POLICY & PLANNING RESPONSE FOR EARTHQUAKE & TSUNAMI HAZARDS IN MALAYSIA

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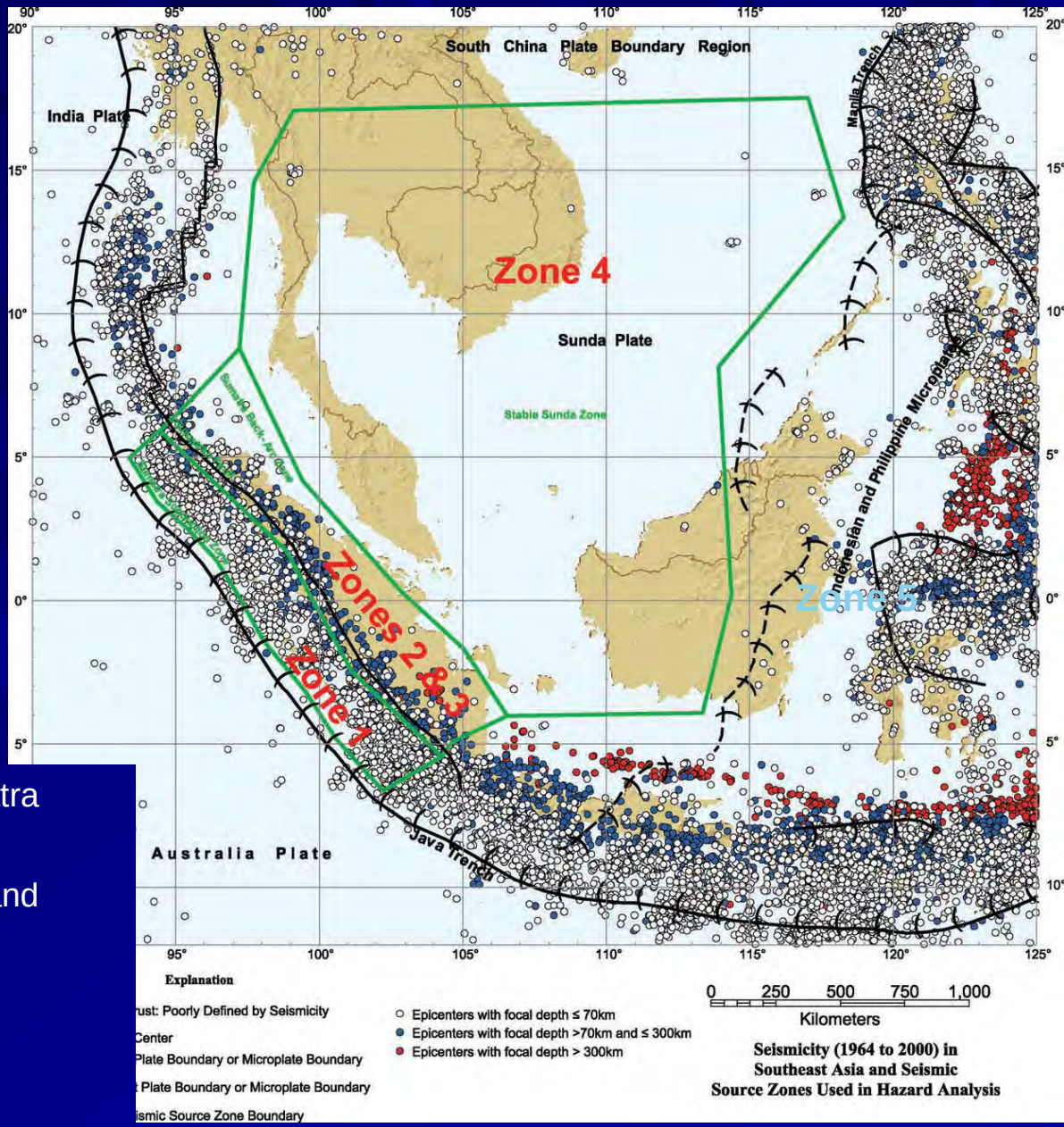
Introduction

- In line with Hyogo Framework of Action (2005), LESTARI UKM is preparing a “Policy & Planning Response for Earthquakes & Tsunami Hazards” for Malaysia.
- Formulation process is based on and back-up by:
  - Scientific and integrated reasearches by local universities and government agencies.
  - Collaboration & recommendations by experts/ experienced countries (e.g. Indonesia, Japan, etc.)
- All these are in line with the objectives of an intergrated Disaster Risk Management (incl: identifying and assessing the hazards and associated risks, mitigation, disaster preparedness, public awareness, etc.)

Background

Seismicity Zones in SE Asia

1. Convergence plate boundaries
2. Transform plate boundaries/ Faults
3. Spreading zones
4. Poorly delineated boundaries – relatively stable Sunda Plate.



Zone 1: Shallow seismicity along the Sumatra Subduction zone

Zone 2: Shallow seismicity in the backarc and along the Sumatran fault

Zone 3: Deep seismicity

Zone 4: Seismically-stabled Sunda Shelf

Zone 5: Poorly defined seismic active zone

Source: Petersen et al. 2004

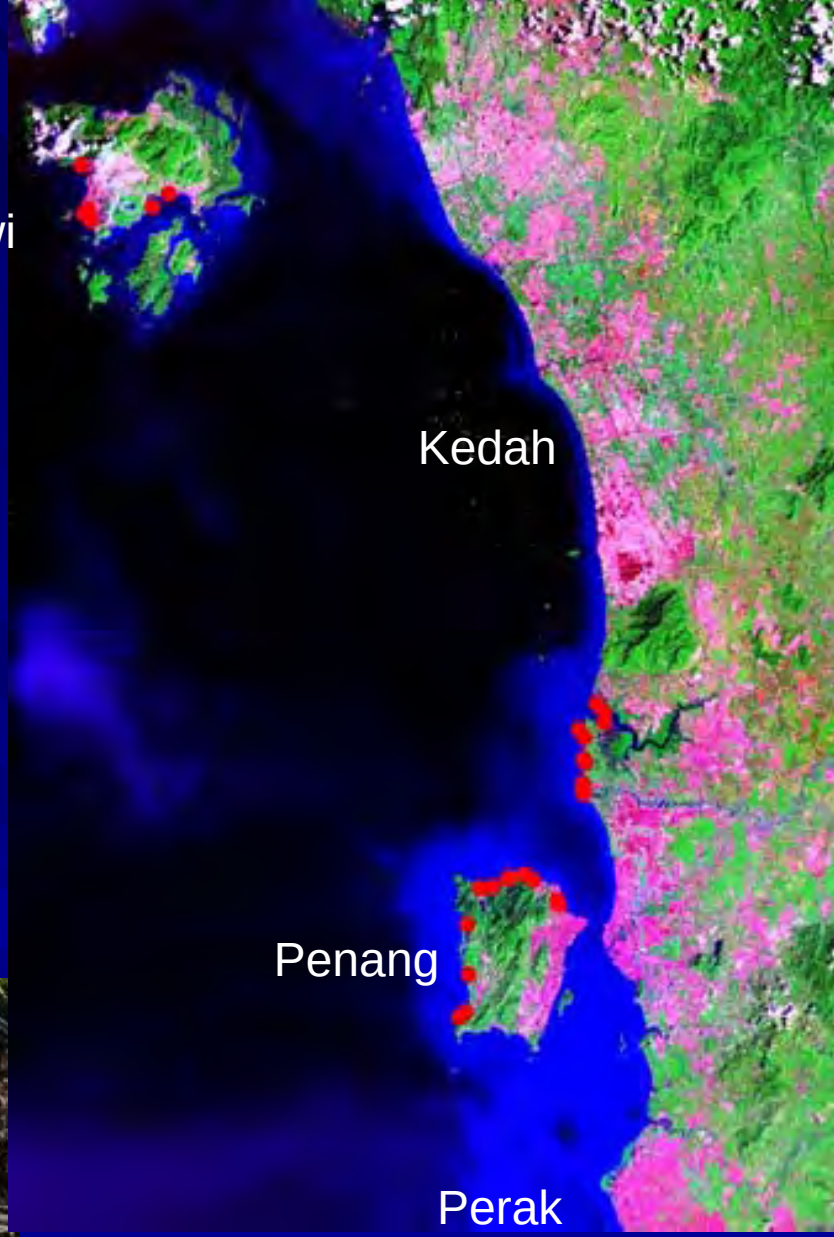
Seismic-Induced Hazards - Malaysian Experiences

1. **Tsunami (26 Dec 2004) – the first ever experience!**
   - Langkawi
   - Kuala Muda
   - Penang
   - Perak & Selangor

   Claimed 68 lives; RM100 millions of damages
2. **Ground shaking, minor – v. minor e/q**
   - Highrise buildings in Penang, Kuala Lumpur, Johor Bahru and other urban areas
3. **Ground rupture (Sabah)**
   - Lahad Datu/1976/Mg=7.0
   - Ranau/1991/Mg=5.0
   - Tawau/1995/Mg=5.0
4. **Earthquake-induced hazards**
   - Subsidence (Kinta Valley area)
   - Landslides (?)

Tsunami

- 26th Dec 2004
- Affected areas
  - Langkawi
  - Kedah
  - Penang
  - Perak & North Selangor

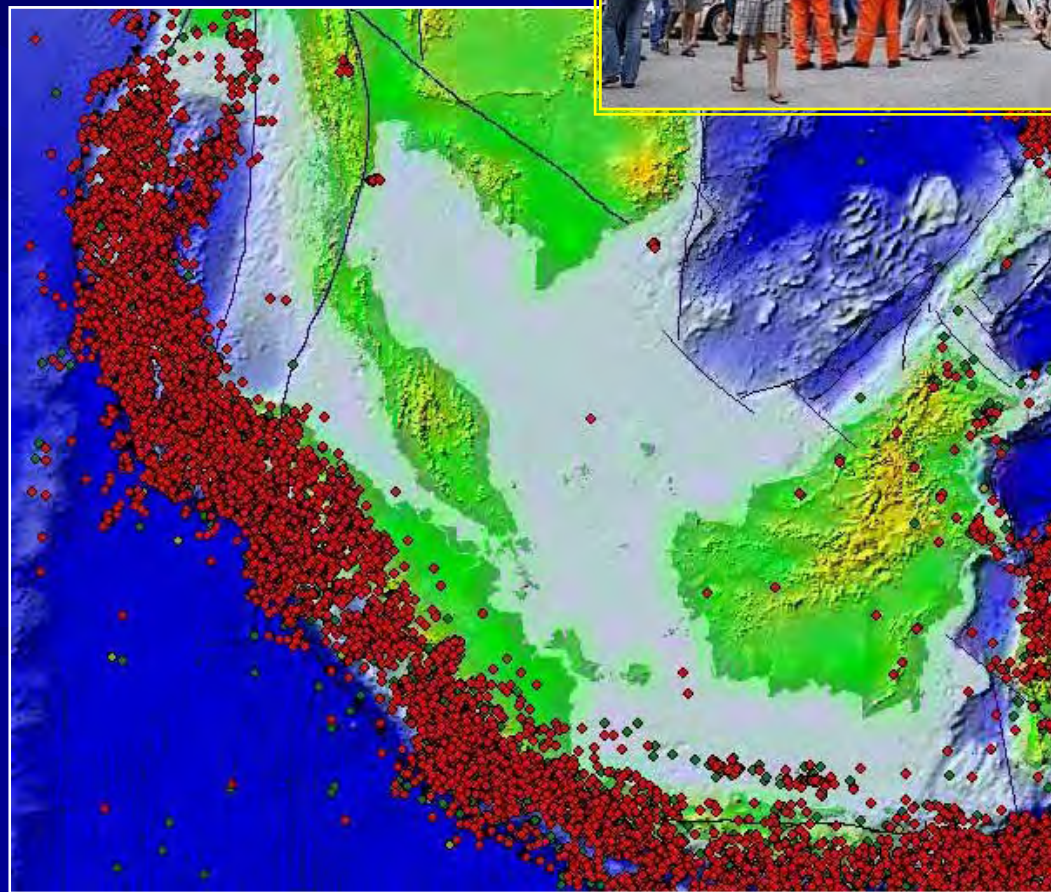


Potential Source of Tsunami for Malaysia

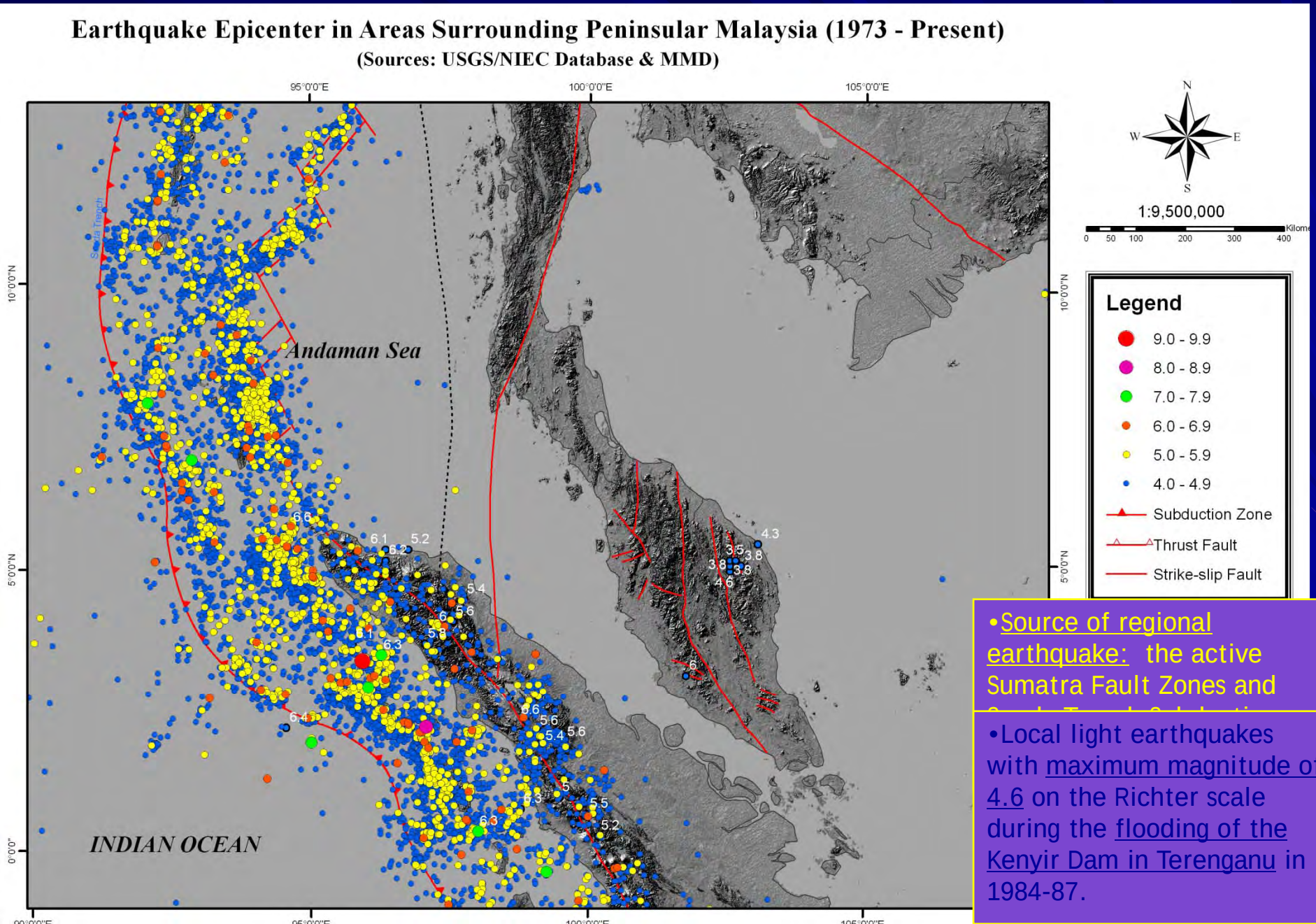
- Only those shallow foci (<33 km depth) earthquakes with magnitude > 6 (along the major active plate boundaries) can potentially generate tsunami.
- Potential Sources:
  - in the Andaman Sea, West Sumatara and West Java → large e/q along Java Trench.
  - In the Banda Sea → e/q along the Banda Trench.
  - In the Celebes Sea → e/q along the N. Sulawesi Trench & the Cotabato Trench offshore S Mindanao
  - In South China Sea → e/q along the Manila Trench,
  - In the Sulu Sea are → e/q along the the Negros Trench.
- **Most of the tsunami events (except for the tsunami in 26 Dec. 2004) recorded in Indonesia and Philippines appears to quite localized in nature.**

Earthquakes

- No major local earthquakes!
- Minor ground vibration due to major earthquakes in neighbouring countries, notably Indonesia; felt by occupants of high rise buildings in western coast of Pen. Malaysia.
- Mild earthquakes only occurred in Sabah
  - Ranau
  - Sandakan
  - Lahad Datu
- Localised minor dam-induced earthquakes in Terengganu (1986-87)
- E/q from the Sulu and Celebes seas are periodically felt as slight tremors in Sabah.
- Only recently, very mild localised earthquakes in Bukit Tinggi Area, Pahang.



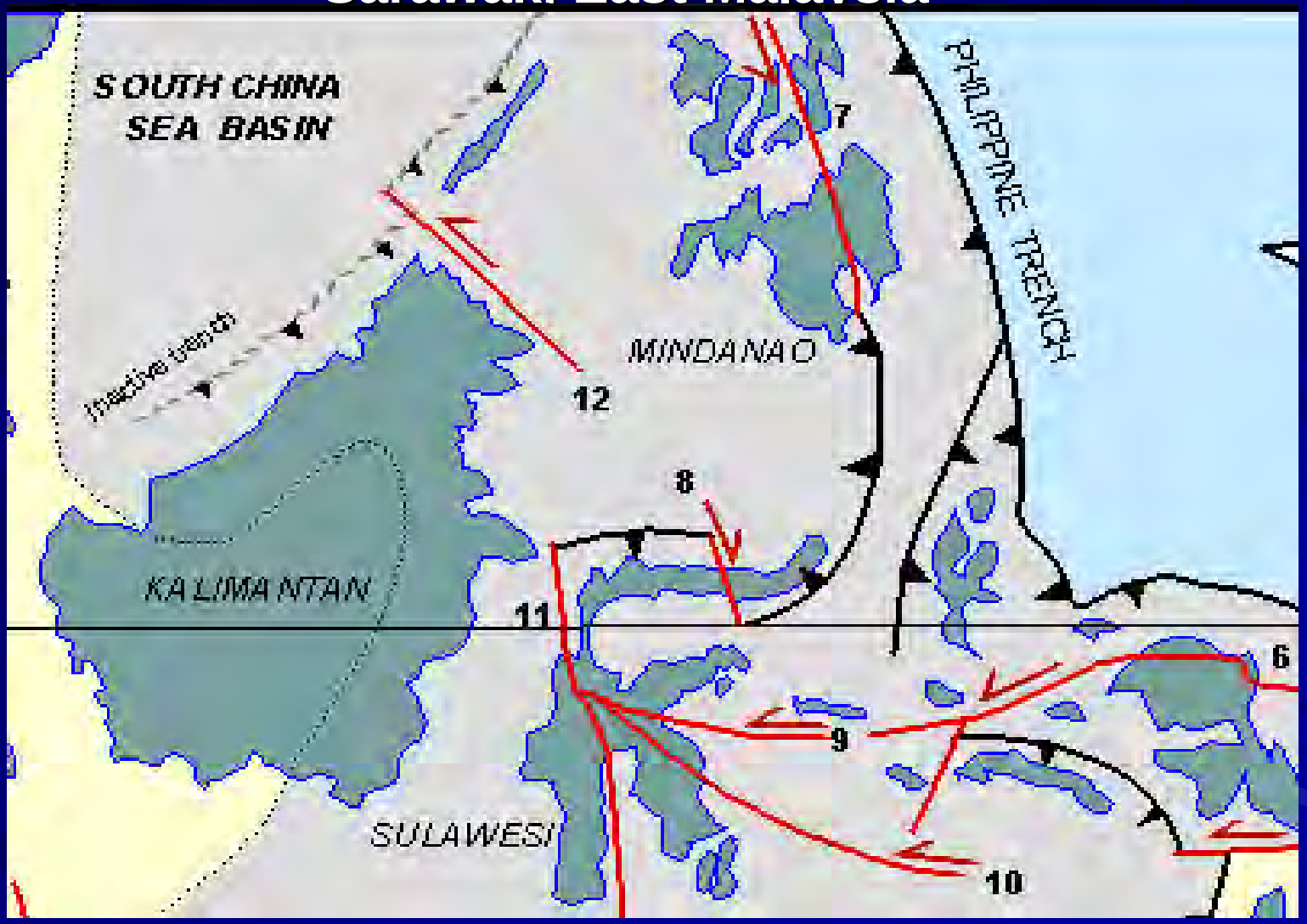
Earthquake Hazards & Vulnerability in Pen. Malaysia



- Source of regional earthquake: the active Sumatra Fault Zones and

- Local light earthquakes with maximum magnitude of 4.6 on the Richter scale during the flooding of the Kenyir Dam in Terenganu in 1984-87.

Potential Source of Regional Earthquakes for Sabah & Sarawak. East Malaysia



- The source of regional earthquakes for Sabah comes from the active subduction zones marked by the Manila Trench, Negros Trench, Sulu Trench, Cotabato Trench and North Sulawesi Trench.