

Tsunami hazard assessment for coastal areas of Thailand: Developing a comprehensive tsunami hazard map

Panon Latcharote^{1,*}, Wilawan Robroo², Nattapon Trumikaborworn³, Natt Leelawat^{4,5,6}, Pennung Warnitchai⁷

¹Department of Civil and Environmental Engineering, Faculty of Engineering, Mahidol University, Nakorn Pathom, Thailand

²Independence Researcher, Bangkok, Thailand

³Disaster Preparedness, Mitigation and Management, School of Engineering, Asian Institute of Technology, Pathum Thani, Thailand

⁴Risk and Disaster Management Program, Graduate School, Chulalongkorn University, Bangkok, Thailand

⁵Department of Industrial Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok, Thailand

⁶Disaster and Risk Management Information Systems Research Unit, Chulalongkorn University, Bangkok, Thailand

⁷Department of Civil and Infrastructure Engineering, School of Engineering, Asian Institute of Technology, Pathum Thani, Thailand

ABSTRACT

The 2004 tsunami on the Andaman coast underscored the critical importance of preparedness for such disasters, particularly in Phuket and Phang Nga. It emphasized the pressing need for improved tsunami hazard maps, essential for identifying risk-prone areas and establishing safe evacuation zones, thus mitigating damage in tourist-heavy areas in Thailand. This study seeks to create detailed maps to assist places in Thailand, including Phuket and Phang Nga, in tsunami preparedness. Tools like satellite imagery and Google Street View, coupled with walking surveys, were employed to accumulate extensive information about the areas and their structures. This information is fundamental in assessing which areas are vulnerable and in determining suitable enhancements to strengthen their safety. Preliminary results indicate numerous buildings in high-risk zones are sufficiently elevated to serve as safe shelters during a tsunami. However, comprehensive evaluations are imperative to ascertain the structural integrity and safety of these buildings in such scenarios. These findings are helpful for enhancing tsunami safety in Thailand and have implications for strengthening safety in other locations. The insights and methodologies from this research can facilitate tsunami planning locally, serving as a valuable resource for mitigating the impact of future tsunamis. Moreover, beyond simply creating hazard maps, this study acts as a foundational work for a variety of related research fields and practical applications. It has facilitated the development of maps that are essential components of tsunami evacuation drill exhibitions, improving the realism and effectiveness of such preparatory exercises. Additionally, it has made significant contributions to the environmental modeling of agent-based tsunami evacuation simulations, allowing for a comprehensive understanding of diverse evacuation scenarios.

Keywords: Tsunami, Hazard map, Evacuation, Preparedness, Andaman