Ministry of Civil Affairs		
Assessment	Expert Committee of National Committee for Disaster Reduction	National Disaster Reduction Center	Provincal Government of Disaster Affected Region	
Examination and Verification	Ministries of Related Industries			

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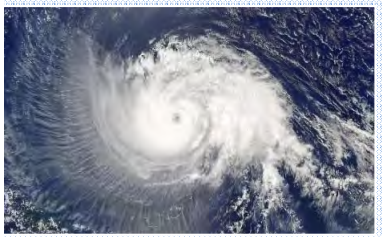


Post-disaster reconstruction

Placing the people at the central place

Following the law of nature

Taking multiple factors into consideration and coordinated development

Assessment of disaster scope and losses

Assessment of the capacity of resources and environment

Assessment of secondary disaster

Research on urban and rural planning

Wenchuan Earthquake

Yushu Earthquake

Zhouqu mud-rock flow

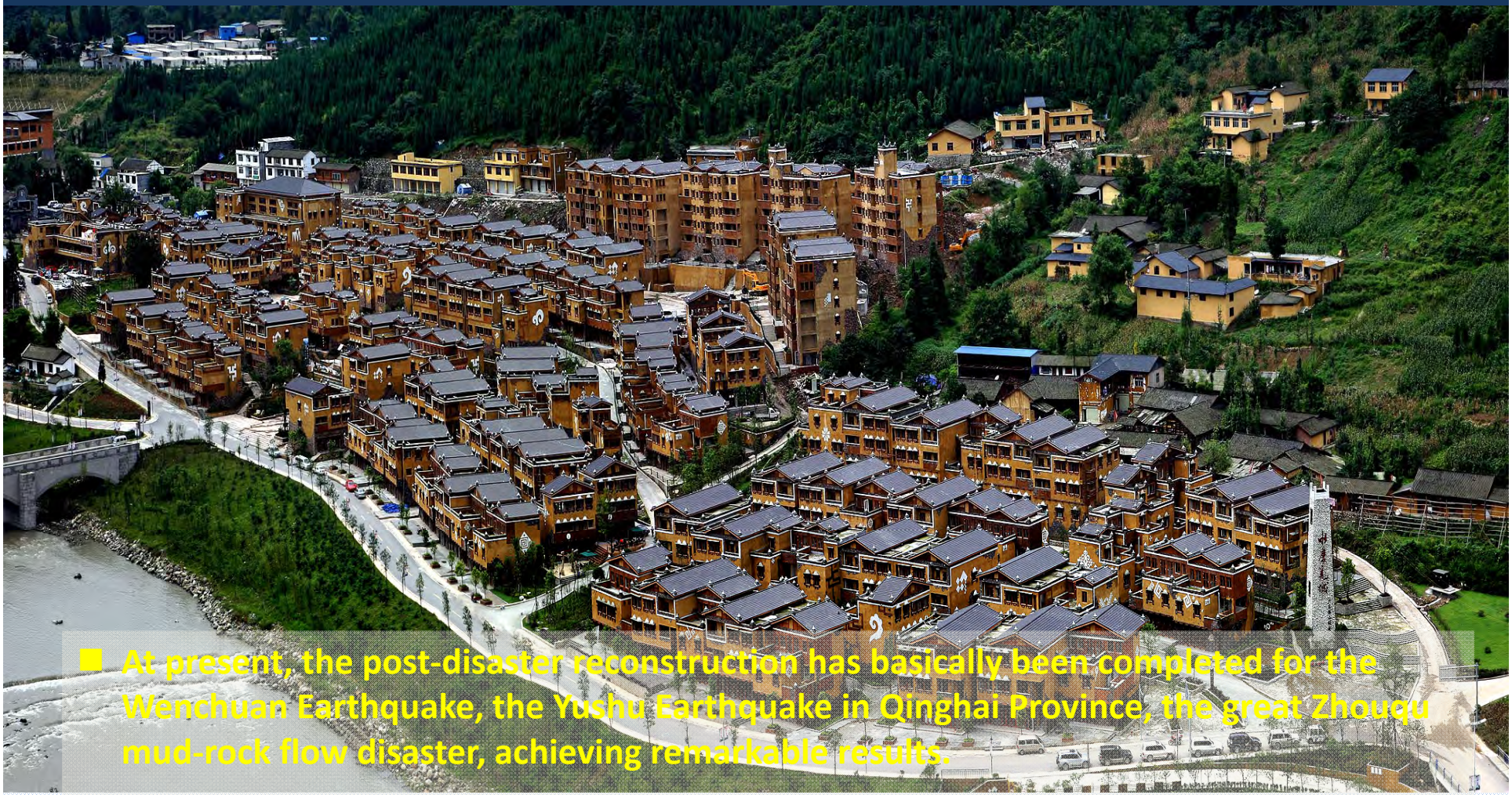
Lushan Earthquake

Plans of post-disaster reconstruction

Post-disaster reconstruction

- The different levels of local government in the disaster-affected regions, together with the people, act as the main force in the reconstruction.
- The principle for disaster reduction "The government plays the leading role with different levels of governmental management, and the society carries out mutual relief and self-help by production" are followed.
- The local government and people make efforts to obtain funds for reconstruction from various sources and allocate them properly.
- Point-to-point support policy is formulated so that non-disaster-affected regions can assist disaster-affected regions and cities can assist rural areas, thus to speed up the settlement of the livelihood of disaster-affected people and the post-disaster reconstruction.

Post-disaster reconstruction



- At present, the post-disaster reconstruction has basically been completed for the Wenchuan Earthquake, the Yushu Earthquake in Qinghai Province, the great Zhouqu mud-rock flow disaster, achieving remarkable results.

- The post-disaster reconstruction for the Lushan Earthquake in Sichuan Province is learning from the post-disaster reconstruction of these previous disasters and the relevant work is being carried out smoothly.

Thanks…