

Introduction

The 2004 Sumatra-Andaman earthquake and Indian Ocean tsunami have highlighted inherent vulnerabilities of the world's coastal communities to extreme natural hazardous events. During the Indian Ocean tsunami, which lasted for only a few hours, nearly 300,000 people were killed and more than one million people were left homeless in more than 10 countries surrounding the Indian Ocean. Based on various reports, the total property damage is estimated over US\$10 billion. Most of damage occurred because neither a tsunami warning system nor a simple communication network among the countries in the region was in place. Public education and coastal zone planning for tsunami hazard were also practically non-existent in the region.

After the 2004 Indian Ocean tsunami, many countries, including the United States, Japan, Germany and other European countries, have been working independently and collectively to develop tsunami warning systems for Indian Ocean region countries. To ensure the safety and protection of American lives and property from tsunami, the US government has also made plans to expand the U.S. tsunami detection and warning capabilities. The plan has committed more than \$50 millions over the next several years to deploy 29 new deep ocean sensor systems in the Pacific Ocean rim and Caribbean Sea.

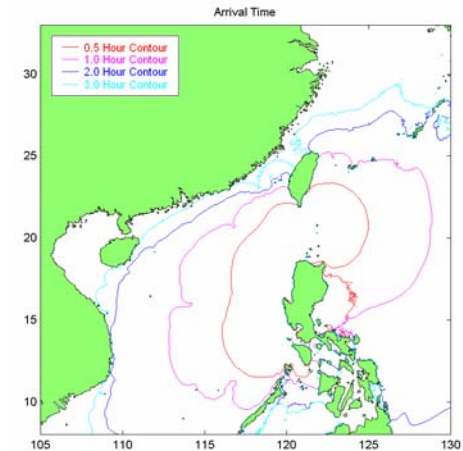
Recently the USGS issued a report assessing the potential risk as a tsunami source along the entire Pacific seduction zones. It identified the Manila (Luzon) trench as a high risk zone, where the Eurasian plate is actively subducting eastward underneath the Luzon volcanic arc on the Philippine Sea plate. Two other medium risk subduction zones in the neighboring area are also identified. Along the Ryukyu trench the Philippine Sea plate subducts northward beneath the Ryukyu Arc on the Eurasian plate, while along the North Sulawesi trench the Pacific-Philippine, Indo-Australian Plates and the Sunda Block meet. These subduction zones can also rupture and generate large tsunamis in the future that will have significant impacts on the countries in the South China Sea region.

It is clear that recent attention on tsunami hazard mitigation planning and early warning system development has been primarily focused on Indian Ocean, Pacific Ocean and Caribbean Sea. Potential devastating tsunami disasters in the South China Sea region have been overlooked. During the recent 2007 NUS-TMSI workshop on "Earthquake and Tsunami: From Source to Hazard" (<http://et2007.org/>), this concern was raised and discussed. The participants of the workshop supported the idea of forming a working group to initiate a study on a regional tsunami hazard mitigation plan and an early warning system in the South China Sea region.

Organizing Committees
(in alphabetic order)
Center for Space and Remote Sensing Research National Central University (Taiwan)
Chinese Geophysical Society (Taiwan)
Graduate Institute of Hydrological and Oceanic Sciences, National Central University (Taiwan)
Institute of Earth Sciences, Academia Sinica (Taiwan)
Research Center of Ocean Environment and Technology (Taiwan)
School of Civil and Environmental Engineering, Cornell University (USA)

SCSTW 2007

A Workshop on a System Approach for Tsunami Warning and Hazard Mitigation in the South China Sea Region (South China Sea Tsunami Workshop 2007)



Date: December 5-7, 2007
Location: Academia Sinica (Taipei, Taiwan)

Sponsored by:
(in alphabetic order)

- Academia Sinica (Taiwan)
- College of Earth Sciences, National Central University (Taiwan)
- Cornell University (U.S.A.)
- Earth Science Research Promotion Center (Taiwan)
- National Center for Ocean Research (Taiwan)
- National Science Council (Taiwan)

Objectives

To understand the fundamental processes for tsunami, one needs to address the generation mechanisms, the propagation characteristics and, finally their coastal effects. Therefore, strong interactions and collaborations among coastal physical oceanographers, geophysicists, and engineers are necessary. The objective of the workshop is to create such a forum.

The specific objectives of the workshop include:

1. To review the on-going tsunami early warning program for Indian Ocean region.
2. To review the on-going tsunami research in the South China Sea region.
3. To discuss the future research and implementation plans for tsunami early warning system and coastal hazard mitigation programs in the South China Sea region.

Program

The workshop is planned for three days. During the first two days (December 5-6) the workshop will be held in Academia Sinica, Taipei, which has the following address:

**Institute of Earth Science,
Academia Sinica
128, Sec. 2, Academia Rd.,
Nankang, Taipei 115, Taiwan (R.O.C.)**

In the third day (December 7) a field trip will be arranged to visit the Center for Space and Remote Sensing Research at National Central University (Taoyuan, Taiwan) and the Tainan Hydraulics Laboratory at National Cheng Kung University, located in Tainan, Taiwan.

December 5

- 08:00 – 09:00
Registration
- 09:00 – 09:30
Welcome and opening remarks
Prof. Bor-ming Jahn, Director, Institute of Earth Sciences, Academia Sinica, Taiwan
Prof. Wing Ip, Vice President, National Central University, Taiwan
Dr. Robert Y. Lai, Chairman, National Applied Research Laboratories, Taiwan
- 09:30 – 10:15
Present practice of tsunami warning system and hazard mitigation programs in Japan (Dr. Nobuo Shuto, Nihon University, Japan)
- 10:15 – 10:30
Coffee Break
- 10:30 – 11:15
Overview of on-going activities on tsunami warning systems and tsunami hazard mitigation in Indian Ocean and presentation of the framework for South China Sea Initiative (Prof.. P.L.L.-F. Liu, Cornell University, USA)
- 11:15 – 11:45
A review on the characteristics of Manila (Luzon) subduction zone and other potential tsunami generation source regions in the South China Sea (Prof.. Shu-Kun Hsu, National Central University, Taiwan)

- 11:45 – 12:15
An overview of current tsunami research activities in Taiwan (Prof. Tso-ren Wu, National Central University)
- 12:15 – 13:30
Lunch
- 13:30 – 14:00
Current tsunami research activities in Philippines (Prof. Edanjarlo J. Marquez, Department of Physical Sciences and Mathematics, University of the Philippines-Manila)
- 14:00 – 14:30
On-going tsunami research in tsunami research group, Bandung Institute of Technology (Dr. Hamzah Latief, Bandung Institute of Technology, Indonesia)
- 14:30 – 15:00
Overview of Singapore tsunami research program (Dr. Pavel Tkalich, National University of Singapore, Singapore)
- 15:00 – 15:15
Coffee Break
- 15:15 – 15:45
Tsunami research in Malaysia post Andaman 2004 tsunami: A country overview (Prof. Hock Lye Koh, Universiti Sains Malaysia, Malaysia)
- 16:15 – 16:45
The effect of tsunamis generated in Manila trench on the South China Sea and the Gulf of Thailand (Prof. Anat Ruangrassamee, Chulalongkorn University, Thailand)
- 16:45 – 17:15
Current tsunami research activities in Vietnam (Prof. Vu Thanh Ca, Institute of Meteorology and Hydrology, Vietnam)
- 17:15 – 17:45
Current tsunami research activities in China (Prof. Hua Liu, Shanghai Jiao-Tong University, China)
- 17:45 – 18:15
General discussions

December 6

- 08:30 – 08:50
Long-term earthquake potential modeling around Sunda Arc: A case study of Sumatra plate margin (Dr. Wahyu Triyoso, Bandung Institute of Technology, Indonesia)
- 08:50 – 09:10
Tsunami source mechanisms in the Philippine archipelago (Dr. Cala Dimalanta, University of the Philippines, Philippines)
- 09:10 – 09:30
The subduction zones of Ryukyu, Manila and Philippine Trenches: Tsunamiogenic or Nontsunamiogenic? The necessity of Ocean-Bottom crustal deformation and GPS measurements (Dr. M. Ando, Academia Sinica, Taiwan)
- 09:30 – 09:50
Fault mechanism and essential fault parameters for predicting tsunami generation in South China Sea (Pro. S-H Chew, National University of Singapore, Singapore)
- 09:50 – 10:10
Review of seismic network activities in the Manila-taiwan subduction zone (Prof. P.F.Chen, National Central University, Taiwan)
- 10:10 – 10:30
Possible future reupture scenarios of the Manila trench (Prof. K. Megawati, Nanyang Technological University, Singapore)
- 10:30 – 10:45
Tsunami Hazard near Taiwan and implications for rheological stratification under Taiwan (Prof. D. A. Yuen, University of Minnesota, UAS)
- 10:45 – 11:00
coffee break
- 11:00 – 11:20
Numerical Simulation of Tsunami propagation and Inundation on the West-Coast

of South China Sea (Prof. Phung D. Hieu, Hanoi University of Science, Vietnam)

- 11:20 – 11:40
Modeling of tsunami run-up and inundation in Singapore (Prof. Z. Huang, Nanyang Technological University, Singapore)
- 11:40 – 12:00
Tsunami runup and inundation simulation in Malaysia including the role of mangroves (Ms. Su Yean The, Universiti Sains Malaysia, Malaysia)
- 12:00 – 12:20
A numerical model for tsunami runup calculation (Prof. Vu Thanh Ca, Institute of Meteorology and Hydrology, Vietnam)
- 12:20 – 13:30
Lunch
- 13:30 – 13:50
Taiwan seismic network status and plans for seismic monitoring cooperation with countries surrounding the South China Sea (Dr. Bor-Shouh Huang, Academia Sinica, Taiwan)
- 13:50 – 14:10
Construction of the marine earthquake and tsunami monitoring stations (Dr. Yuanqing Zhu, Earthquake Administration of Shanghai Municipality, China)
- 14:10 – 14:30
Current initiatives on the development of tsunami early warning systems in the South China Sea region (Dr. Bart Bautista, Philippine Institute of Volcanology and Seismology, Philippines)
- 14:30 – 14:50
The roles and responsibilities of the Institute of Geophysics (IGP) in tsunami research, and early warnings for Vietnam (Dr. B.C. Que, IGP, Vietnam)
- 14:50 – 15:10
Effect of sea-dikes on tsunami run-up (Dr. K.S. Hwang, National Cheng Kung University, Taiwan)
- 15:10 – 15:30
Simulating mangrove succession and recovery after tsunami (Ms. Su Yean The, Universiti Sains Malaysia, Malaysia)
- 15:30 – 15:45
Coffee Break
- 15:45 – 17:00
General discussion on the future plans for SCS initiatives

December 7

There will be a field trip to the Center for Space and Remote Sensing at National Central University, Jhongli and the Tainan Hydraulic Laboratory at National Cheng Kung University, Tainan. This field trip requires advance registration. The deadline for the registration is 15 November, 2007.

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