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Intergovernmental Oceanographic Commission

South China Sea Region Tsunami Ready
Related Training Course (Online)
22-23 December 2025

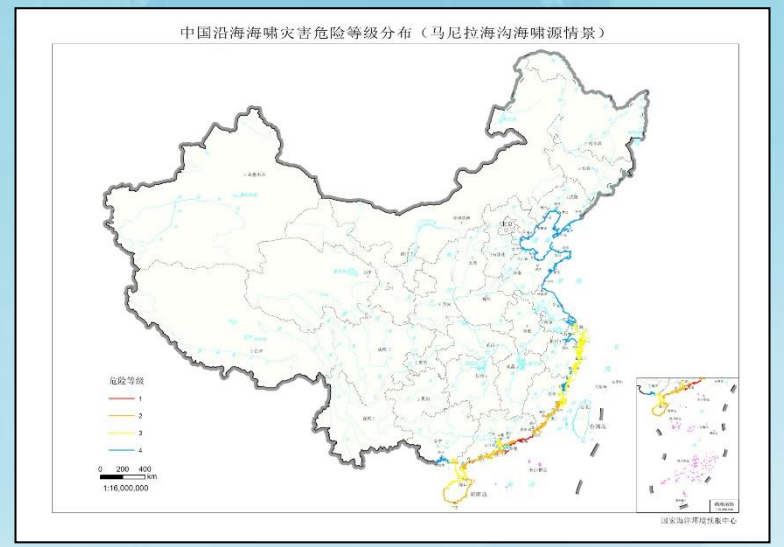
Tsunami Ready Preparations in China

Jingming Hou

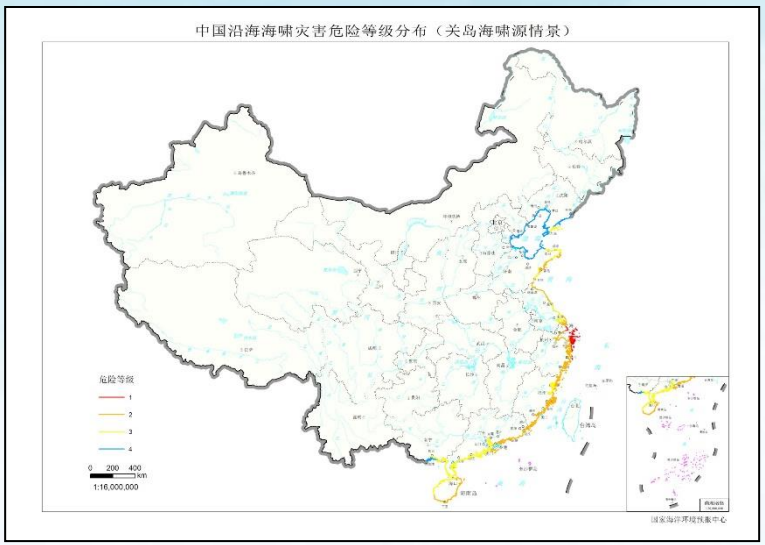
National Tsunami Warning Center, Ministry of Natural Resources
National Marine Environmental Forecasting Center
South China Sea Tsunami Advisory Center

Tsunami risk assessment

National-scale tsunami assessment



National tsunami risk level



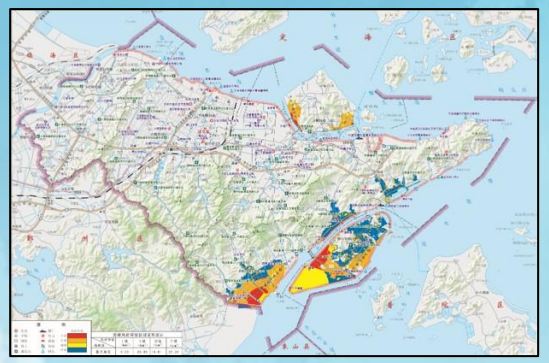
National tsunami risk zoning

Provincial-scale tsunami assessment

Tsunami risk of Fujian Province

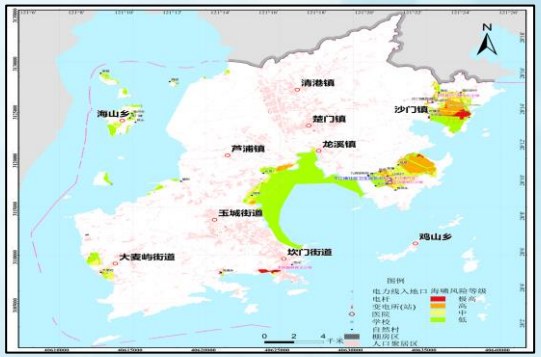
Tsunami risk of Hebei Province

County-scale tsunami assessment



Beilun County

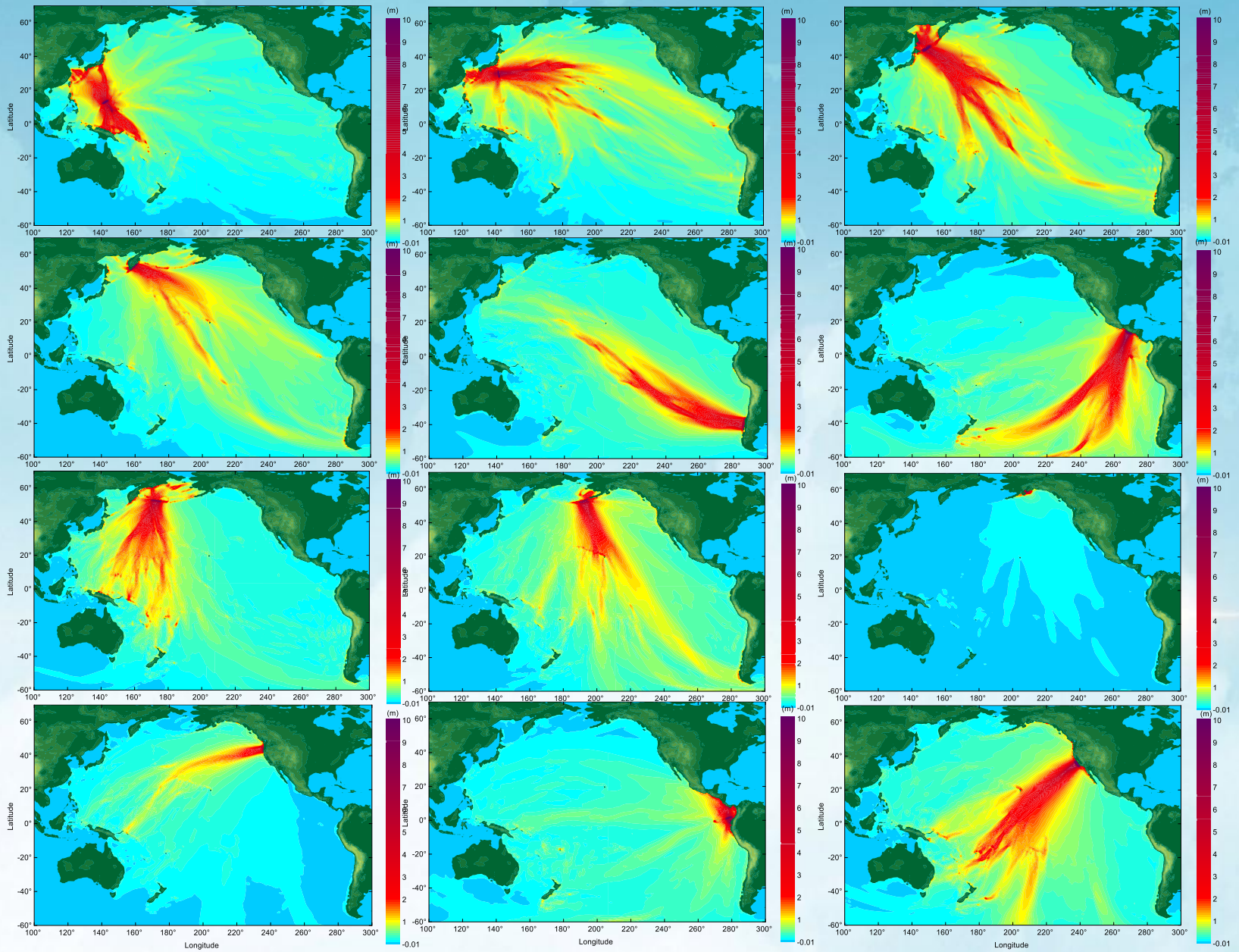
Lianyun County



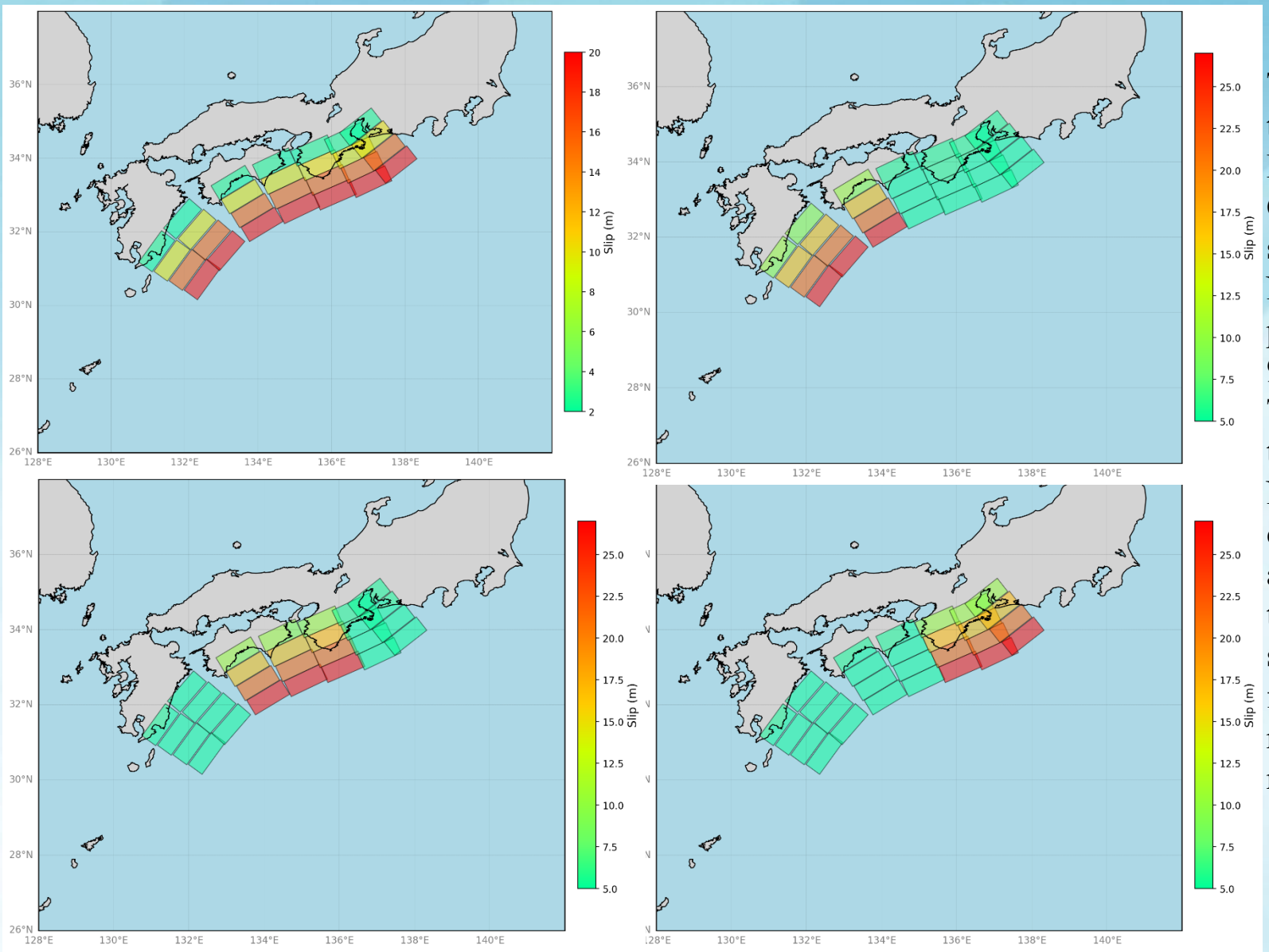
Yuhuan County

Tsunami risk assessment

Numerical calculation



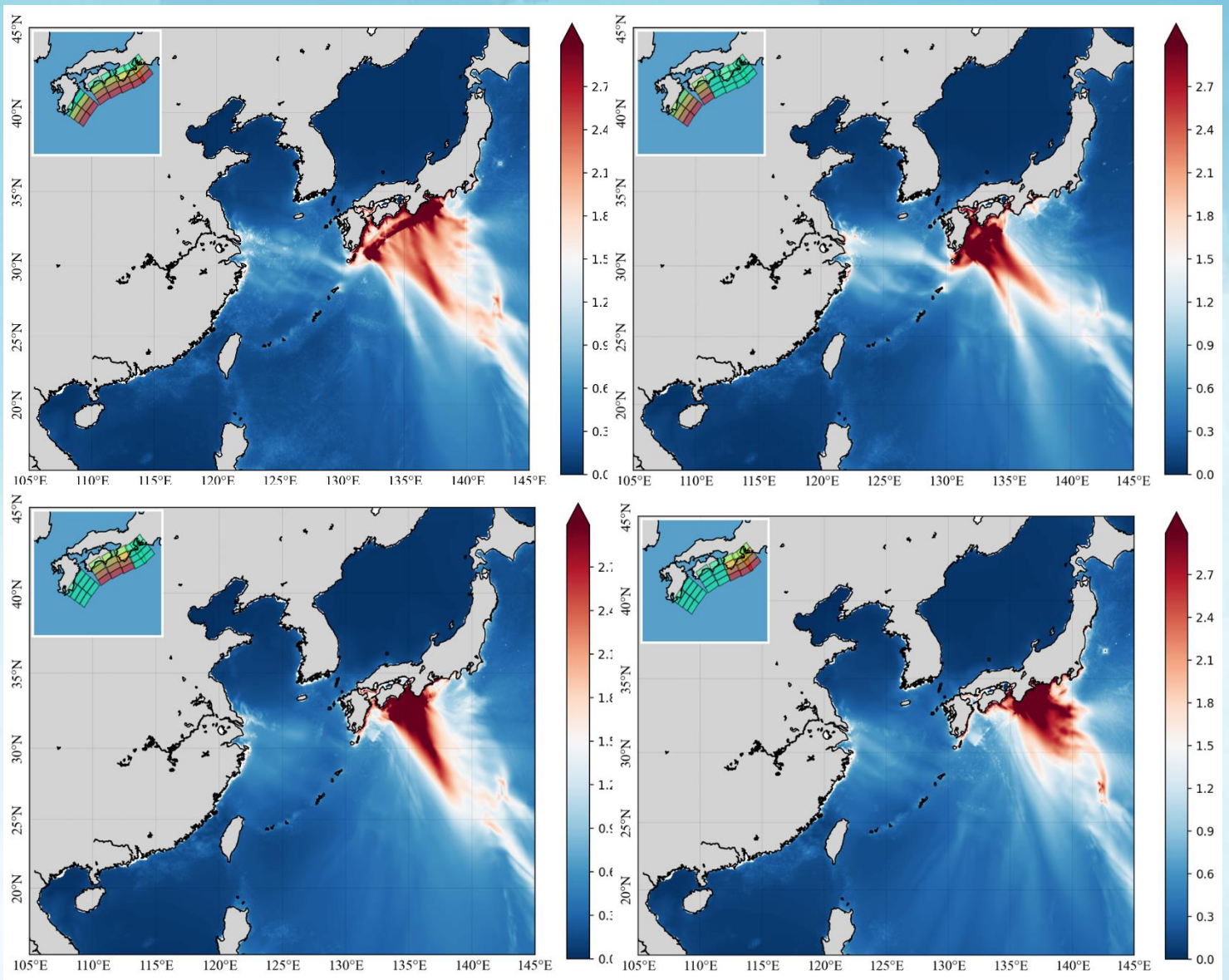
Tsunami Hazard - Japan Nankai Trough



The assessment results from the Japanese government's Earthquake Research Committee indicate that the seismic intensity in the Nankai Trough could potentially reach magnitude 9.0 within the next 30 years. To accurately assess the tsunami risk from Japan's Nankai Trough, the study employs a unit source data analysis method, subdividing the magnitude 9 earthquake scenario into four situations: full-domain rupture, left-side rupture, central rupture, and right-side rupture.

Tsunami hazard assessment

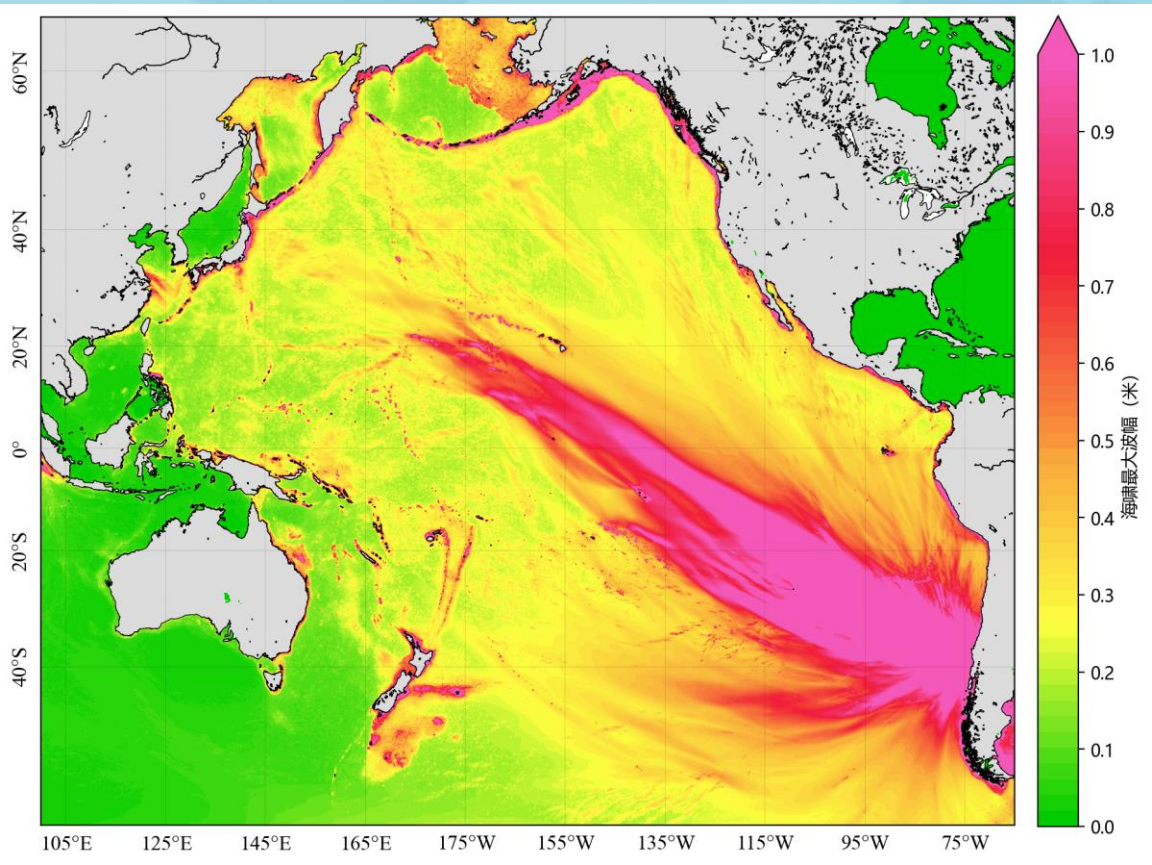
Tsunami Hazard - Japan Nankai Trough



From the distribution of maximum tsunami wave amplitudes in each scenario, the coastal areas of the Southeast China show the largest amplitudes, with the coast of Zhejiang and Guangdong Provinces being particularly significant. Tsunami waves pass through the Ryukyu Islands via the Osumi Strait, Tokara Strait, and Amami Strait, subsequently propagating to China's waters. Among these, the left-side rupture scenario of the Nankai Trough produces the largest amplitudes, with wave heights exceeding 3 meters in some areas.

Tsunami Event Monitoring

1960 Chile Mw9.5 Tsunami

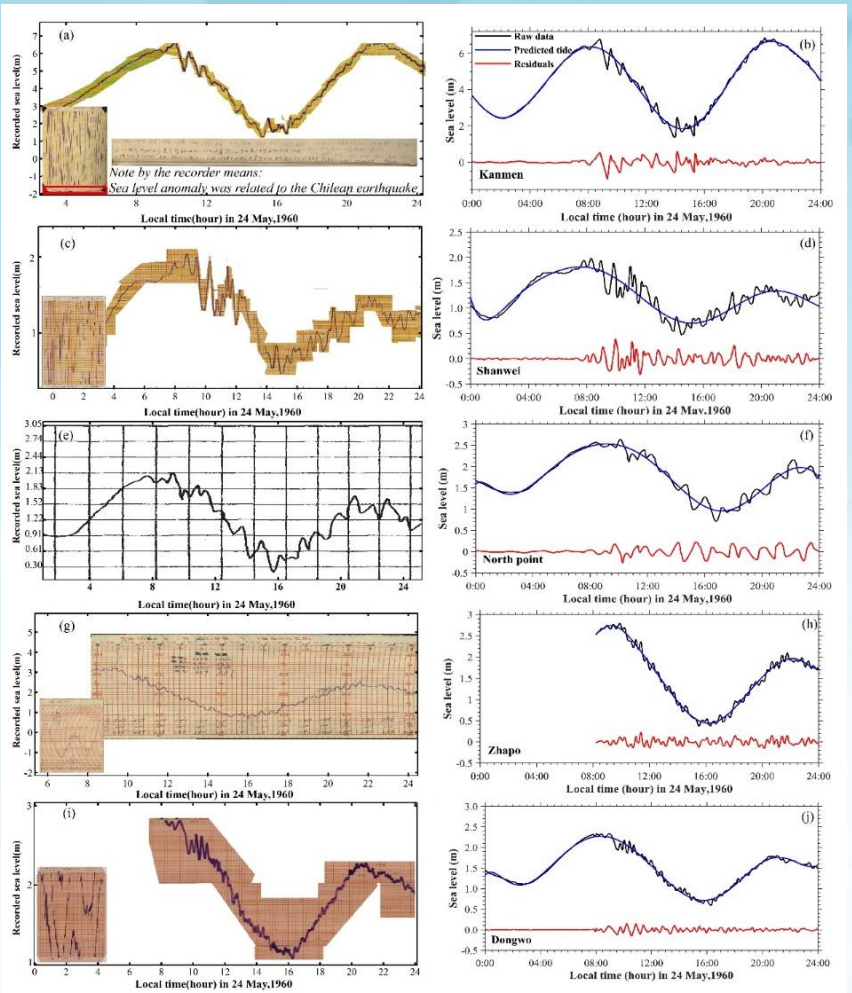


On May 22, 1960, a magnitude 9.5 earthquake occurred in southern Chile. The devastating tsunami triggered by the earthquake caused severe impacts on multiple countries along the Pacific coast.
Kanmen Station recorded a maximum tsunami wave amplitude of 93 centimeters, and Shenjiamen recorded 97 centimeters. Numerical calculation results showed Shipu at 95 centimeters and Shengshan at 50 centimeters.

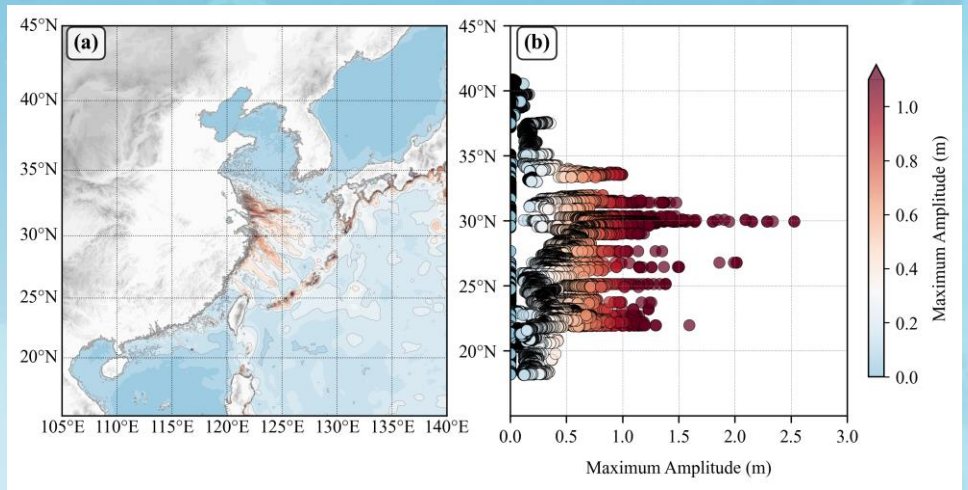
Tsunami Event Monitoring

Reconstruction of 1960 Chilean tsunami

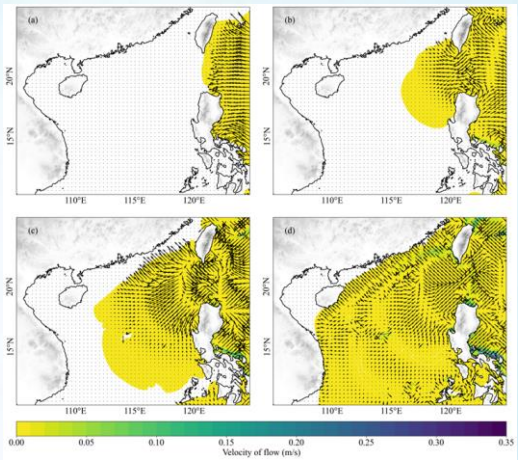
- Tsunami observation extracted from historical paper water level records

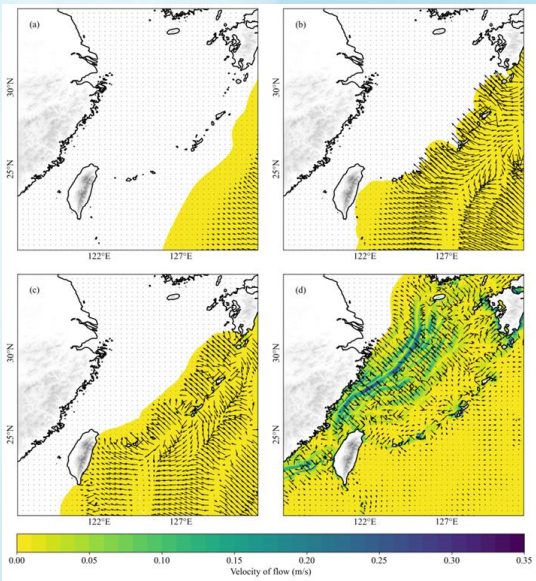


- Maximum amplitude of Chile tsunami in 1960



- Instantaneous velocity field at different times during propagation





Tsunami Event Monitoring

2010 Chile Mw8.8 Tsunami

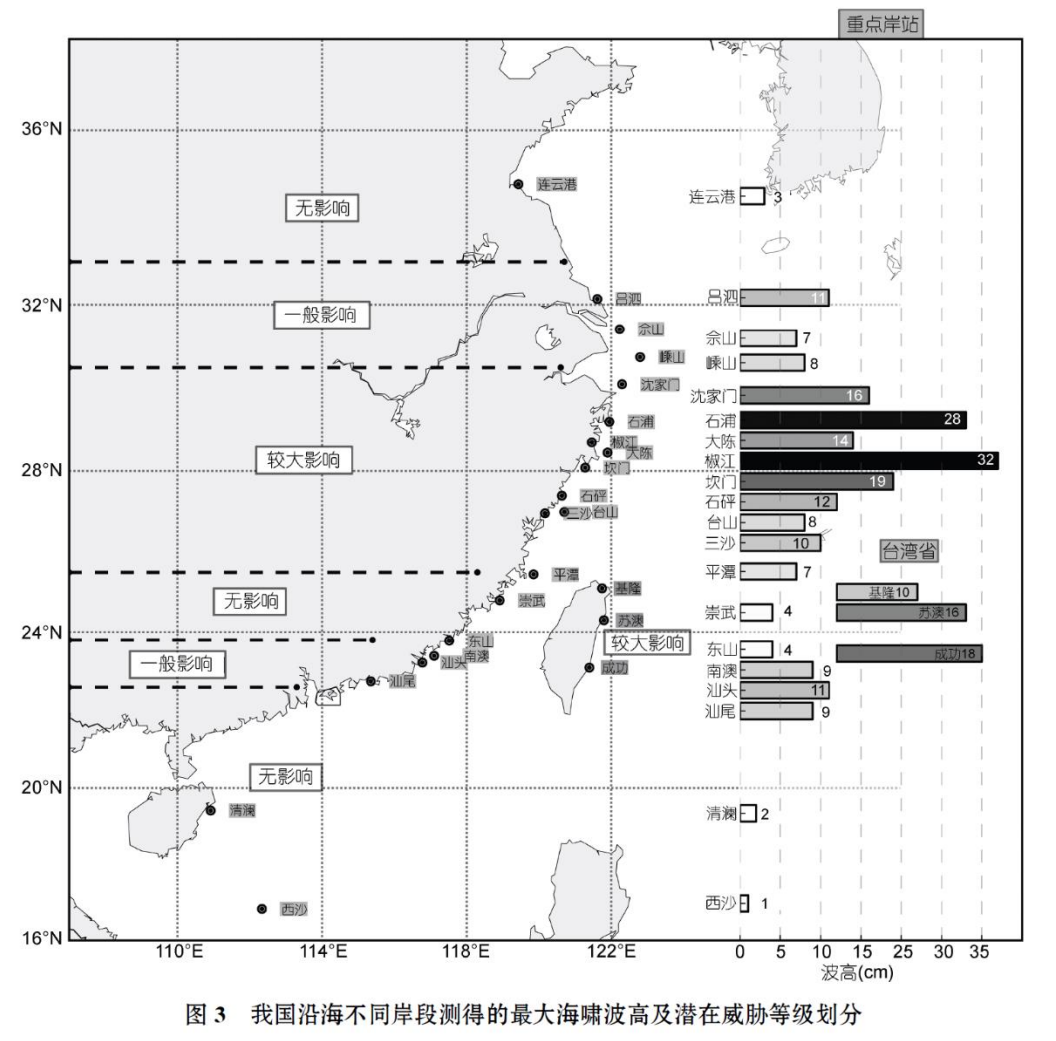


图 3　我国沿海不同岸段测得的最大海啸波高及潜在威胁等级划分

On February 27, 2010, a powerful magnitude 8.8 earthquake occurred near the coast of central Chile. Subsequently, dozens of countries and regions around the Pacific Rim successively detected the transoceanic tsunami triggered by the strong earthquake. Jiaojiang, Shipu, Kanmen, and Dachen stations detected tsunami waves of 10-40 centimeters, with the maximum being 32 centimeters at Jiaojiang.

Tsunami Event Monitoring

2011 Japan Mw9.1 Tsunami

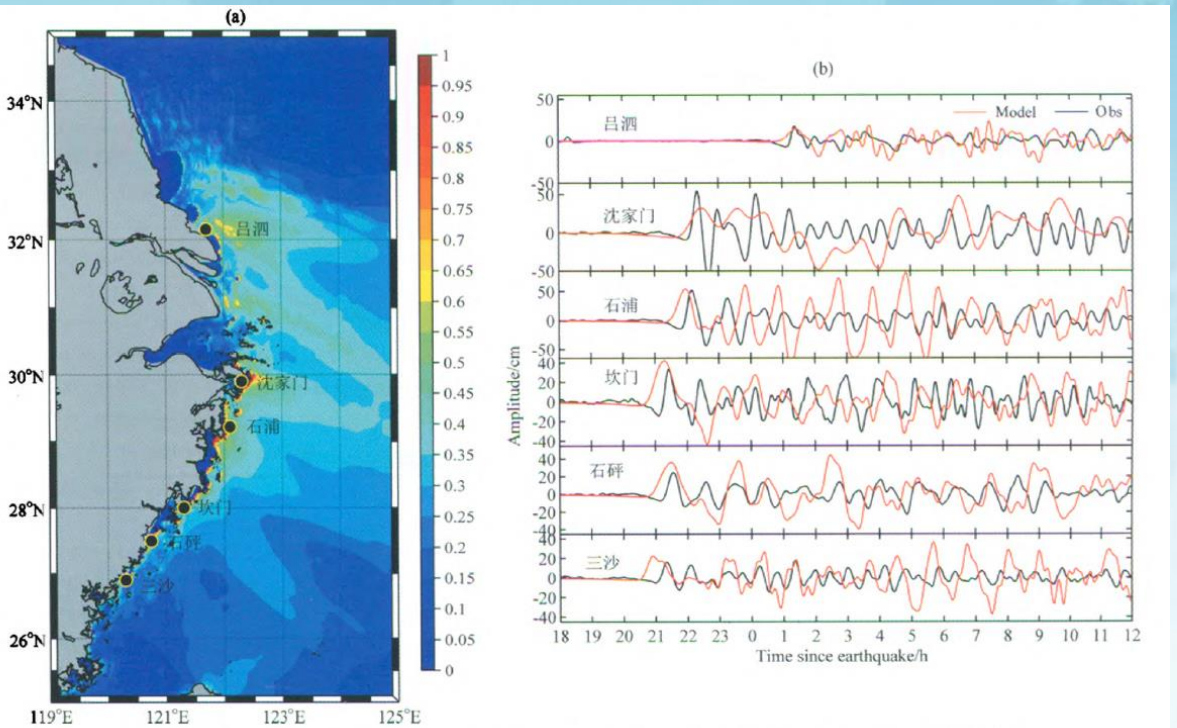


图 5　福建北部至江苏南部一带沿海海啸能量分布(a)及典型站点海啸时间序列数值模拟分析(b)

Fig. 5　Tsunami energy distribution around coastal region from northern Fujian to southern Jiangsu (a) and comparison of numerical simulation result (b) with tidal gages measurements at typical sites

On March 11, 2011 Beijing time, a magnitude 9.1 mega-earthquake occurred off the northeastern coast of Japan. Subsequently, tide gauge stations and tsunami monitoring buoys in dozens of countries and regions around the Pacific Rim all detected the transoceanic tsunami triggered by the strong earthquake.

The southeast coast was successively affected by tsunami waves. Shenjiamen, Dachen, Kanmen, Shiping, Shipu, Jiantiao and other tide gauge stations successively detected tsunami waves with amplitudes of 10-55 cm. Among them, Shipu and Shenjiamen tide gauge stations recorded the largest tsunami waves at 55 cm and 52 cm respectively, which were also the largest instrumentally measured tsunami wave records in China.

Tsunami Event Monitoring

2022 Tonga HTHH Volcanic Tsunami

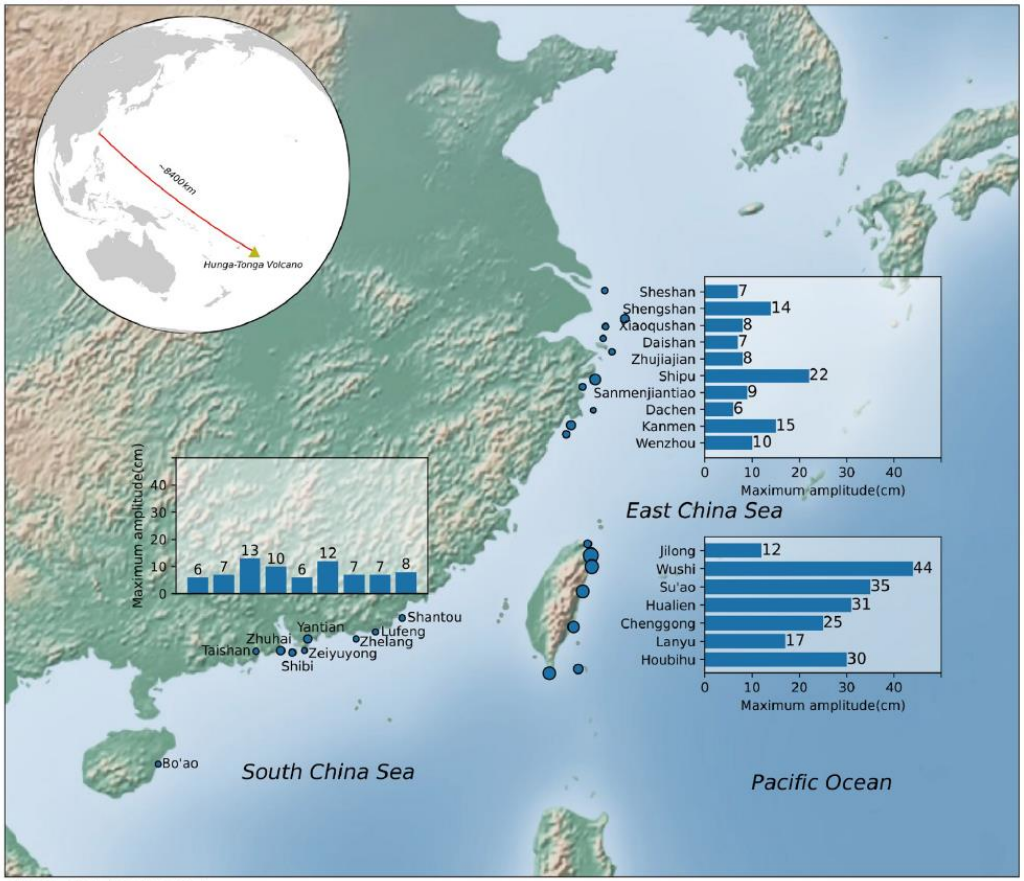


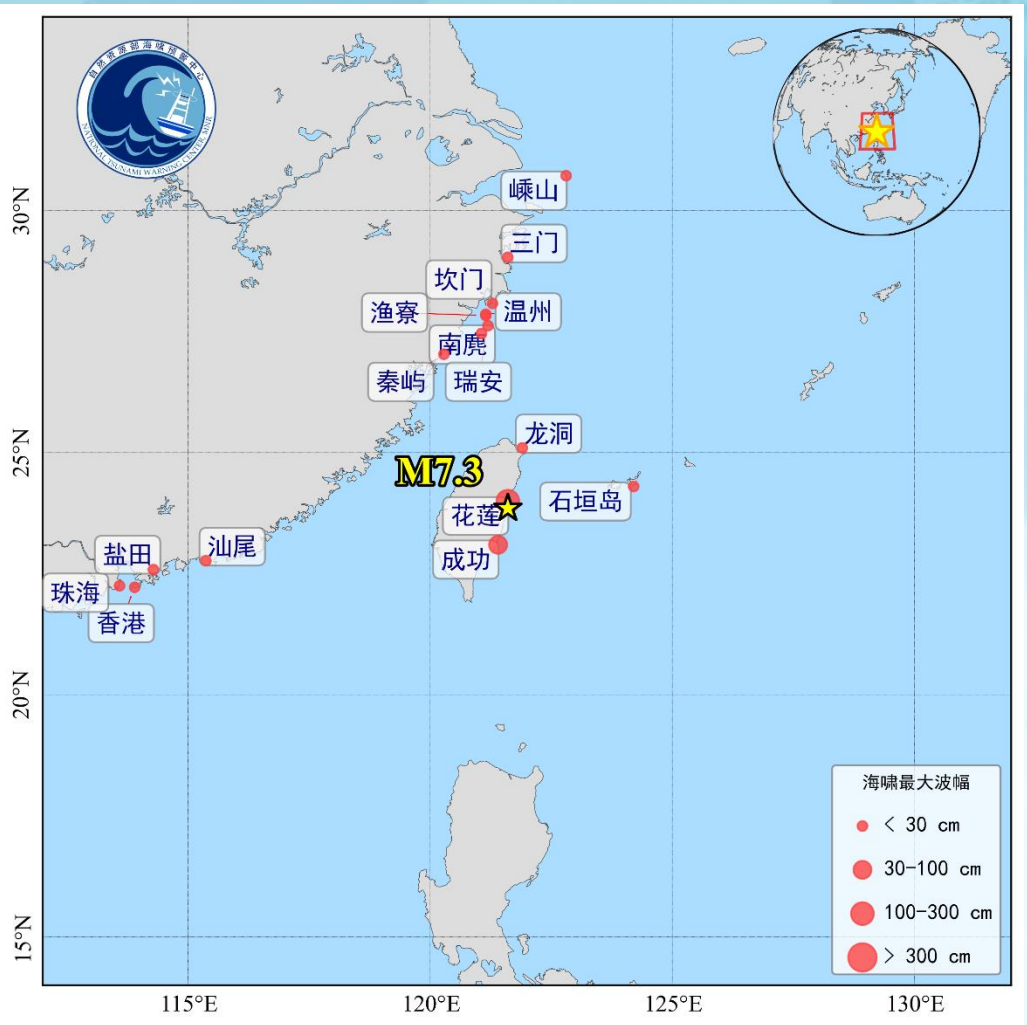
Figure 3 Maximum tsunami wave amplitudes recorded at tidal gauges in China (sorted by longitude in southern China, and by latitude in eastern China and eastern Taiwan Island).

On January 15, 2022, the Hunga Tonga-Hunga Ha'apai (HTHH) volcano near Tonga erupted, causing violent atmospheric pressure disturbances and triggering atmospheric Lamb waves and a tsunami that spread across the Pacific.

More than ten stations in the southeast coast of China detected tsunami waves, with the maximum wave amplitude being 22 cm at Shipu Station.

Tsunami Event Monitoring

2024 Taiwan Mw7.3 Tsunami



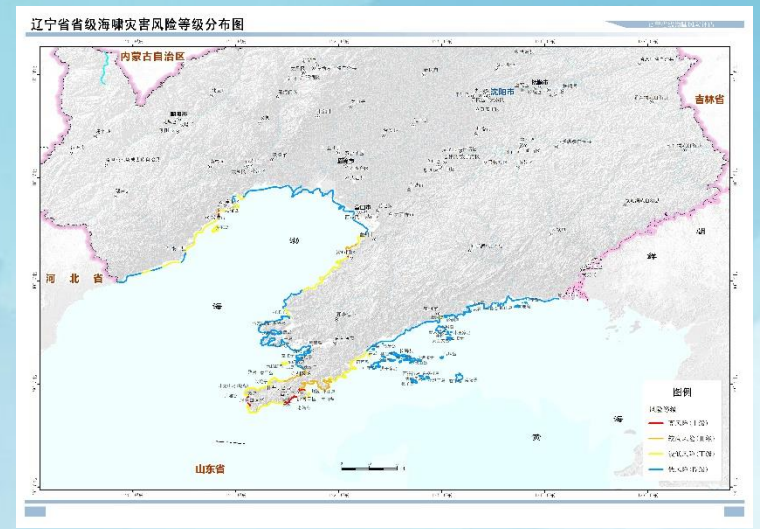
On April 3, 2024, a magnitude 7.3 earthquake occurred in the waters off Taiwan, China. The earthquake triggered a tsunami near the epicenter.

The stations in the southeast coast of China detected tsunami waves, Kanmen Station detected 23 centimeters, Wenzhou Station detected 17 centimeters, Yuliao Station detected 17 centimeters, Nanji Station detected 17 centimeters, Shengshan Station detected 12 centimeters, and Zhuhai Station detected 10 centimeters.

Tsunami risk assessment

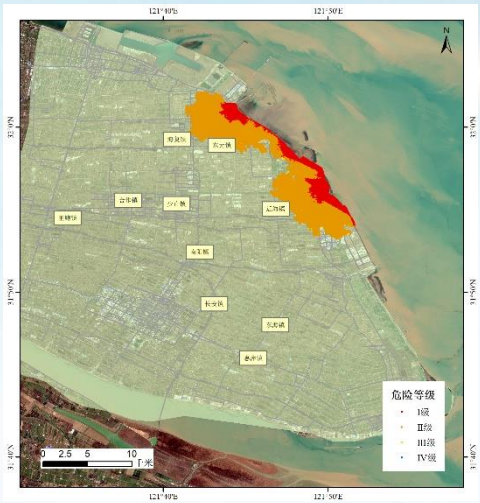
Tsunami risk assessment and zoning

Tsunami inundation areas

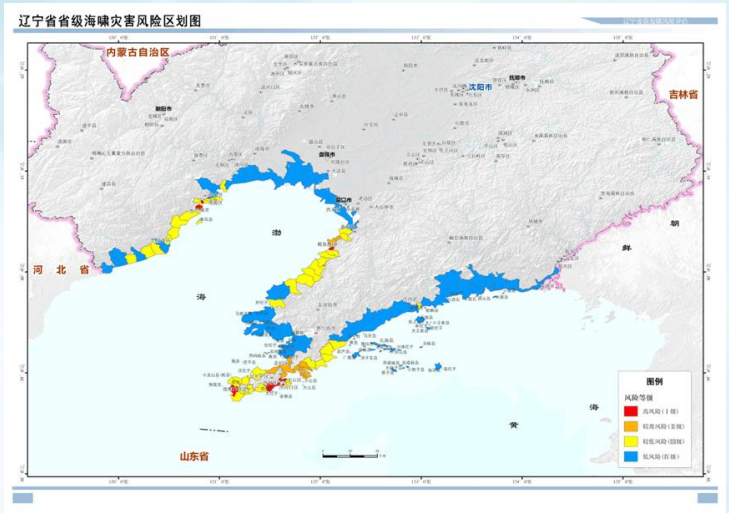


Tsunami hazard levels

Tsunami vulnerability levels



Tsunami inundation levels



Tsunami risk levels

Tsunami prevention areas

Tsunami evacuation

- The tsunami evacuation standards have been developed to standardize the production of evacuation maps and plans.
  - Technical Guidelines for Tsunami Disaster Risk Assessment and Zoning
  - Technical specifications for tsunami evacuation plan preparation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中华人民共和国海洋行业标准

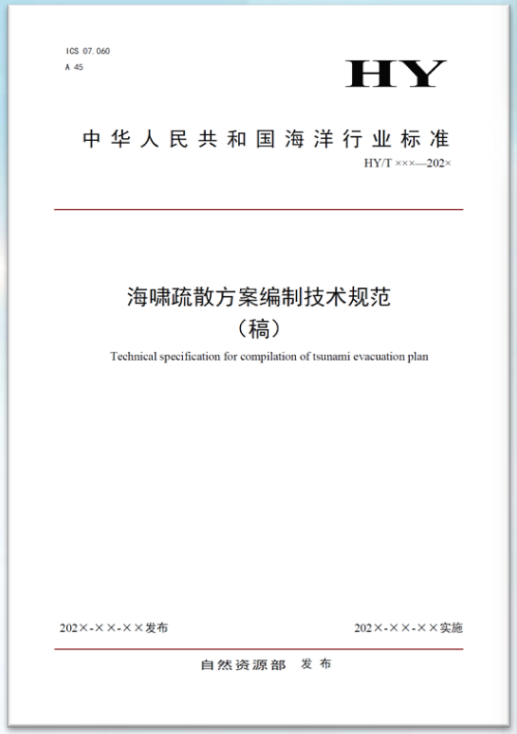
HY/T 0273.3—2021

海洋灾害风险评估和区划技术导则
第 3 部分：海啸

Technical directives for risk assessment and zoning of marine disaster—
Part 3: Tsunami

2021-02-09 发布　　2021-06-01 实施

中华人民共和国自然资源部 发布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中华人民共和国海洋行业标准

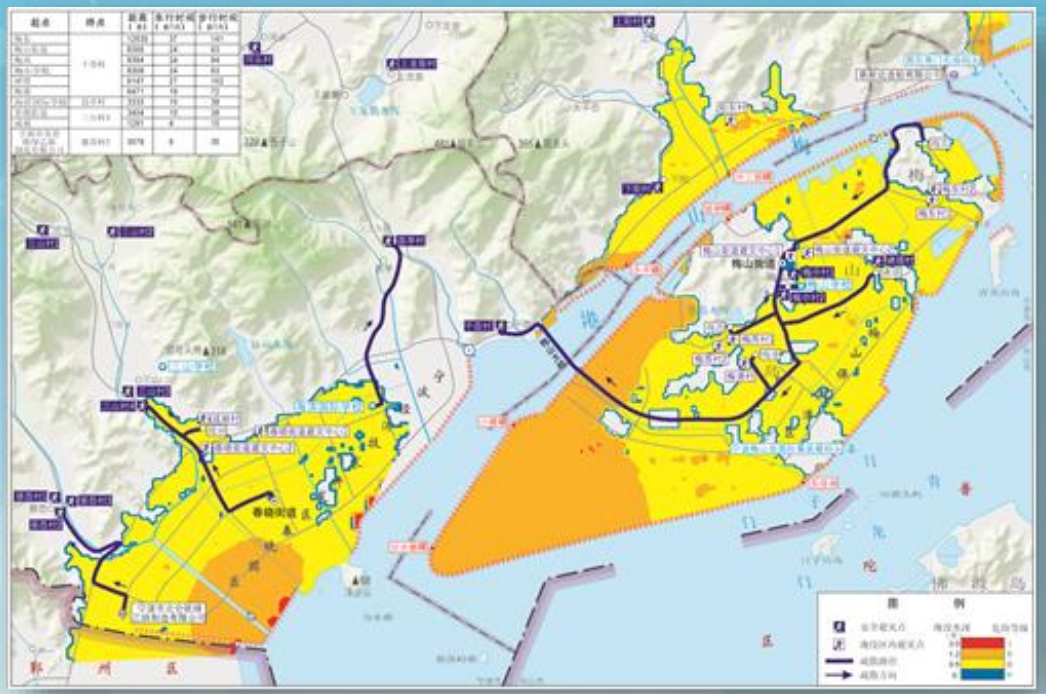
HY/T ×××—202×

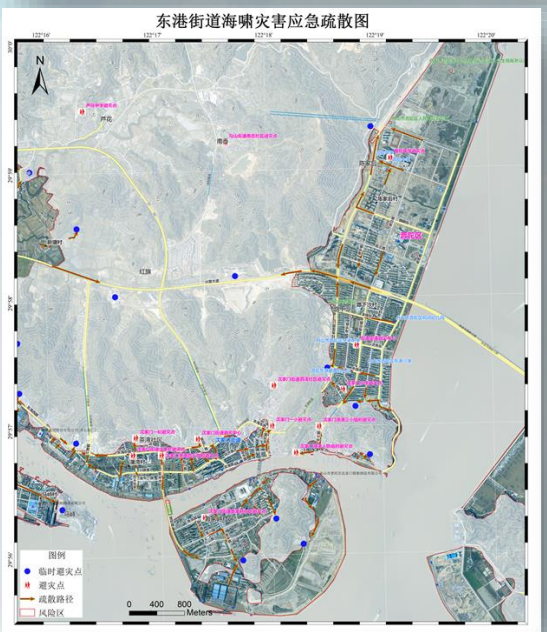
海啸疏散方案编制技术规范
（稿）

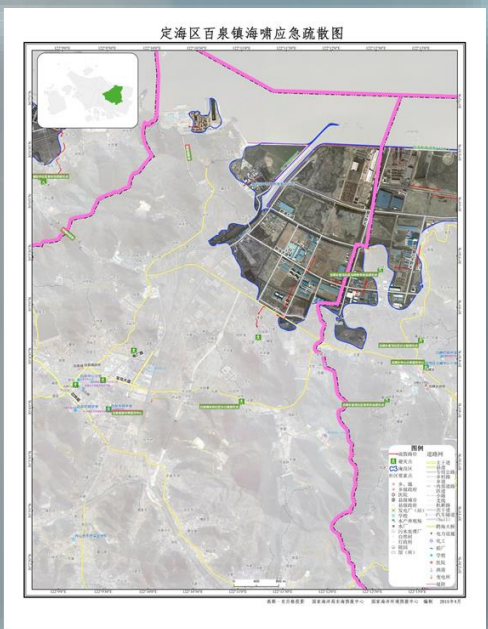
Technical specification for compilation of tsunami evacuation plan

202×-××-×× 发布　　202×-××-×× 实施

自然资源部 发布



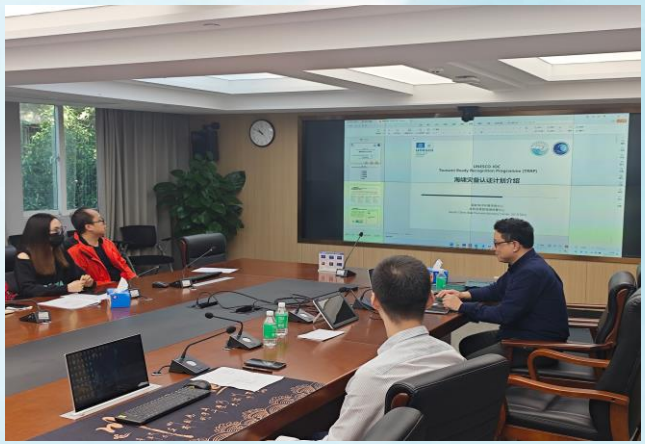




On-site investigation for tsunami ready

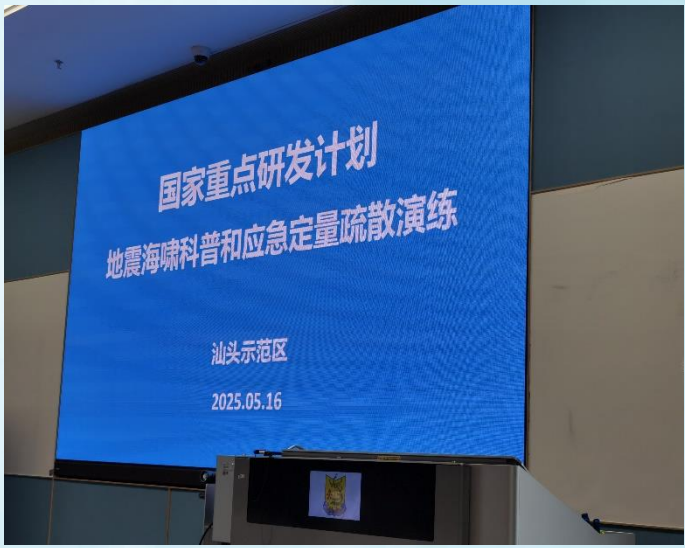
On-site investigation in Zhejiang and Guangdong Provinces:

(1) Representative Areas Where Tsunami Waves Have Been Detected
Shengshan, Daishan, Zhujiajian, Shenjiamen, Shipu, Dachen, Sanmen, Jiaojiang, Kanmen, Shipeng, Wenzhou, Zhuhai, Shantou.
(2) Tsunami-Vulnerable Communities Islands, coastal communities, bays, and other areas susceptible to water level rise.
(3) Resource Capacity
Communities with basic resources to implement education and training programs, drills, and infrastructure development
(4) Government Support
Local governments with the willingness and capability to implement disaster preparedness plans



Tsunami Drill

- On May 16, 2025, a tsunami evacuation drill was conducted at the Haiwan Shangjing Community in Shantou City.
- The command center identified potentially affected communities;
- Emergency evacuation notices were issued.
- Evacuation scenes were transmitted to the command center;
- Shelter sites reported evacuation status;



Tsunami Ready Plans for 2026

- This year, some budget for tsunami ready has been prepared.
- A key challenge is that in recent years, China has experienced only relatively small tsunami waves, which has led to diminished enthusiasm for mitigation efforts in coastal communities.
- In 2026, community tsunami drills will continue to be organized to build practical experience.
- Targeted tsunami ready promotional materials will be developed and distributed to high-risk communities.
- 1-2 high-risk communities are planned to be selected for pilot projects, with the goal of having 12 key indicators completed.

THANK YOU !