Tsunami

Malajsie 2004, 2005
a teorie

http://walrus.wr.usgs.gov/tsunami/ aj.

Šalamounovy ostrovy

The quake measured 8.0 and hit at 0740 local time on Monday (2.4.2007, 2040 GMT Sunday).

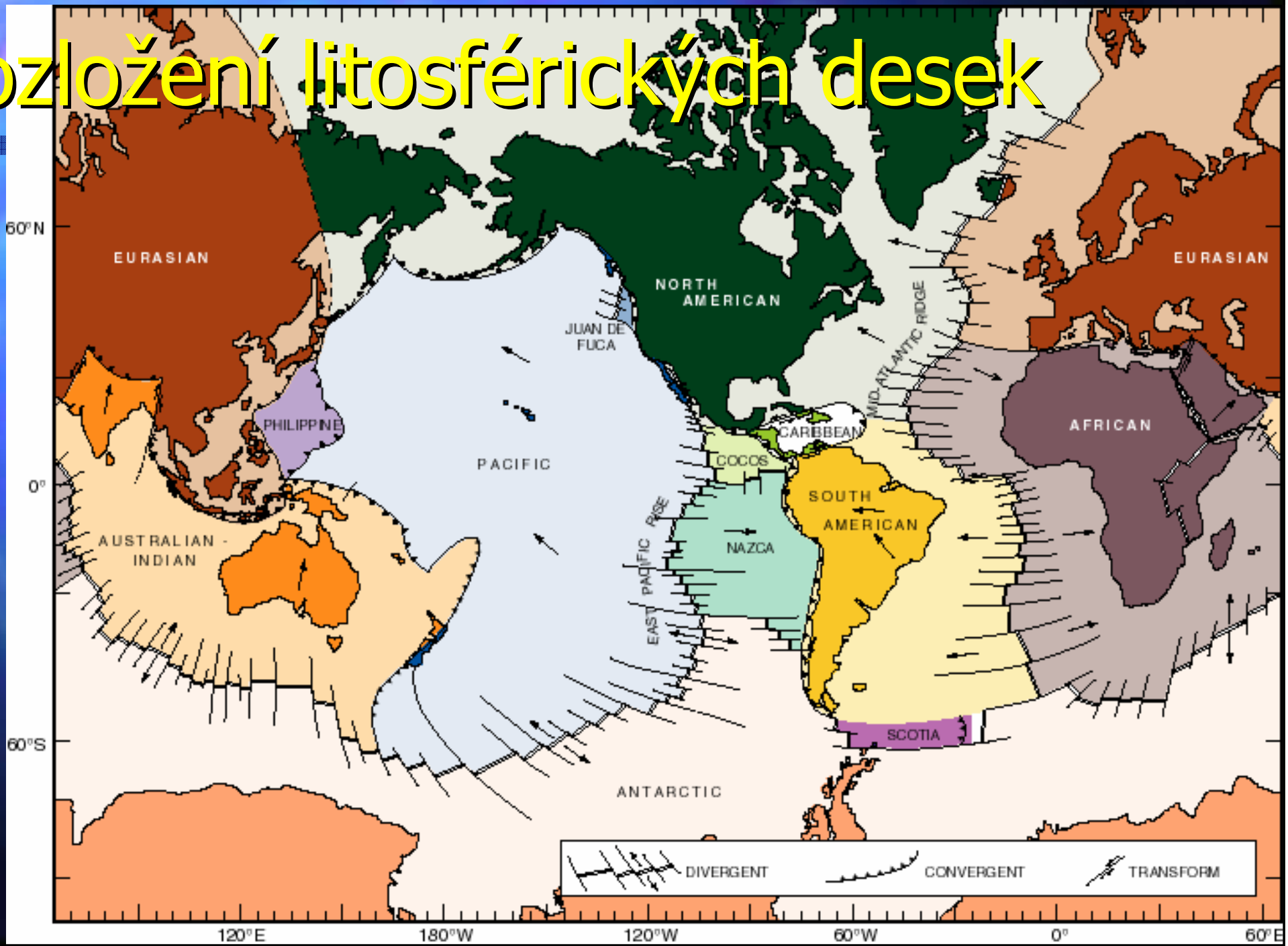
Fakta dvou událostí

datum	28.3.2005	26.12.2004
čas (SEČ)	17:09:36	01:58:53
hloubka epicentra	30 km	10 km
stupňů Richtera	8,7	9,0
dosah otřesů	6827 km	9213 km
budovy pobořeny do	544 km	735 km
počet mrtvých	více než 1000	přes 320 000

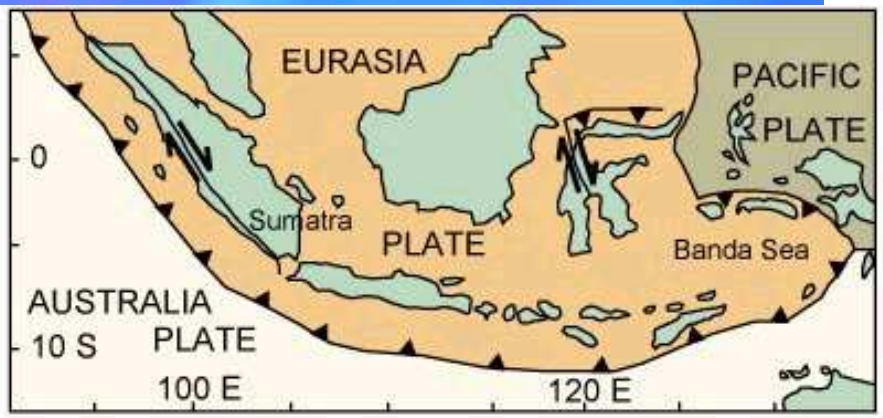
Výstup na pláž

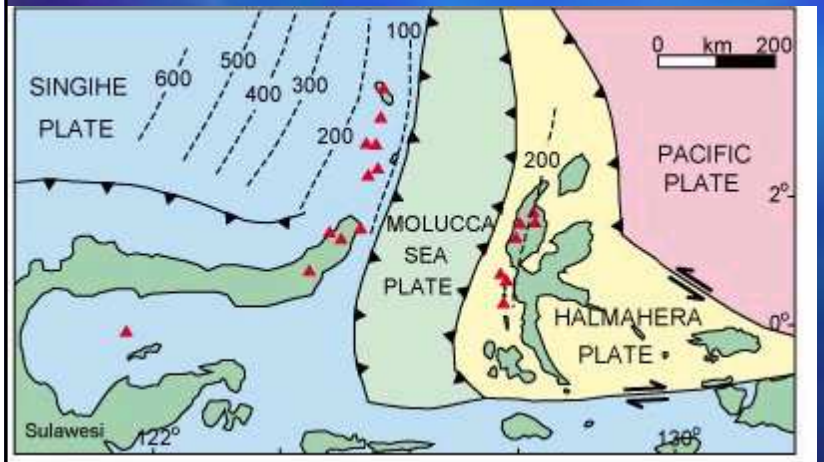
a dále

Rozložení litosférických desek

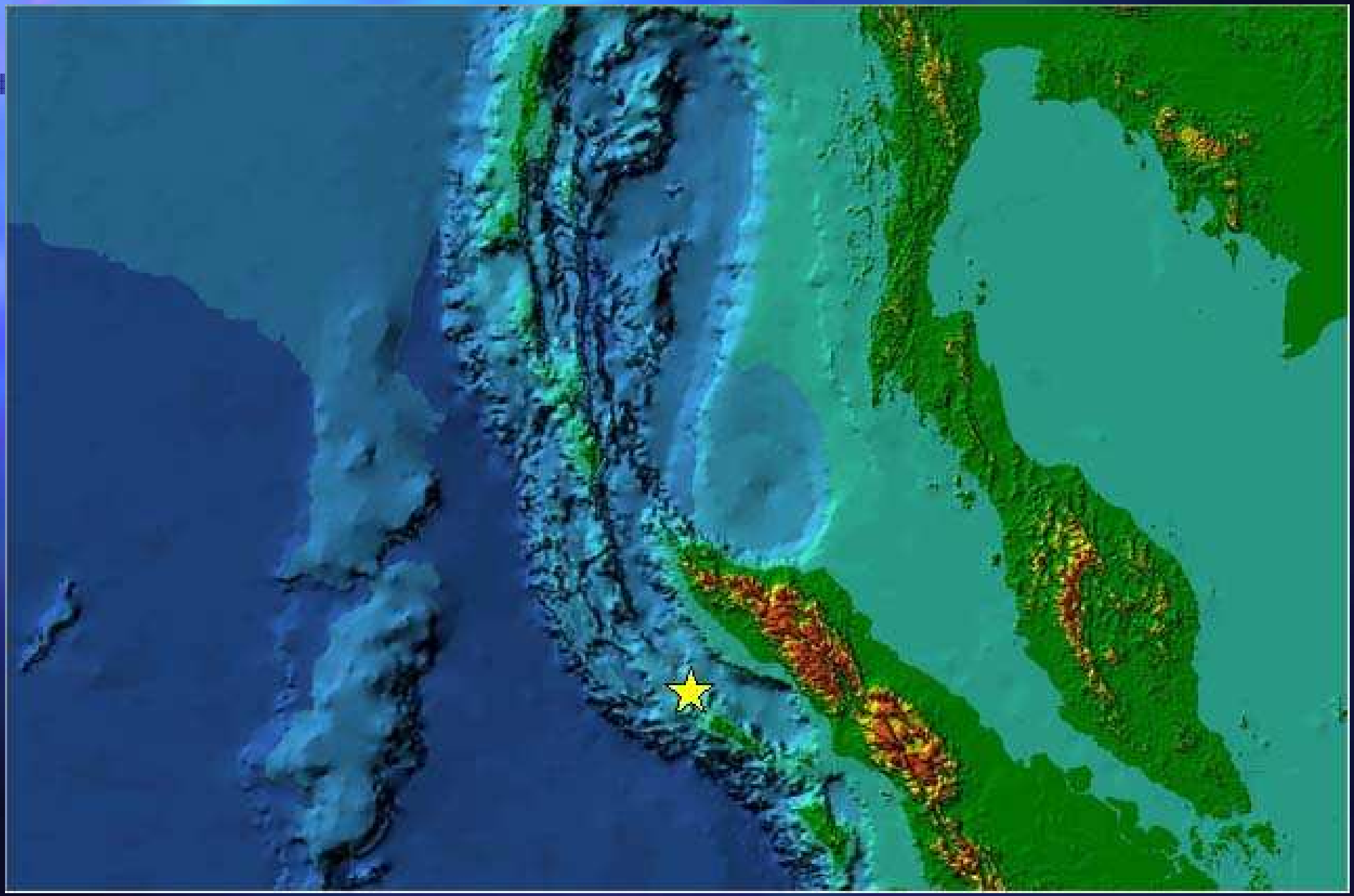


Malajsie a její desky

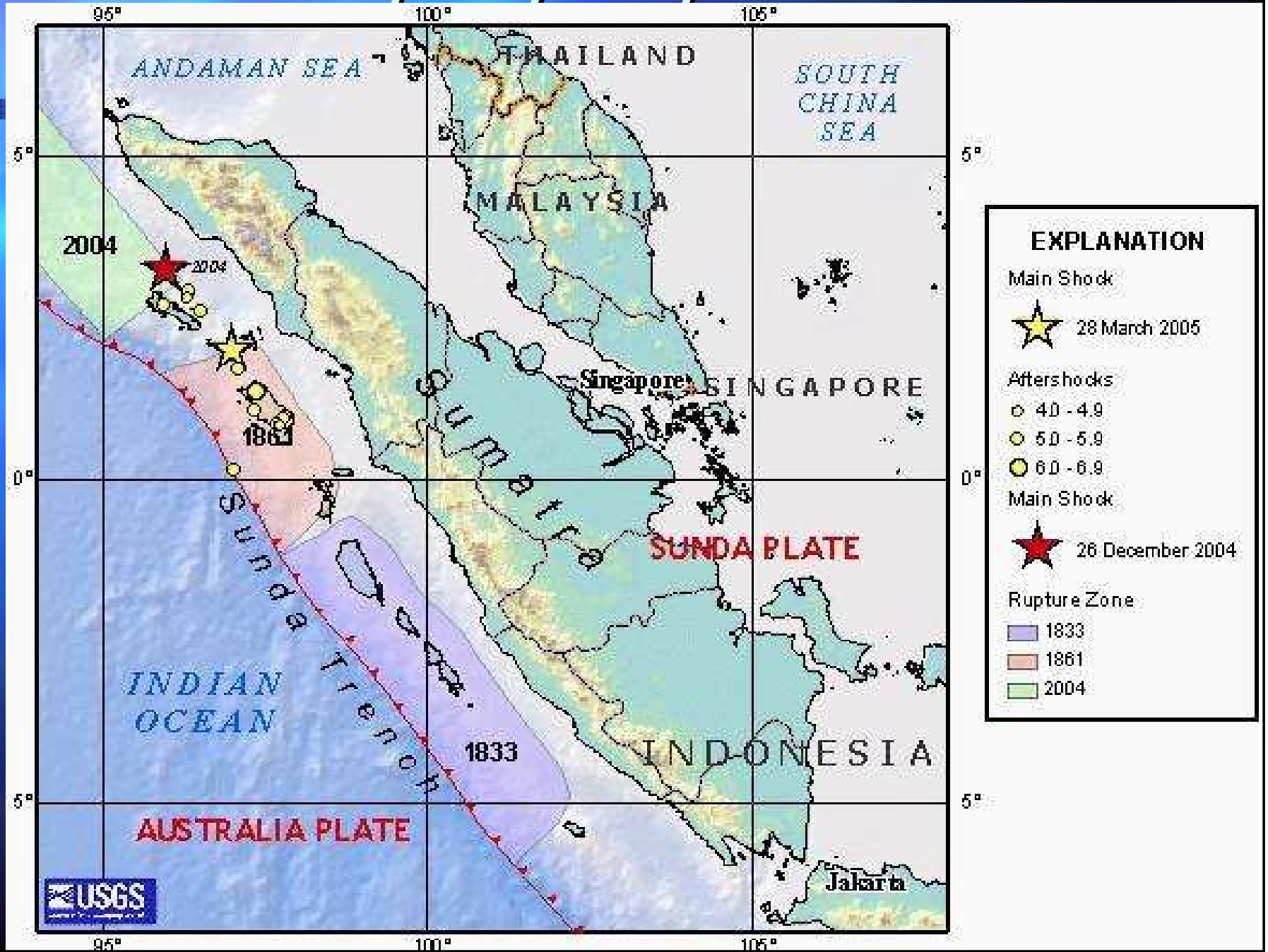




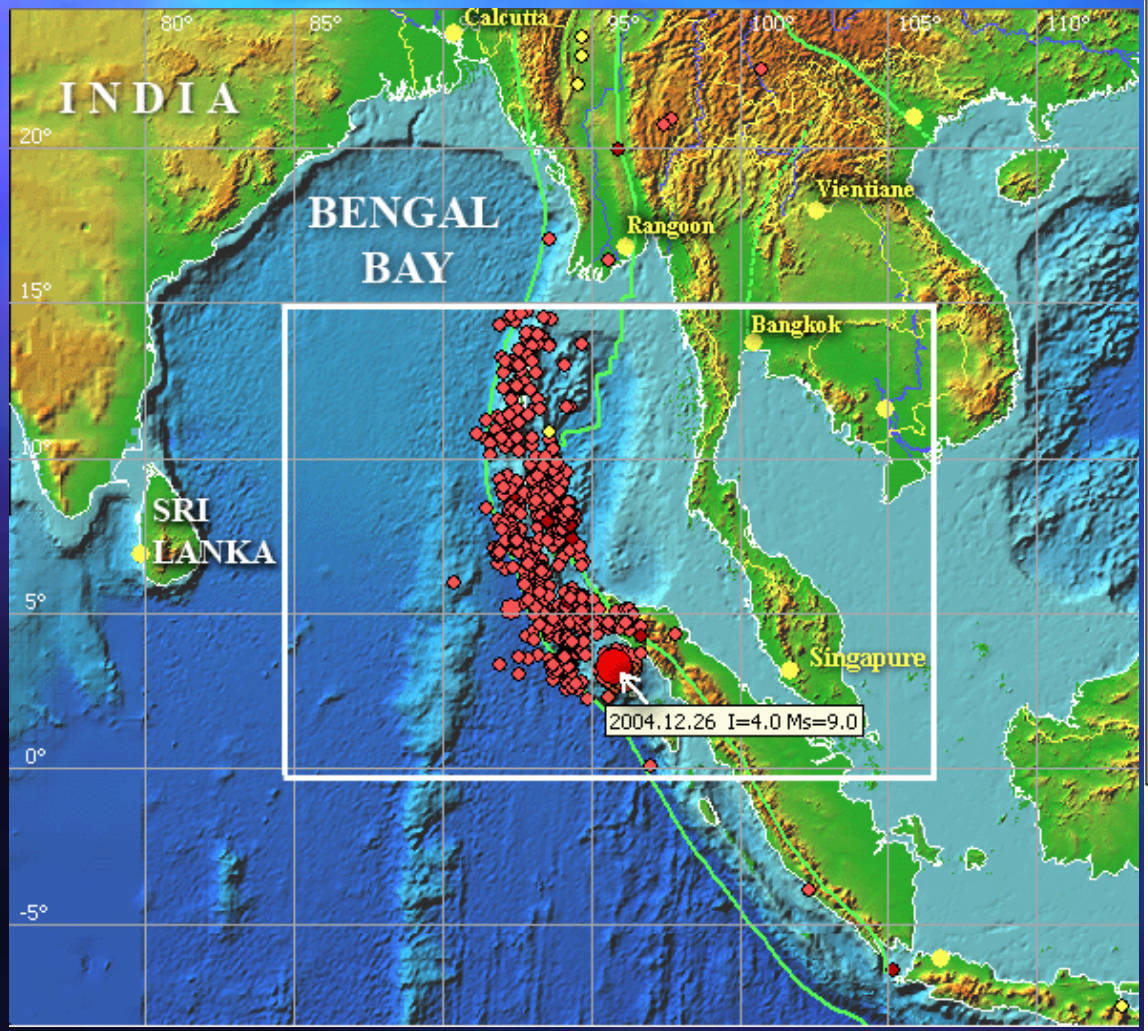
Morfologie

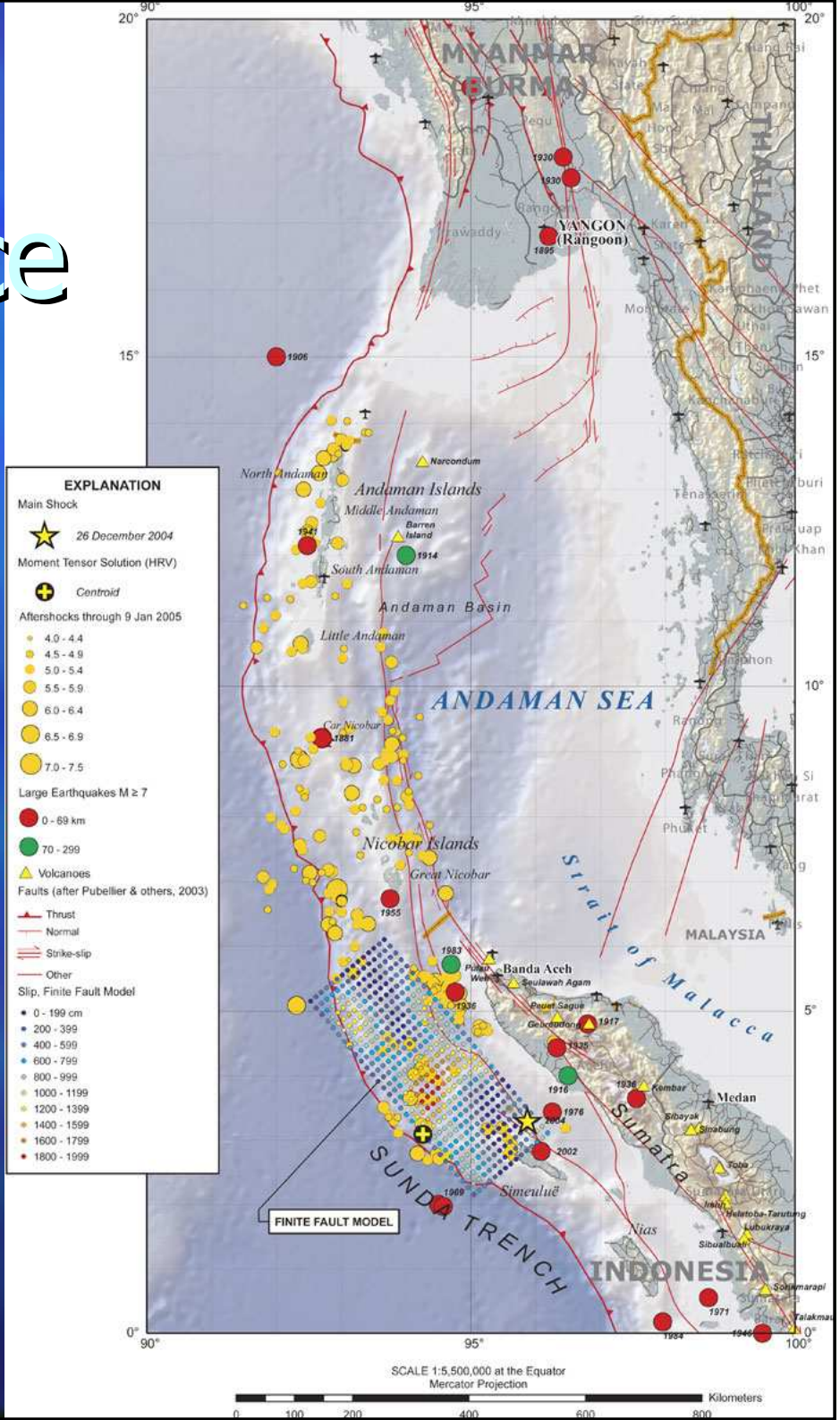


Epicentra – 12/04, 03/05

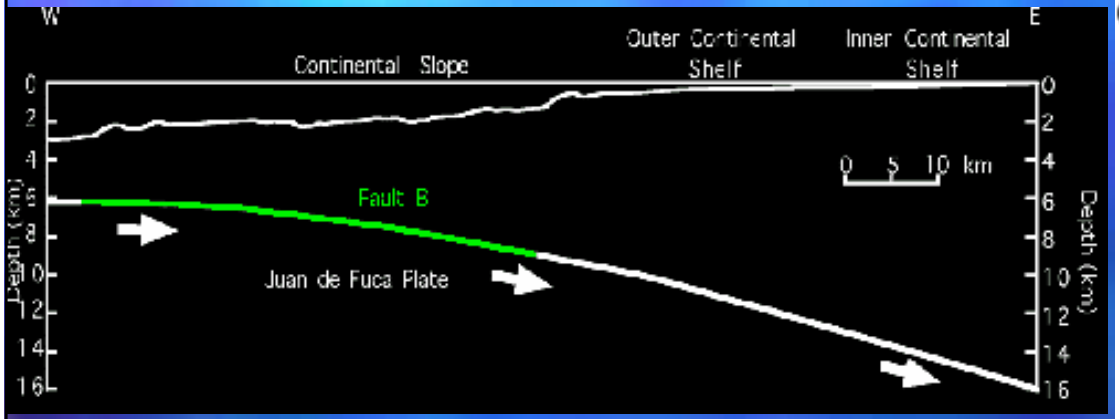


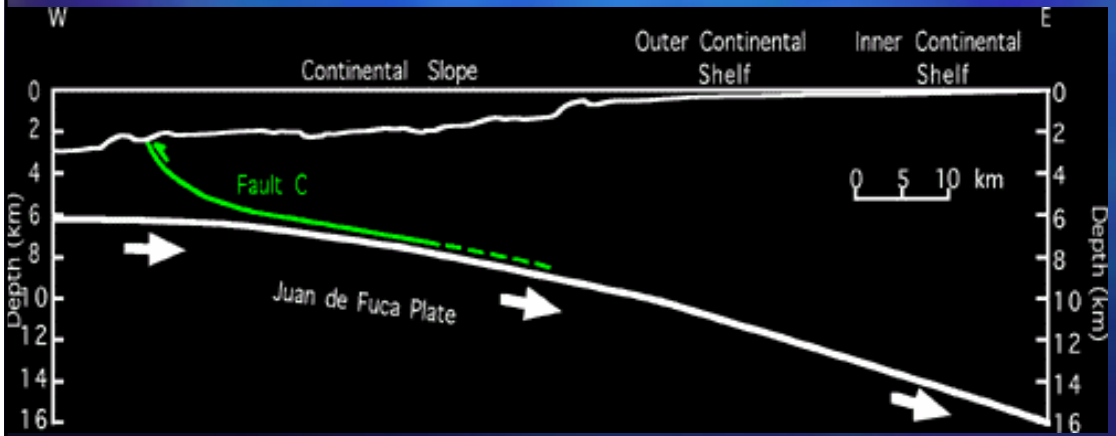
Geofyzikální indikace

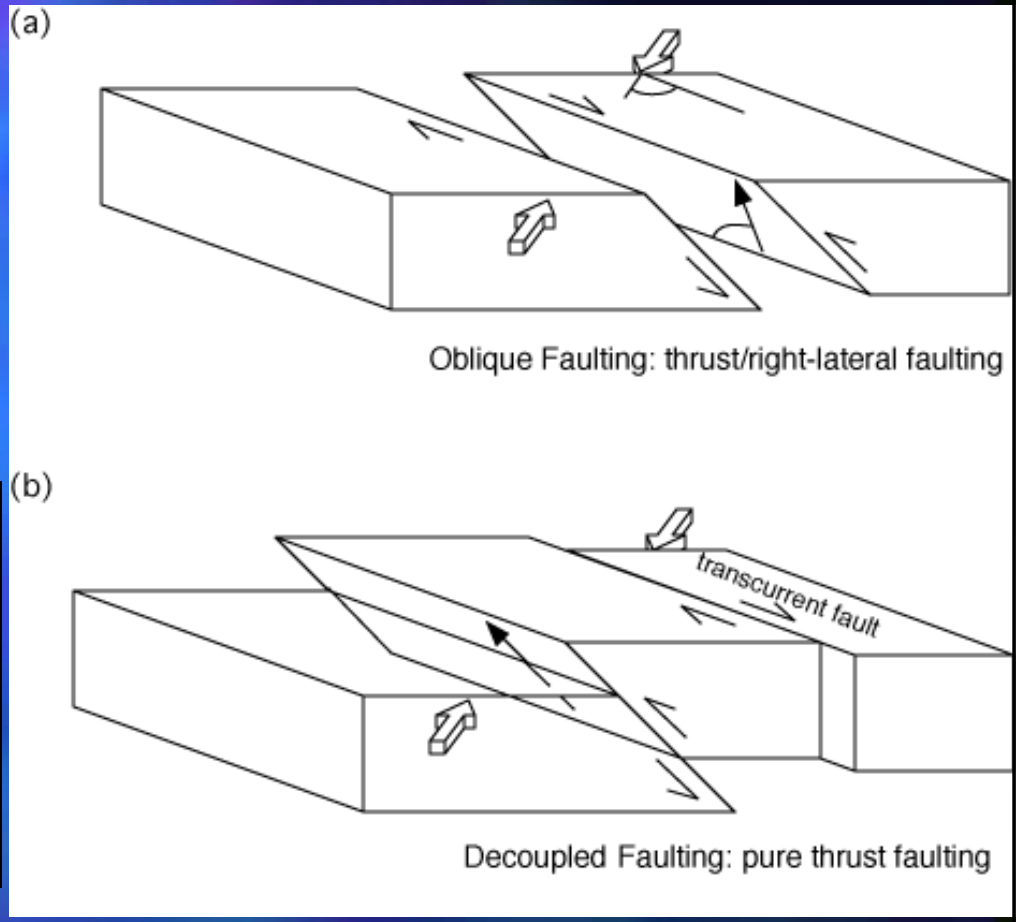




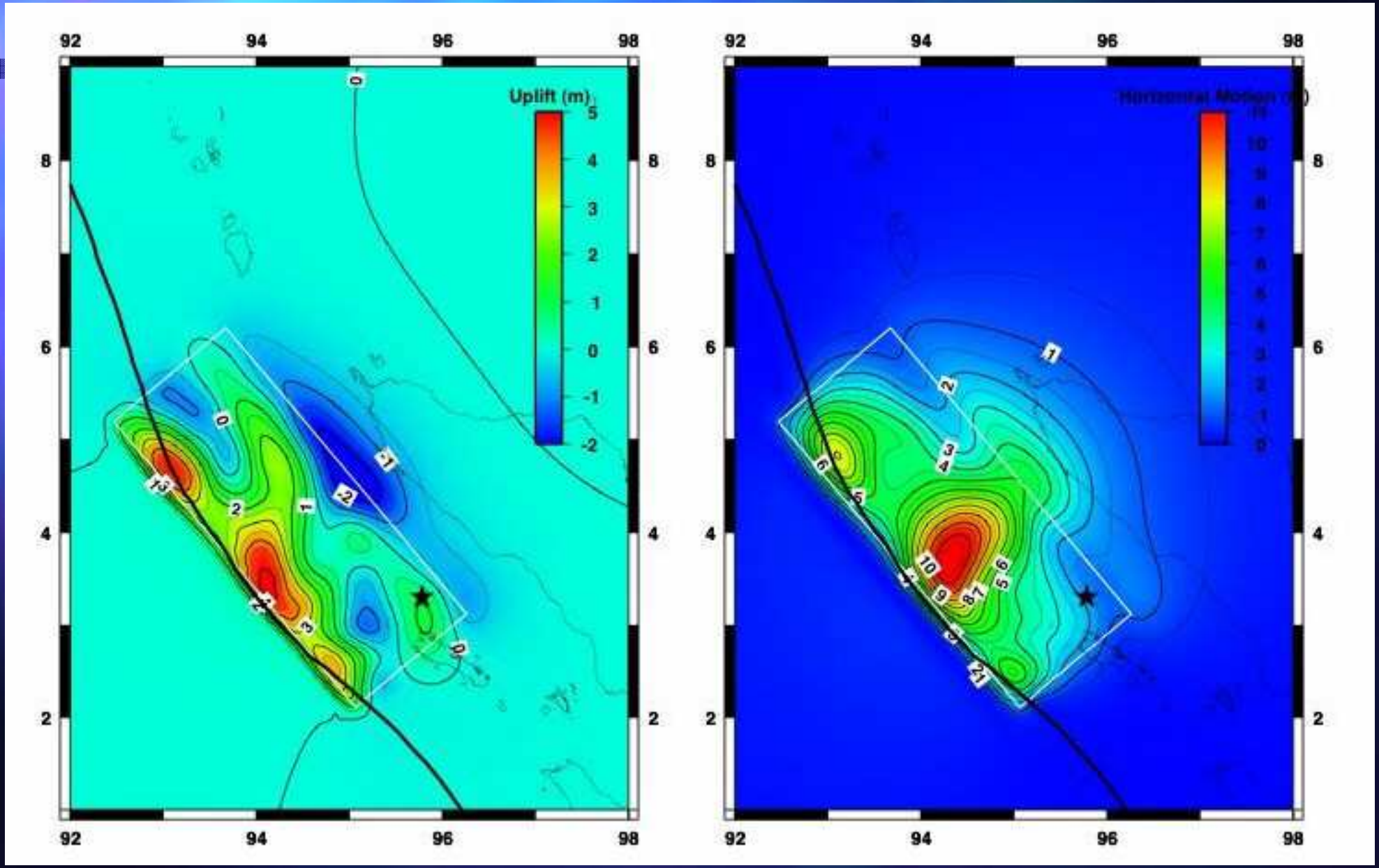
Desky a zlomy



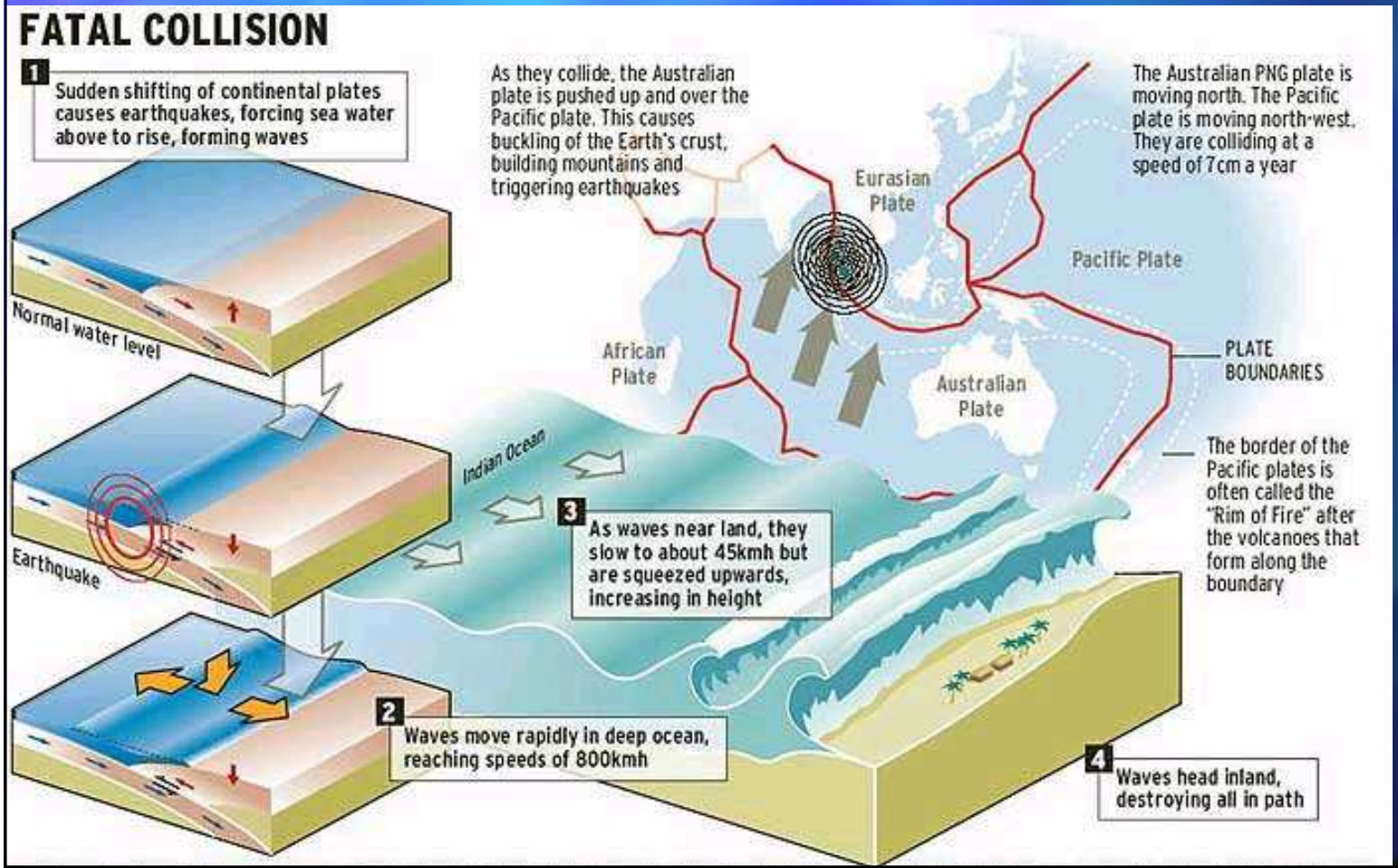




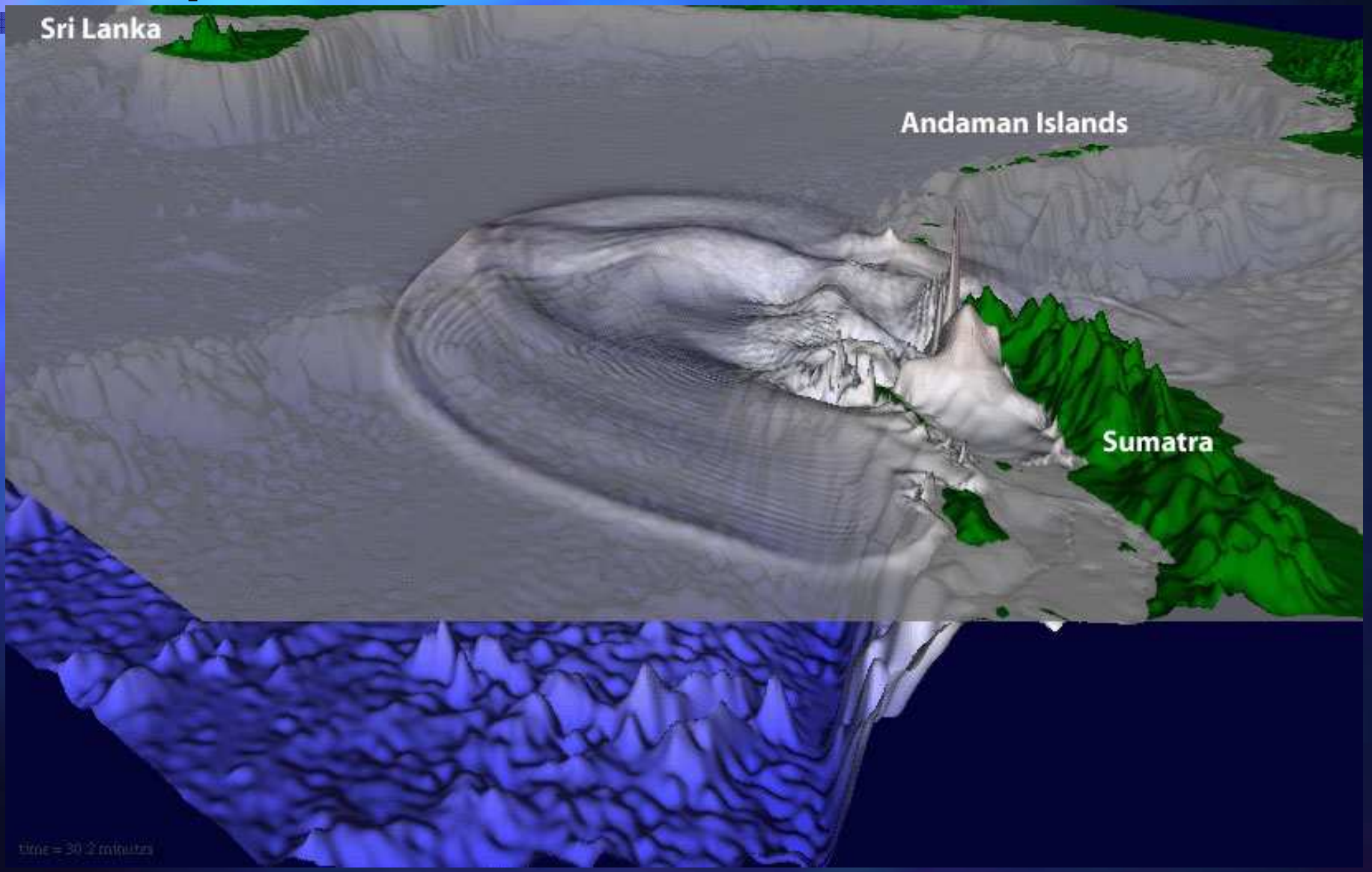
Uplift and slip



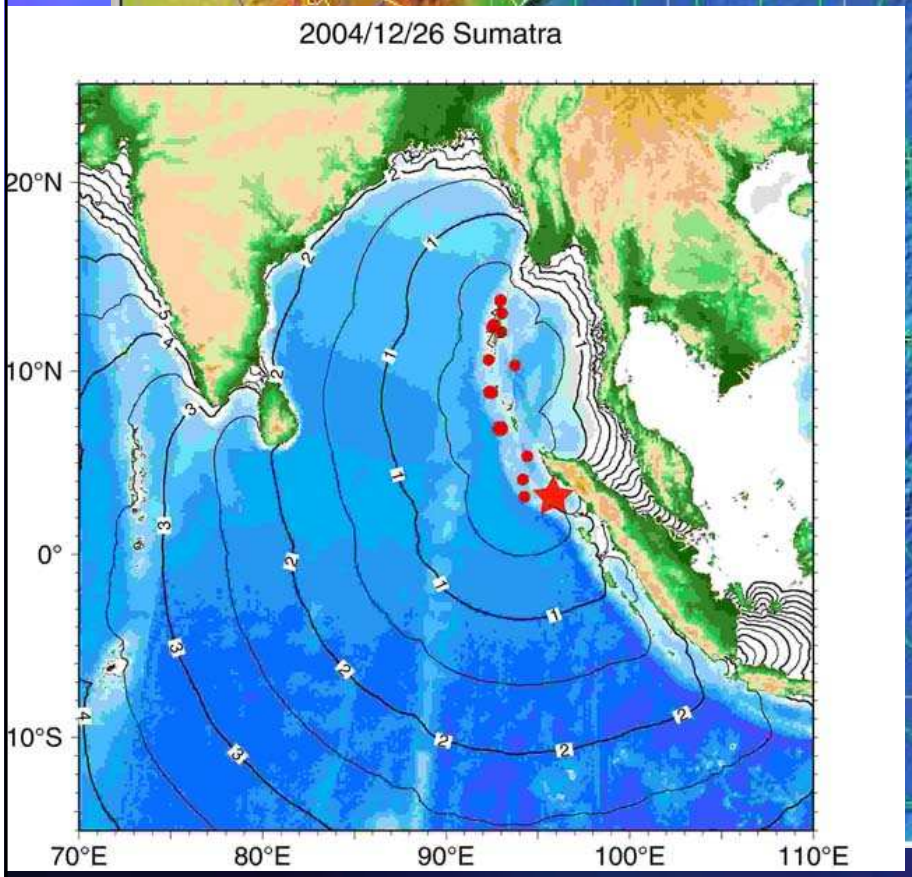
Vznik vlny


FATAL COLLISION
1 Sudden shifting of continental plates causes earthquakes, forcing sea water above to rise, forming waves
Normal water level
Earthquake
As they collide, the Australian plate is pushed up and over the Pacific plate. This causes buckling of the Earth's crust, building mountains and triggering earthquakes
Eurasian Plate
Pacific Plate
African Plate
Australian Plate
Indian Ocean
The Australian PNG plate is moving north. The Pacific plate is moving north-west. They are colliding at a speed of 7cm a year
PLATE BOUNDARIES
The border of the Pacific plates is often called the "Rim of Fire" after the volcanoes that form along the boundary
3 As waves near land, they slow to about 45kmh but are squeezed upwards, increasing in height
2 Waves move rapidly in deep ocean, reaching speeds of 800kmh
4 Waves head inland, destroying all in path

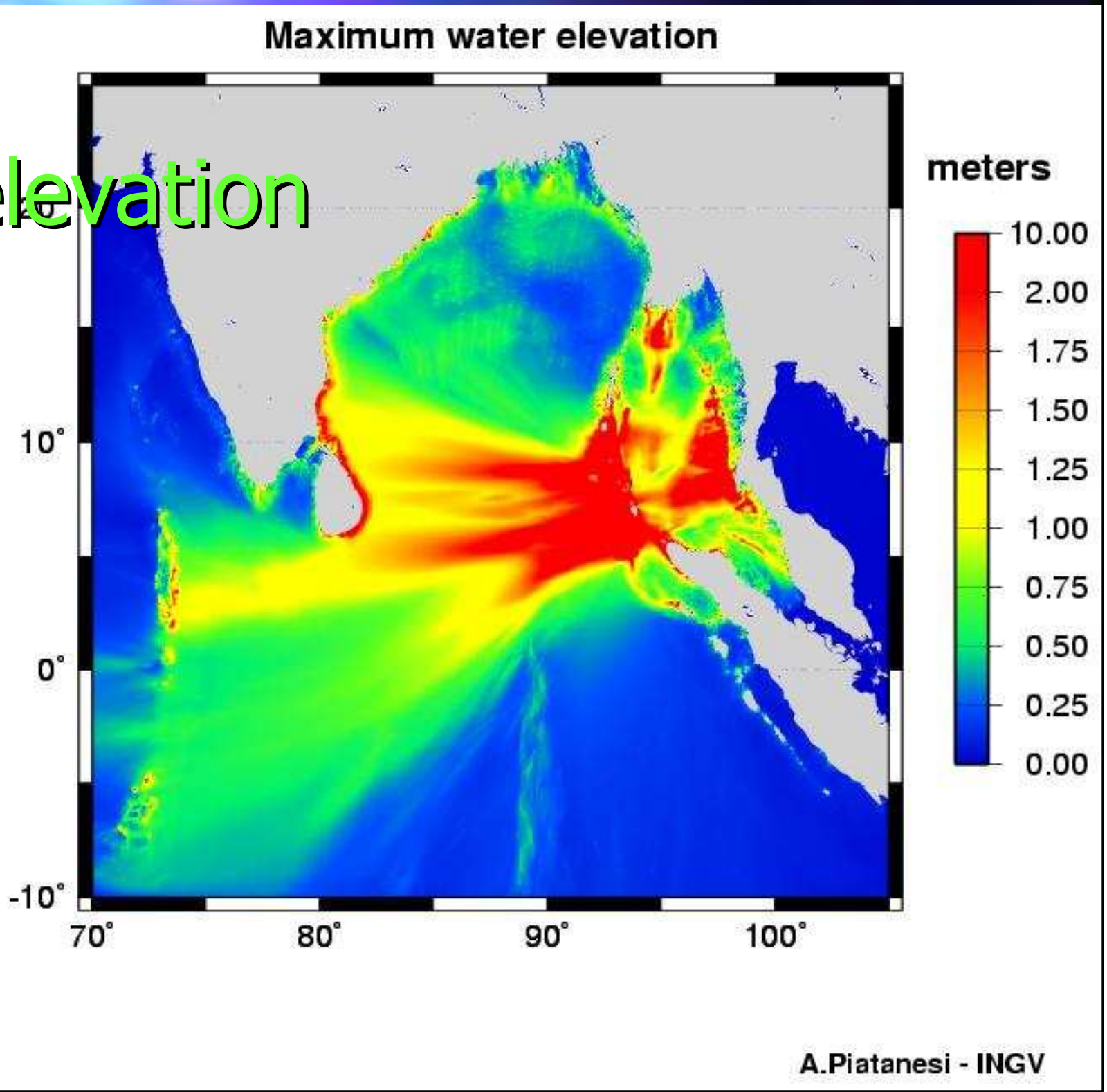
Postup tsunami



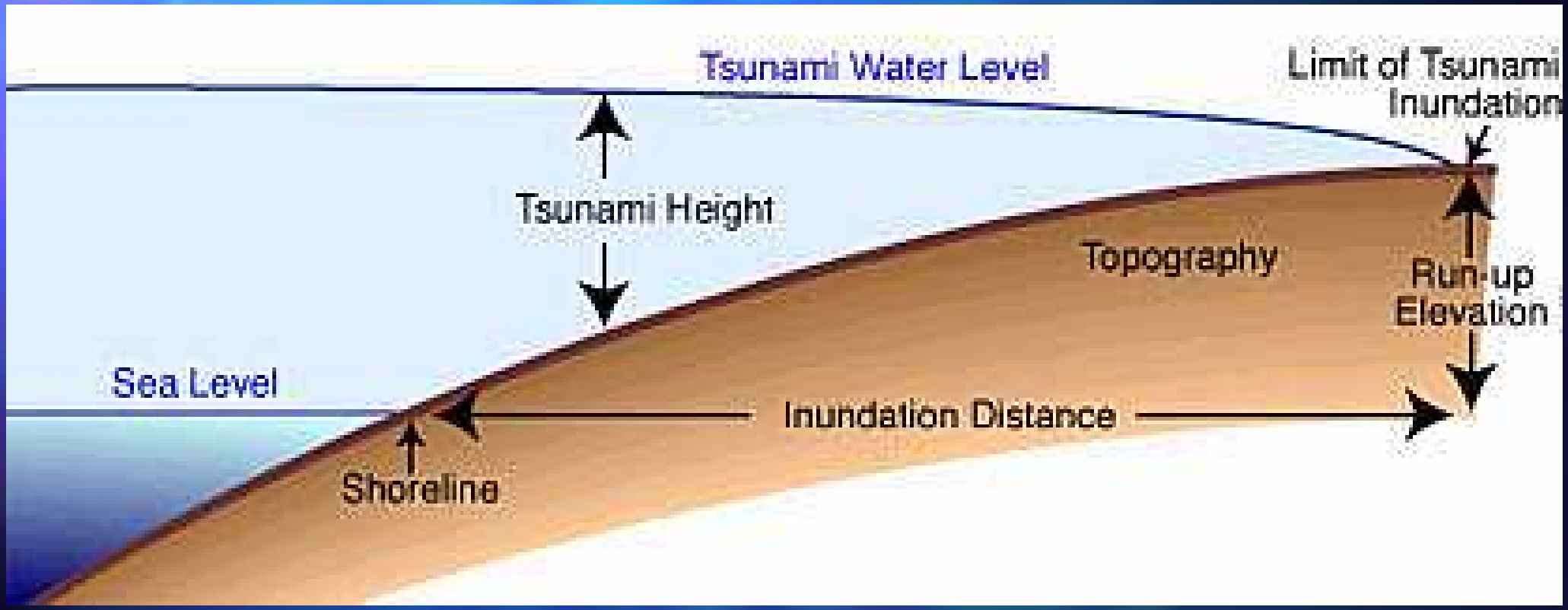
Postup tsunami - rychlost



Water elevation



Tsunami - terminologie



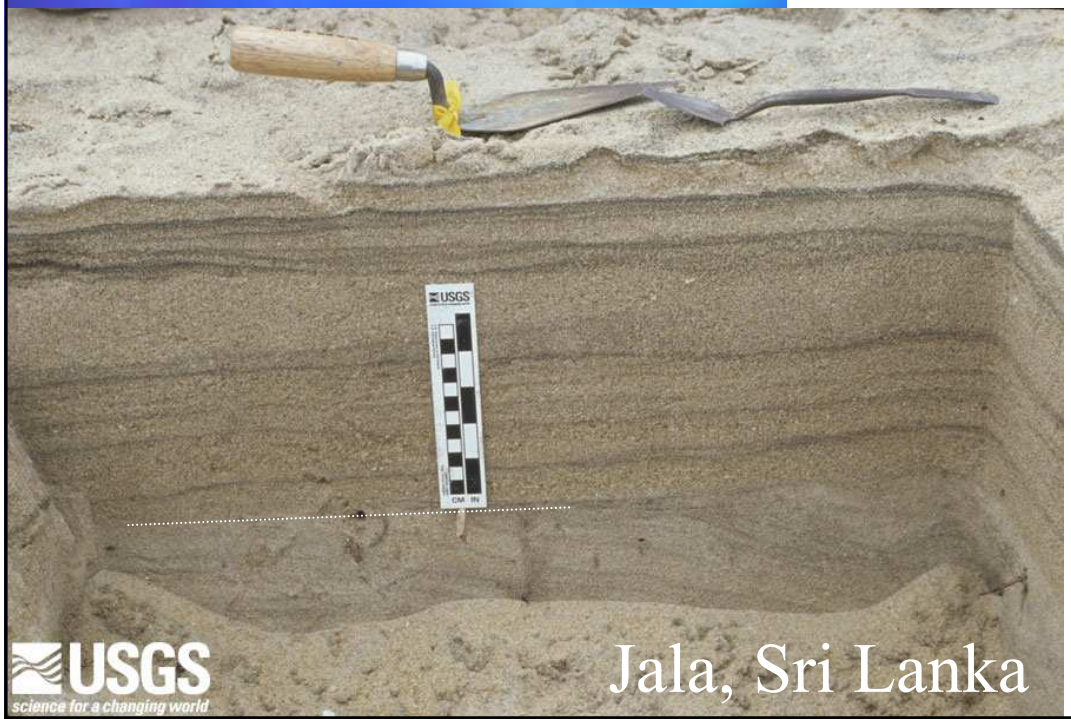
Následky

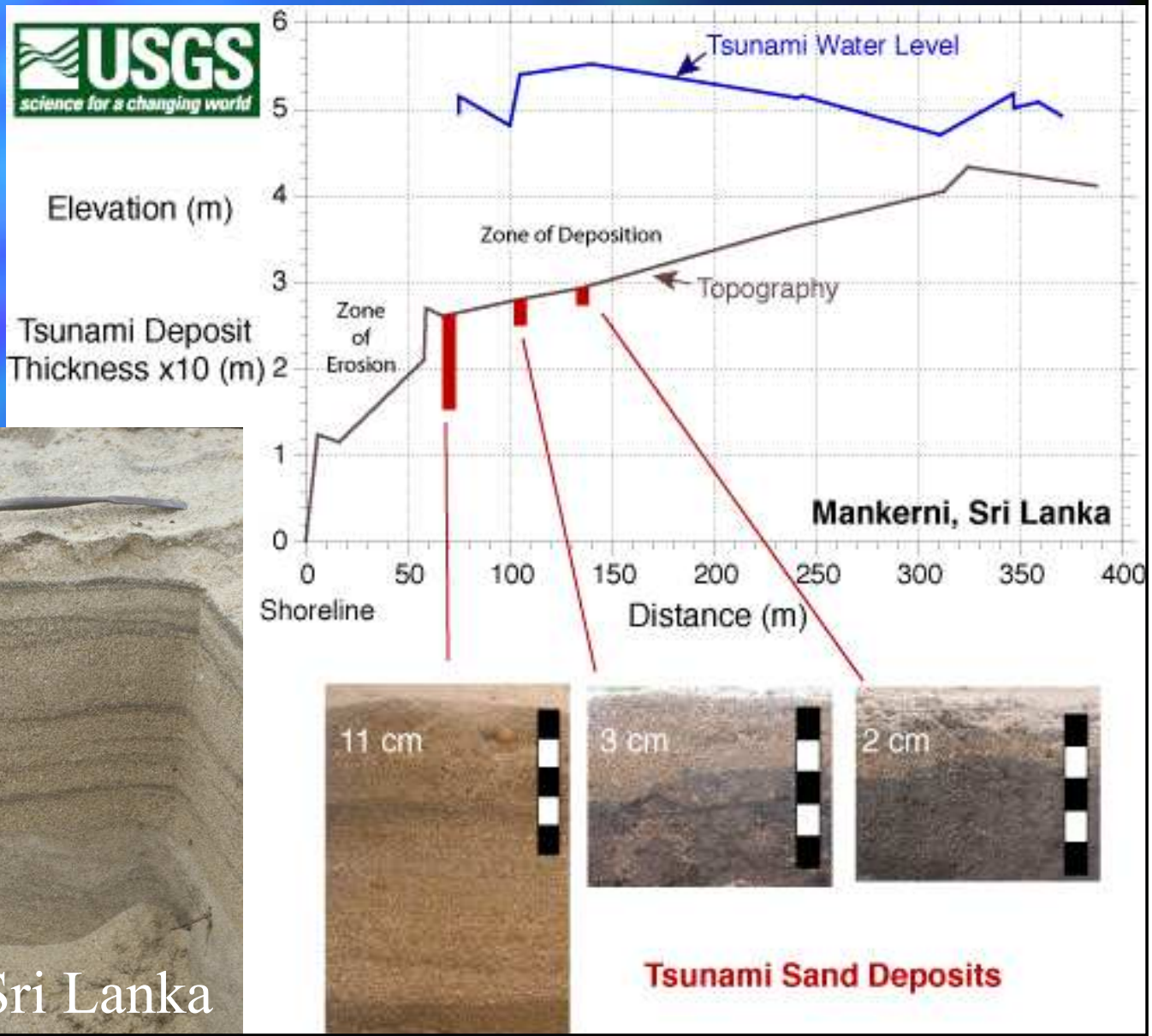
Kalmunai, Sri Lanka

Maledivy

Malé, Maledivy

Sedimenty a jejich mocnost





34 m

Banda Aceh, 34 metrů

Before - after

Indonesia - Banda Aceh Subset 4

1 : 5000

IKONOS - January 10, 2003 - PRE-DISASTER IMAGE

IKONOS - December 29, 2004 - POST-DISASTER IMAGE

Indonesia, Banda Aceh

Center for Satellite based Crisis Information

German Remote Sensing Data Center
German Aerospace Center

DLR

Interpretation

The map shows a mining and processing area with a harbour in the area of Banda Aceh on the island of Sumatra (Indonesia) before and after the devastating Tsunami flood wave, which struck many countries in the Indian Ocean on December 26, 2004.

The IKONOS images were taken on January 10, 2003 and December 29, 2004, respectively.

The map shows the destructions caused by the Tsunami. The entire mining and processing area was affected by the flood wave. In the harbour one can see a cargo ship that was wrecked.

Scale

1 : 5000

Projection : UTM Zone 46 N
Spheroid : WGS84
Datum : WGS 84

N

Data Source

IKONOS imagery provided through

Centre for Remote Imaging, Sensing and Processing (CRISP)

SPACE IMAGING
Visual Information. Visible Results.

Map created December 29, 2004 by ZKI@DLR.DE

Before – after II

Indonesia - Banda Aceh Subset 3

1 : 5000

Center for Satellite based Crisis Information
Emergency Mapping & Disaster Monitoring

German Remote Sensing Data Center
German Aerospace Center

DLR

IKONOS - January 10, 2003 - PRE-DISASTER IMAGE

IKONOS - December 29, 2004 - POST-DISASTER IMAGE

Cvičení s tsunami

- Co je hlavní podmínka vzniku tsunami?
- Lze předvídat riziko vzniku tsunami?
- Jaké procesy-události vedou ke vzniku tsunami? A podle tohoto, kde všude mohou vzniknout?

Faktory vzniku a pohybu tsunami

- změna polohy či objemu hornin na dně
- fakt, že voda je nestlačitelná
- volný průběh energie vlny
- omezení vlny, hmoty vody zespodu, vytlačení