



Assessing tsunami hazard for Hong Kong

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Hong Kong as a coastal city is oblivious to hazards from the sea. Landslides and other onshore hazards have been comprehensively studied but very little is known about coastal hazard as offshore geology is very rarely studied. Compared to the density of population of coastal South China, coastal hazards especially tsunami are very poorly understood in the face of the potential risk associated with such a high population density in coastal China.

This presentation will focus on identifying geological features in South China Sea region with potential to generate a tsunami affecting Hong Kong. The South China Sea is a marginal sea basin with extension most active in 35-15Ma. It is bound by the Philippine Plate from the East, Eurasia Plate from the West and Indo-Australian Plate from the South. The most prominent tectonic feature likely to generate tsunami is the Manila Trench, a subduction complex at which the Eurasia Plate is subducted beneath the Philippine Plate and their relative motion is at about 7 m per ka. This setting generates 2-3 earthquakes with magnitude larger than 7 every 10 years and is a constant source for tsunami generation, the most recent in 1934.

Apart from the Manila Trench there are also geological features relevant to determining potential of tsunami affecting Hong Kong. Among them, faults and volcanoes in the seabed that could reactivate and generate seafloor displacement; location of gas hydrate reservoirs the probability of bolide impacts could potentially affect the likelihood of Hong Kong being struck with a tsunami.

The potential sources of tsunami are evaluated and compared against the topography of coastal cities, and the population distribution so as to assess threat posed by tsunami in Hong Kong and South China.