Geophysical Hazards and Early Warning System

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Natural Hazards Affecting Malaysia

- Geophysical (seismological)
  - Tsunami, Earthquake, Land Slide &Volcano
- Meteorological
  -Wind storms e.g. typhoons, hurricanes, - tornadoes, thunderstorms/squall lines;
  -Floods/La Nina & Land Slides;
  -Droughts/El Nino & Forest Fires/Haze;&
  -Storm Surges.

Flood In Johor (Dec. 2006 – Feb. 2007)

Segamat, Johor, Jan 13: Flood victims can only look at the impassable stretch of Jalan Medoi, at KM6 of Jalan Segamat. NST pix by Abd Rahim Rahmat.

Kota Tinggi, Johor, Jan 14: Residents of Taman Muhibbah surveying the situation in their area using a raft made of pieces of planks and empty containers. NST pix by Shahrul M. Zain.

Batu Pahat, Johor, Jan 14: Newly weds Rita Paikuni and Zulham Jonit being taken on a boat for their bersanding ceremony to be held at the flood relief centre at SK parit Bingan. NST pix by Amran Hamid.

Kota Tinggi, Johor, Jan 14: Evacuees at the Sekolah Agama Taman Kota Jaya flood relief centre had to be relocated to another centre as floodwaters begin to rise at the school. NST pix by Zain Ahmed.

Kota Tinggi, Johor, Jan 14: The half-visible bridge over Sungai Johor in the middle of the town leads to the Kota Tinggi Hospital. NST pix Ahmad Bahri Mardi.

Tsunami (December 26, 2004)

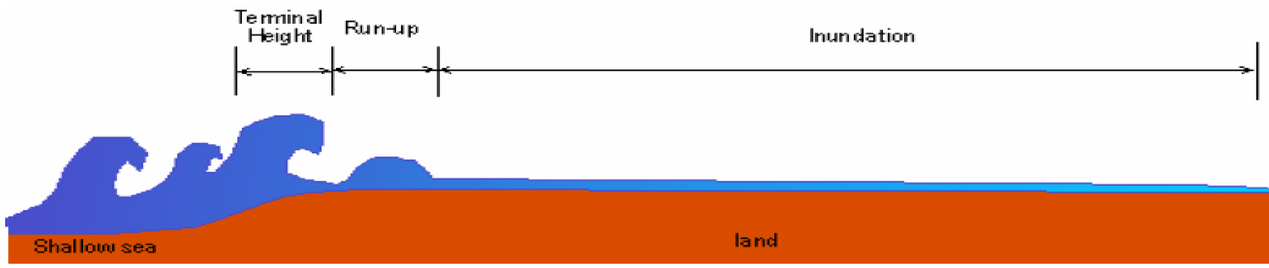
SIGNS OF DANGER: Breaking waves churning up the silt along the shoreline

FIRST WAVE: The waves crashing onto the retaining wall of the E&O hotel

Physical Impact

characterization of tsunami impact

Tsunami impact in these areas affected by (i) terminal height of the waves, (ii) run-up area and (iii) inundation.



Local District Council
Kota Kuala Muda

Chronology of Events

Local District Council Kota Kuala Muda,Kedah

Langkawi	1230hr
Penang	1300hr
Kota Kuala Muda	1330hr

Tsunami Early Warning System of MMD

Data & Information Collection Component

- Seismic Network
- Buoy Network
- Tide Gauge Network
- Coastal Camera Network
- Linkage

Data Communications

Processing Component

Tsunami Operations Center

Integration

Analysis

Decision Making

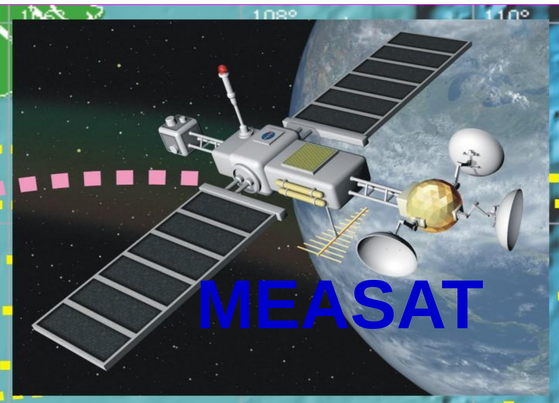
(15 minutes)

Dissemination Component

Information And Warning Dissemination

- *SMS*
- *Telephone/fax*
- *Web MMD*
- *Siren*
- *Cell Broadcast*

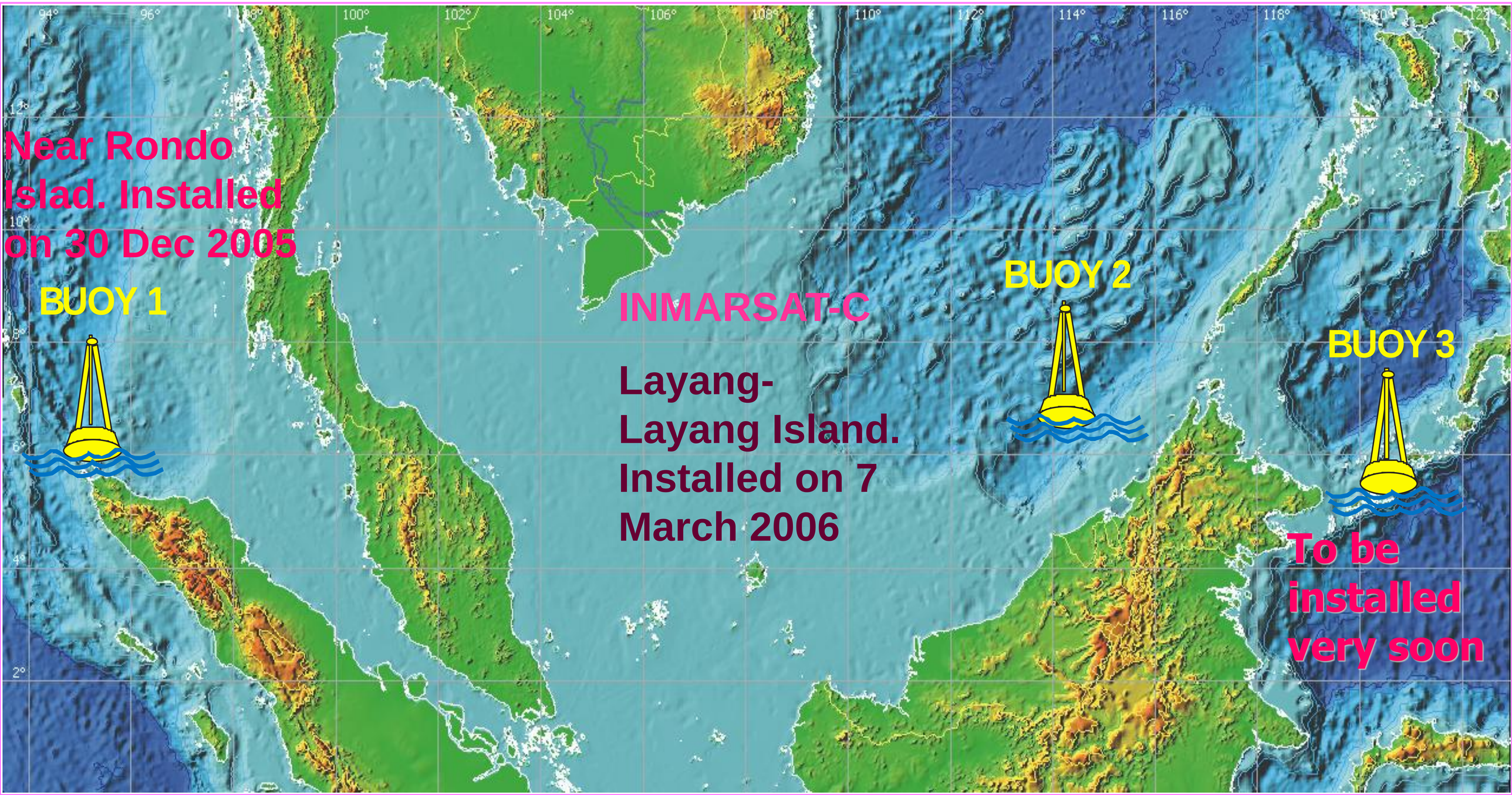
National Seismic Network
Monitoring of Earthquake and Tsunami on a 24-hour basis



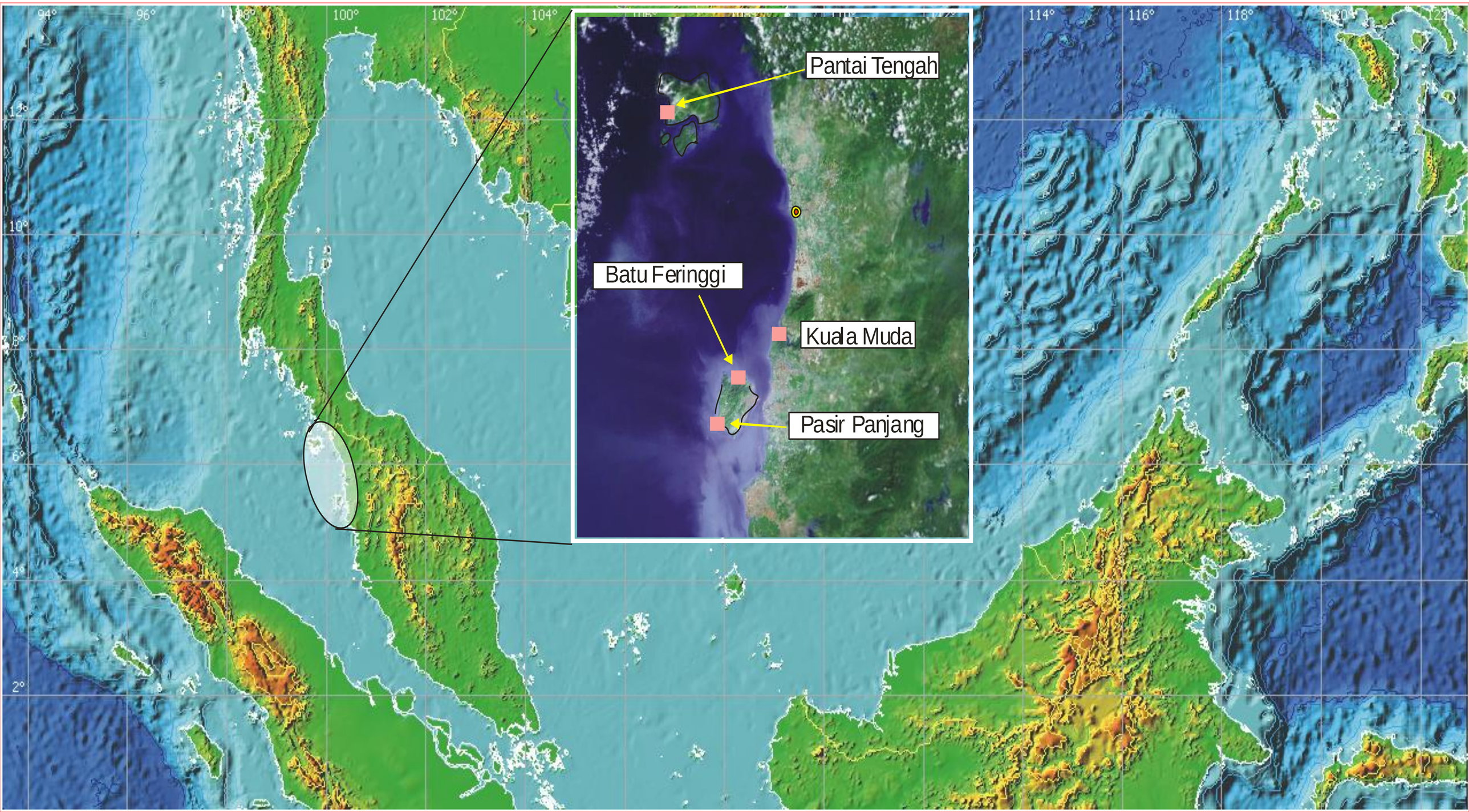
KULIM
IPOH
K.TRENGGANU
FRIM
JMM HQ
KLUANG
K.TINGGI
KUCHING
SIBU
BINTULU
K.KINABALU
SANDAKAN
KUDAT
L.DATU
TAWAU

Deep Ocean Buoy Network

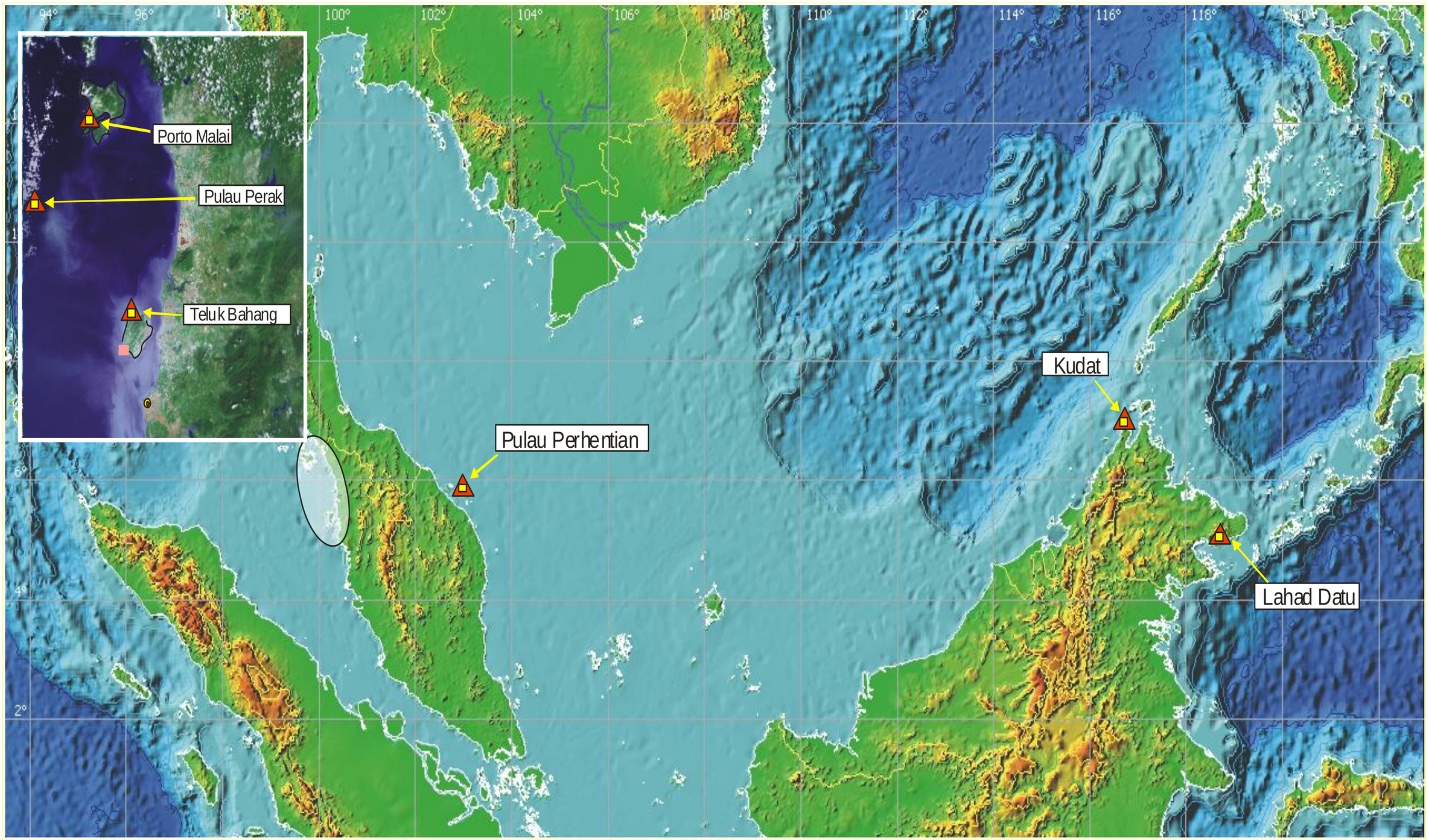
Deep Ocean Tsunami Buoys located at strategic locations in the seas surrounding Malaysia will form a network of ocean level observing stations.



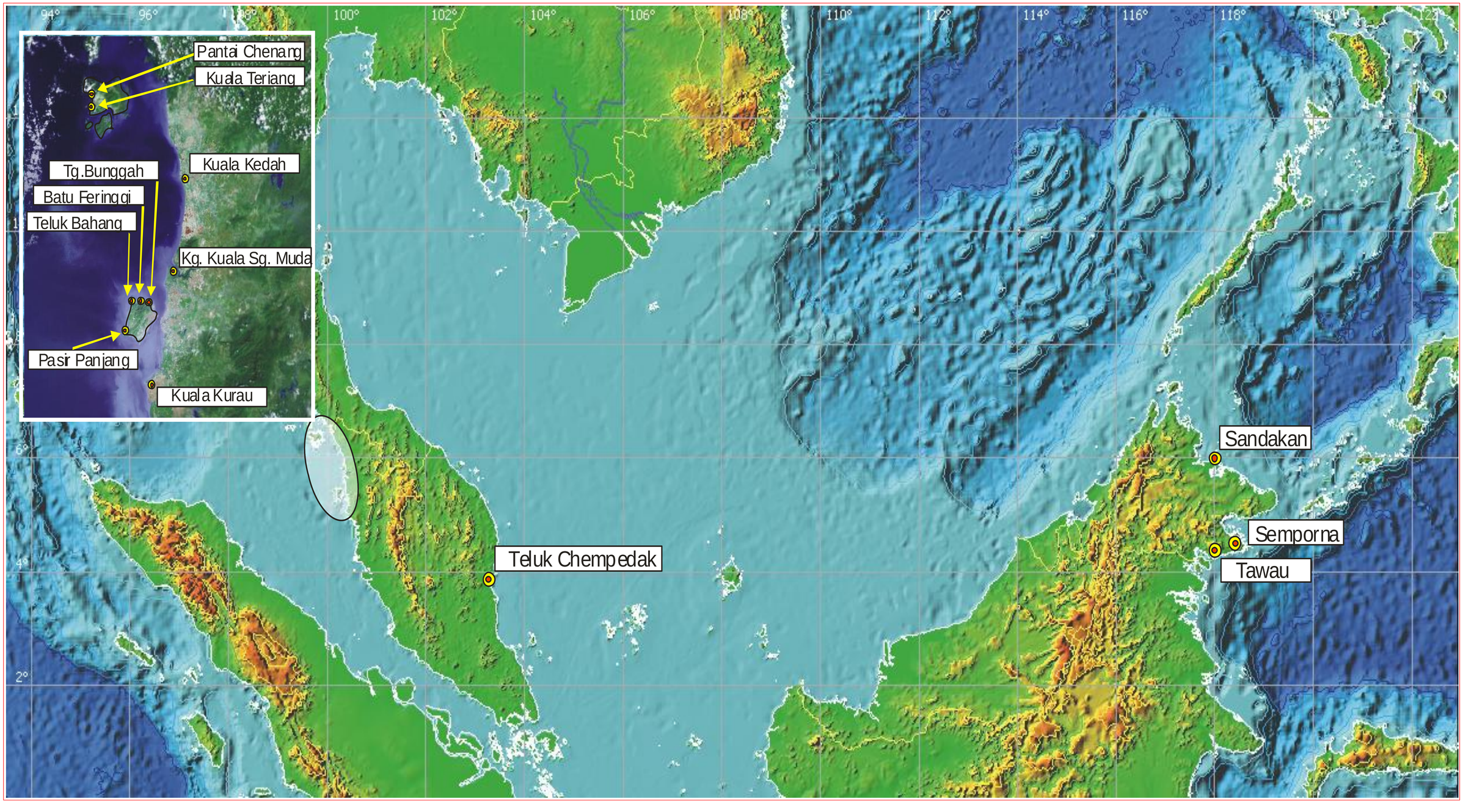
Monitoring of Tsunami on a 24-hour basis
Coastal Camera Network



New Tidal Gauges for **Sea level Monitoring Stations**



Tsunami Siren Warning
For Dissemination of Tsunami Warning



Linkage

- Pacific Tsunami Warning Centre
-Japan Meteorological Agency

The linkage with PTWC, Honolulu and JMA Tokyo will provide a direct communication means for receiving tsunami advisory services for tsunami that occur in the Pacific, South China Sea and Indian Ocean area. This linkage will assist the verification of the possibility of tsunami generation as a result of earthquake activities.

Conclusion

- With an effective early warning system in place, Malaysia is able to provide earthquake information and tsunami warning in the vicinity with confidence and accuracy towards disaster risk reduction.