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Tsunami Mitigation Plan for Manakarra Beach of West Sulawesi Province, Indonesia

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Abstract

Due to the increasing activities of underwater earthquake along the Sulawesi's Waters past this one last decade, the development of future tsunami mitigation plan become important for Sulawesi Island. This research pin pointed to the easiness of the mitigation plan concept and the availability of the infrastructure.
The development of this mitigation plan was based on future tsunami modeling of Manakarra Beach of Mamuju at West Sulawesi Province. TUNAMI N2 algorithm at SiTProS Ver 1.5 was used on the tsunami propagation modeling and based on Sulawesi Seismic System for tsunami generation. Tsunami run-ups and time impact interval as the modeling results, were used as basis to develop the tsunami mitigation plan for the Manakarra Beach.
The evacuation scheme which put into map and module for the Manakarra Beach of Mamuju has been established in this research; with mainly based on a mass evacuation plan to the high buildings or high ground.

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Keyword: Manakarra; mitigation; Sulawesi; tsunami

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1. Introduction

The island of Sulawesi geographically located in the range of 5.36°N - 7.48°S and 117.02° -125.74°E, is one of the safest islands in the Indonesian archipelago due to its location which is not directly located between two oceans, the Pacific Ocean and Ocean Indies. It divided into six provinces and has several small islands, which makes it one of the largest islands in Indonesia, and has quite long coastline. Unfortunately, this also means that the island of Sulawesi vulnerable to disasters at sea, such as the tsunami due to the earthquake in the sea (visible from the red point and date of occurrence) shown in Figure 1, occurs in all parts of the island of Sulawesi. Since the Boxing Day Tsunami of Aceh in 2004, the term tsunami began widely known Indonesian society and since that time the Government and people of Indonesia are also increasingly aware of the threat of a tsunami and realize the need for mitigation measures to minimize casualties and losses caused by the tsunami.

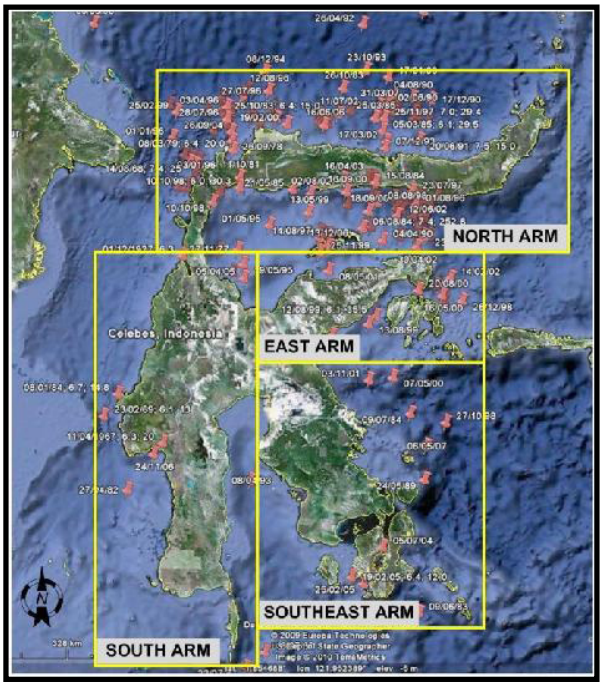

Figure 1. Earthquake epicentres around Sulawesi's waters from 1976-2010 (Baeda,2011)

The word tsunami derived from Japanese, where *tsu* means harbour and *nami* means wave. It almost universally accepted and literally means high waves that hit the beaches or coast. Tsunamis are often caused by large tectonic earthquake in the sea, although basically a tsunami can also be triggered by landslides on the seabed, volcanic eruptions, or due to meteor impact. Tsunami occurs basically due to the movement of the fault or fracture extends vertically so that the sea water is sucked into the fracture and then thrown back after fracturing achieved a balance condition. In the case of tsunami propagation, speed of the water can reach hundreds of kilometres per hour. Between the earthquake and tsunami there is a lag time that can be used to provide an early warning to the public. It is necessary for Tsunami Mitigation to give early warning before the disaster.

Successfulness of the upcoming tsunami mitigation will depend on the tsunami modelling for each coastal cities across the Sulawesi Island itself. The results of research in the form of tsunami mitigation scheme will specifically apply to the area in question and will ultimately facilitate the preventing process of the upcoming tsunami disaster response in the area.