

National Emergency Management of Meteorological Disasters

**—Towards Improving the Effectiveness of Meteorological
Disaster Prevention and Mitigation**

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Outline:

I. Situations: Meteorological Disasters

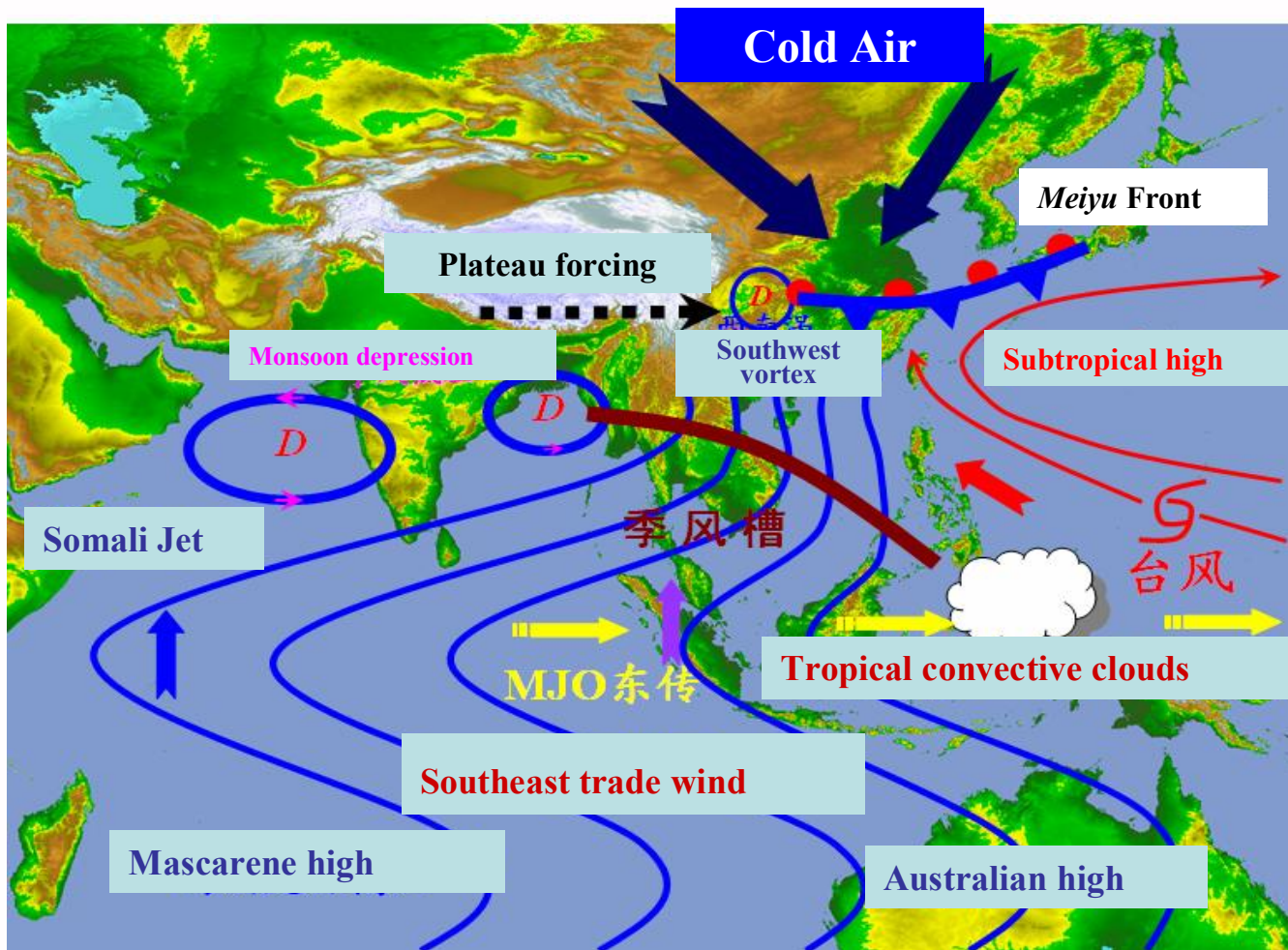
**II. Towards the Meteorological Disasters
Emergency Management**

**III. Cases of Emergency Response and the
Effectiveness**



I. Meteorological Disasters

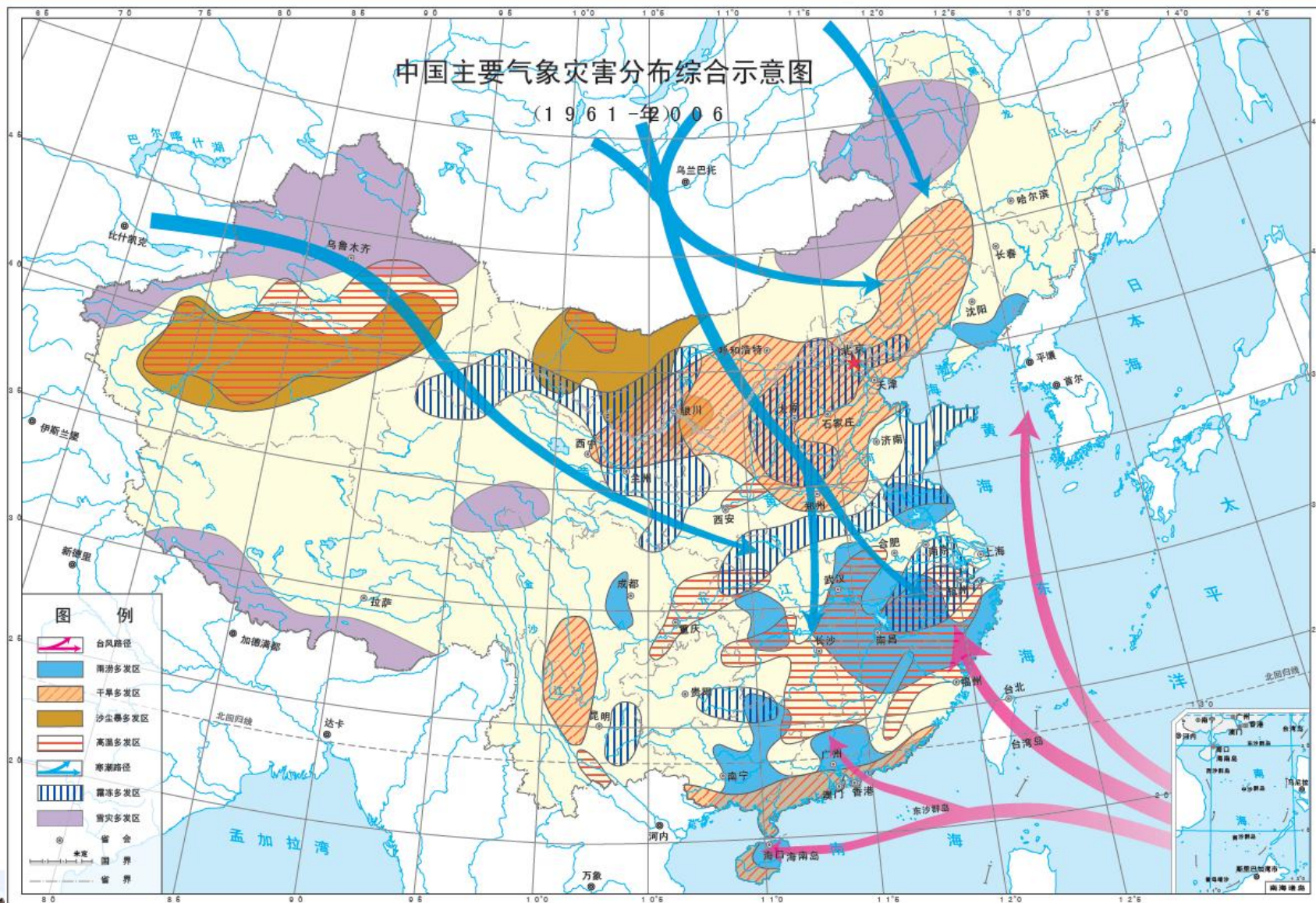
Climate Background



Meteorological Disasters in China, in terms of Frequency, Variety and Severity.

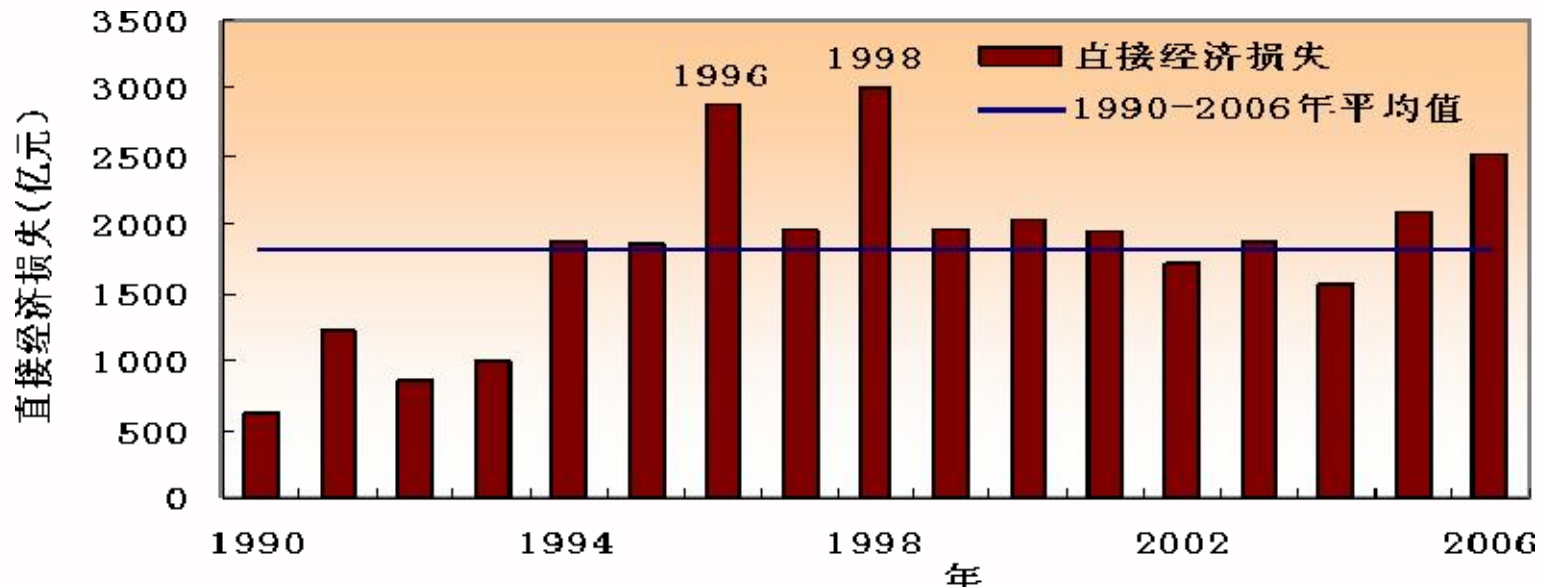


The Distribution of Meteorological Disasters in China



Features 1: Severity

The Economic Losses Caused by Meteorological Disasters



Averagely Losses per year: **250 billion RMB**

Averagely Death per year: **4427 death**

Meteorological Disaster :**70%** of Natural Disasters

Losses: **1%-3%** of GDP



Features 2: Un-expectancy

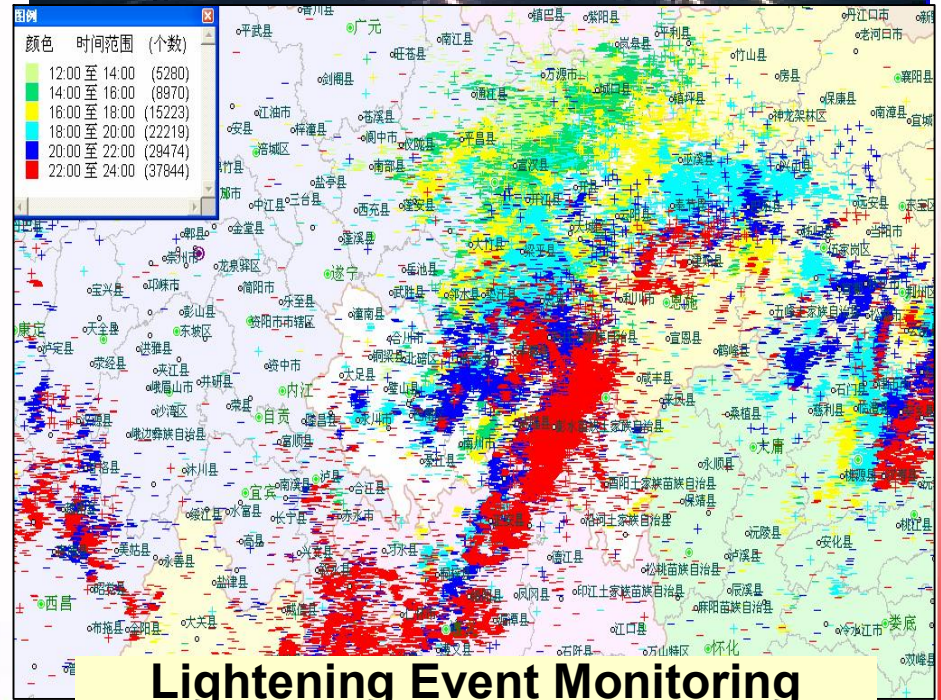
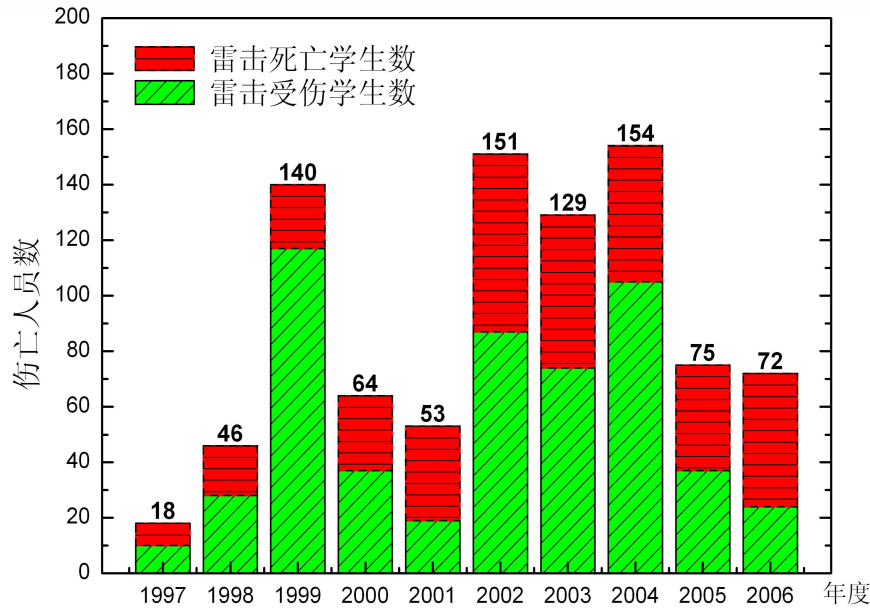
Sudden Severe Weather Occurs Frequently



An Extreme Rain Storm in Jinan, Capital of Shandong Province
Hourly Maximum Rainfall **151** mm
Caused **37** Deaths



Lightening Event



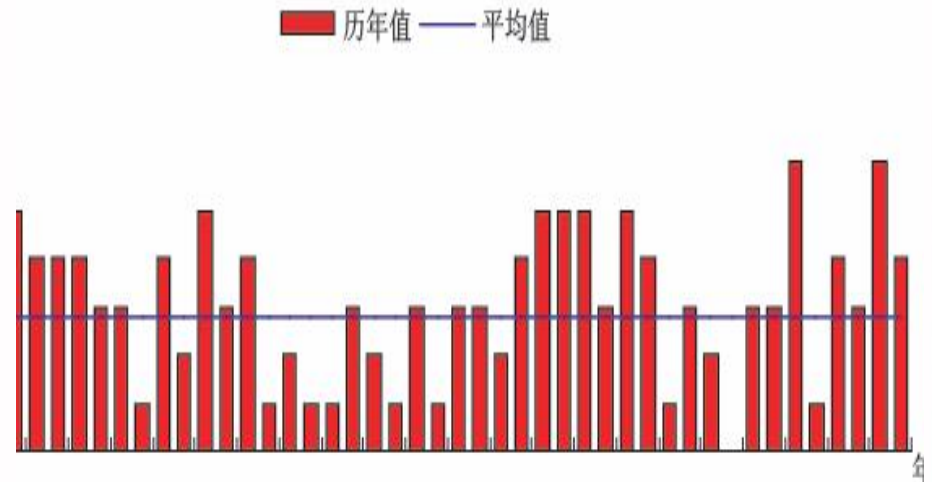
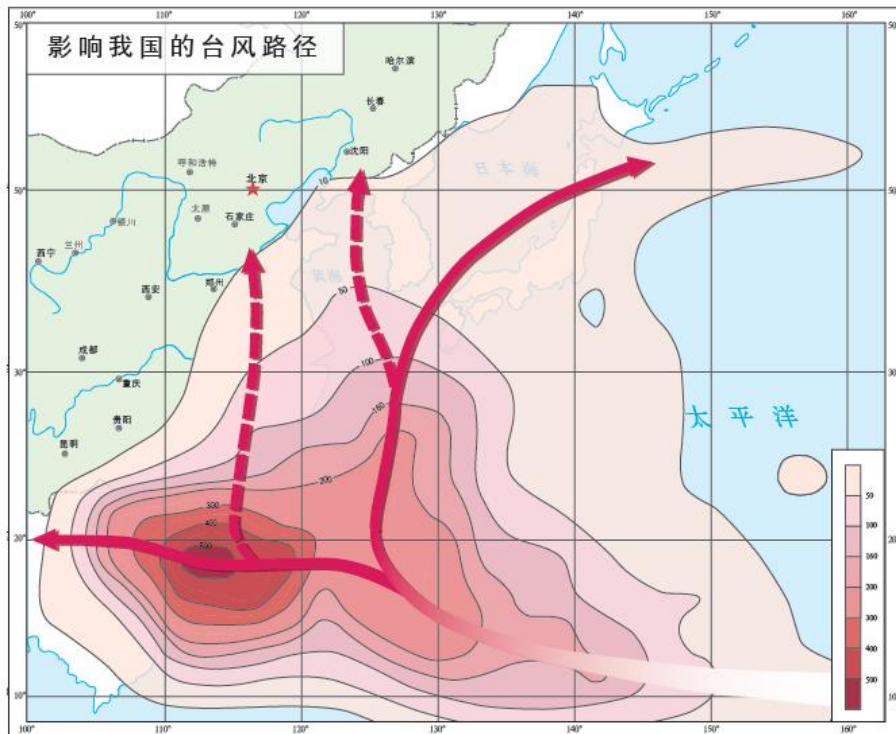
Children injured and Death by lightening every year

A heavy lightening event hit a school in the rural area and caused 7 children death and 43 people injured.

Lightening Event Monitoring



Features 3: Abnormality



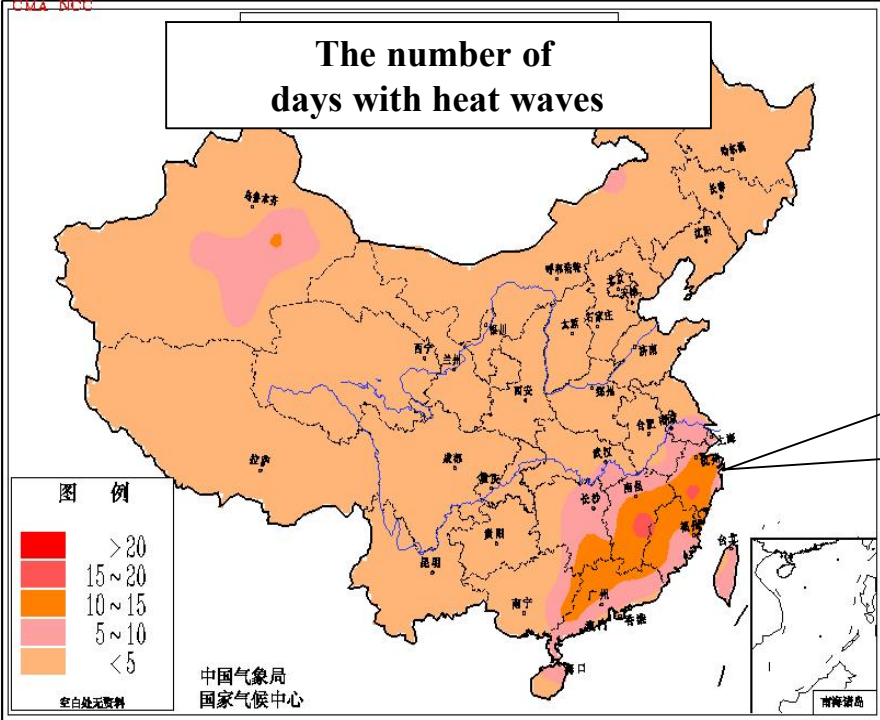
Major typhoon tracks for China

Number of strong TC landing in China during 1961-2006

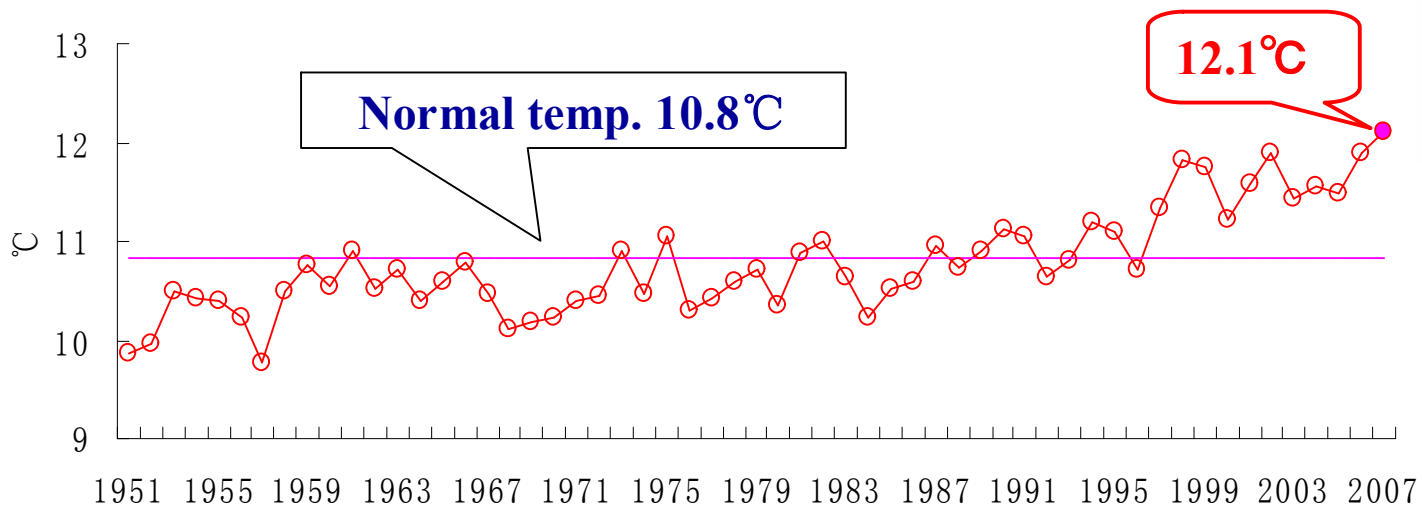
Typhoons with abnormal tracks increase, and extreme weather & climate events increase.



The number of days with heat waves



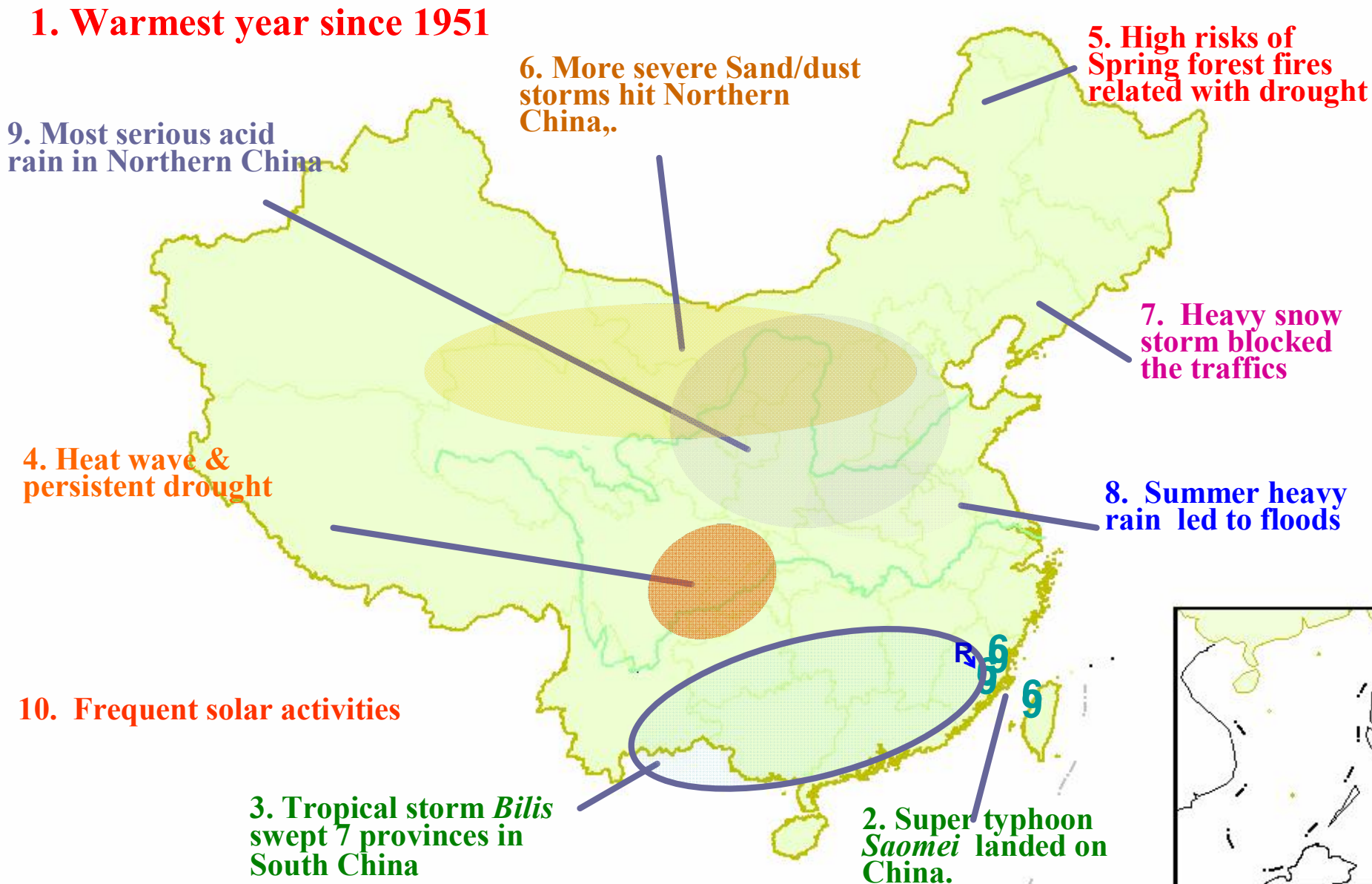
the total number of days with high temperature (heat waves) broke the historical records



Monthly mean temperature variations in China



Extreme Weather & Climate Events in China (2006)



Huge Impacts of Meteorological Disasters on Society

**Serious Impacts on :
Agriculture,
Industries,
Human health and daily activities**



—— How to keep our society in safety and security



II. Towards the Meteorological Disasters Emergency Management

Why do We Need Emergency Management?

Forecasting and Warnings \neq Safety and Security

Key Point: Actions for Prevention and Mitigation

**Government: Awareness of the urgency from two big events
A National Plan for Emergent Response was Set Up in 2005**

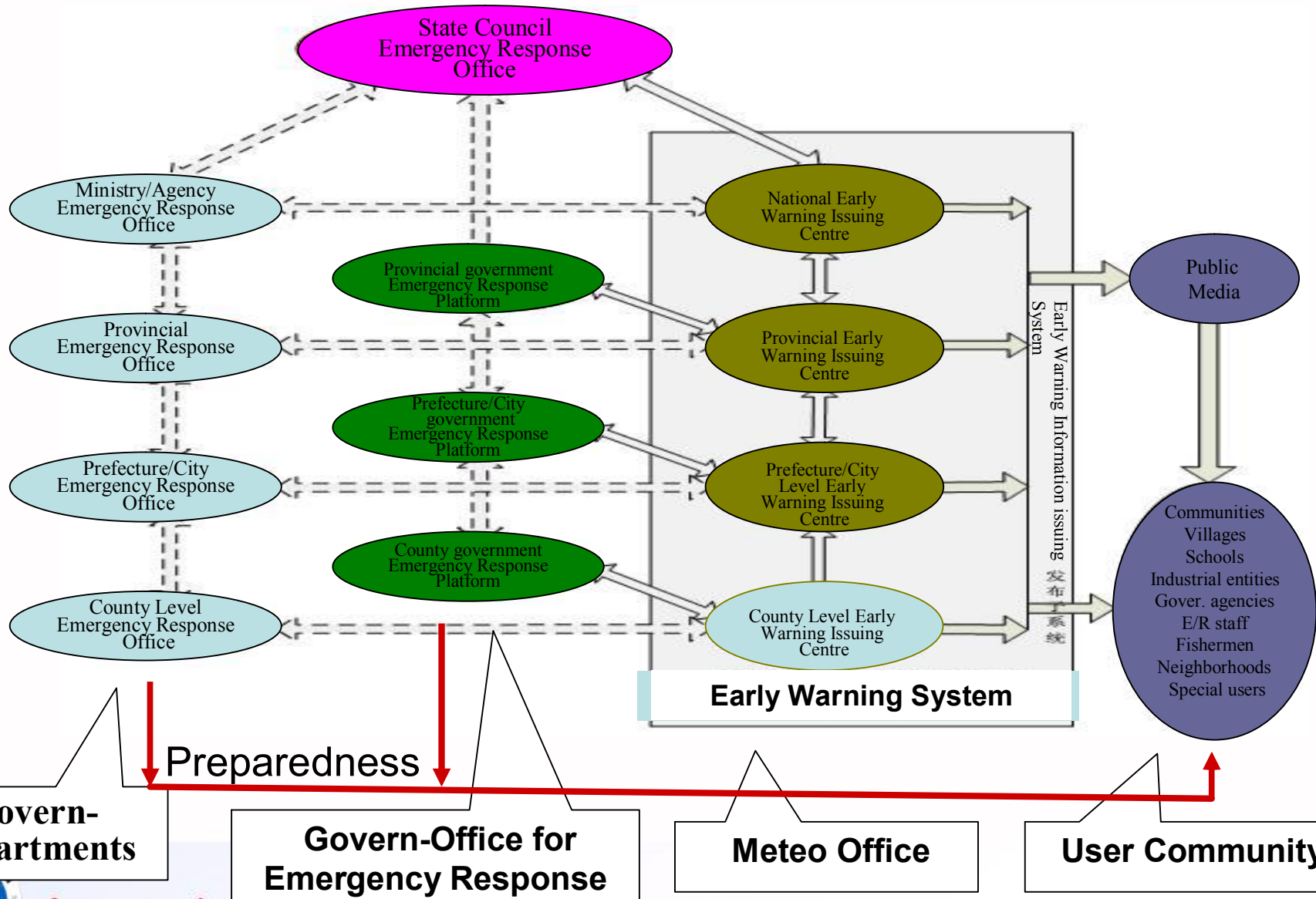
The 911 Event in USA



SARS Event in 2003



Structure of Emergency Management



Emergency Management Information Platform

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中国气象
www.cma.gov.cn

中国气象局应急管理信息平台

CMA Emergency Management Information Platform

» 首页 » 法规预案体系 » 事件评估总结 » 应急管理动态 » 重大突发事件信息 » 气象灾害预警信号 » 值班快报信息 » 科普宣传 » 系统管理

- 上海市人民政府批转市...
- 河南省政府应急办到省...
- 重要天气预报
- 新疆石河子气象局首次...

监测评价产品

24小时全国降水量图



应急管理工作体系

- 组织机构体系
- 法规预案体系
- 中办国办部委机构联系表

手机
短信



图例：
● 安全生产事故信息 ● 重大气象灾害信息
● 公共卫生事件信息 ● 重大气象案件

预警预报产品



灾害性
天气预
警



降水量



重要天
气公报

专业专项服务产品



沙尘暴预报警报



森林草原火险预报



交通天气预报



地质灾害等级预报

公告栏

MORE...

- 河南省三门峡市气象台20...

专题信息

MORE...

- 安徽省芜湖市三山区发生山...
- 山东省气象台预报
- 山东省发布重要天气预报
- 台风黄色和暴雨蓝色预警信...

《值班快报》信息

MORE...

- 中国气象局值班快报第18...
- 中国气象局值班快报第18...
- 中国气象局值班快报第18...
- 中国气象局值班快报第18...

事件评估总结

MORE...

- 海南省10月中旬强降雨过...
- 福建省9月份雷电灾害情况...
- 0715号台风“利奇马”...
- 安徽众志成城御“韦帕”

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中国气象局 China Meteorological Administration

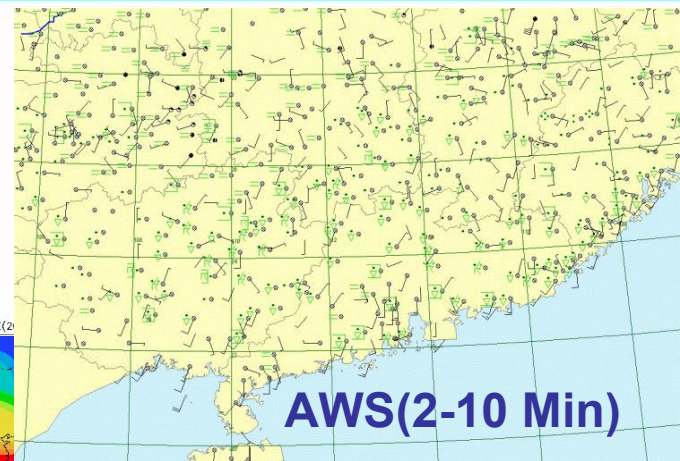
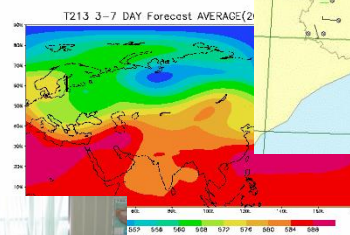
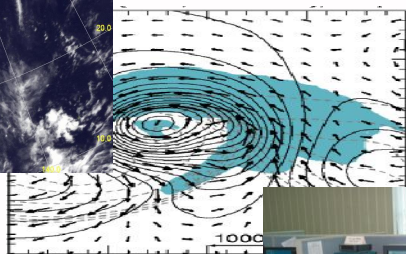
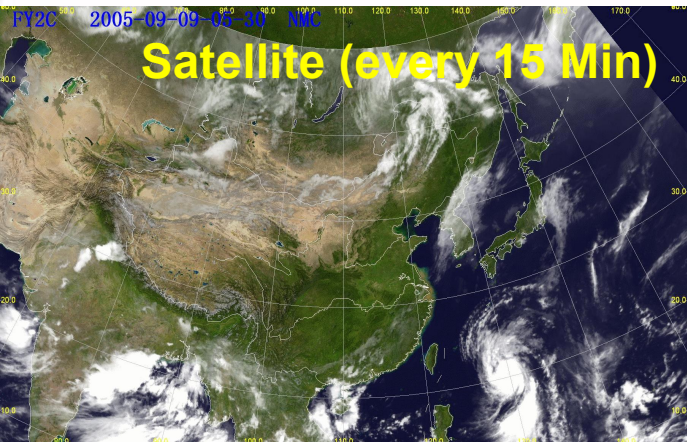
Mechanism Building

Key Points:

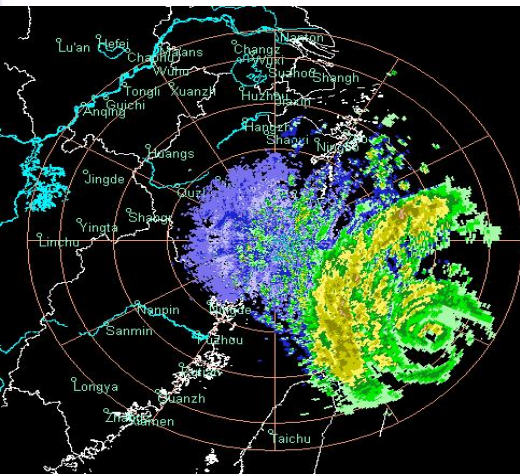
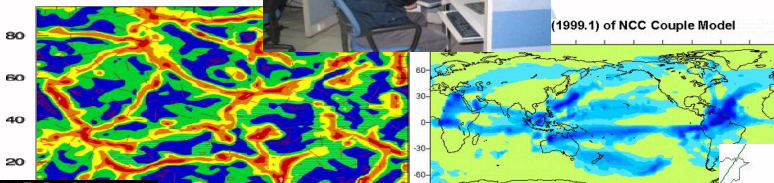
- **Warning Information**
 - Efficient Monitoring and Warning on Severe Weather
 - Information Dissemination System
- **Collaboration Mechanism**
 - Government Agencies Working together
 - Information Exchanging
 - Emergency Response Actions



Monitoring and Warning System



(1999.1) of NCC Couple Model



Base Reflectivity 05/12/200021:00:00 to 05/13/200001:00:00

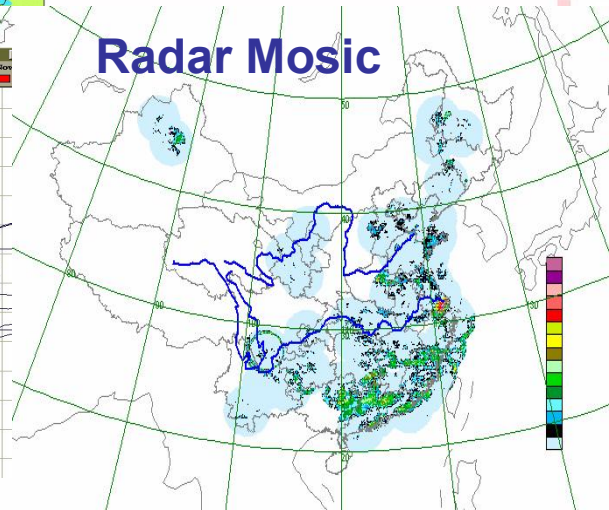
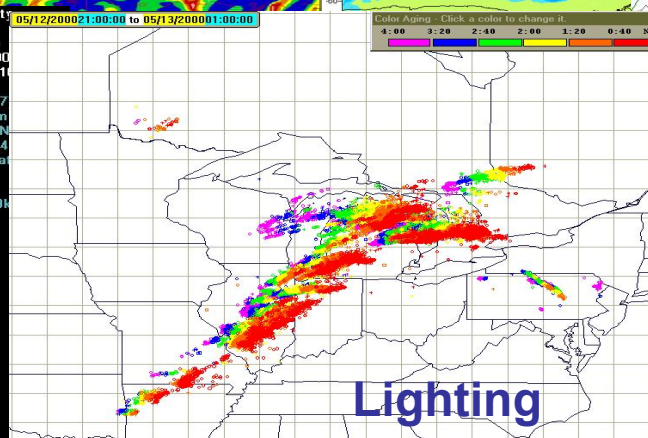
(R 2D)
 Range: 460 km
 Resolution: 2.00
 Date: 2005 09 11
 Time: 17:00:58
 RDA: 温州 (577)
 Height: 734.7 m
 Lat: 27/53/42 N
 Long: 120/44/34
 Mode: Precipitat

VCP: 21
 Cntr: 0deg 0k

Elev = 0.5deg
 Max: 62dBZ

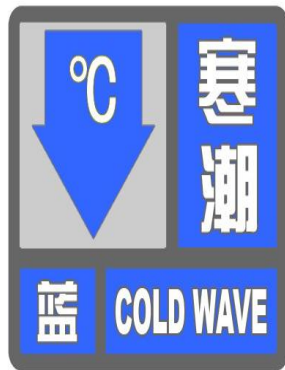


Polar: 100km 30deg



Early Warning Signals

- *‘Meteorological Disaster Early Warning Signals And Guidance for Preparedness’* was issued in August 2004
- Four categories of Signals: **Blue**, **Yellow**, **Orange** and **Red**
- Guidance for preparedness was included



Typhoon, Torrential Rain, Thunderstorm.....,

11 categories in total



Warning Information Delivery

- **Multi-Channels of Warning Information Deliveries**

- Television
- Telephone
- Cell Phone
- Radio
- Internet
- Newspaper
- Electronic billboards



Over 1 billion people/times receive weather forecast and warning information every day.



Wide Coverage of Weather Information

◆ Weather TV programs

- **100** daily programs on **7** channels of the National CCTV
- Nearly **4,000** daily programs are shown on the **76** provincial TV channels, **360** city TV channels and **1,800** county TV channels.
- China Weather Channel is broadcasting weather information 24 hours plus 7 days.
- All the TV stations are request to broadcast warning information in time.



Wide Coverage of Weather Information

◆ Cell phone text message

- A nationwide SMS platform
- The SMS on warning information was sent to the those people who work for emergency response, totally 620,000 both in national and local agencies;
- SMS on severe weather warnings will sent to 83 millions mobile phone users.
- **Example:** 83.352 millions of SMS on typhoon warning were sent to people in the influenced area

----A very efficient way for the emergency response

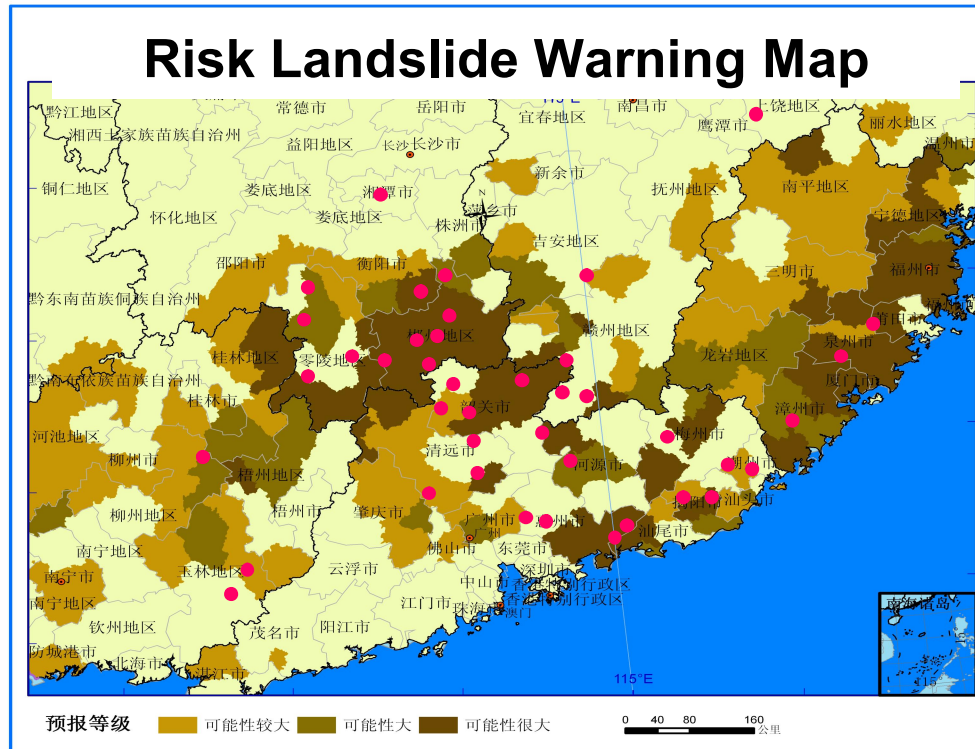


Collaborations on Emergency Response

- **Collaboration with Government Agencies**
 - Working together with **54 Government agencies** in National Level
 - Team: **500 persons** in national level
 - Same Mechanism in Provinces, Cities and Counties
- **Warnings and Actions**
 - Working together to issue warning of disaster risks
 - Organizing the prevention actions



Collaboration with National Resource Ministry



Issuing the risk of landslide warning and the response action will be taken

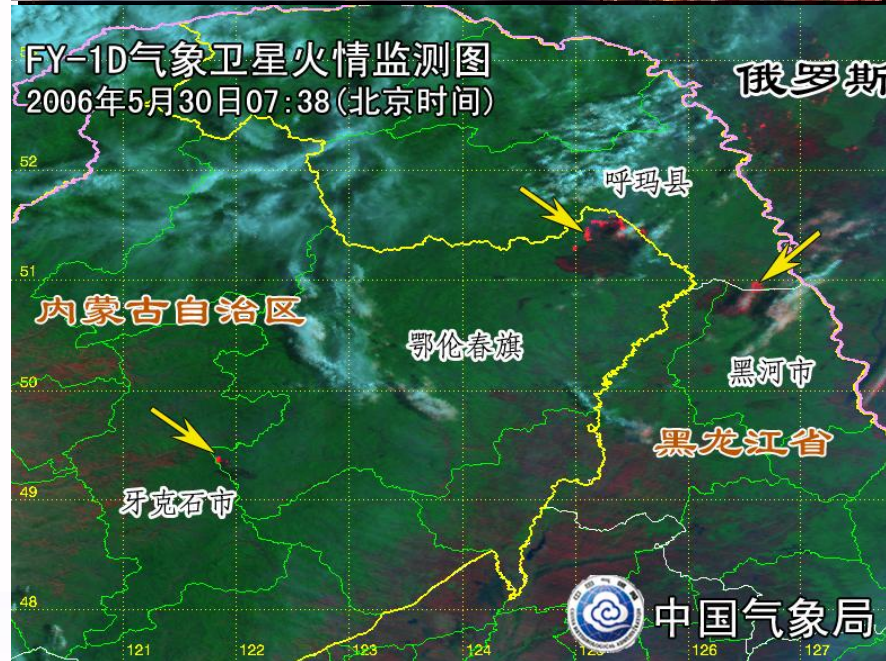


Collaboration with National Forest Ministry

Risk of Forest Fire Warning



Issuing the risk of forest fire warning together



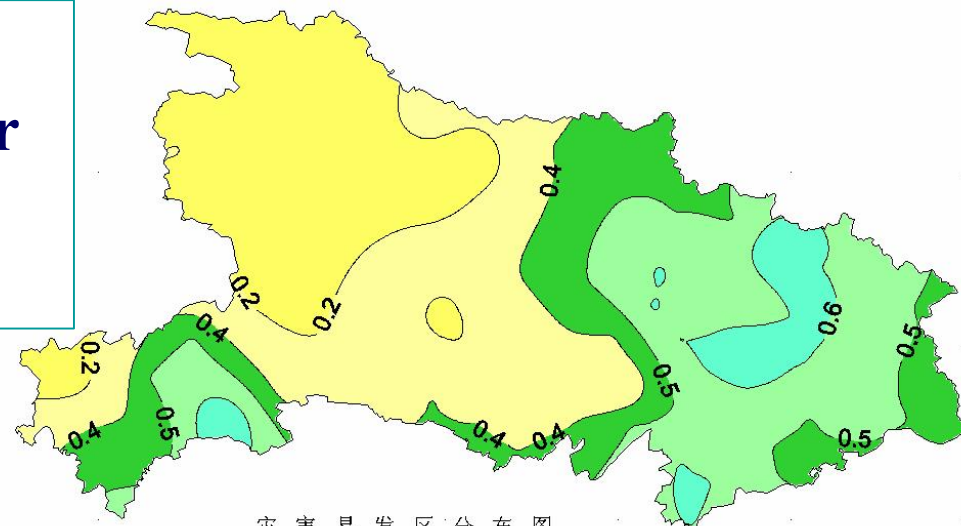
Awareness of Disasters Risk

Disasters Risk Map:

A guidance to the disaster prevention and mitigation.

Factors of Disaster Risk

- Frequency of Severe Weather
- Geographic Information
- Population Density



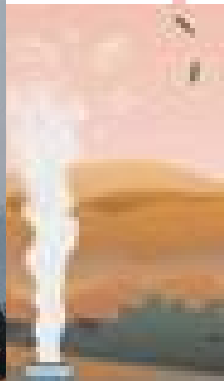
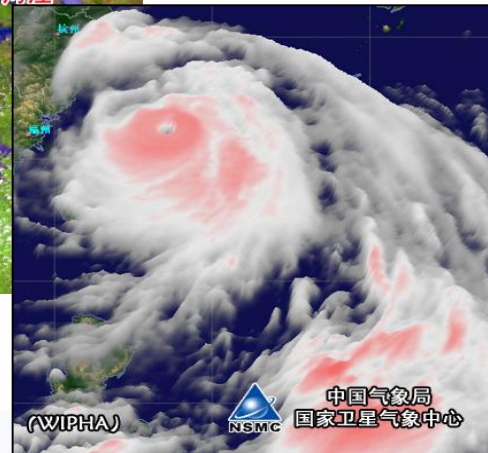
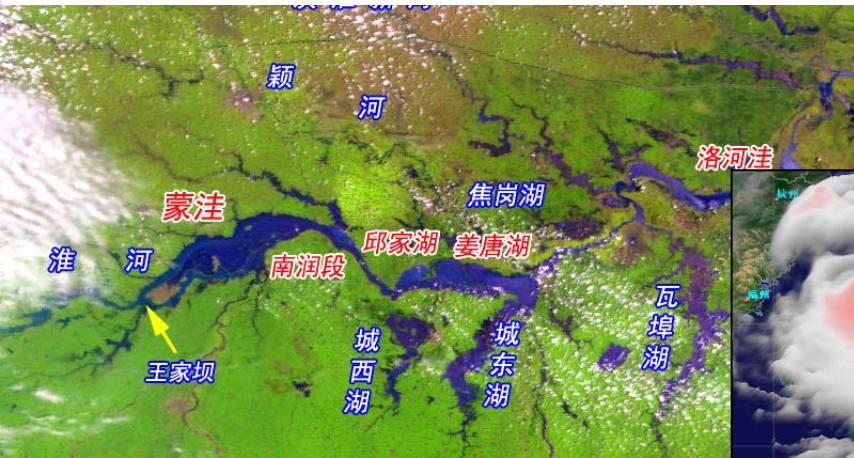
Flooding Risk Map in *Hubei* Province



III. Cases of Emergency Response and the Effectiveness

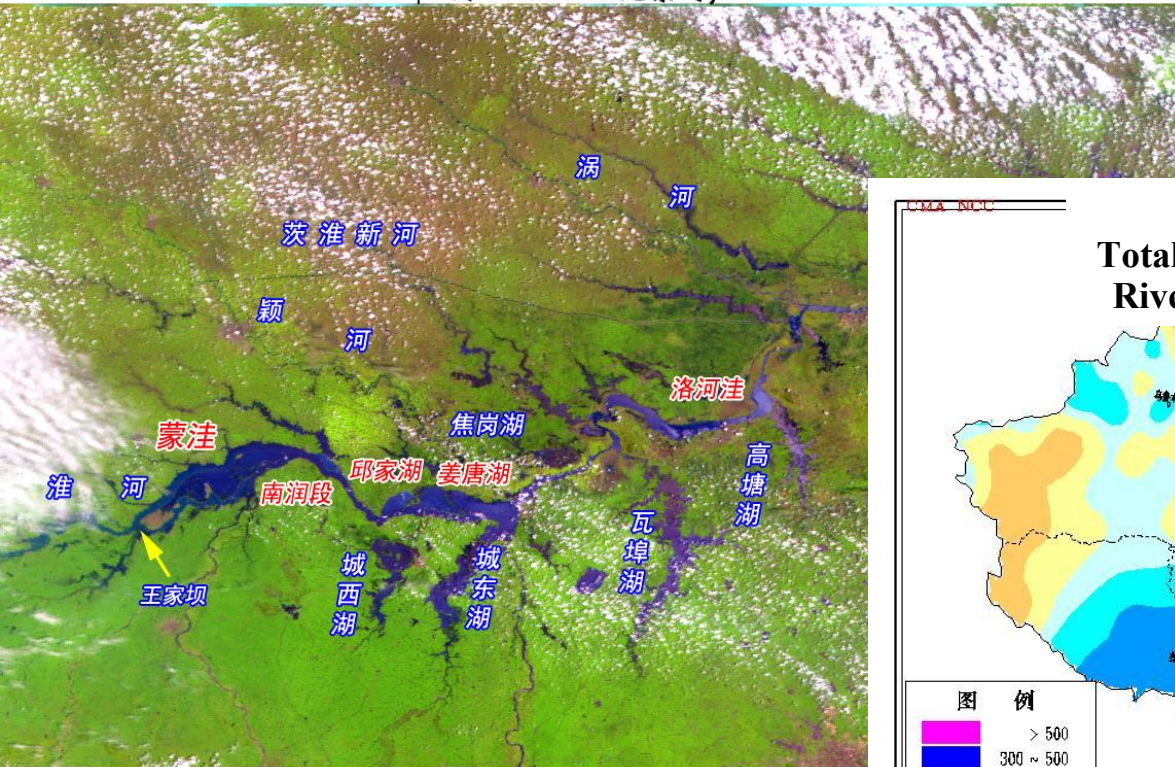
Meteorological Disasters Emergency Response:

- Regional Heavy Rainfall and Flooding
- Typhoon Landing
- Drought and Forest Fire

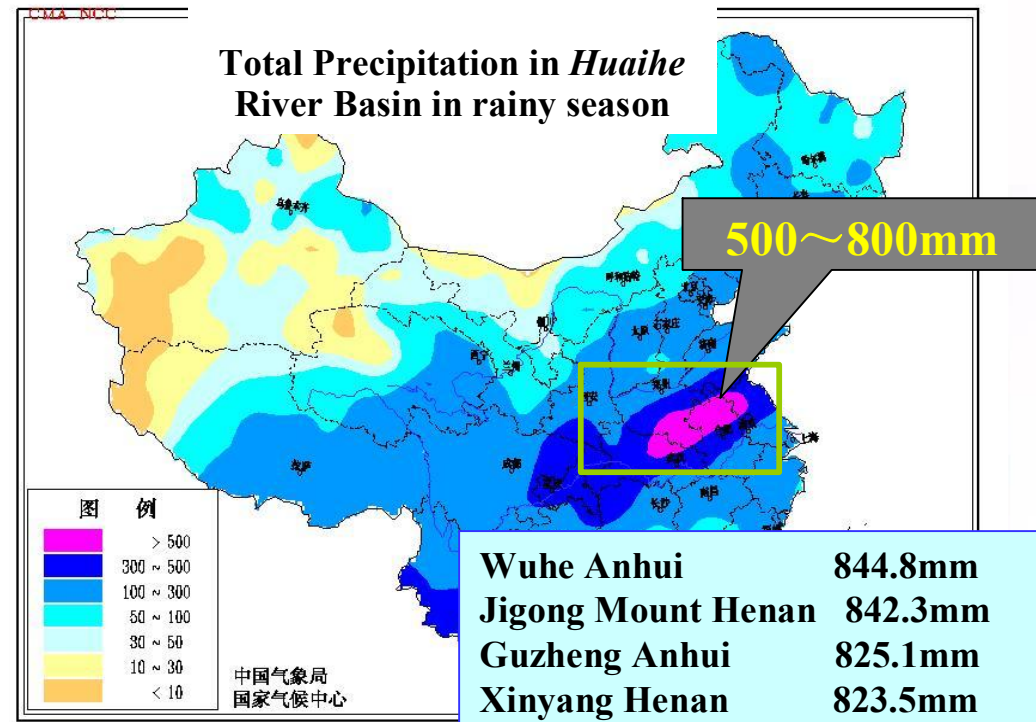


Case 1: Heavy Rainfall and Flooding in *Huaihe* River Basin

气象卫星淮河流域水情监测图
(2007年7月16日10:58北京时)



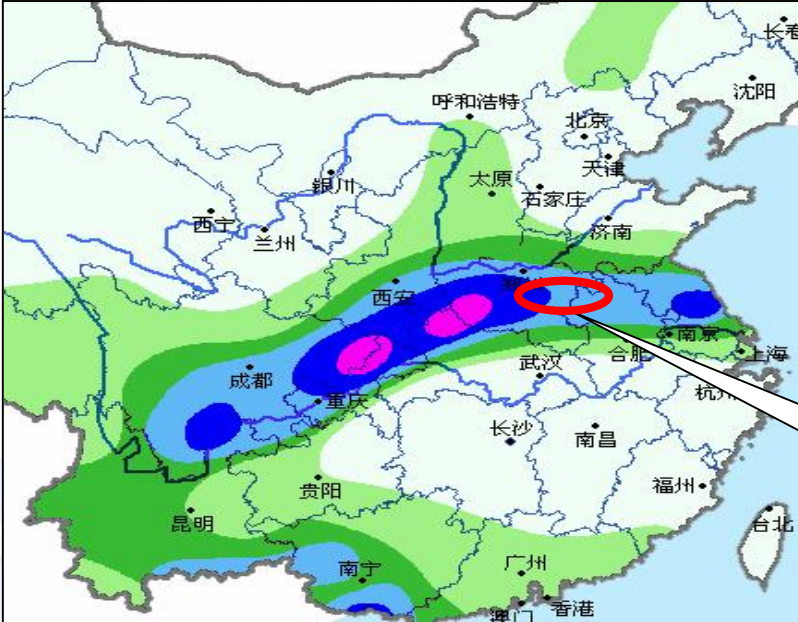
中国气象



Continuous heavy rainfall leads a quickly rise of water level. A serious situation of flood diversion was faced



Flooding Emergency Response



- On site monitoring and forecasting
- Flooding Forecast focus on the vital area with detail information
- Working closely together with decision-makers

The Vital Area



Effectiveness in Prevention and Mitigation

- The flooding covered three provinces ,where a total of 29 millions people and 3 million hectares of cropland were affected
- 10 flood zones including detentions and storages have been opened for diversion.
- More than million of people were evacuated to the safe area
- All the actions were taken depending on the flooding forecast

Not A Single Death!

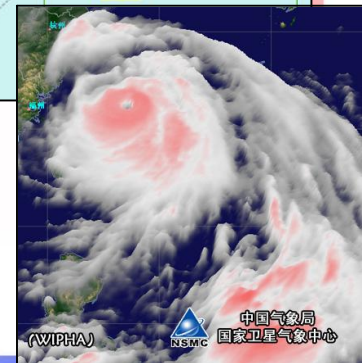
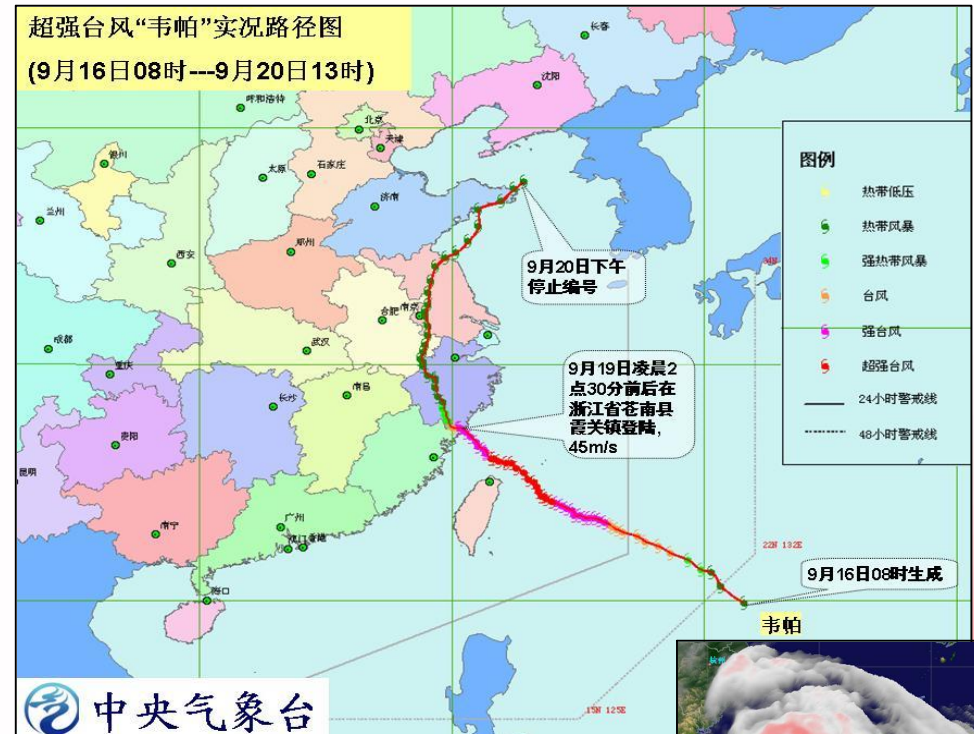
Thanks to the Meteorological Emergency Response



Case 2: Typhoon Emergency Response

- Super Typhoon with the intensity of 55.3 m/s (Grade 16)
- Torrential rain with a total rainfall of 531 mm
- Risk of flooding, wind destroy, landslide etc.
- High life loss risk in the very high population area

Actual Pathway of *Wipha* (16-20 September 2007)



Emergency Response Actions

For Meteorological Section

- Early warning issued 3 days ahead
- Enhance the monitoring: positing typhoon every hours, forecasting the movement every three hours.
- Working face to face with government, Decision-Makers and keep them with fresh information and warnings
- Closely contact with the media to deliver the fresh information to public

----**83millions SMS were sent to users**

For the local government

- Issue the typhoon emergency response order
- To organize the people evacuating from the risk area according to the Typhoon landing warning

---- **Totally 2.5 millions people were evacuated from the risk area**



Effectiveness in Prevention and Mitigation

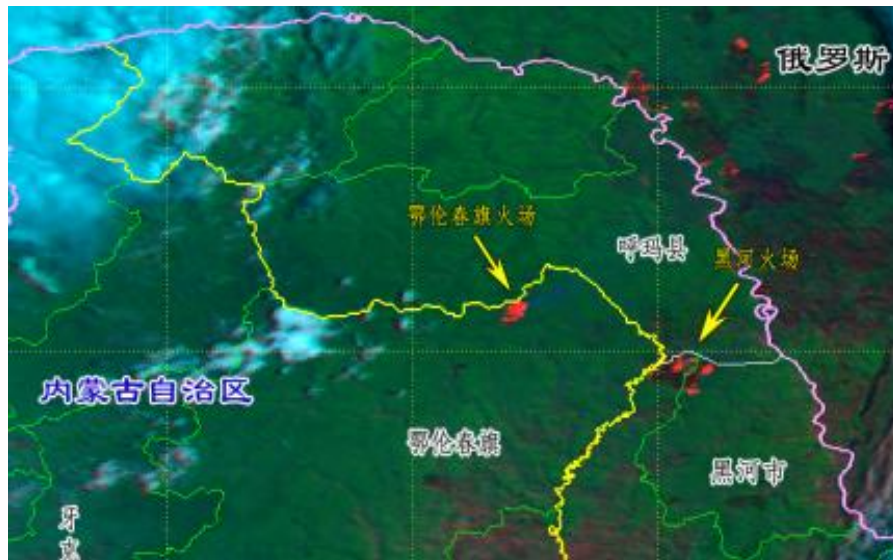
The dearth was the least among the top list of most intensive typhoon

Intensity	No & name	Date	Location	Scale & speed	Central pressure	Direct losses (100 million)	Deaths
1	0608 Saomai	10.8.2006	Zhejiang Cang'nan	17, 60 m/s	920	196. 6	483
2	5612 wanda	1.8.1956	Zhejiang Xiangshan	16, 55 m/s	923	Not available	Over 5000
3	0515 Khanun	11.9.2005	Zhejiang Taizhou	15, 50 m/s	945	92. 5	16
4	0713 Wipha	19.9.2007	Zhejiang Cang'nan	14, 45 m/s	950	77. 92	7
4	0509 Wipha	6.8.2005	Zhejiang Yuhuan	14, 45 m/s	950	180. 4	29
4	0414 Rananim	8.12.2004	Zhejiang Wenling	14, 45 m/s	950	202. 95	184



Case 3: Forest Fire Emergency Response

21 May – 2 June 2006, forest fires occurring in *Heilongjiang* and Inner Mongolia because of drought climate

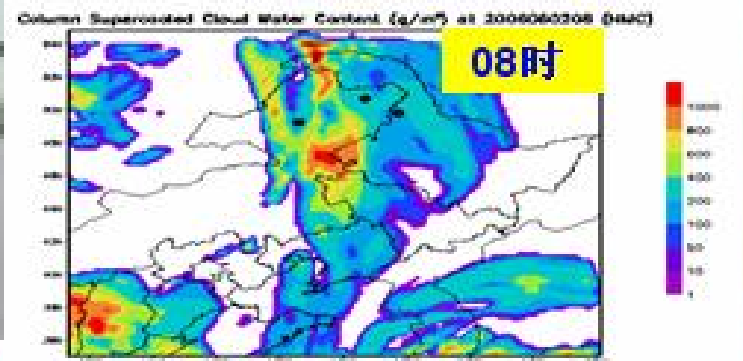
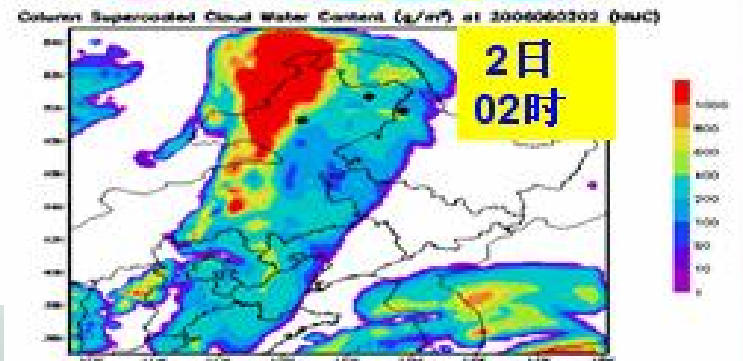
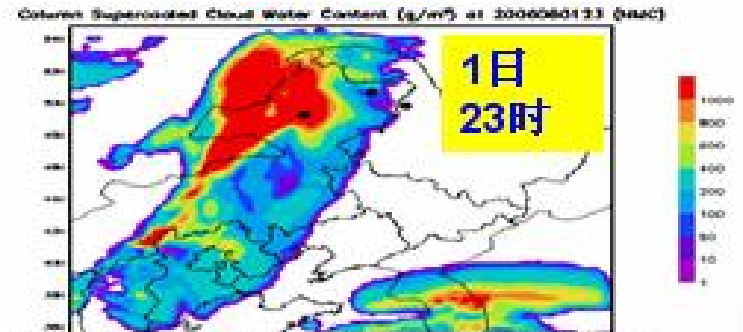


Emergency Response Actions

- Rain-making action was employed to control the forest fires
- Cloud conditions of model output were used as a guidance to the Rain-Make actions

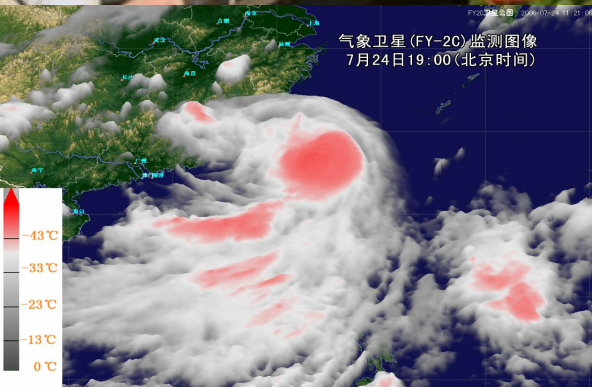


Mesoscale rain-making clouds
Total supercooled cloud water column forecasting (g/m²)



Facing the Challenges

Emergency Meeting for Typhoon Landing Preparedness



➤ Challenges of Emergency Management

Better early warning ,quick information deliveries, well organized response actions,.....

a Meteorological Administration

Thank you for your attention!

