Assessment of tsunami hazard in Sabah – Level of threat, constraints and future work

ABSTRACT

The coastal areas of Sabah are exposed to far-field earthquake-induced tsunamis that could be generated along the trenches of Manila, Negros, Sulu, Cotabato, Sangihe and North Sulawesi. Tsunami simulation models from these trenches indicated that tsunami waves can reach the coast of Sabah between 40 and 120 minutes with tsunami wave heights reaching up to 3 m near the coast. The level of tsunami threat is high in southeast Sabah due to its narrow continental shelf and proximity to tsunami source in the North Sulawesi Trench. The level of tsunami threat is moderate in north and east Sabah due to their proximity to tsunami source in the Sulu Trench. The level of tsunami threat is low in west Sabah due to its distant location to tsunami source from the Manila Trench. While tsunamis cannot be prevented, its impact on human life and property can be reduced through proper assessment of its threat using tsunami simulation models. Unfortunately, constraints remain in producing a reliable tsunami inundation models due to the lack of high-resolution topography and bathymetry data in Sabah and surrounding seas. It would be helpful if such data can be acquired by the relevant government agencies, at least first, in high threat-level areas, such as Tawau and Semporna districts. In order to properly plan mitigation measures tsunami risk mapping should be intensified in high threat-level areas. The locations of settlements (including water villages), population concentrations, types of buildings and houses, road system, drainage system, harbours, jetties and vegetations (including mangroves) need to be mapped in great detail. Based on the detailed tsunami risk map, targeted vulnerable communities could be given continuous and intensive education and awareness on basic tsunami science and tsunami hazard preparedness.