Seismic and Tsunami Observations of Malaysia

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1. Real Time Digital Seismic Network

Malaysian National Tsunami Early Warning Centre (MNTEWC) operates a total of 17 seismological stations throughout the country – 10 broadband sensor stations and 7 short period sensor stations. 7 stations are located in the Malay Peninsula (Kulim, Ipoh, FRIM (Kuala Lumpur), Kluang, Kota Tinggi, Kuala Terengganu and Jerantut), 6 stations are located in Sabah (Kota Kinabalu, Kudat, Sandakan, Lahad Datu, Tawau and Sapulut) and 4 others are in Sarawak (Kuching, Sibu, Bintulu and Bakun) as shown in Fig. 1. Data are shared with other countries by importing near real time waveform data from the broadband stations through the IRIS and USGS LISS's server.

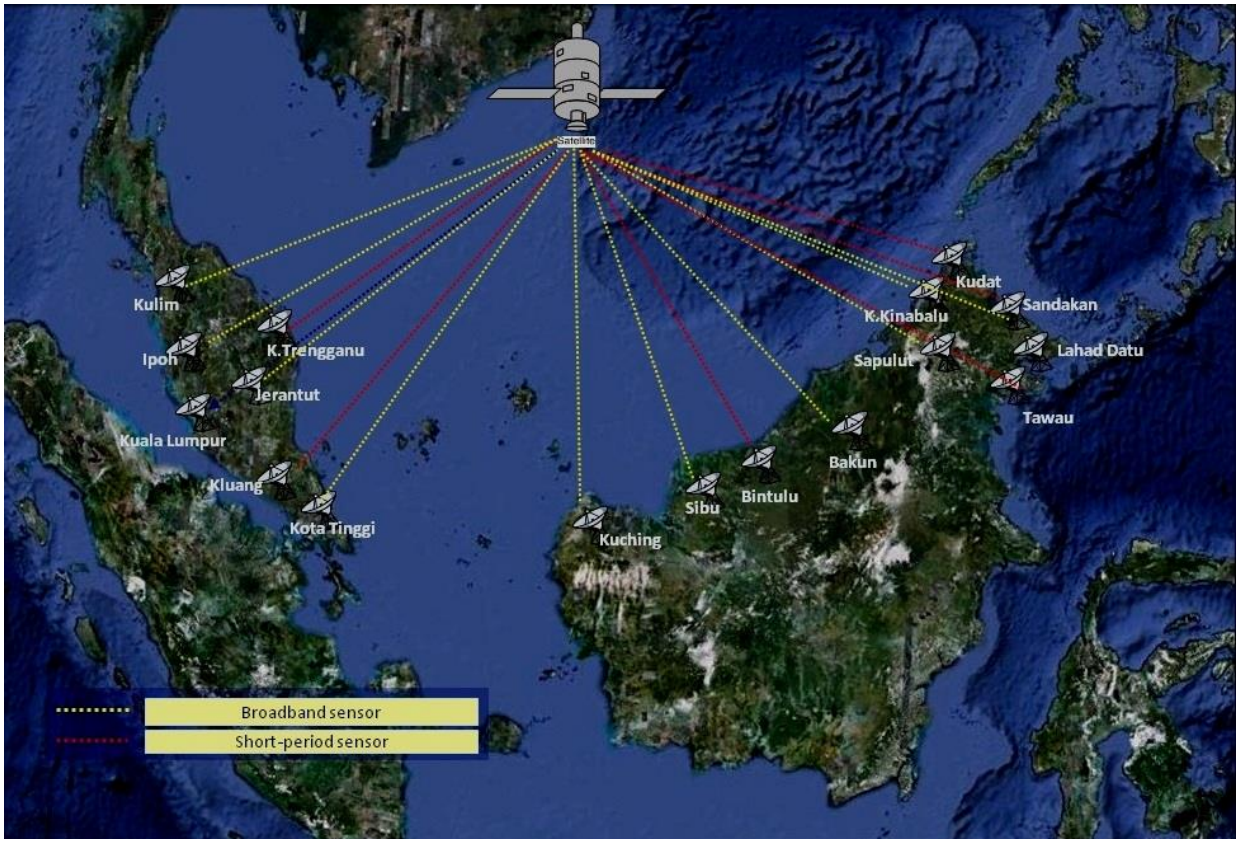

Figure 1. Malaysian National Seismic Network

2. Tidal Gauge Network

A total of 17 tide gauge stations have been installed – 8 in the Malay Peninsula (Awana Porto Malai, Perak Island, Kerachut, Perhentian Island, Jarak Island, Tanjung Keling, Tanjung Gelang and Tioman Island), 6 in Sabah (Kudat, Sepanggar, Layang-layang Island, Lahad Datu, Labuan and Tawau), and 3 others in Sarawak (Mukah, Bintulu and Miri). These tide gauge stations serve as the first line monitoring system as they will detect the sudden change of the water level when tsunami occurs.

International Maritime Satellite Organization (INMARSAT) Communication System is used to transmit data from every tide gauge station to Malaysian National Tsunami Early Warning Centre at MMD Headquarters. The data is transmitted every hour when in normal mode and every minute in tsunami mode. In future, MMD plans to use VSAT Communication System so that data from every tide gauge can be sent to MMD Headquarters for every 15 minutes in normal mode and every minute in tsunami mode.

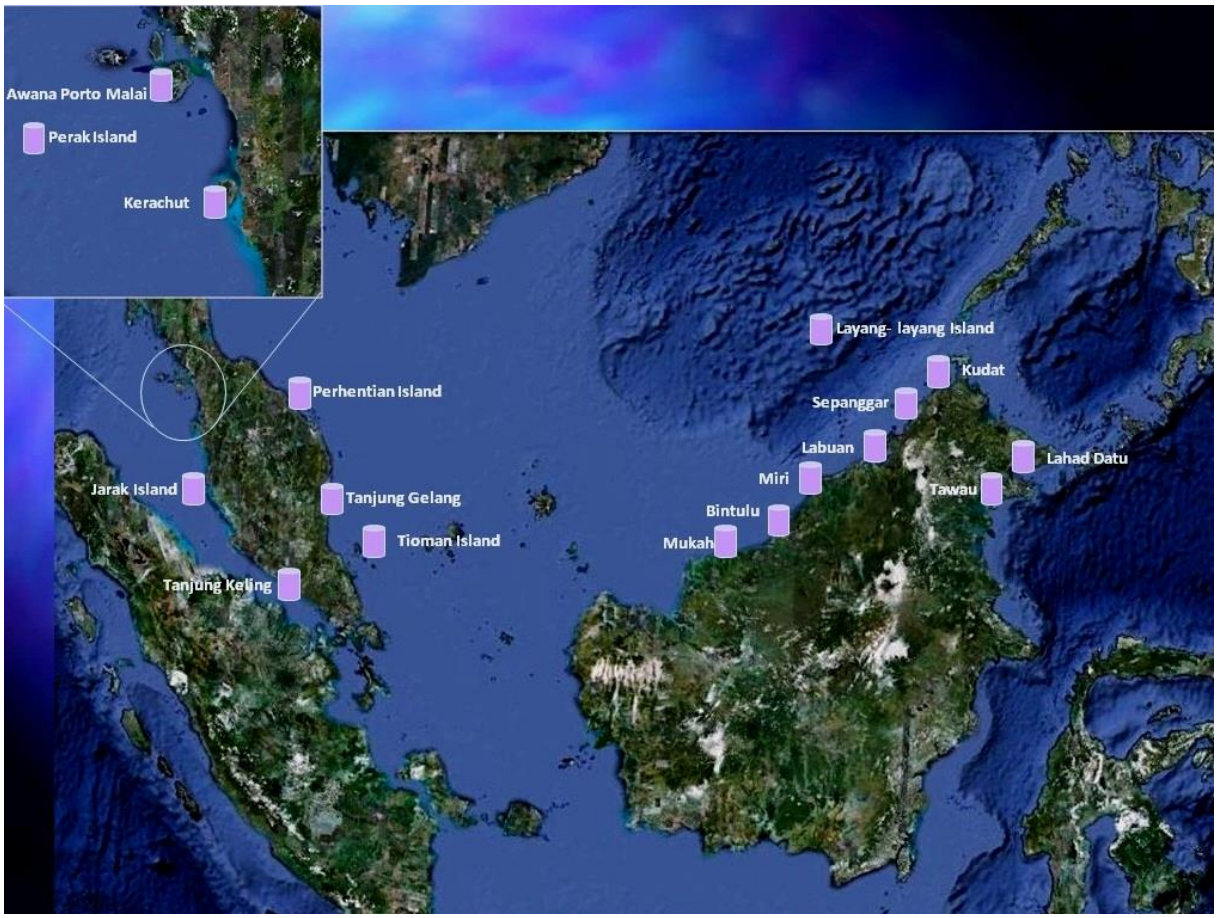

Figure 2. Tide gauge locations

3. Deep Ocean Buoy Network

MMD deployed Malaysian first buoy at Rondo Island, northern Sumatra, Indonesia on 30th December 2004. The 2nd buoy was deployed on 7th March 2006 in Layang-Layang Island, South China Sea whilst the third buoy was deployed on 22nd August 2010 near the Sipadan Island. These buoys are equipped with bottom pressure sensor to detect the early passage of a tsunami before it reaches shallow waters and causes destruction along the coasts. INMARSAT Communication System is used to transmit data from the buoy to MMD Headquarters every hour in normal mode and every 15 minute in tsunami mode.

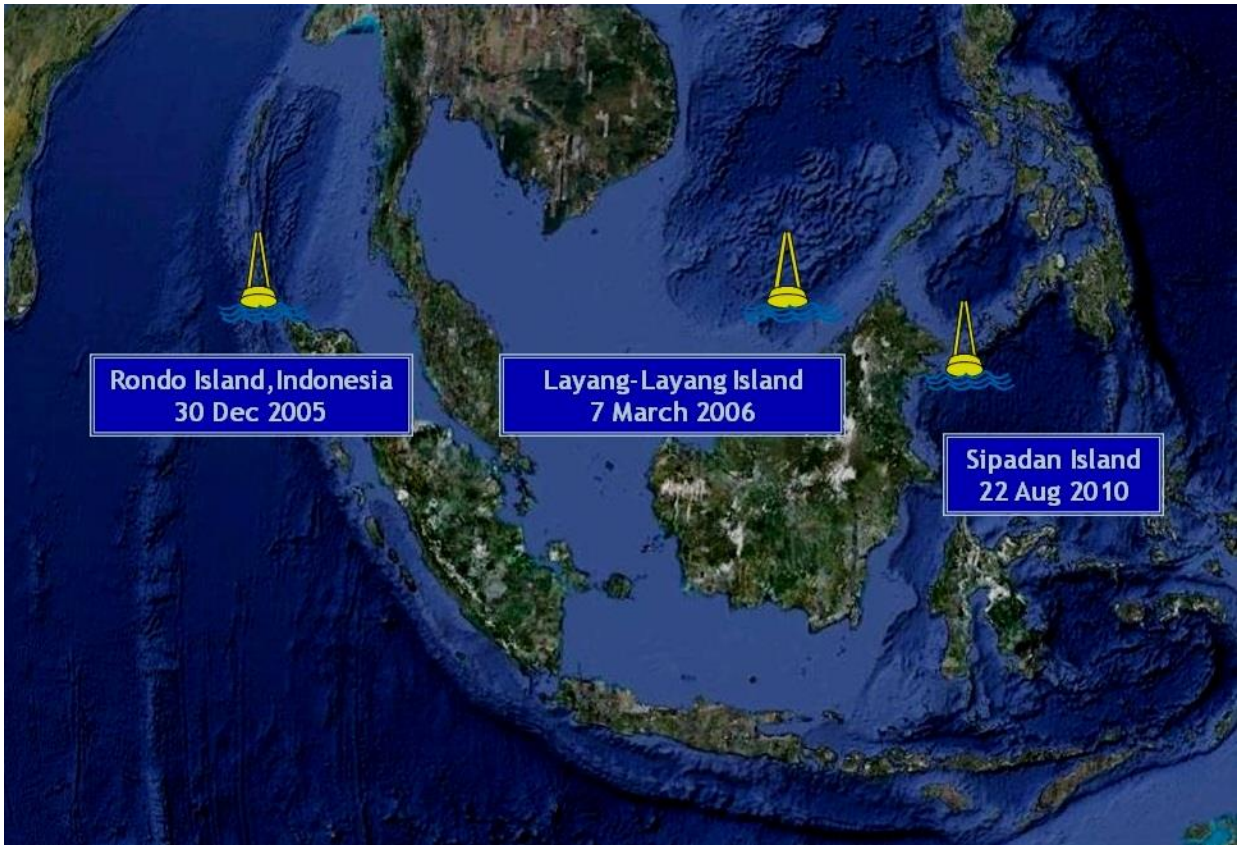

Figure 3. Ocean buoy locations