

# Flood Risk Monitoring and Early Warning

Guizhen Guo

National Disaster Reduction Center of China

May 19, 2022

Co-organized by

◆ WFP Centre of Excellence for Rural  
Transformation (WFP China COE)

◆ National Disaster Reduction  
Center of China (NDRCC)



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## Basic Information

### Characteristic

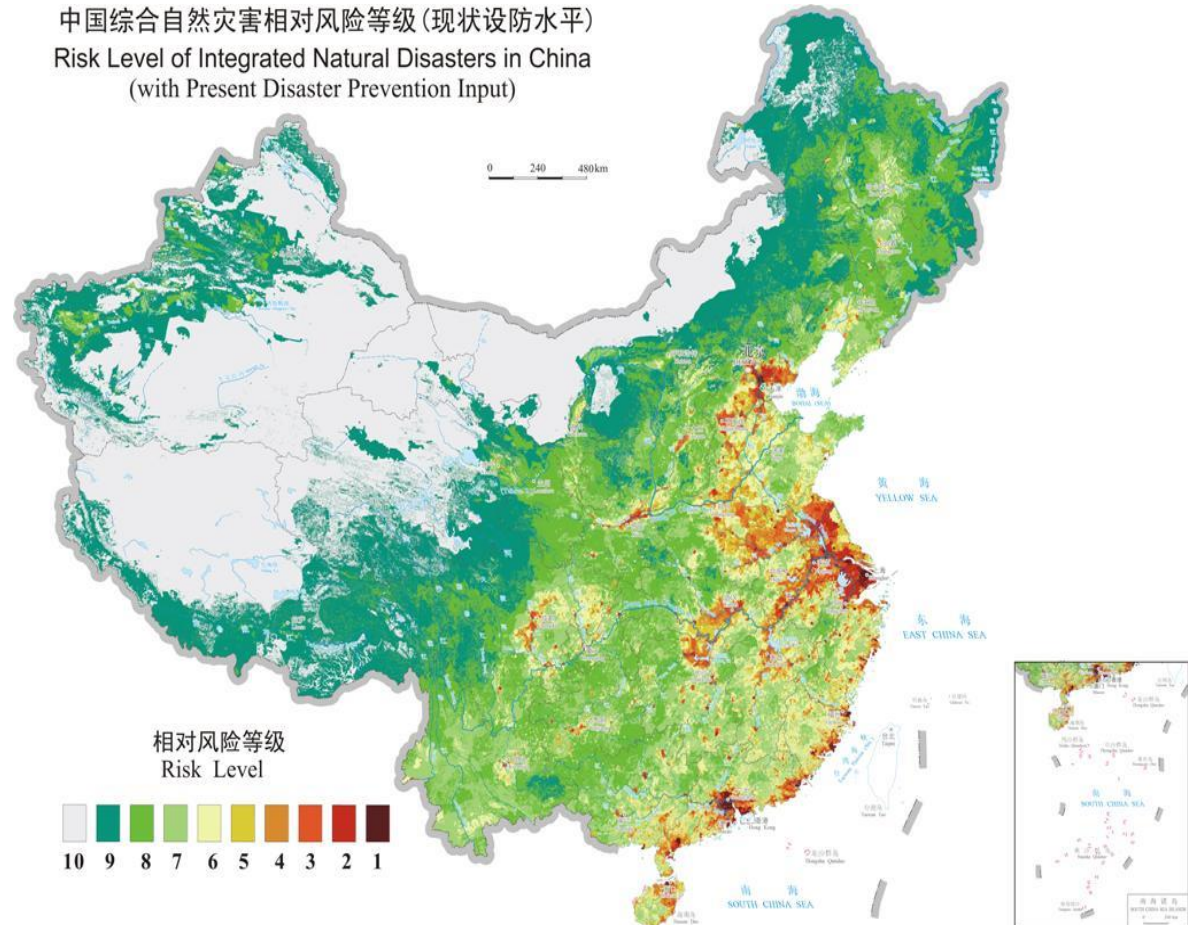
Many kinds of disasters

Wide distribution

High frequency

serious damage

中国综合自然灾害相对风险等级 (现状设防水平)  
Risk Level of Integrated Natural Disasters in China  
(with Present Disaster Prevention Input)



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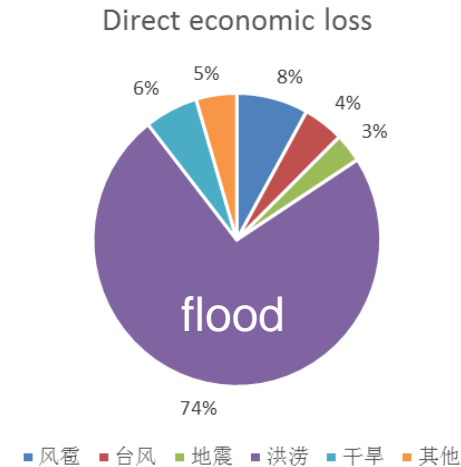
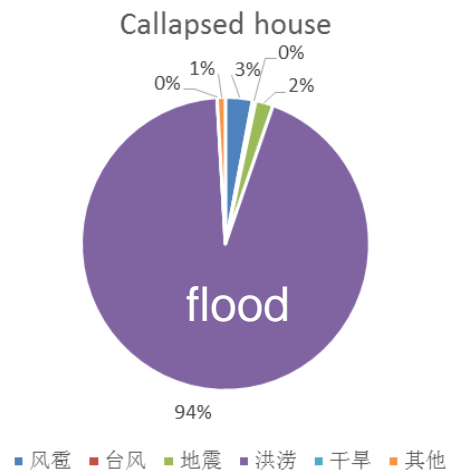
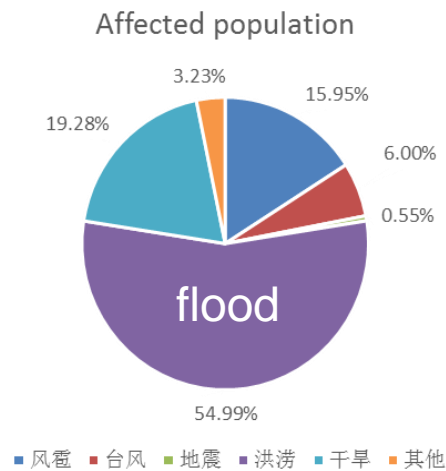
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## Basic Information

### Disaster loss of 2021



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## Basic Information

Main functions of natural disasters:

- Prepare plans
- Monitoring and early warning
- Hazard assessment
- Emergency response command
- The disaster statistics
- Disaster information system construction
- Natural disaster prevention
- Natural disaster research

Established in March 2018



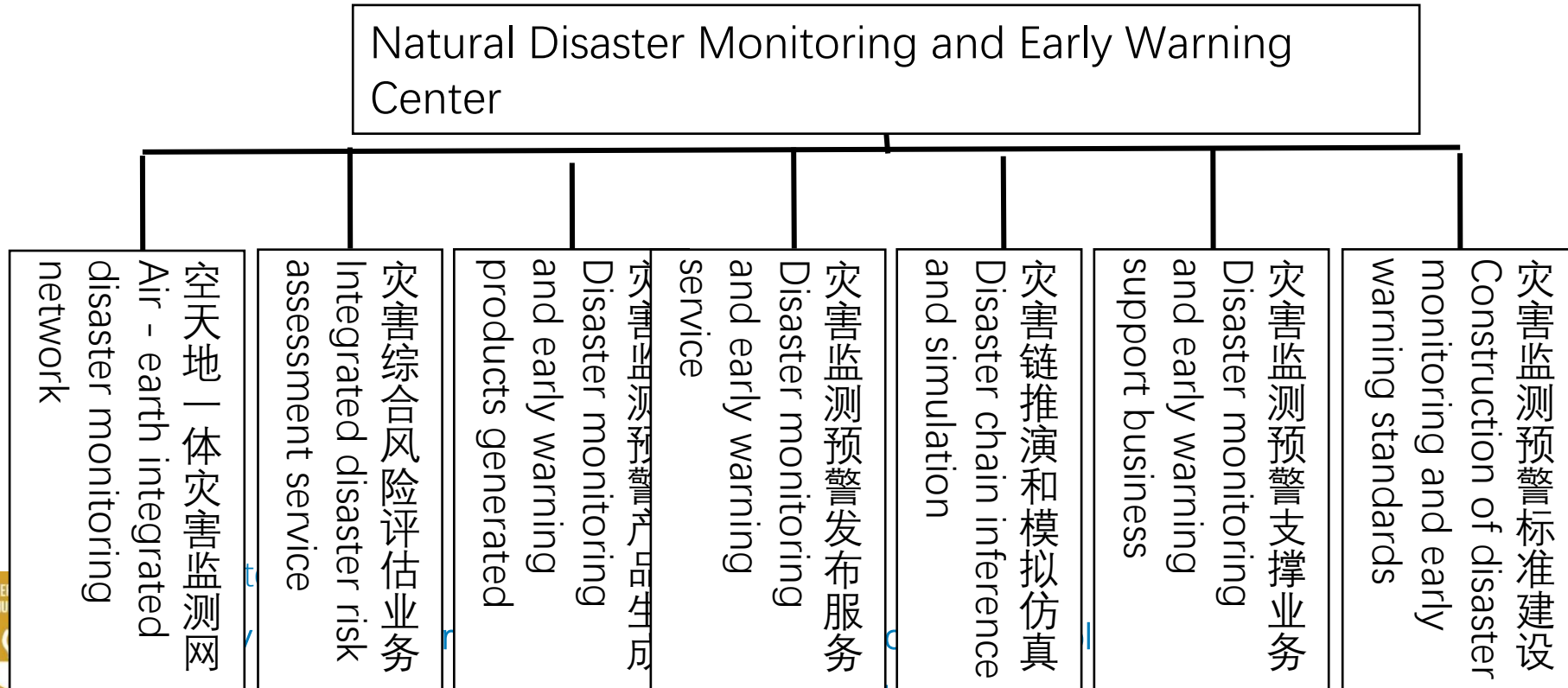
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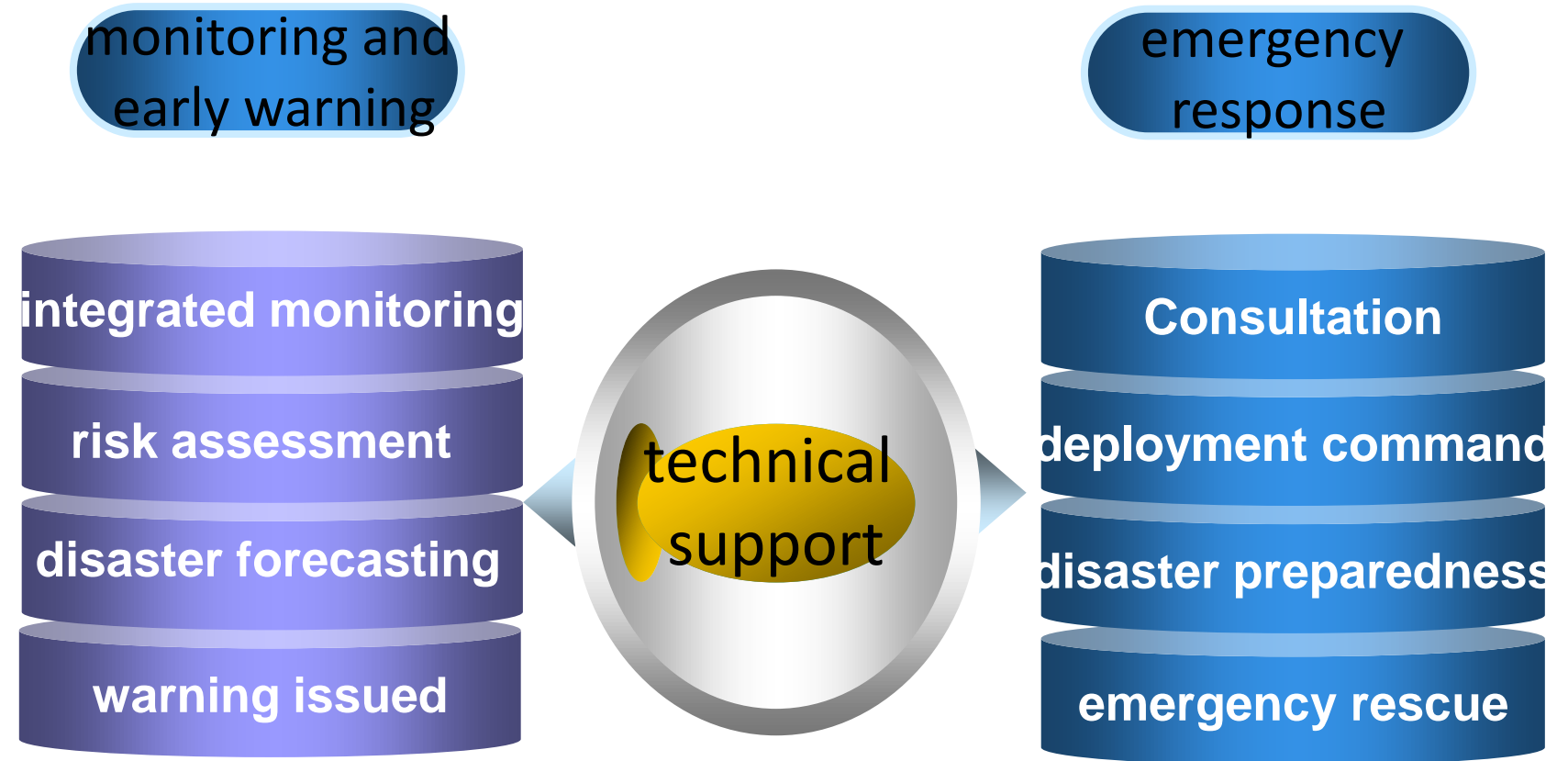
- ❑ 目标：推动灾害监测预警信息汇集，加强监测预警信息的支撑能力，提升灾害风险评估精准性
- ❑ Objective: To promote the pooling of disaster monitoring and early warning information, strengthen the supporting capacity of monitoring and early warning information, and improve the accuracy of disaster risk assessment



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## 监测预警体系对灾害应急响应 响应的支持

Monitoring and early  
warning system support for  
disaster emergency respons

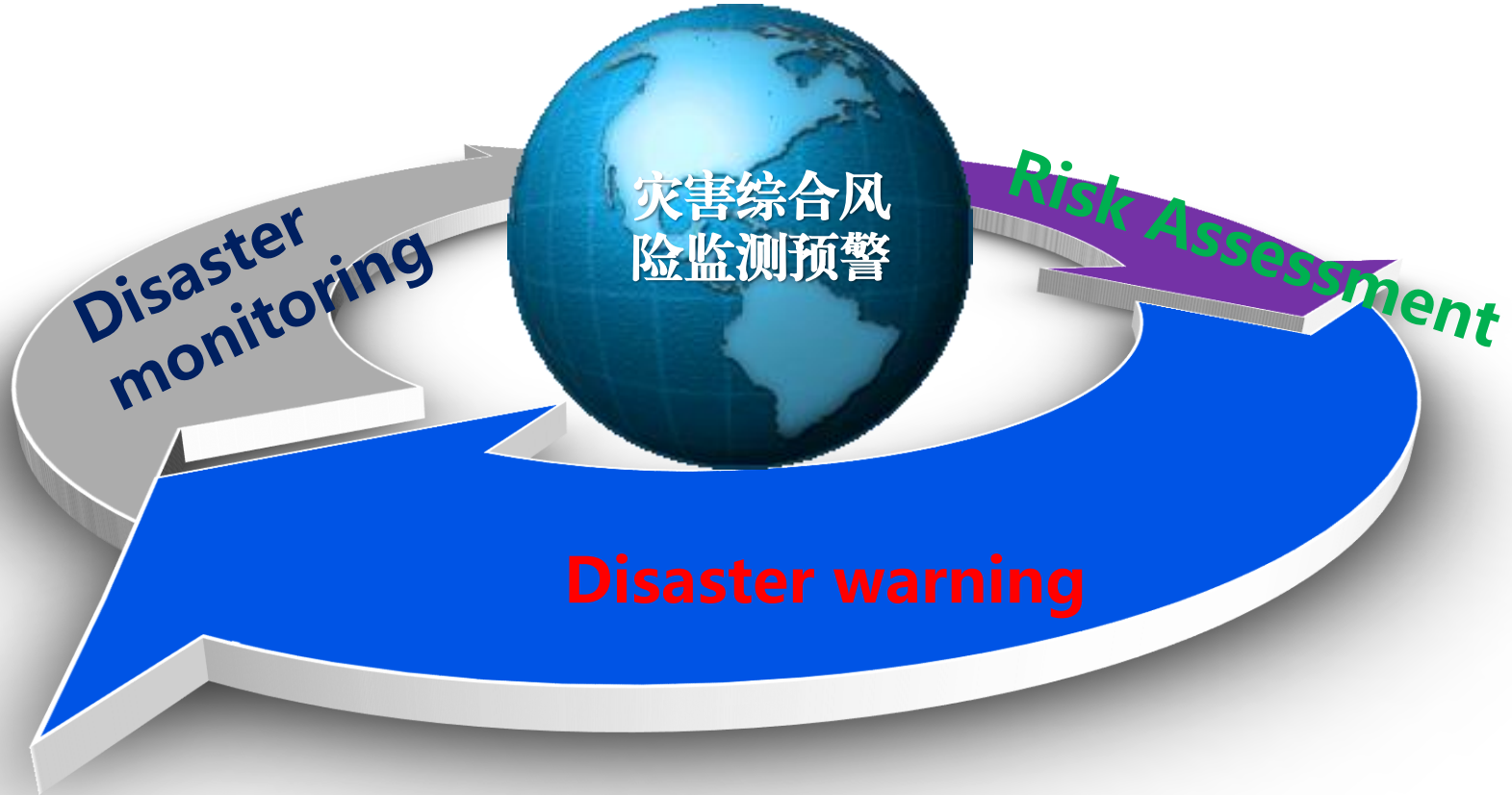


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- 02 Risk Assessment
- 03 Disaster Warning



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# 1. Monitoring System



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## ➤ 空-天-地一体化 灾害监测体系

➤ An integrated air-  
space-earth  
monitoring system



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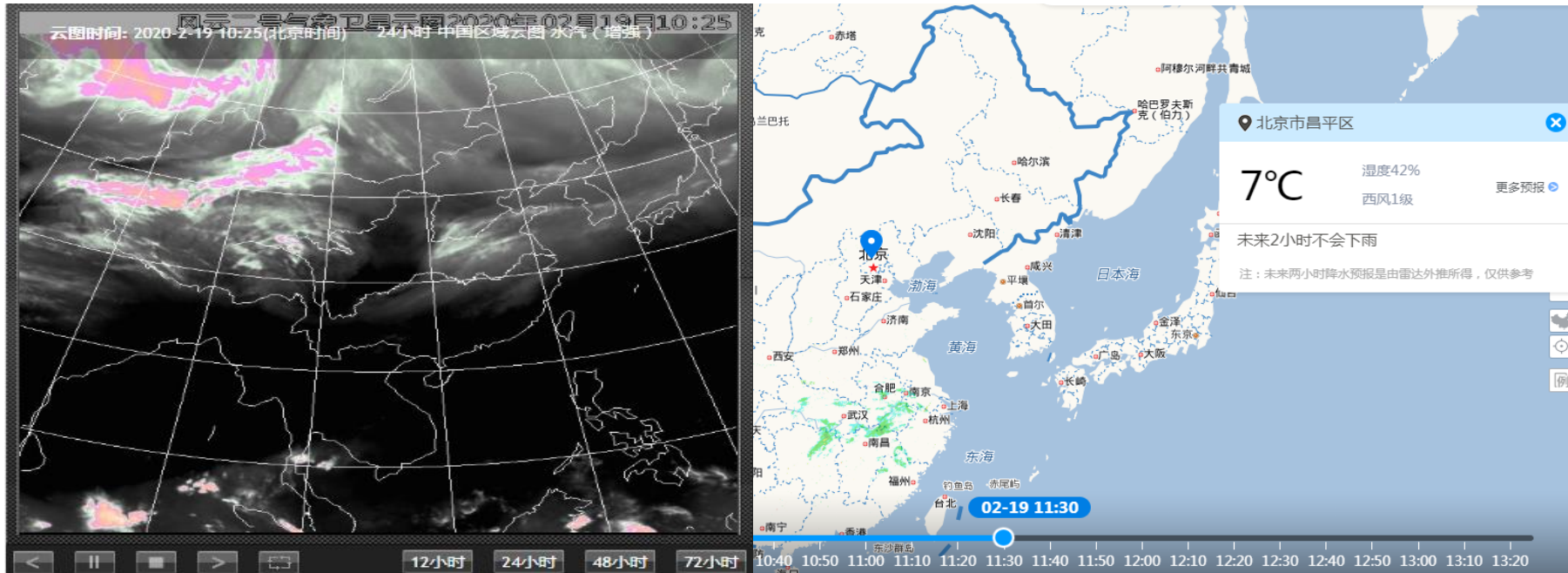
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# Seminar on Disaster Risk Reduction and Emergency Management



- 地面、高空、雷达、卫星全方位24小时气象要素综合监测
- Comprehensive monitoring of surface, upper air, radar and satellite weather elements in 24 hours



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- 水文站点实时动态监测水情、雨情、潮位等信息
- Hydrological station real-time dynamic monitoring of water conditions, rain conditions, tide level and other information



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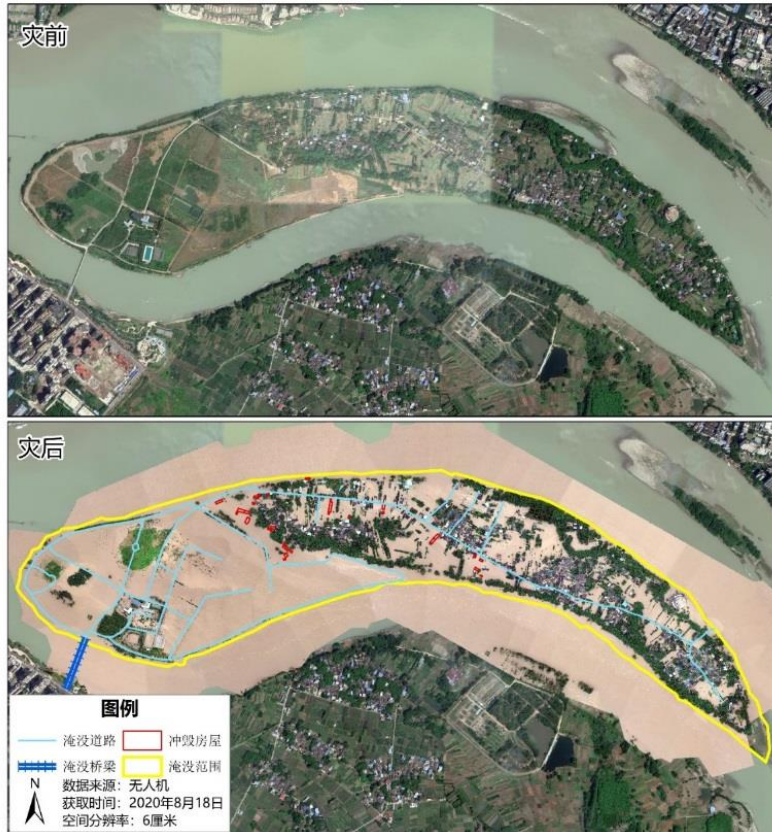
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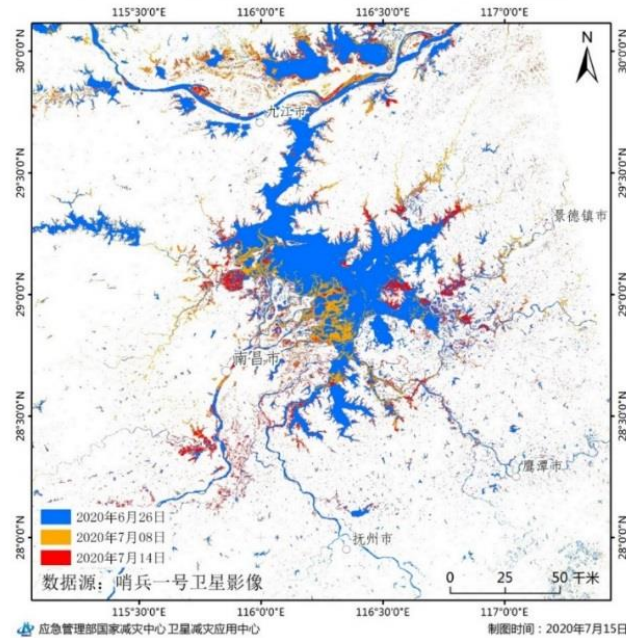
四川省乐山市市中区凤洲岛大佛坝村洪涝灾害监测



应急管理部国家减灾中心 消防救援局

制图时间：2020年8月19日

长江流域鄱阳湖及周边区域洪涝范围遥感监测图



卫星遥感和航空遥感

Satellite and aerial  
remote sensing

吉林省德惠市五家子村屯国堤决口无人机遥感监测



应急管理部国家减灾中心 消防救援局

制图时间：2020年9月15日



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- 灾情数据统计：中国有近80万基层报灾员，实现了省、市、县、乡、村五级报灾。根据要求，**灾后2小时内**报告初步灾情、重大灾情直接上报和24小时零报告制度。 Disaster statistics: China has nearly 800,000 disaster reports at the grass-roots level, realizing disaster reports at the provincial, city, county, township and village levels. According to the requirements, the initial disaster report within 2 hours after the disaster, major disaster directly reported and 24 hours of zero report system.

[illegible]

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## 2. Risk Assessment



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- 基础信息数据：包括基础地理、孕灾环境、致灾因子和承灾体等数据
- Basic information data: including basic geography, disaster-pregnant environment, disaster-causing factor and disaster-bearing body data



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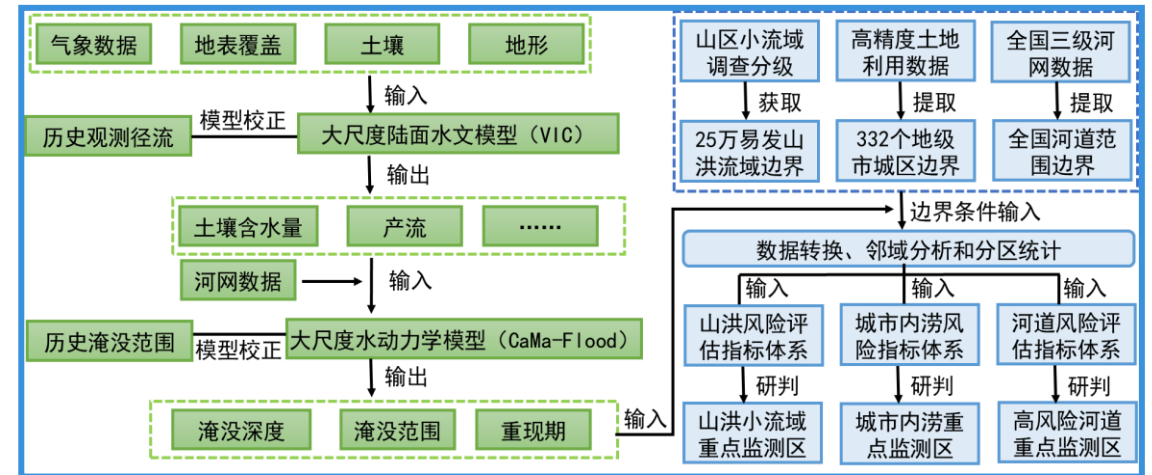
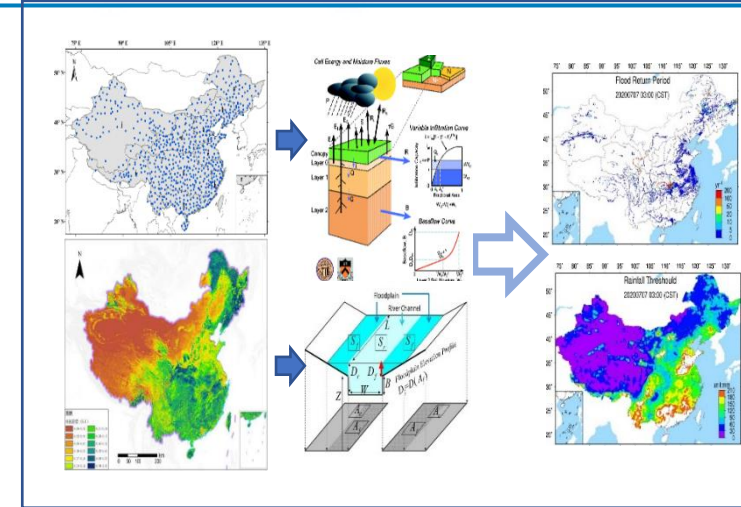


## Flood Risk Assessment Model



Flood and waterlogging

WetSpa distributed hydrological model

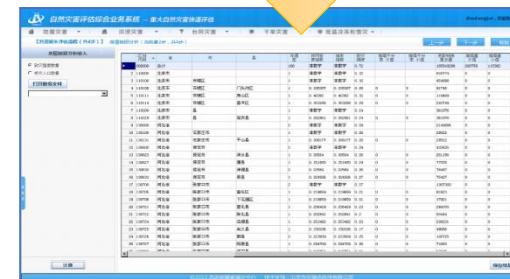
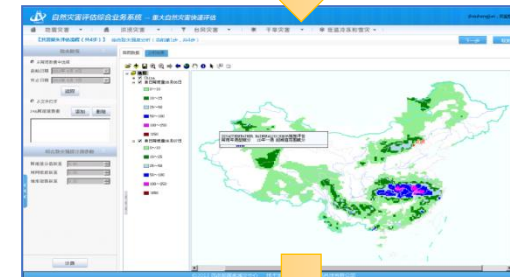
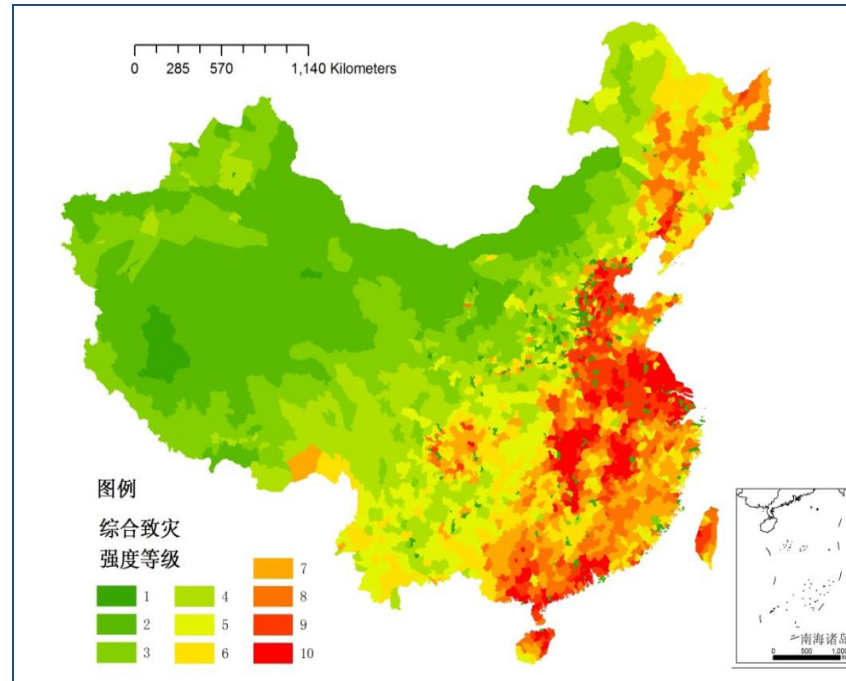
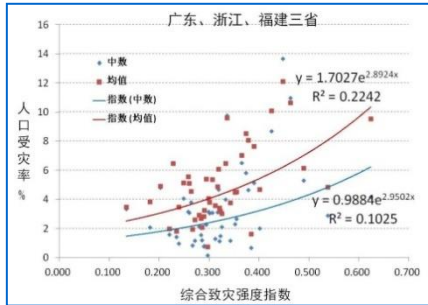
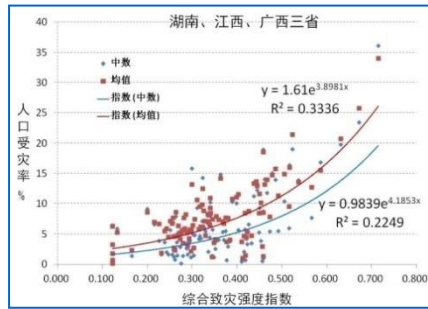


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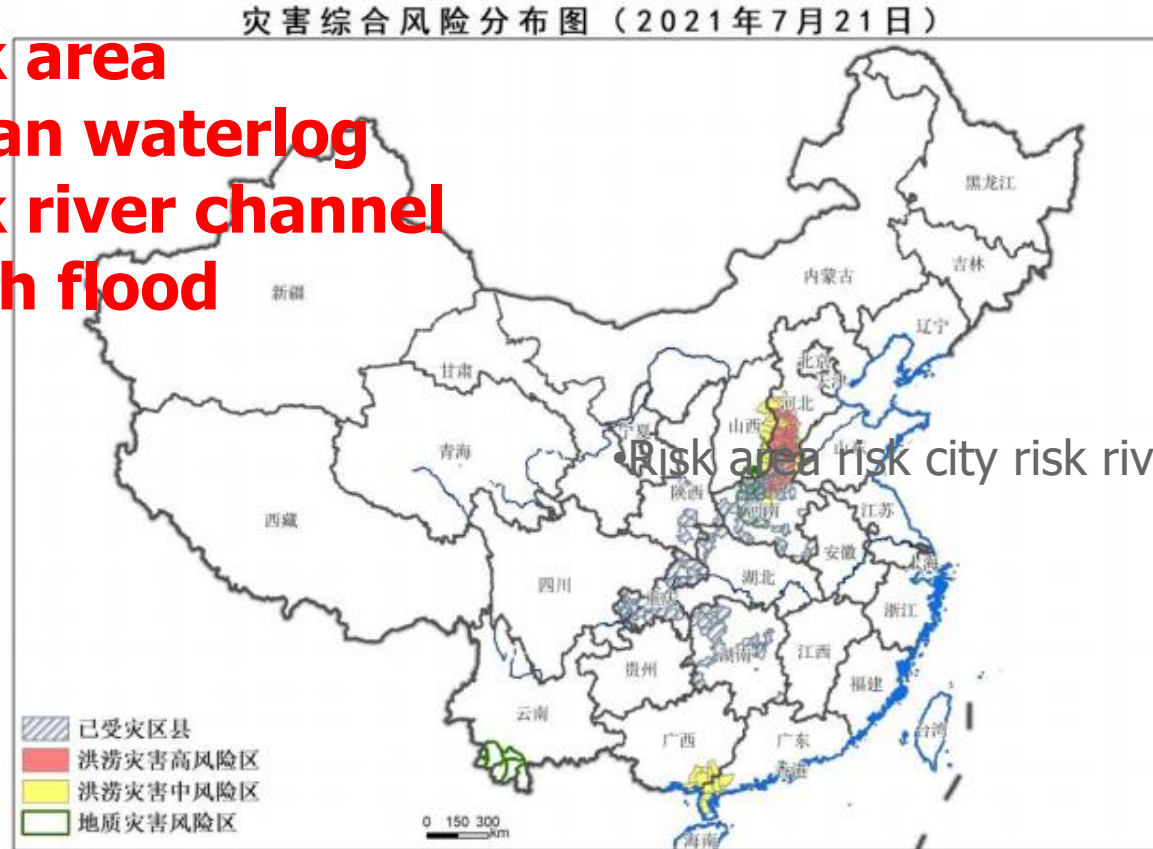
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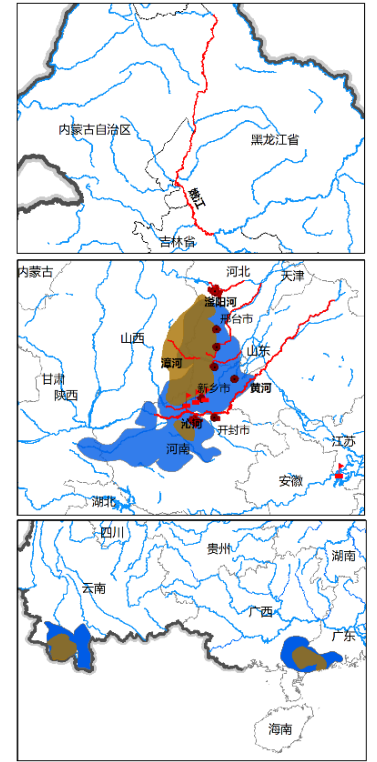
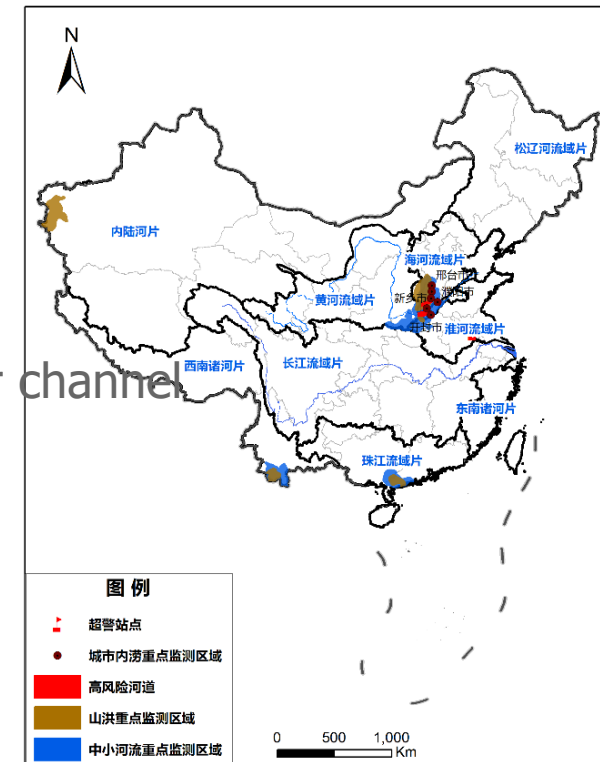
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- Risk area
- Urban waterlog
- Risk river channel
- Flash flood



应急管理部国家减灾中心·灾害综合风险监测预警中心

制图时间：2021年7月21日8时



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## 3. Disaster Warning



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ICS 07.060  
A 47



中华人民共和国国家标准

GB/T 27962—2011

气象灾害预警信号图标

Graphical symbols for meteorological disaster warning signals

2011-12-30 发布

2012-03-01 实施

中华人民共和国国家质量监督检验检疫总局  
中国国家标准化管理委员会 发布

ICS 07.060  
A 47



中华人民共和国气象行业标准

QX/T 451—2018

暴雨诱发的中小河流洪水气象风险  
预警等级

2018-11-30 发布

2019-03-01 实施

中国气象局 发布

Warning standard

台风				
暴雨				
高温				
寒潮				
大雾				
雷雨大风				
大风				
沙尘暴				
冰雹				
雪灾				
道路结冰				



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信息服务层

业务运行管理

数据产品共享交换

可视化标绘研判与产品制作服务

数据类型	数据名称	数据来源部门	数据接入方式	数据需求灾种	数据优先级
	全国行政区划空间数据(最新)	民政部	矢量数据	洪涝/台风/干旱/地震/低温/冷冻雪灾	优先
				地质灾害	优先
				森林草原火灾	优先
				森林草原火灾	优先
				森林草原火灾	优先
				森林草原火灾	优先
				森林草原火灾	优先
				森林草原火灾	优先
				洪涝/台风/干旱/地震/低温/冷冻雪灾	优先

业务应用层

人才队伍



## 国家灾害综合风险监测预警系统

NATIONAL DISASTER COMPREHENSIVE RISK MONITORING AND EARLY WARNING SYSTEM

wuwei 退出

运维管理

重大灾害  
监测预警系统

灾害综合  
风险监测系统

灾害综合  
风险评估系统

综合会商  
研判平台

日周会商 重大会商

年月会商 国际灾害

综合风险监测预警  
数据库

全球灾害  
数据库

数据资源层

基础设施层

网络系统 主机系统 安全系统 存储系统 视频终端

灾害综合风险监测业务工作平台

Early warning platform



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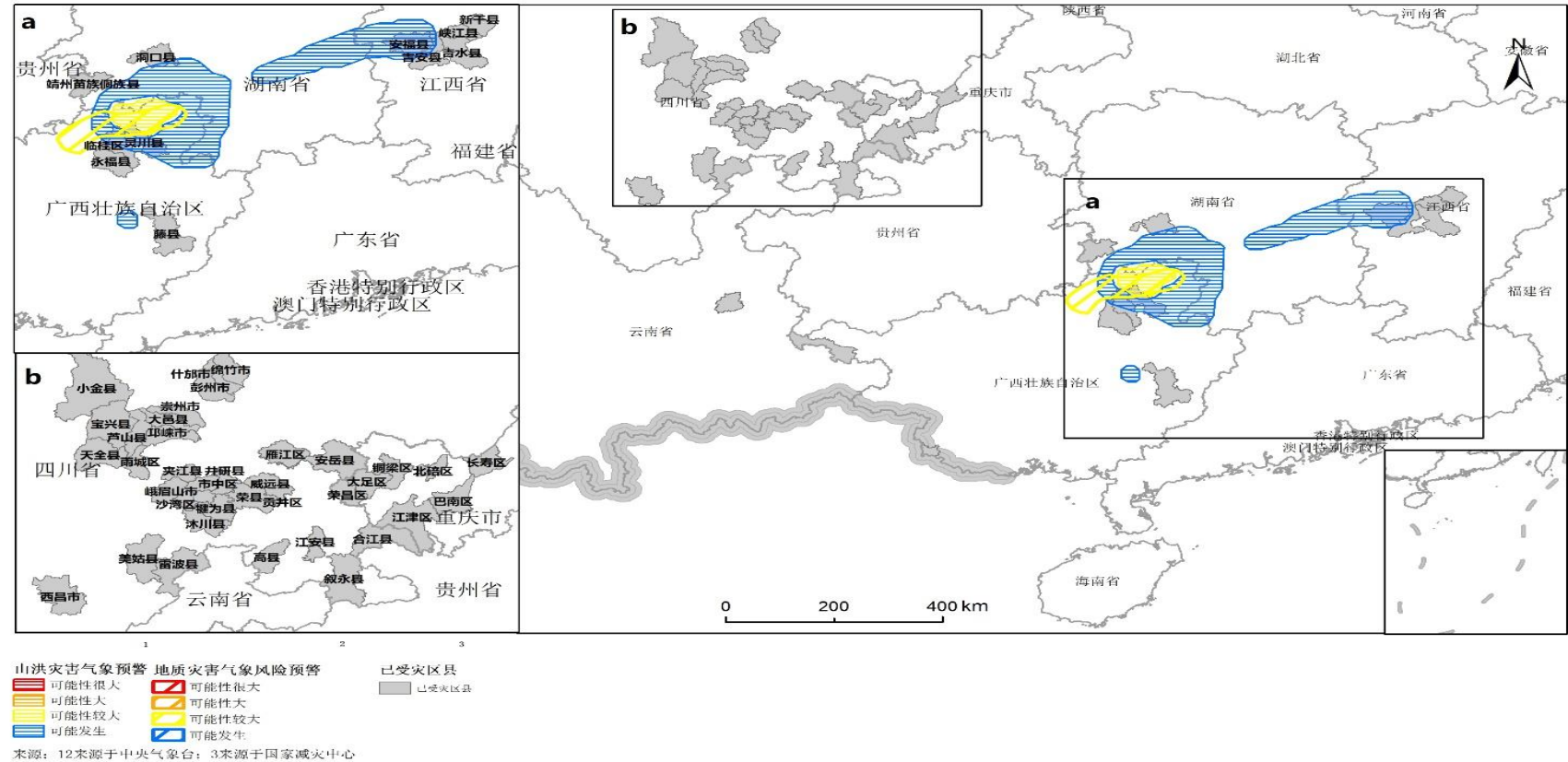
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## Disaster Warning map

### 预警一张图



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