



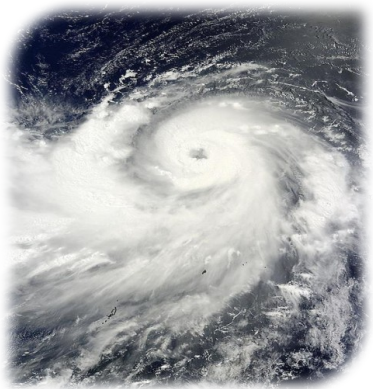
中央气象台
NATIONAL METEOROLOGICAL CENTRE

Proceeds and needs of typhoon early warning for Society and Government

QIAN Qifeng

National Meteorological Centre(NMC), CMA

ESCAP/WMO Typhoon Committee (TC58)



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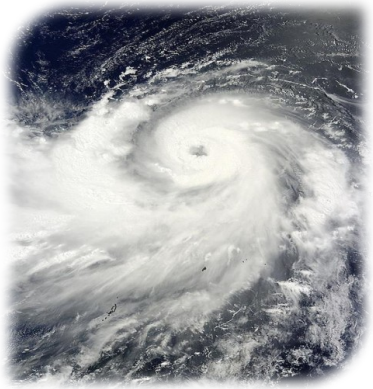
The Demand for TC Disaster Prevention

2

The Development to Meets the Needs

3

**Shortcomings and Future
Plan**



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The Demand for TC Disaster Prevention

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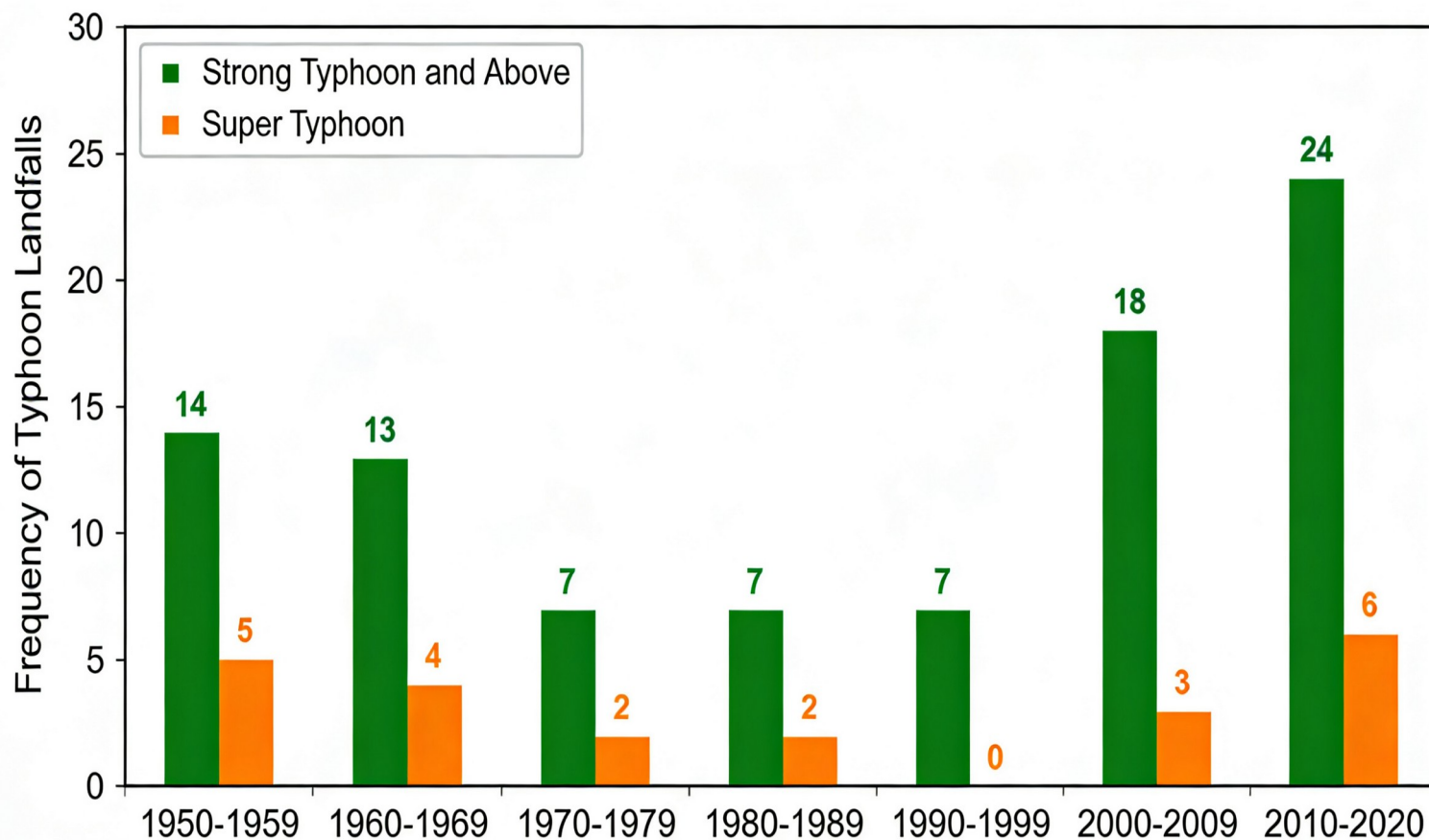
The Development to Meets the Needs

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**Shortcomings and Future
Plan**

Changes of STY and Super-TY making landfall in China

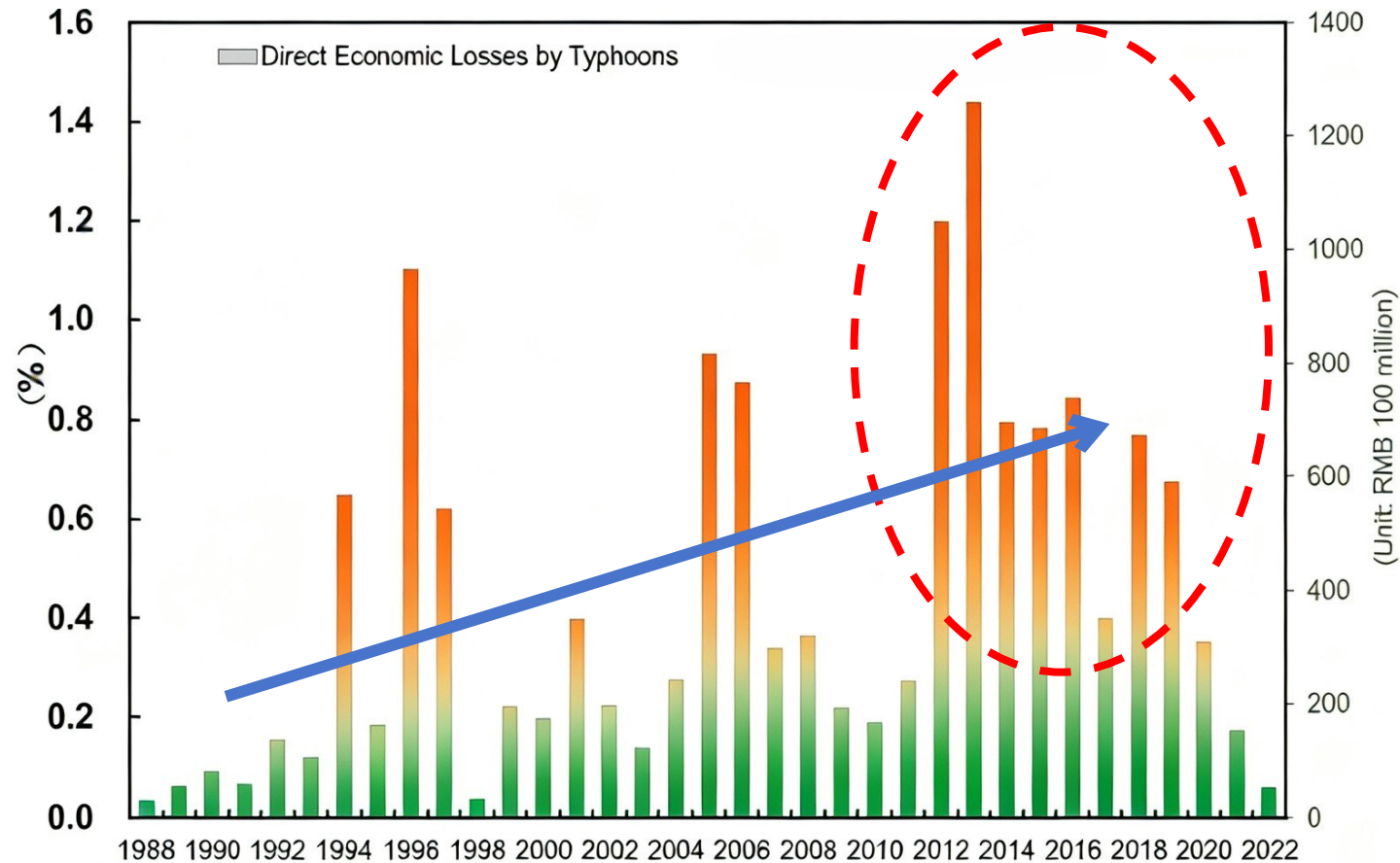
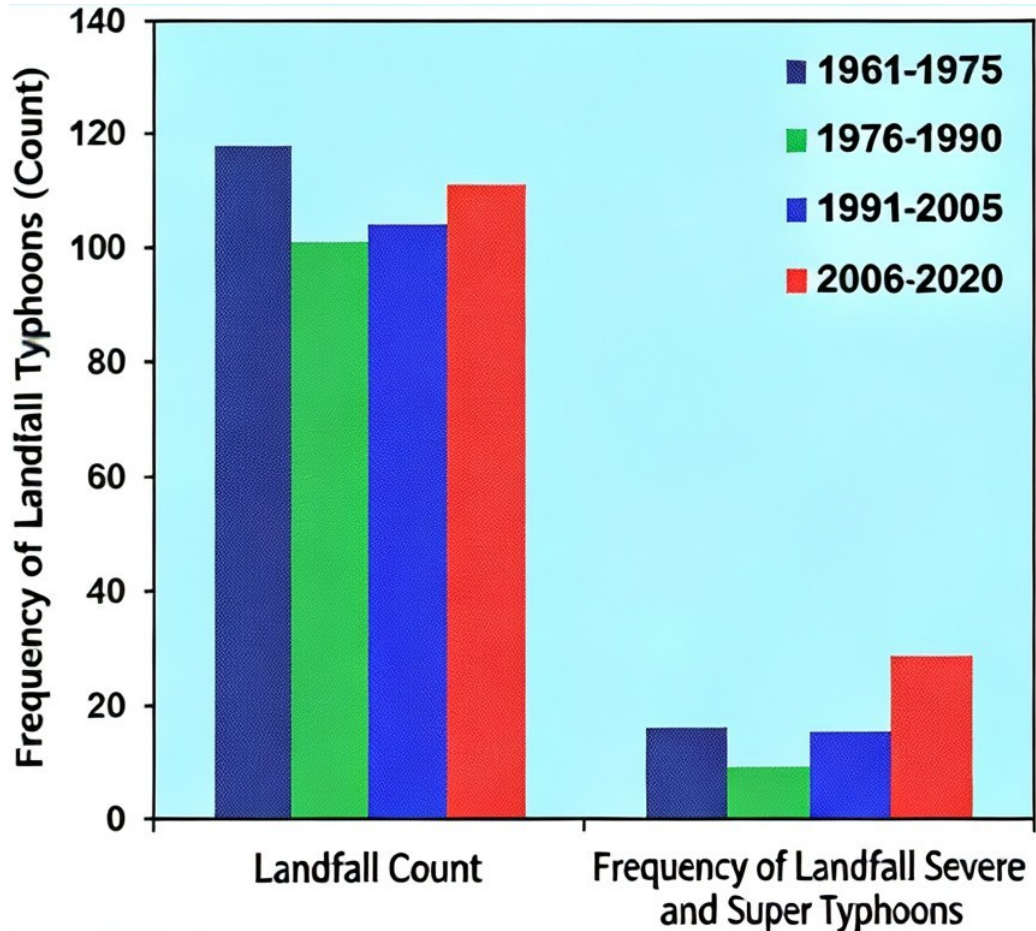
Summary Landfall TC in China (2025)



序号	中央台 编号	国际 编号	中英文 名称	极值强度	在我国登陆				
					地点	时间	最大		中心 气压 (百帕)
							风力 (级)	风速 (米/秒)	
1	2501	2501	蝴蝶 WUTIP	台风	海南东方 广东雷州	6月13日 23:00 6月14日 12:30	11 11	30 30	980 980
2	2504	2504	丹娜丝 DANAS	强台风	台湾嘉义	7月7日 00:00	13	40	960
					浙江洞头	7月8日 21:25	9	23	990
					浙江瑞安	7月8日 23:45	8	20	992
3	2506	2506	韦帕 WIPHA	台风	广东台山	7月20日 17:50	12	33	975
					广东阳江	7月20日 20:15	10	25	980
4	2508	2508	竹节草 CO-MAY	强热带风暴	浙江舟山	7月30日 04:30	9	23	975
					上海奉贤	7月30日 16:40	9	23	978
5	2511	2511	杨柳 PODUL	强台风	台湾台东	8月13日 13:00	14	42	955
					福建漳浦	8月14日 00:30	11	30	990
6	2516	2516	塔巴 TAPAH	强热带风暴	广东台山	9月8日 08:50	11	30	978
7	2517	2517	米娜 MITAG	强热带风暴	广东汕尾	9月19日 14:50	10	25	990
8	2518	2518	桦加沙 RAGASA	超强台风	广东阳江	9月24日 17:00	13	40	955
					广西北海	9月25日 06:30	8	20	992
					广西防城港	9月25日 12:00	8	18	998
9	2521	2521	麦德姆 MATMO	强台风	广东徐闻	10月5日 14:50	14	42	965
					广西防城港	10月6日 01:10	10	28	982

- Over the past 70 years, the intensity of typhoons landing in China every decade has shown a notable increase since 2000
- In 2025, there were 9 typhoons making landfall, 1.9 more (than the average of 7.1 per year), and the intensity of the landfall was stronger than usual

Changes of STY and Super-TY making landfall in China

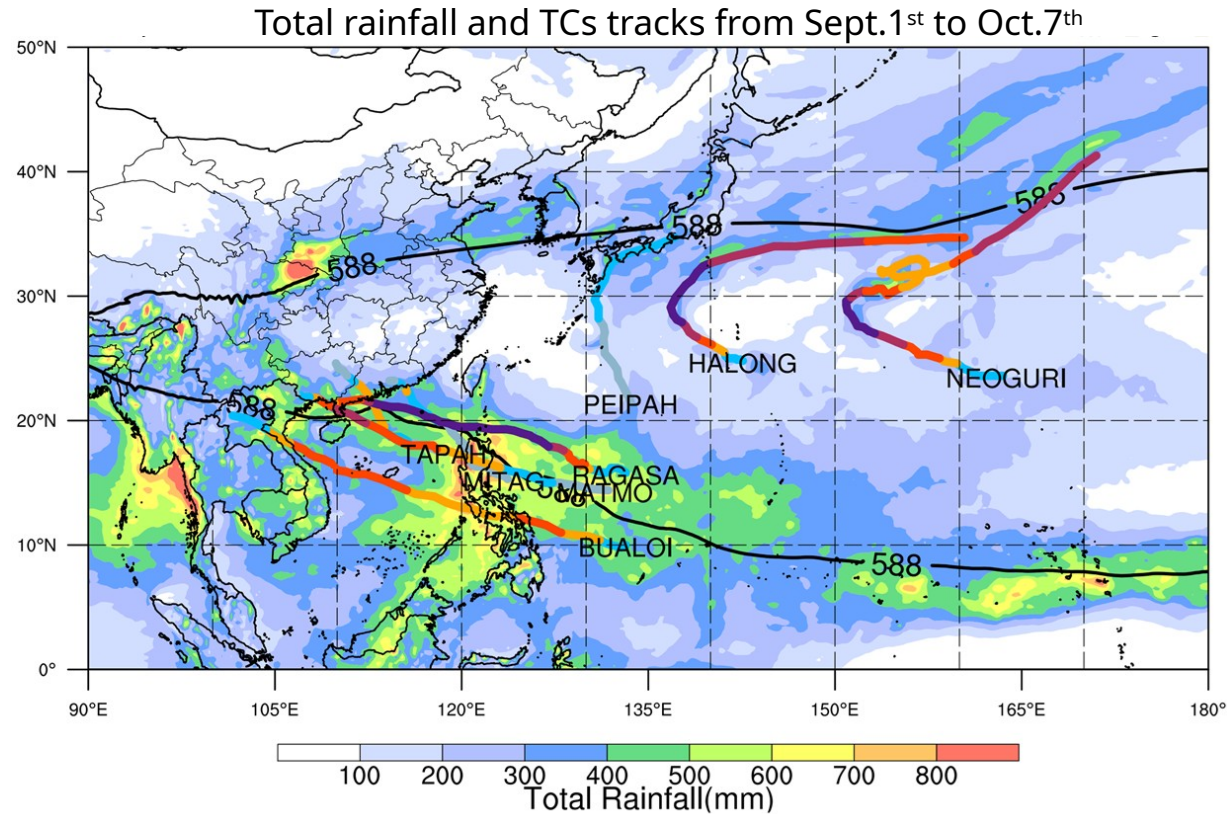
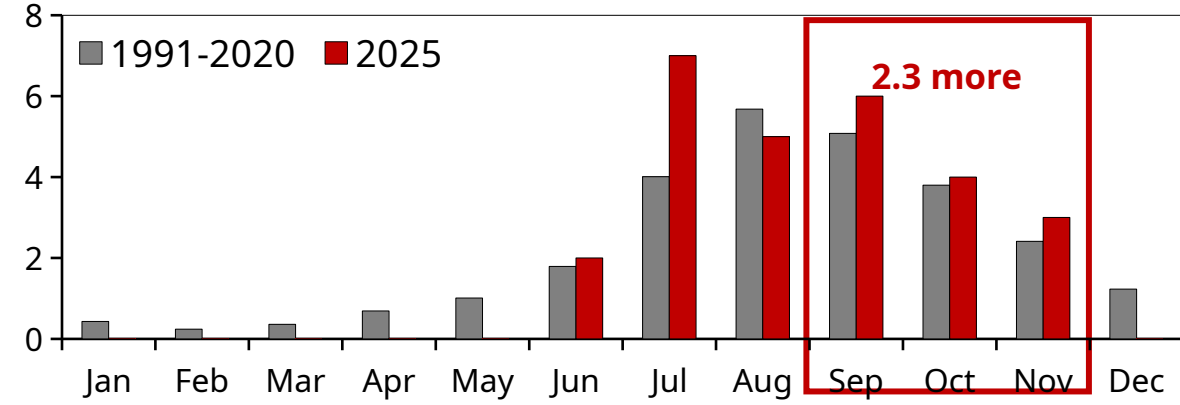
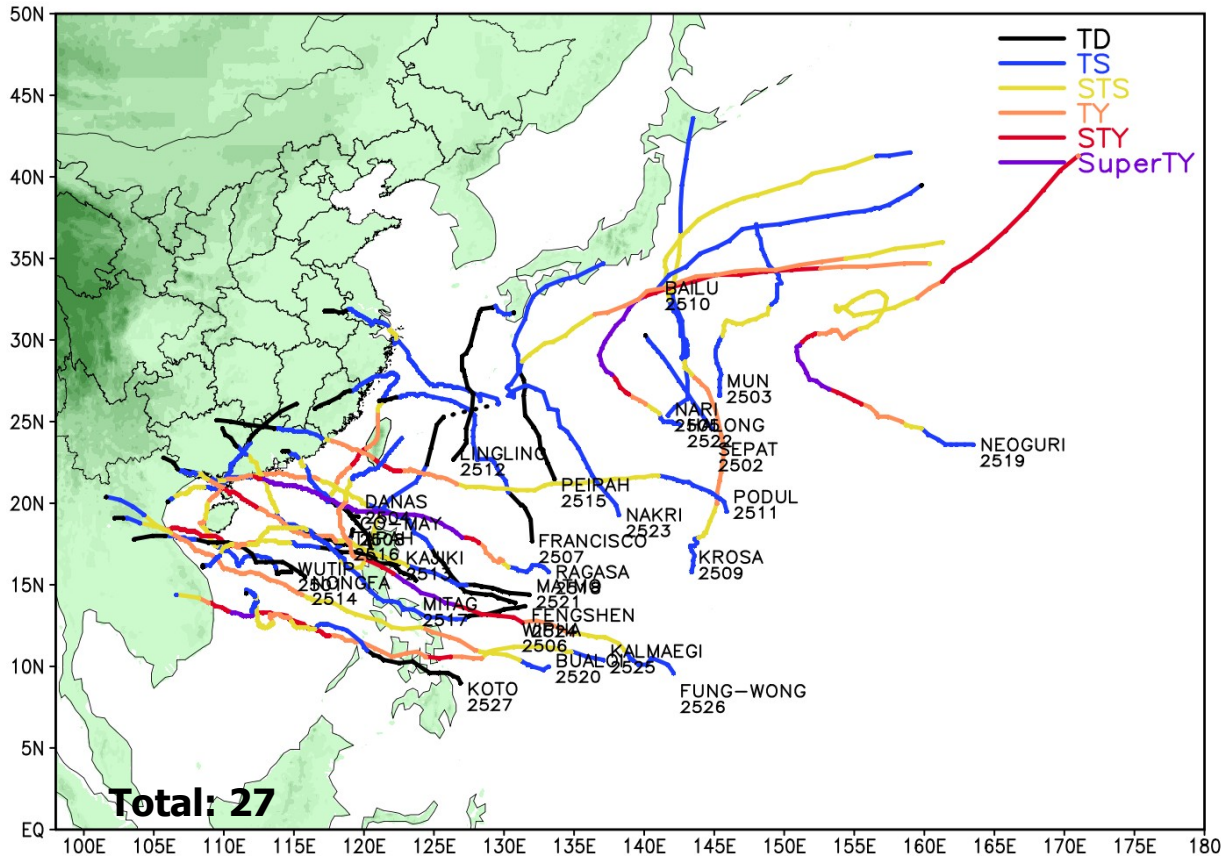


- Since 21st century (2006-2020), while the number of landfalls remained stable, the frequency of strong typhoons and above making landfall showed a significant increasing trend; as well as the reeconomic losses

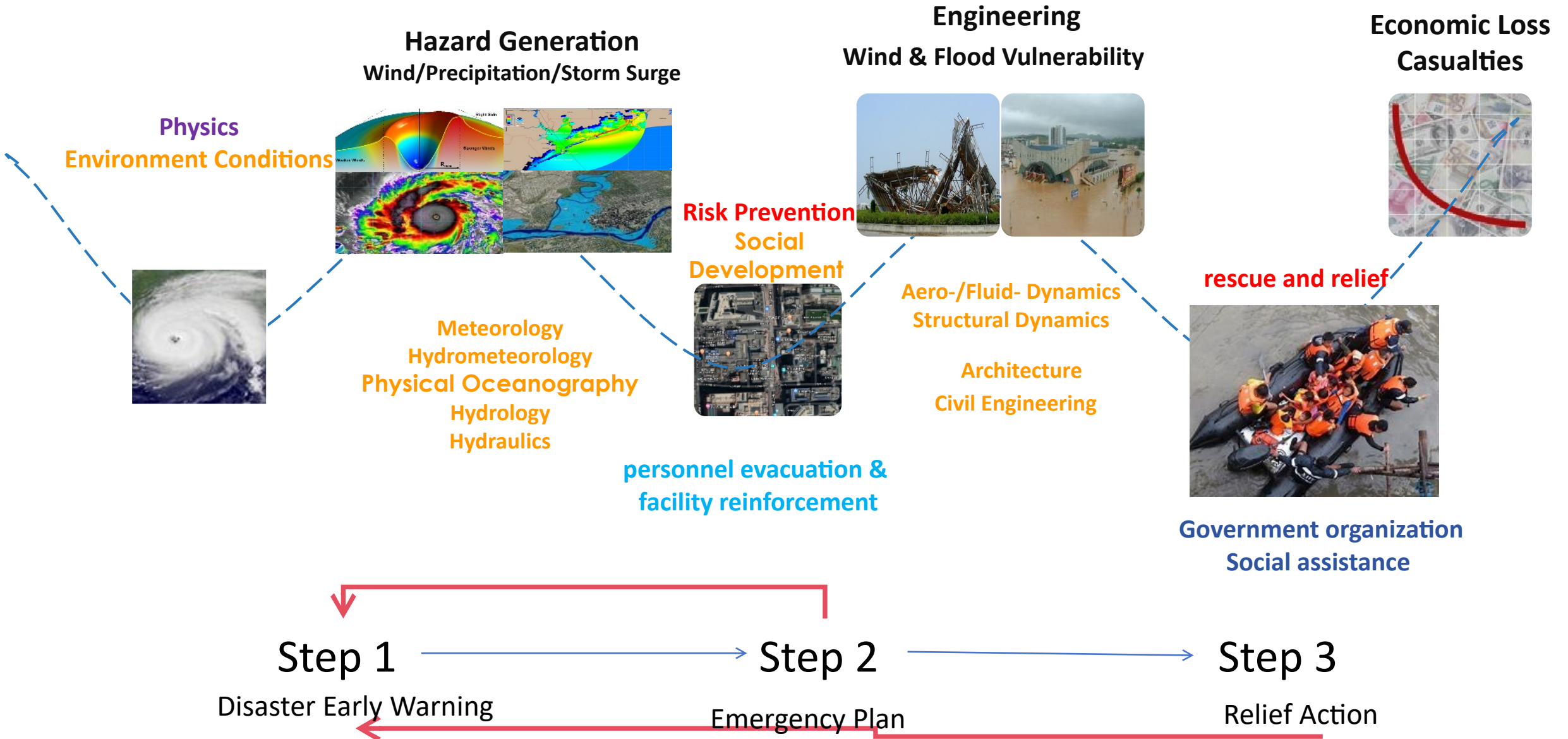
Overview of TC activities in 2025

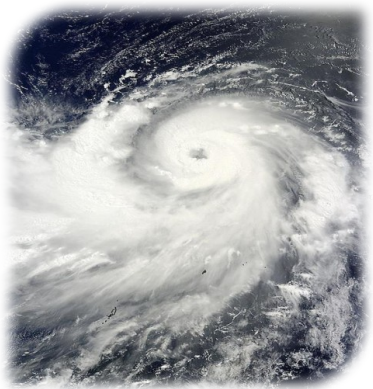


- **Extremely active TCs in autumn 2025**
- **Superposition of disasters caused by successive TC impacts**



Typhoon disaster formation chains





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The Demand for TC Disaster Prevention

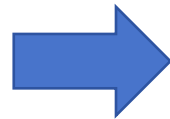
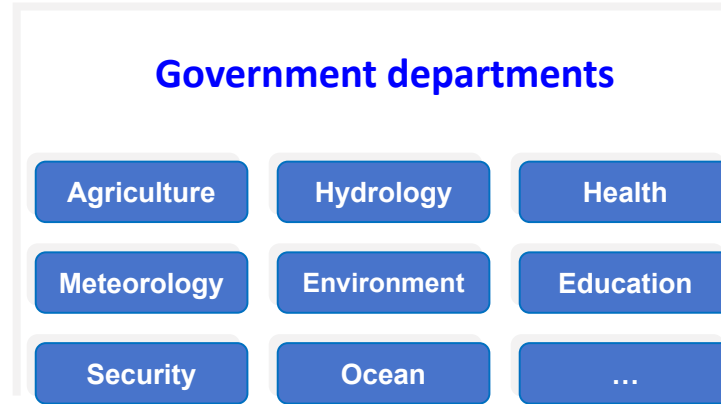
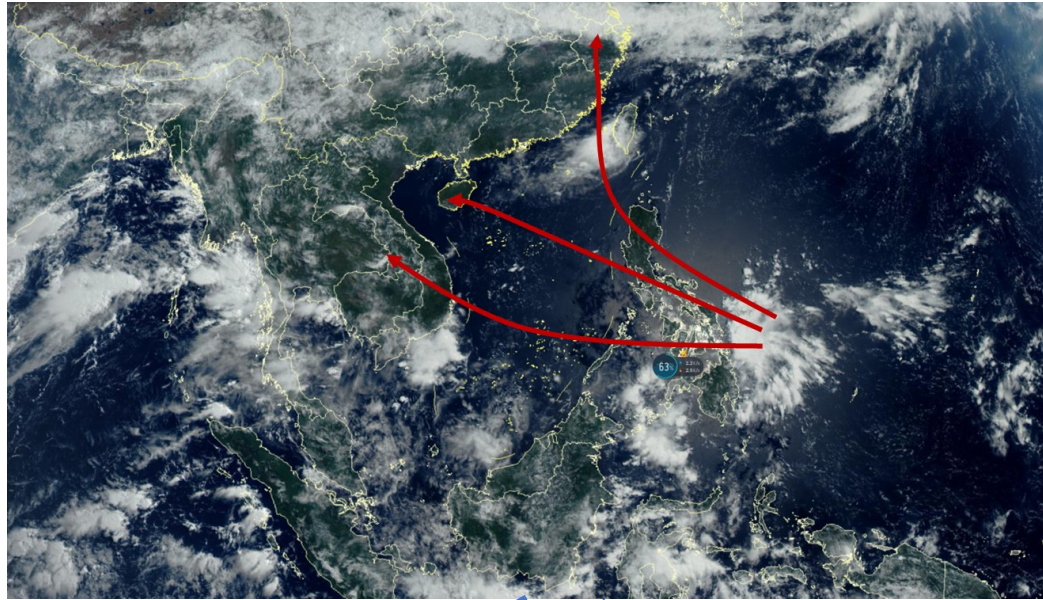
2

The Development to Meets the Needs

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**Shortcomings and Future
Plan**

Situation 1: The need of typhoon genesis forecast



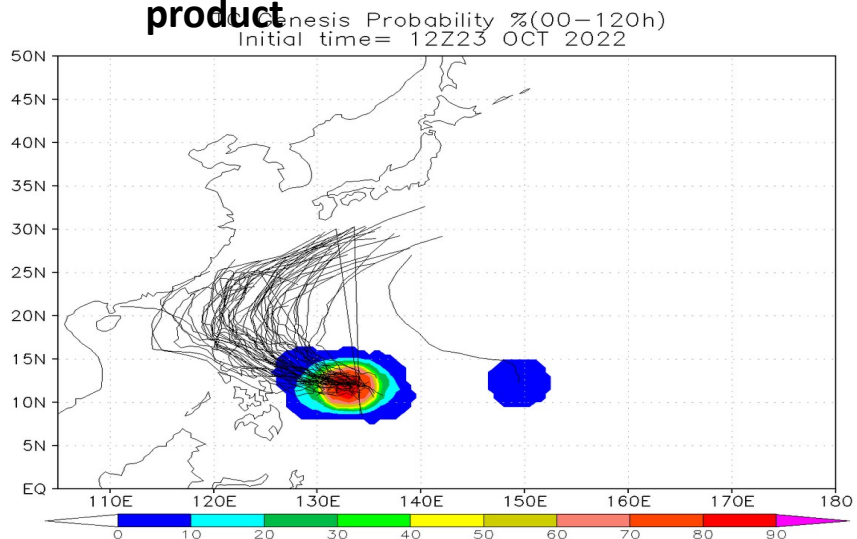
**Emergency
Early Warning
Release Center**



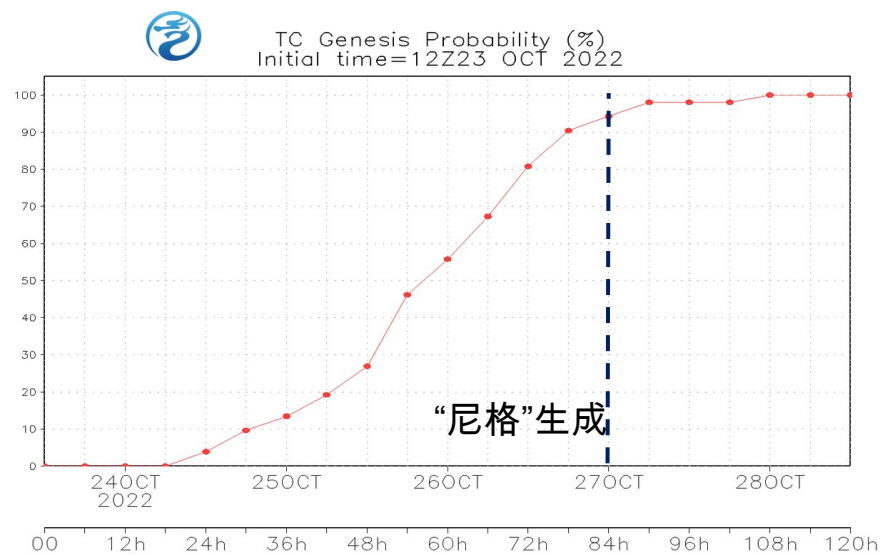
Requires 3-5 days to take measures in advance

Three kinds of TC generation probability product were developed

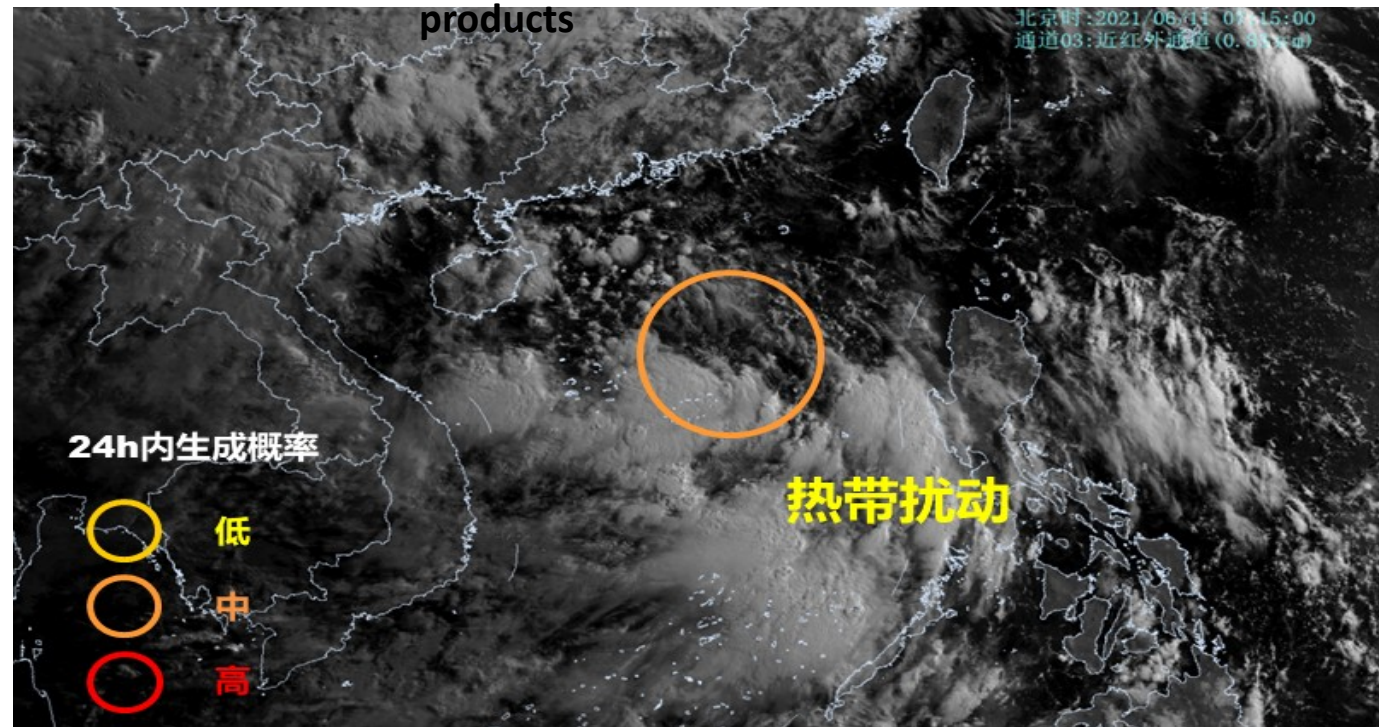
1、spatial probability product



2、time probability product



3、develop potential products



- ✓ It is expected that the tropical disturbance in the South China Sea may intensify into a tropical depression within the next 24 hours.
- ✓ On the morning of the 12th, it made landfall on the eastern coast of Hainan Island (as a TD)

➤ Issue potential forecast guidance bulletin



台风生成潜势预报

第 11 期

中国气象局中央气象台

预报: 宋佳凝

2025 年 09 月 02 日 18 时

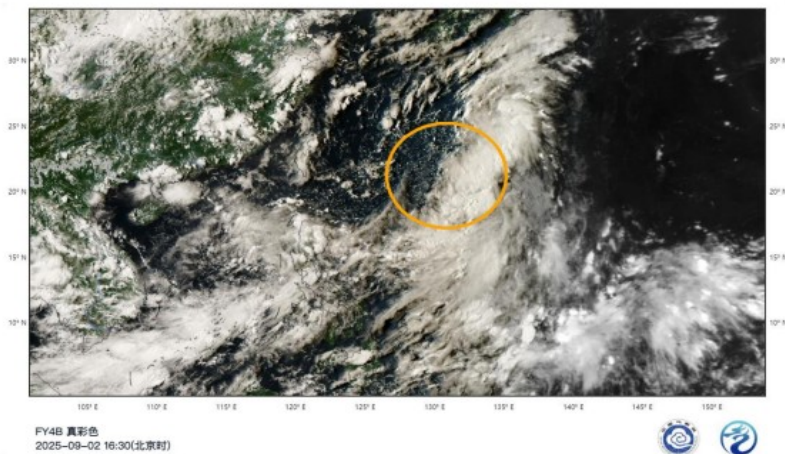
签发: 董林

00 分

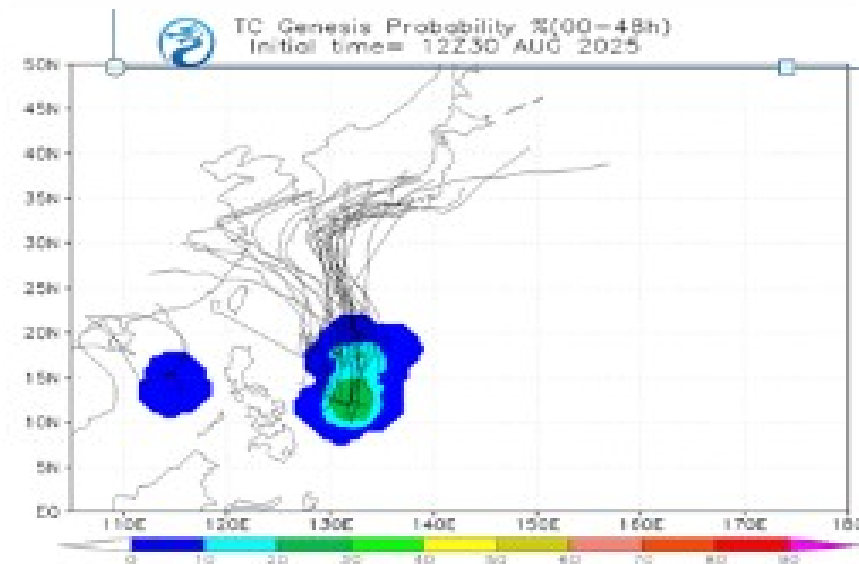
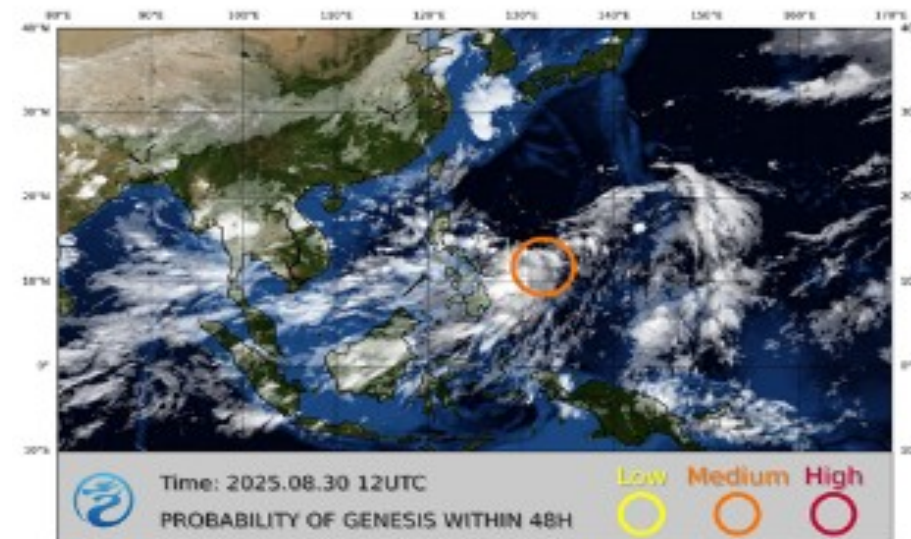
菲律宾以东洋面有热带扰动活动

菲律宾以东洋面的热带扰动今天(9月2日)下午5点钟位于日本鹿儿岛偏南方大约 1050 公里的洋面上, 就是北纬 22.0 度、东经 131.0 度, 最大风力有 5 级(8 米/秒), 最低气压为 1006 百帕。

预计, 该扰动将以每小时 20-25 公里的速度向偏北方向移动, 趋向日本西南部洋面, 将于未来 24 小时内加强为热带低压, 未来 36 小时内有可能加强为今年第 15 号台风。受其影响, 3 日夜间开始, 东海东部的部分海域有 6-8 级风, 阵风 9-10 级。

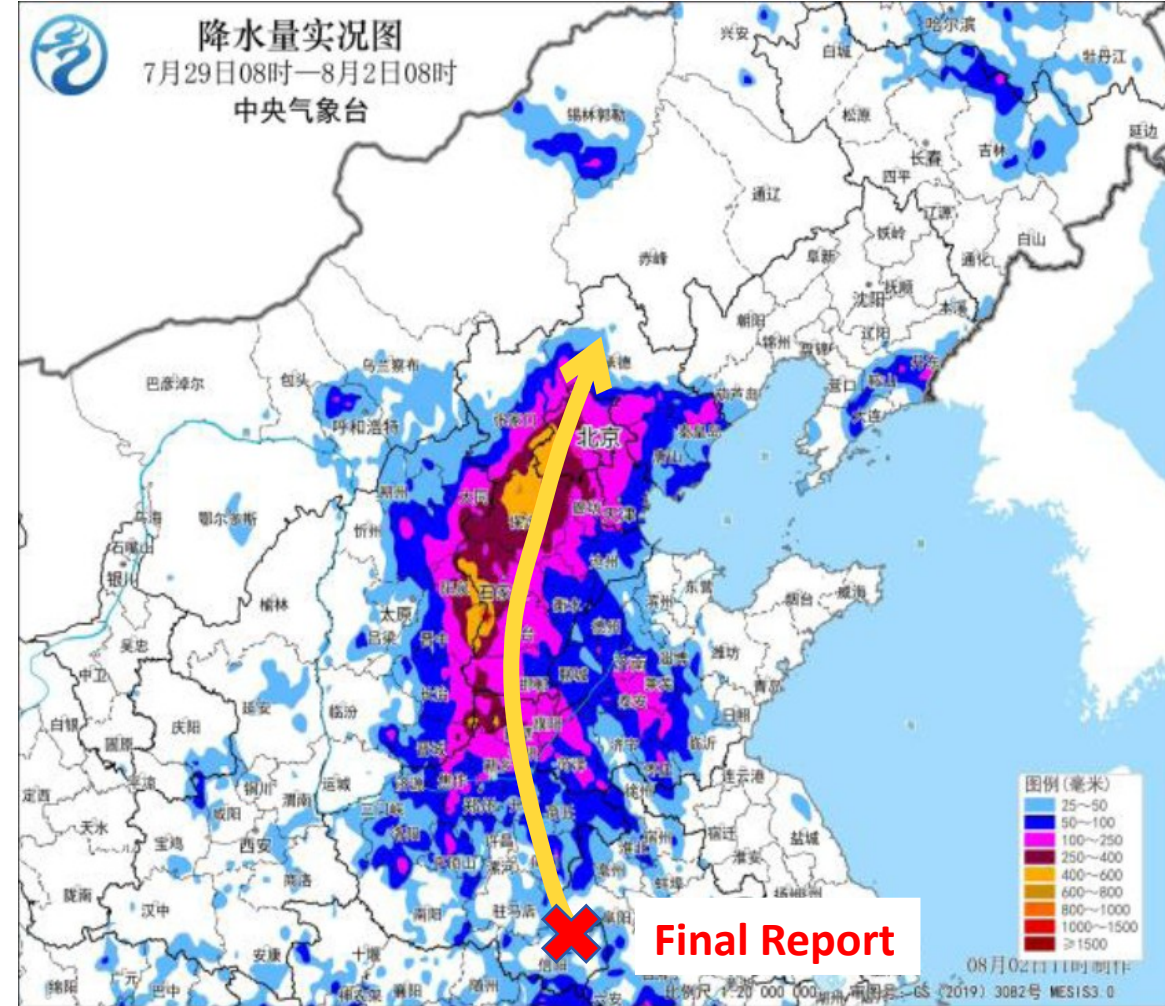
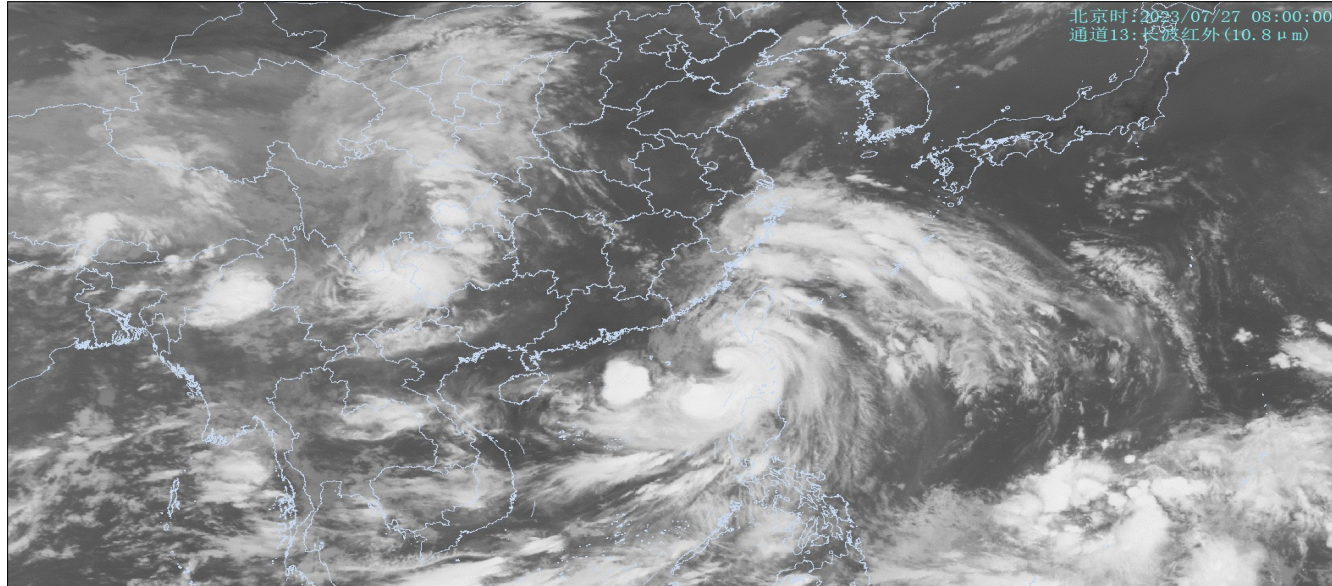


2025 年 9 月 2 日 16:30 时 FY-4B 真彩色云图



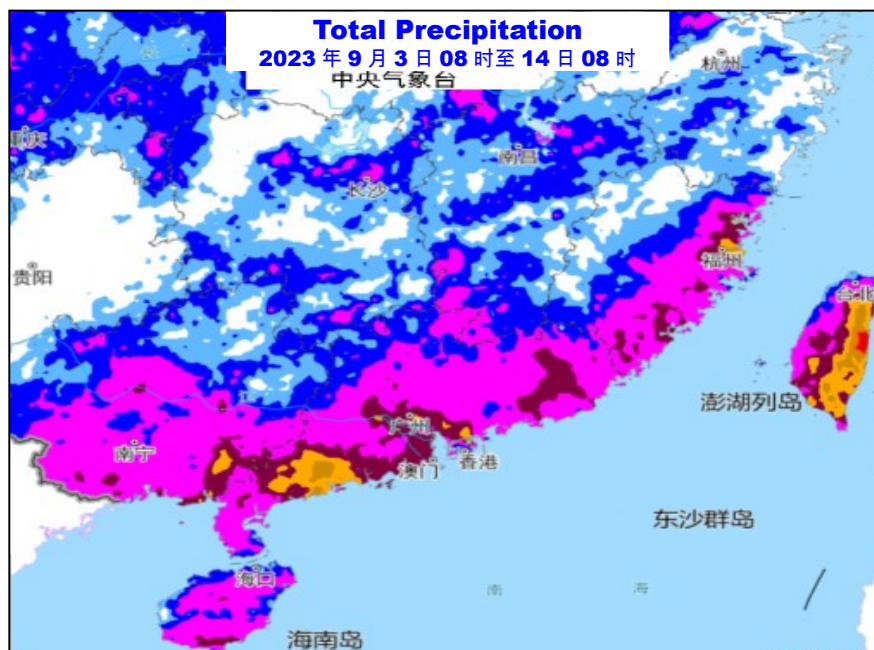
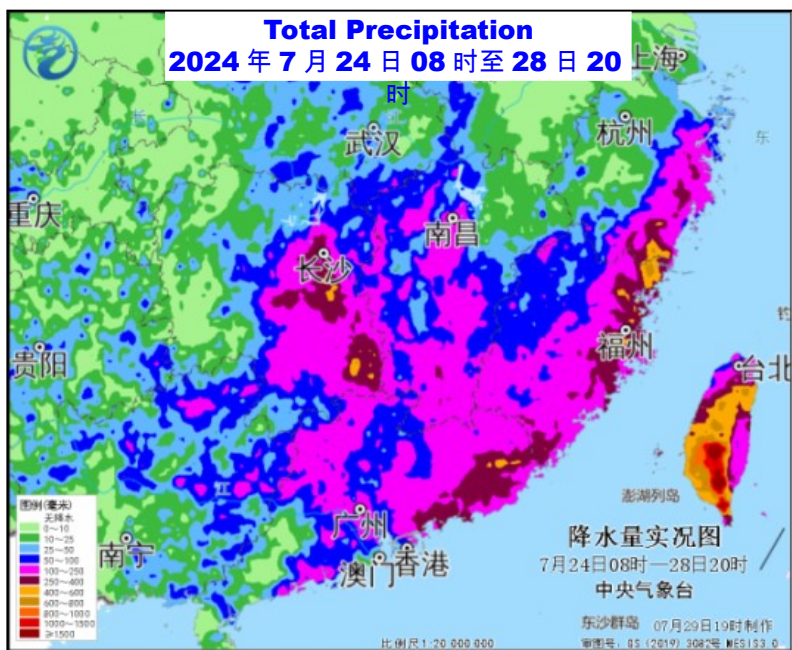
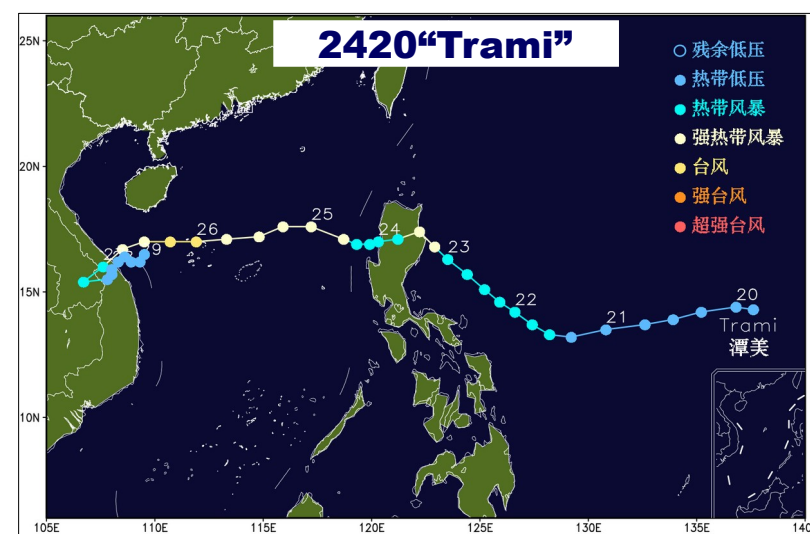
P.S. To local meteorological department for them to provide services to the government and society

Situation 2: The need of TC remnant vortex warnings



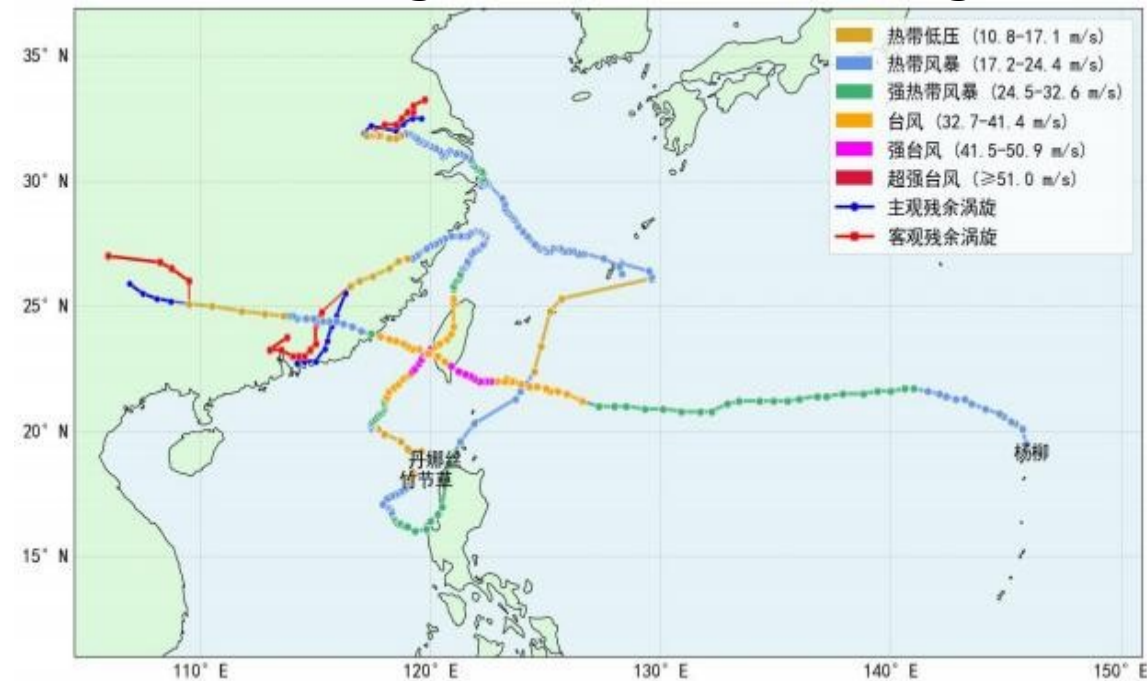
“杜苏芮”过程降水量图
2023年7月29日08时至8月2日08时

Every year, there are 2-3 TC, their remnant penetrate deep into the inland, causing heavy precipitation and triggering disasters such as urban flooding, mountain floods, and mudslides

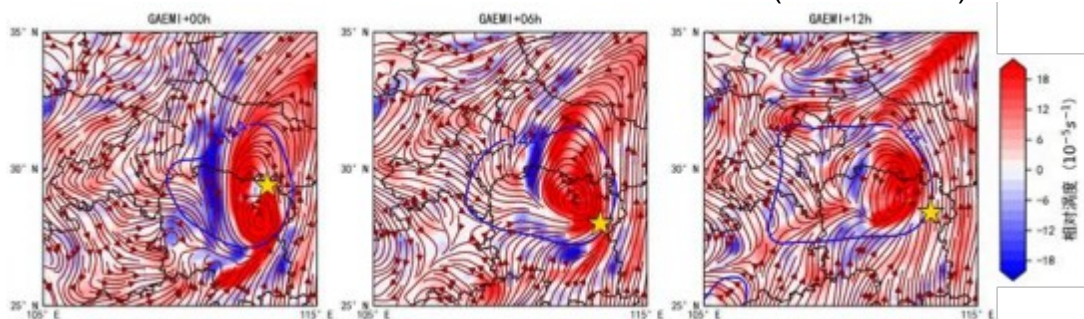


Tracing the remnant of TC issue Typhoon Remnant Vortex Forecast

diagram of vortex tracking



例：2403号台风“格美”客观识别的台风残涡位置（金色五角星）



台风残余涡旋预报

第 2 期

中国气象局中央气象台 预报：刘 达 2025年7月10日18时00分
签发：钱奇峰

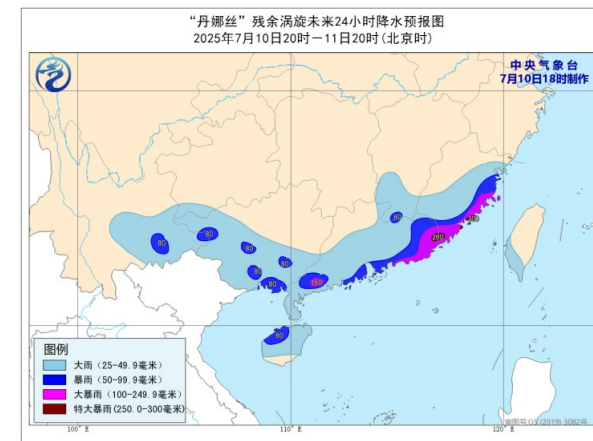
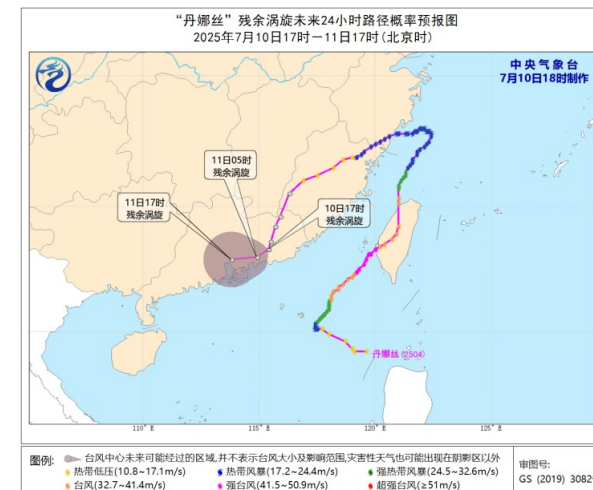
“丹娜丝”残余涡旋移速缓慢

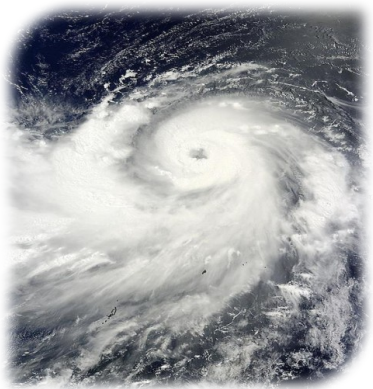
今年第 4 号台风“丹娜丝”减弱后的残余涡旋的环流中心今天（10日）下午 5 点钟位于广东省河源市境内，就是北纬 23.3 度、东经 115.4 度附近。预计，“丹娜丝”的残余涡旋将以每小时 5 公里左右的速度缓慢向西偏南方向移动。

受台风残余涡旋与西南季风的共同影响，7 月 10 日 20 时至 11 日 20 时，福建东部沿海和南部、广东大部、广西南部、海南岛北部、台湾岛、云南南部等地部分地区有大到暴雨，其中，广东东部和南部沿海、福建东南部等地部分地区有大暴雨，局地特大暴雨（250~300 毫米）。上述部分地区伴有短时强降水（最大小时降雨量 30~60 毫米，局地可超过 80 毫米），局地有雷暴大风等强对流天气。

表 1 “丹娜丝”残余涡旋监测及预报位置

	时间 (北京时)	经度 (°E)	纬度 (°N)	位置
监 测	7 月 10 日 02 时	25.5	116.3	福建龙岩
	7 月 10 日 05 时	24.6	115.9	广东梅州
	7 月 10 日 08 时	24.2	115.7	广东梅州
	7 月 10 日 14 时	23.6	115.5	广东梅州
	7 月 10 日 17 时	23.3	115.4	广东河源
预 报	7 月 11 日 05 时	23.0	114.9	广东惠州
	7 月 11 日 17 时	22.9	113.8	广东东莞





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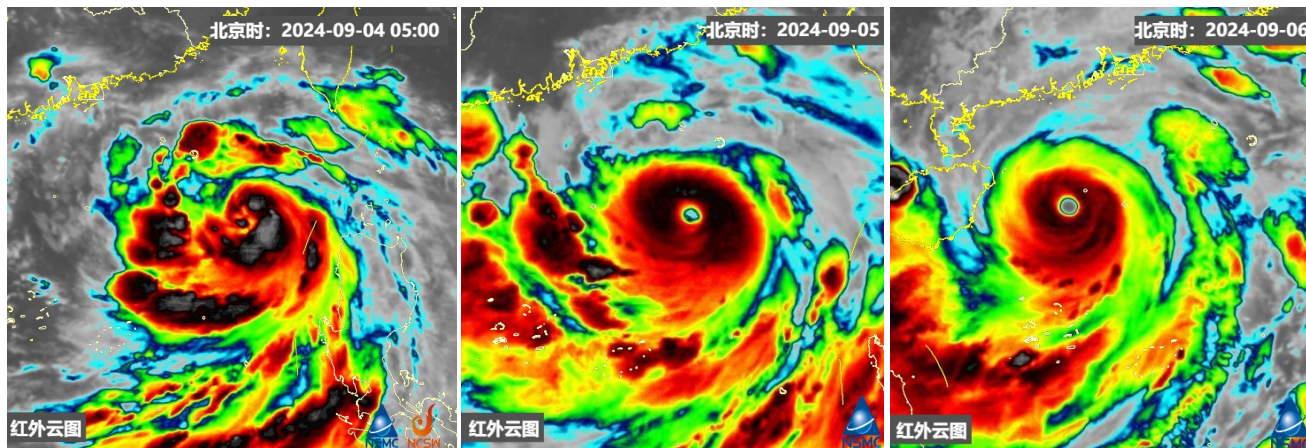
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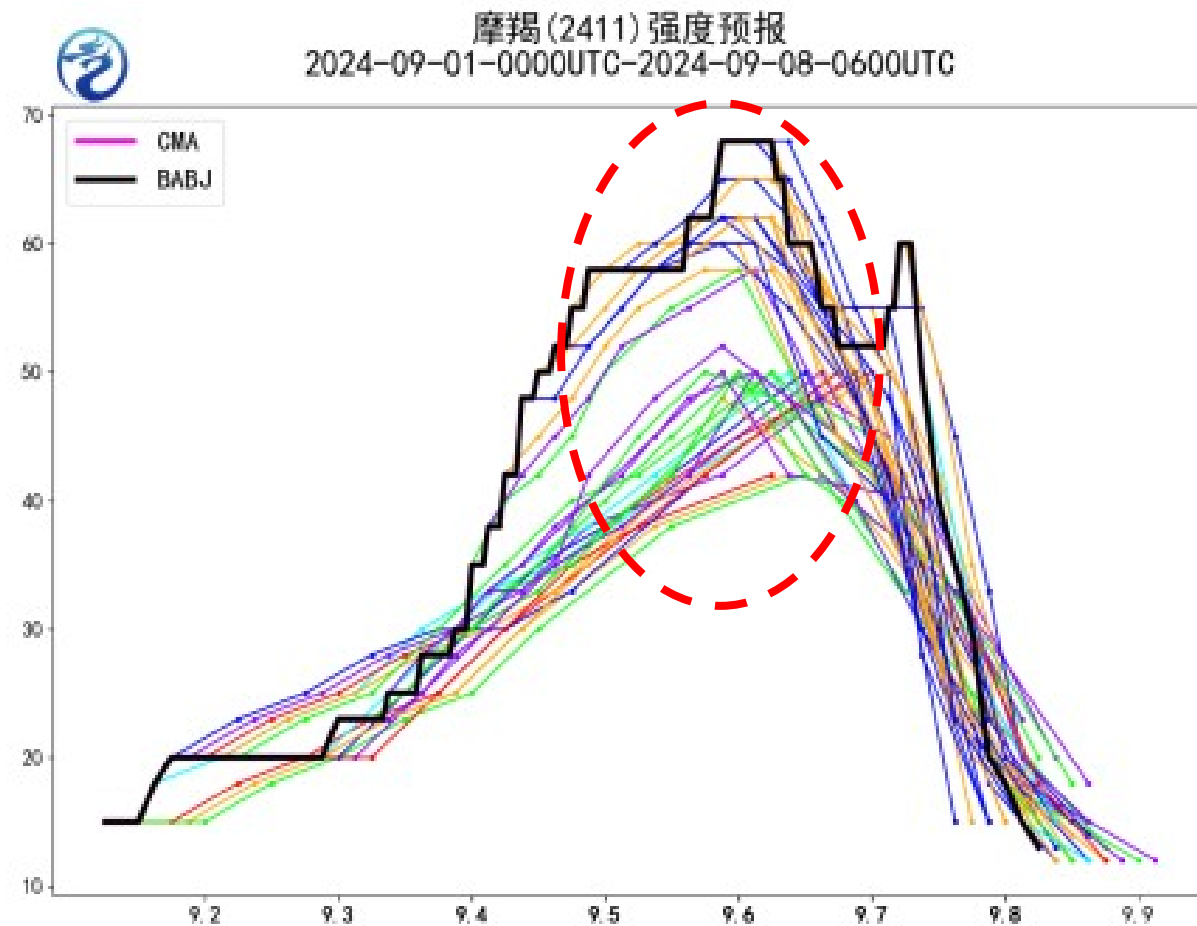
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Plan**

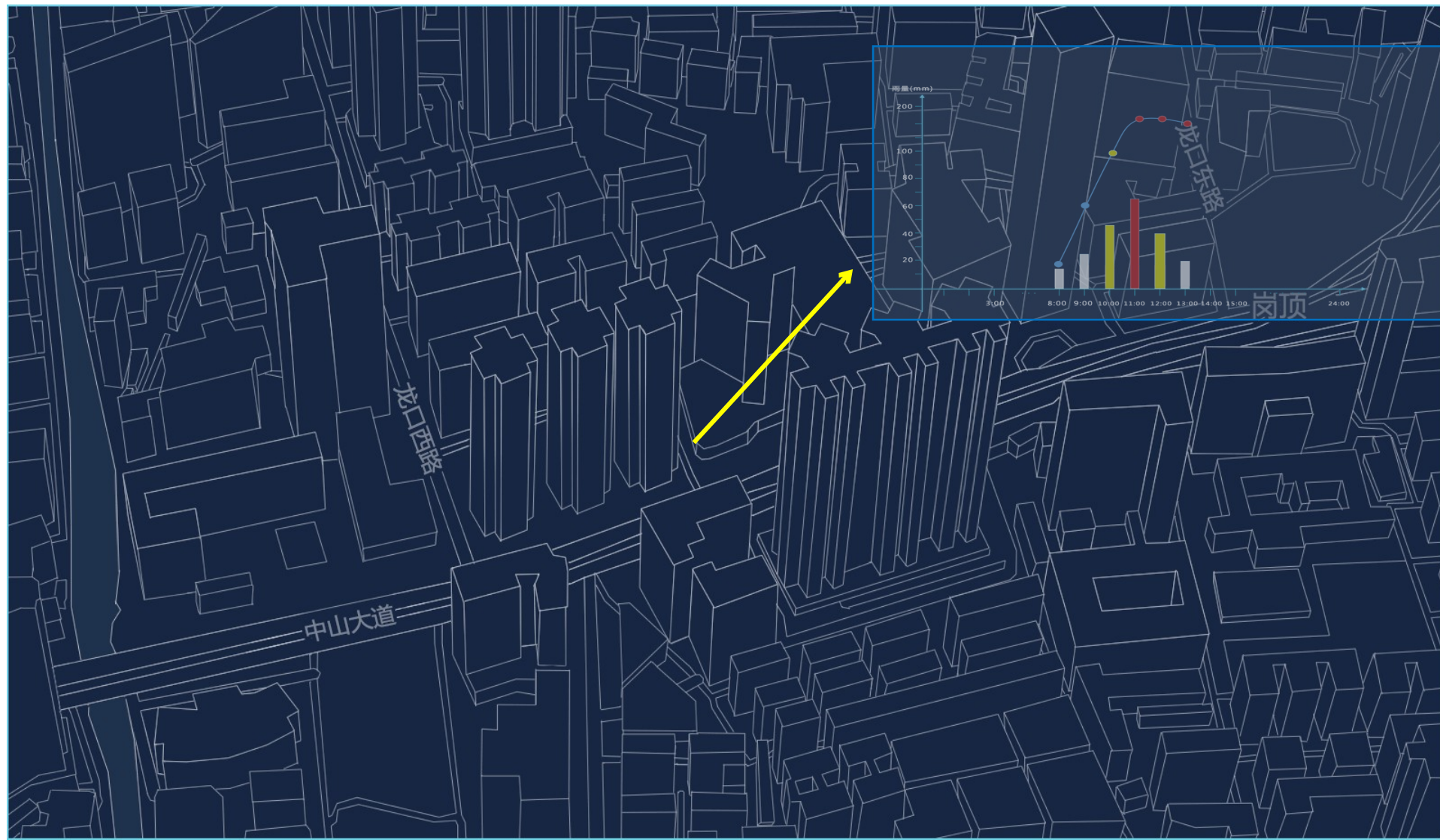
After the formation of a typhoon, the interaction mechanism among its intensity, structure, and track has always been a hot topic in typhoon research, and it is also a long-standing difficulty and challenge in global typhoon research and forecasting work.



	9月4日08时	9月5日08时	9月6日08时 (LMI)
CI	4.5	6.5	7.5
Official	35 m/s	58 m/s	68 m/s
24h Error	-5 m/s	-8 m/s	-6 m/s
48h Error	-5 m/s	-20 m/s	-10 m/s
72h Error		-20 m/s	-18 m/s
96h Error			-23 m/s

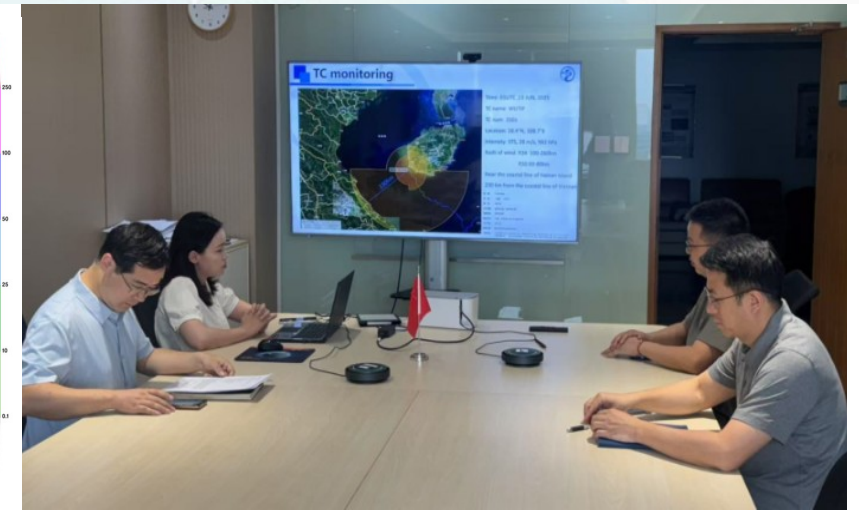
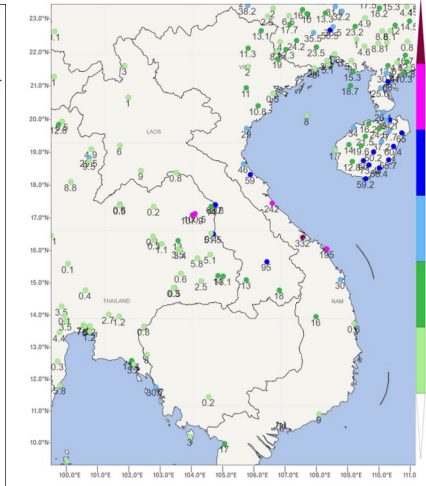
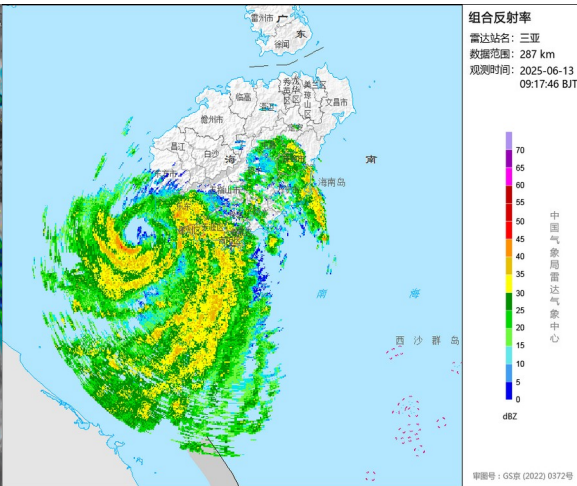
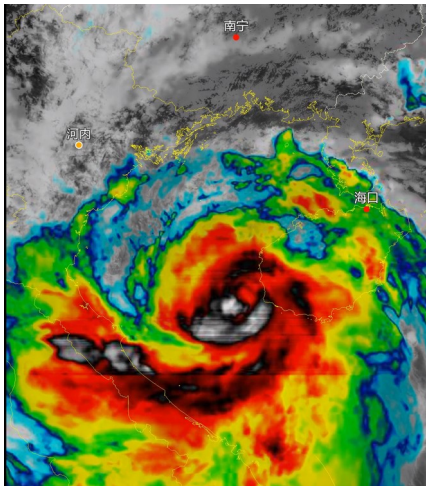
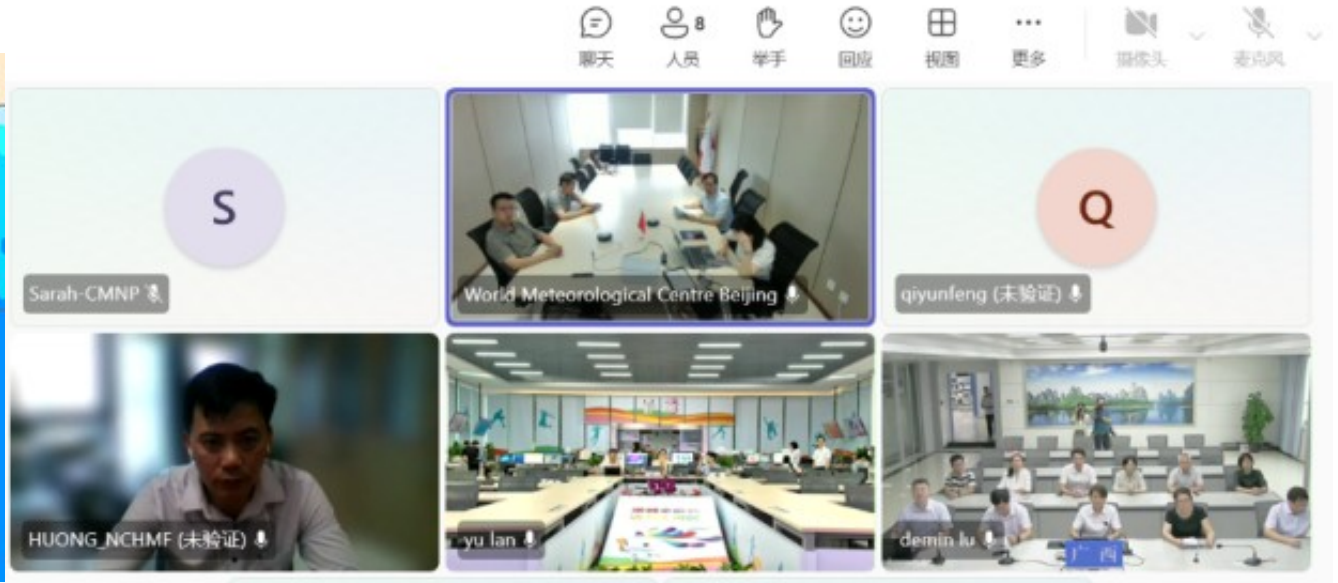
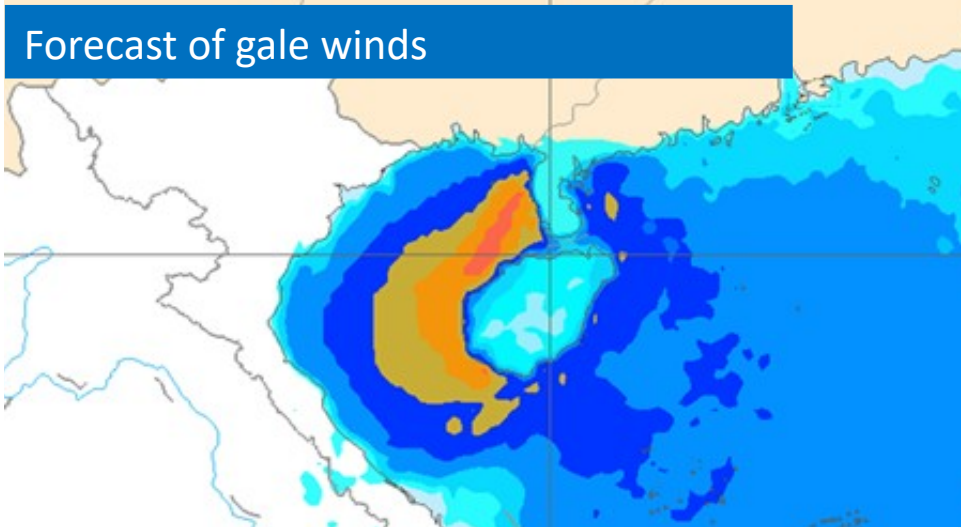


With the development of cities, the increasingly refined impact of wind and rainfall is closely related to the disasters and the effectiveness of rescue organizations, high-resolution forecasts is highly needed.



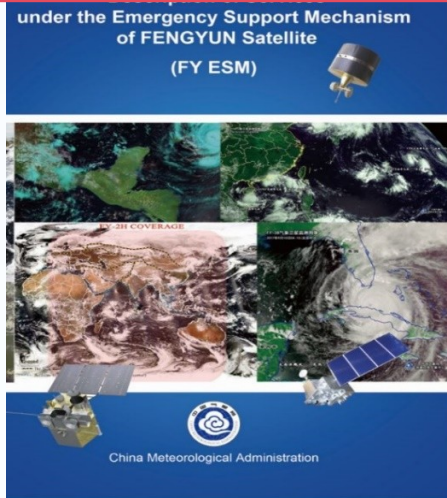
Technical discussion on typhoons

Forecast of gale winds

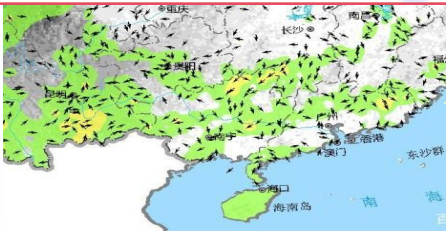


Cloud-based Early Warning supporting System

FY-ESM: Data, products sharing and fast scanning services

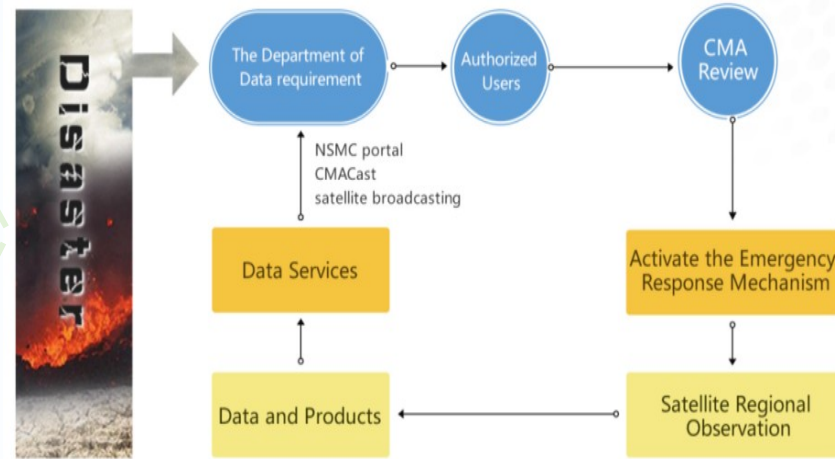


Observation sharing

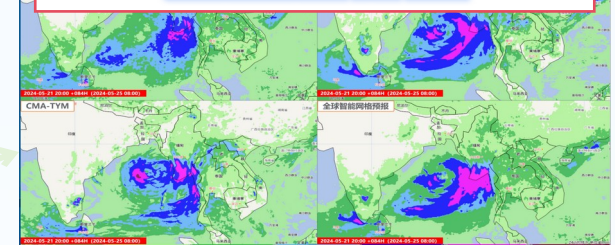


Construction a Co-develop Global Early Warning Operational System

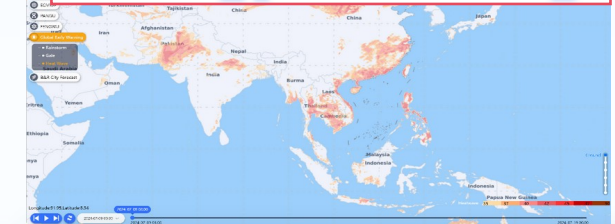
Emergency/Disaster Support Mechanism



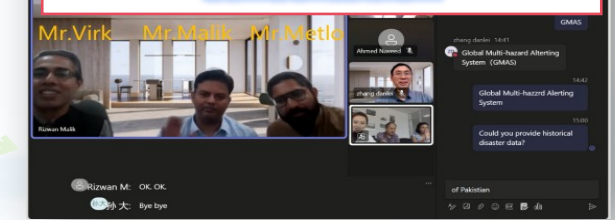
CMA model service



Warning products sharing



International weather consultation



- A global disaster weather early warning operation system and Emergency/Disaster Support Mechanism that is interconnected, mutually beneficial, open, and shared.
- Through these mechanisms, we hope to achieve greater openness, sharing, and win-win outcomes. To support the joint improvement of regional disaster prevention and reduction capabilities.



Thank you!

**Deepening Meteorological Cooperation
and Promote collaboration on Early Warning for ALL**

National Meteorological Centre, CMA

March 10, 2026