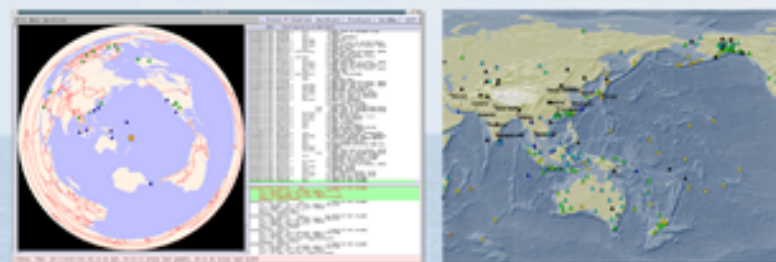


Seismic and Sea Level Monitoring Networks



Seismic Data Processing System



Tsunami Warning Criteria

Tsunami Warning

- Wave amplitude 0.5 meter or more, and ETA less than 3 hours

Tsunami Information Bulletin

- Wave amplitude less than 0.5 meter; ETA more than 3 hours; Tsunami if of widely concern.



Warning Service



Progress on Tsunami Warning in China

NATIONAL TSUNAMI WARNING CENTER,
STATE OCEANIC ADMINISTRATION, CHINA
HONG KONG OBSERVATORY, HONG KONG, CHINA



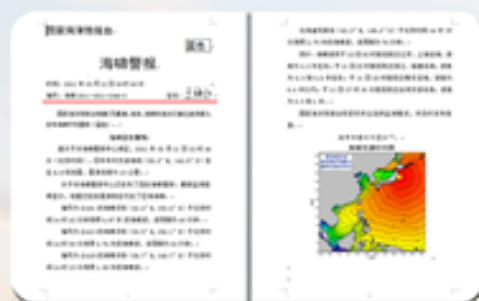
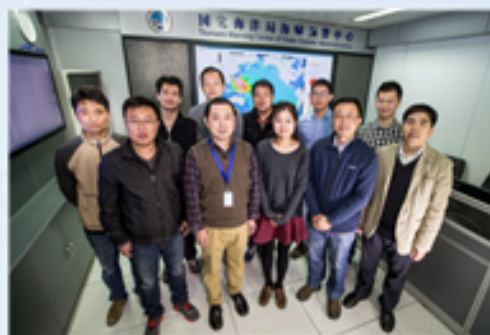


National Tsunami Warning Center State Oceanic Administration, China

Overview and History

National Tsunami Warning Center of SOA, formerly as Tsunami Warning Section of National Marine Environmental Forecasting Center, is the sole national operational center that is responsible for tsunami monitoring and warning in China.

- NMEFC started domestic tsunami warning service after China had joined ICG/PTWS in 1983, mainly by forwarding PTWC's international products.
- NMEFC commenced to identify potential tsunami risks of Chinese coasts and develop tsunami warning capability after the tragic Indian Tsunami in 2004.
- The 24/7 on-duty operation commenced since 2006.
- Tsunami Warning Section/NMEFC was established in 2011.
- NMEFC issued Level Four Tsunami Warning to Zhejiang Province in '3.11' Tohoku Tsunami.
- NMEFC started real-time earthquake monitoring operation since 2013 by equipping with Antelope and SeisComp3.
- National Tsunami Warning Center/SOA was formally approved by Central government of China in 2013 to enhance domestic and regional tsunami warning capability.



Tsunami Warning Section was awarded China Youth Civilization title during 2008-2009 and 2011-2012

2008-2009年度

青年文明号

共青团中央 国家海洋局

2011-2012年度

青年文明号

共青团中央 国家海洋局

荣誉证书

授予：国家海洋环境预报中心海啸预警组
全国地震科技工作先进单位荣誉称号



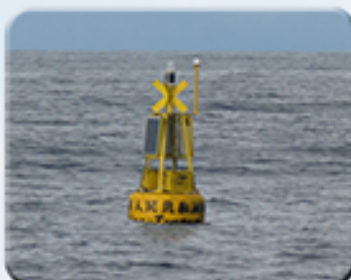
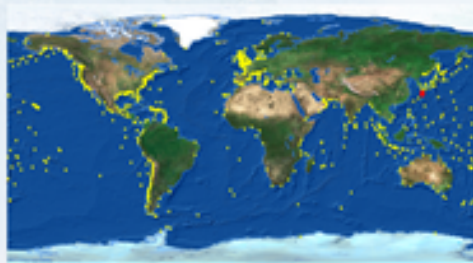
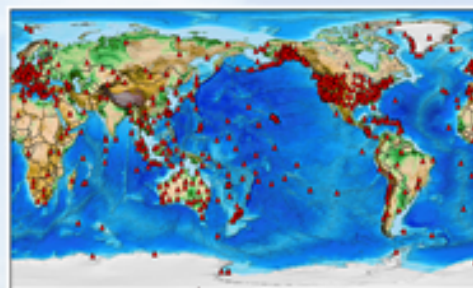


National Tsunami Warning Center State Oceanic Administration, China

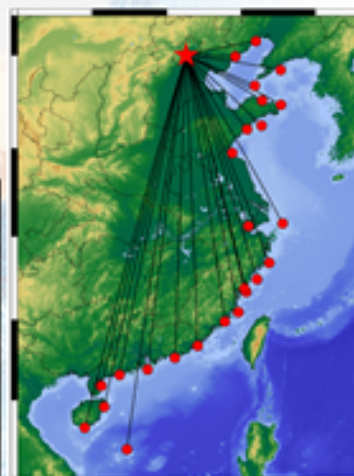
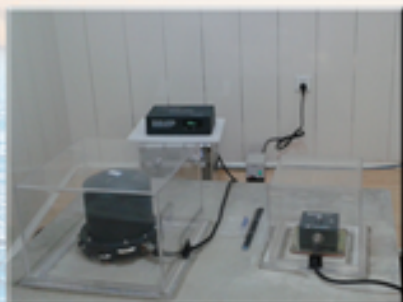
Earthquake and Tsunami Monitoring

Operational monitoring of global and regional earthquake and sea level networks since 2013

- Global Seismic Network (GSN)
IRIS Seedlink
- NDBC (DART buoys)
- SOA tidal gauges
- 2 South China Sea Tsunami Buoys (only one in position since 2011) to detect tsunami events originated from Manila Trench



- 25 seismic stations were installed along coasts of China to enhance the capability of detecting the local and regional earthquakes.





National Tsunami Warning Center State Oceanic Administration, China

Decision Support Systems & Warning Skills

Seismic Monitoring System (Antelope & SeisComp3)

- Antelope and SeisComp3 were equipped to receive global and regional seismic monitoring streams and yield earthquake parameters including epicenter, magnitude and focal depth.
- Quick CMT solution will be injected into Standard Operating Procedures in the near future to facilitate numerical forecasting of tsunami waves with accuracy.



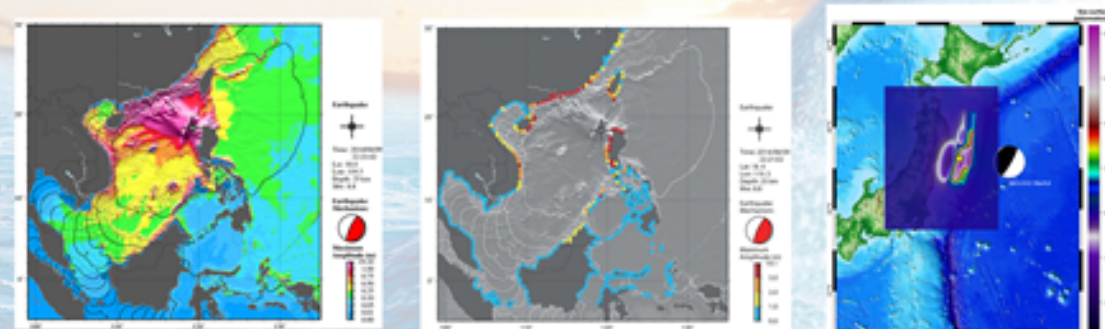
Tsunami Warning Decision Support System & Tsunami Warning Database

- Real-time retrieval of Earthquake parameters and sea level observing data, integration of numerical models, organizing warning products and dissemination by multiple pathways.
- Tsunami Warning Database covering the Northwest Pacific region is under development. At least 70,000 scenarios was stored in the database.



Rapid Tsunami Simulation & Tsunami Buoy Inversion

- Numerical forecasting of tsunami waves propagating across the whole Pacific can be finished within 400 seconds with spatial resolution of 5 arc-minutes, while for the Northwest Pacific it takes less than 40 seconds with spatial resolution of 4 arc-minutes.





National Tsunami Warning Center State Oceanic Administration, China

Tsunami Exercises & Tsunami Risk Assessment

Involved in the PacWave Exercise since 2006

- Tsunami Evacuation drill in Dayawan Estuary (where Dayawan Nuclear Power Plant resides), Guangdong Province during PacWave 2011.
- Nationwide Tsunami exercise in PacWave 2013 to test the emergency response of provincial governments in case of regional tsunami.



Tsunami risk assessment

- County-level tsunami risk assessment and evacuation map compilation was conducted since 2013 in Zhejiang Province.





National Tsunami Warning Center State Oceanic Administration, China

International Cooperation & Domestic Collaboration

In collaboration with the SCS Member States to establish the SCS Tsunami Warning and Mitigation System under the framework of ICG/PTWS.

<Proposal for the establishment of the South China Sea Tsunami Warning and Mitigation System> was submitted to the ICG/PTWS 24th Session in Beijing, and approved by ICG/PTWS 25th Session in Vladivostok in 2013.



Participated in the SCS Working Group Meetings in Sanya, Kuala Lumpur, Hong Kong and Jakarta to promote the establishment of the SCS Tsunami Warning and Mitigation System.



Hosted the 1st training course on Tsunami Risk Assessment and Tsunami modeling, and the training workshop on PTWC New Enhanced Products and SOP.



Domestic collaboration with China Earthquake Information Center/CEA and National Meteorological Information Center/CMA to improve operational procedures and promote data sharing.



5 tidal gauges (green dots) were shared by GTS with assistance of CMA in 2014 (WMO SZCI01). The SCS tsunami buoy data will be available on GTS in 2015.



Cooperation with CEIC/CEA to improve earthquake detection and seismic data sharing.



National Tsunami Warning Center State Oceanic Administration, China

Scientific Research & Public Outreach

NMEFC is the state-level institution that mainly engages in scientific research regarding tsunami warning. NMEFC undertook a branch of national key projects such as National Natural Science Foundation of China, National Eleventh Five-Year Science and Technology Project, National disaster prevention and mitigation key projects in recent years. Research on 'Key Progress on Tsunami Forecasting Skills' was awarded the first prize of the '2011 Marine Science and Technology Innovation' of the State Oceanic Administration.



First Prize of
2011 Marine Science and Technology Innovation



Public Outreach

- Translated <Giant Wave> and <Tsunami Glossary>
- Public outreach on Tsunami risks during the National Disaster Mitigation Day

