

What can we say about the next Sumatran Tsunami?

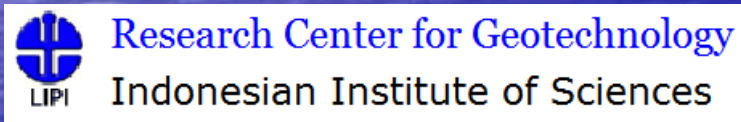
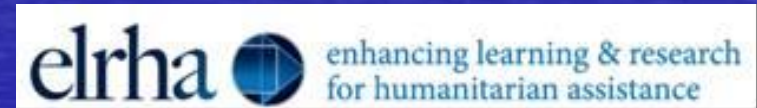
John McCloskey, Environmental Sciences, University of Ulster

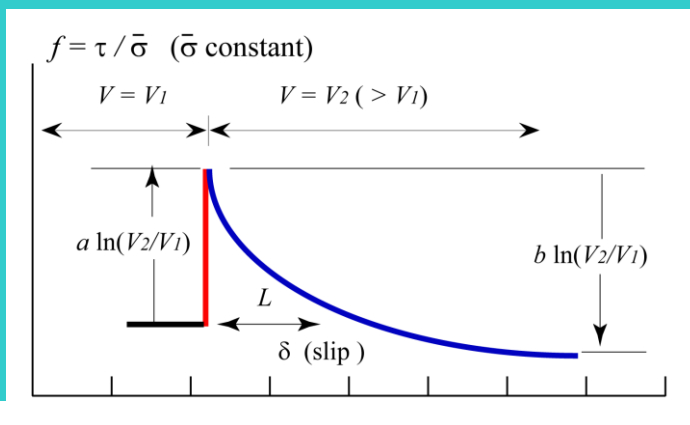
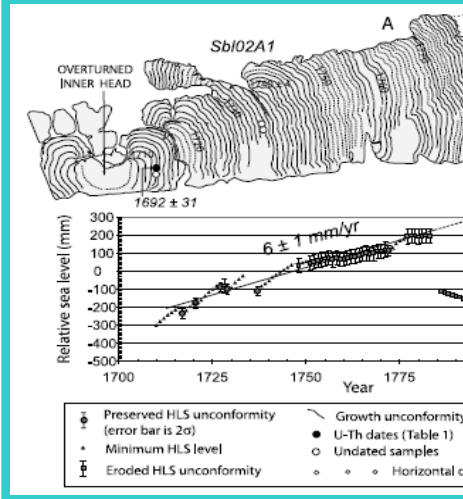
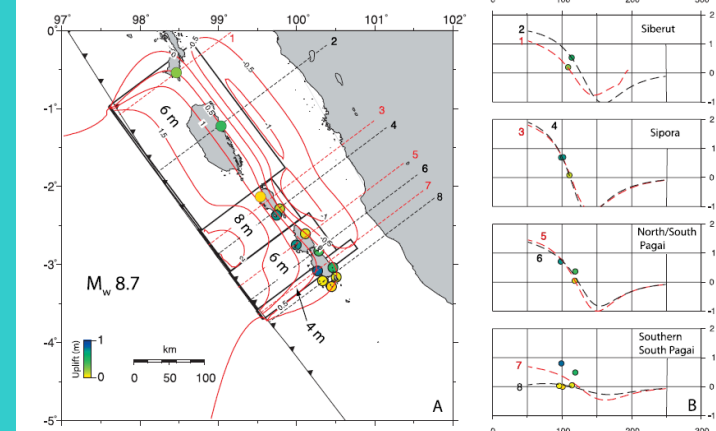
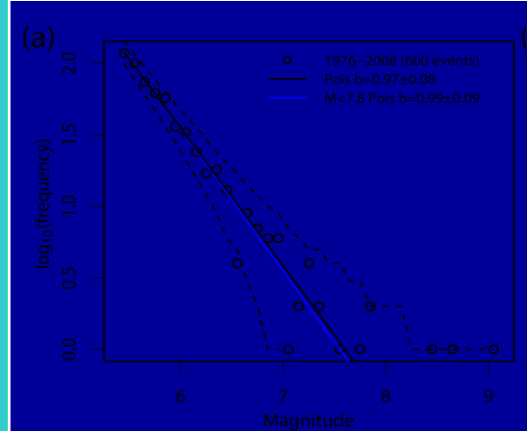
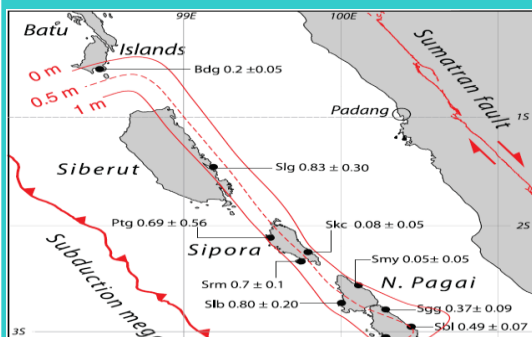
Ian Main, Andy Bell, Mark Naylor, John Greenhough, Chris Bean, Mairead NicBhloscaidh, Peter Clarke, Stefano Lorito, Andrea Antonioli, Alessio Piatanesi, Kerry Sieh, Sandy Steacy, Suleyman S. Nalbant, Massimo Cocco, Carlo Giunchi, JianDong Huang¹ and Paul Dunlop, Hasan Abidin, Danny Natawajaja, Mohamed Chlieh, Ozgun Konca.

Susanne Sergeant

Rachel Shannon, Sara McDowell, Dominic Crowley and Jess Camburn

UCL DDR for Natural Hazards Meeting, 5/11/2009





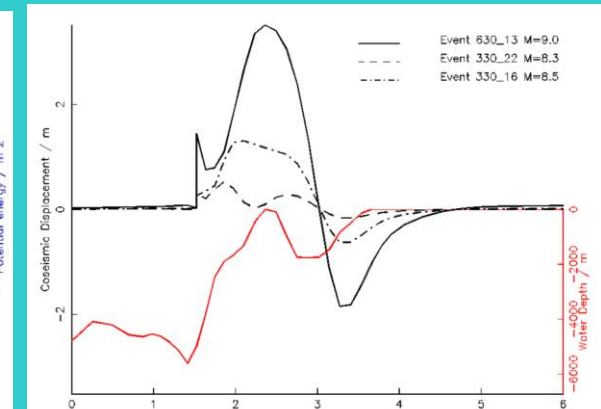
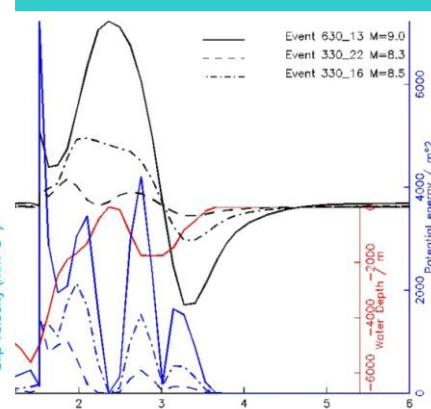
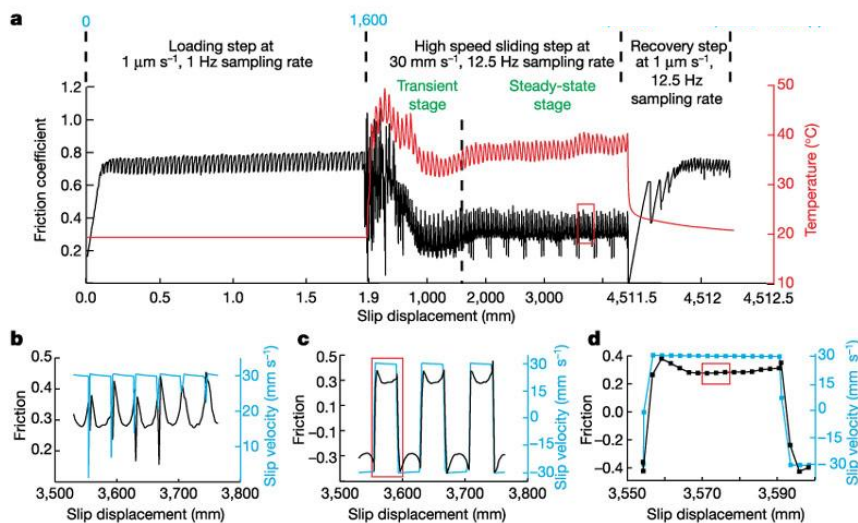
One-state-variable formulation:

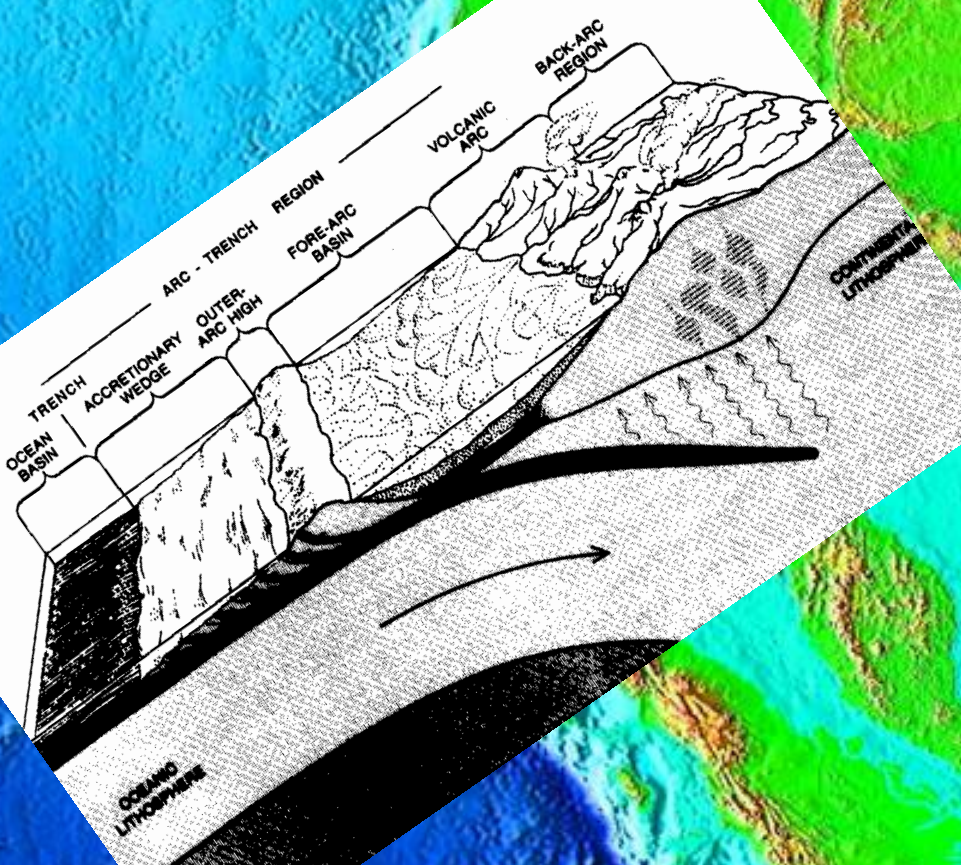
$$\tau = (\sigma - p) \left[f_0 + a \ln\left(\frac{V}{V_0}\right) + b \ln\left(\frac{\theta V_0}{L}\right) \right];$$

Evolution law:

$$\frac{d\theta}{dt} = 1 - \frac{V\theta}{L} \quad \text{"ageing"}$$

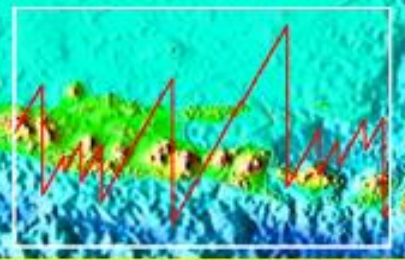
$$\frac{d\theta}{dt} = -\frac{V\theta}{L} \ln\left(\frac{V\theta}{L}\right) \quad \text{"slip"}$$



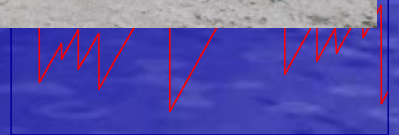


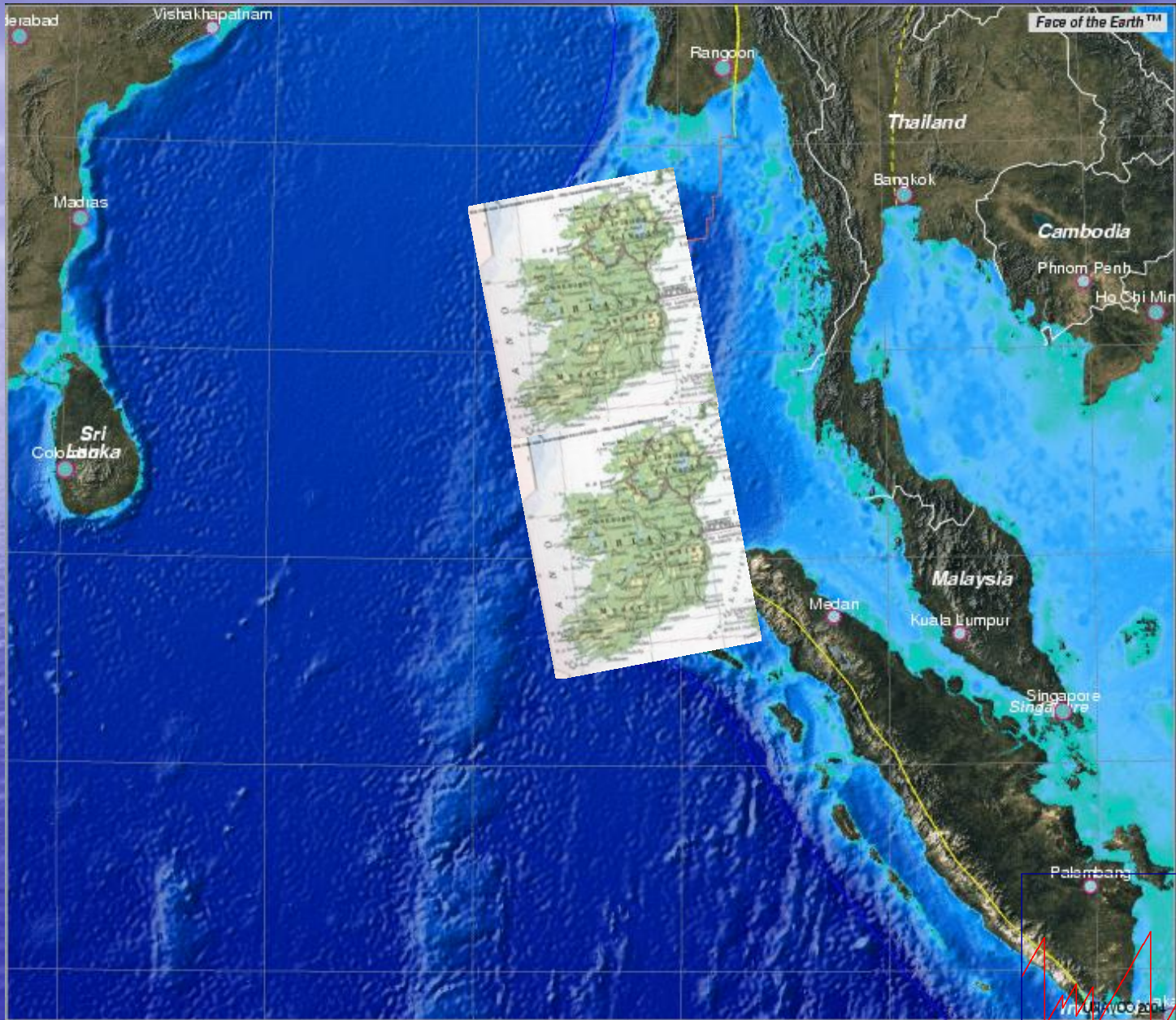
● Padang

Siberut

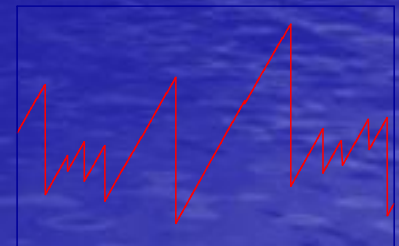


Group

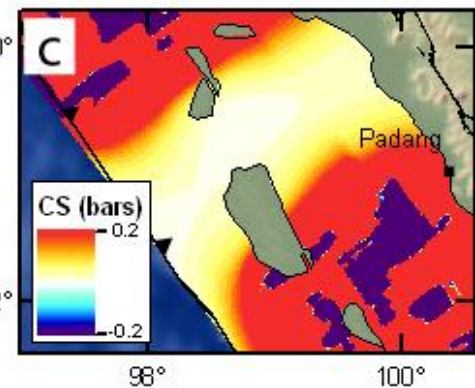
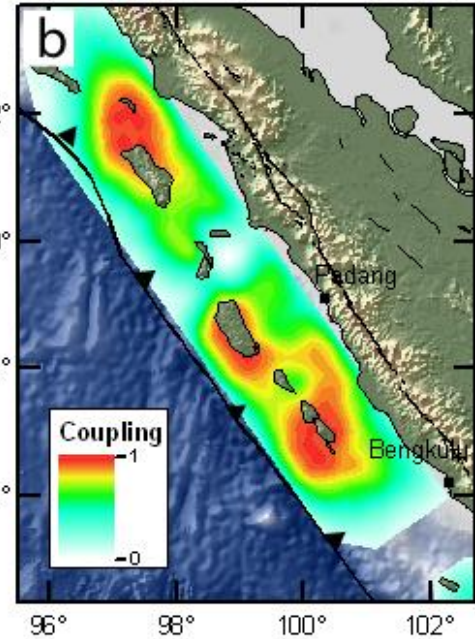
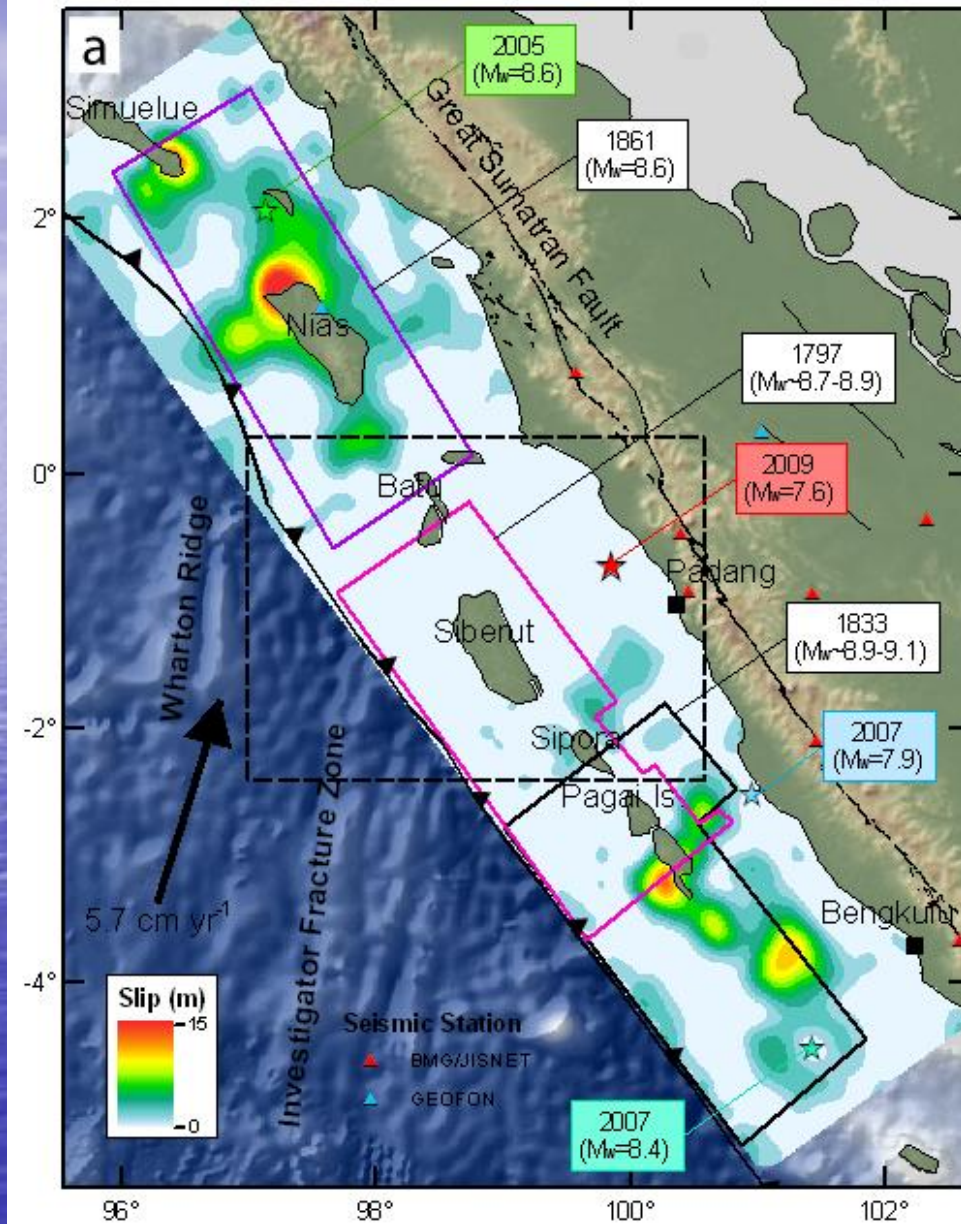


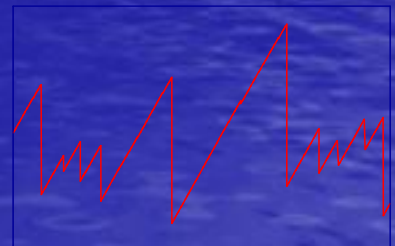
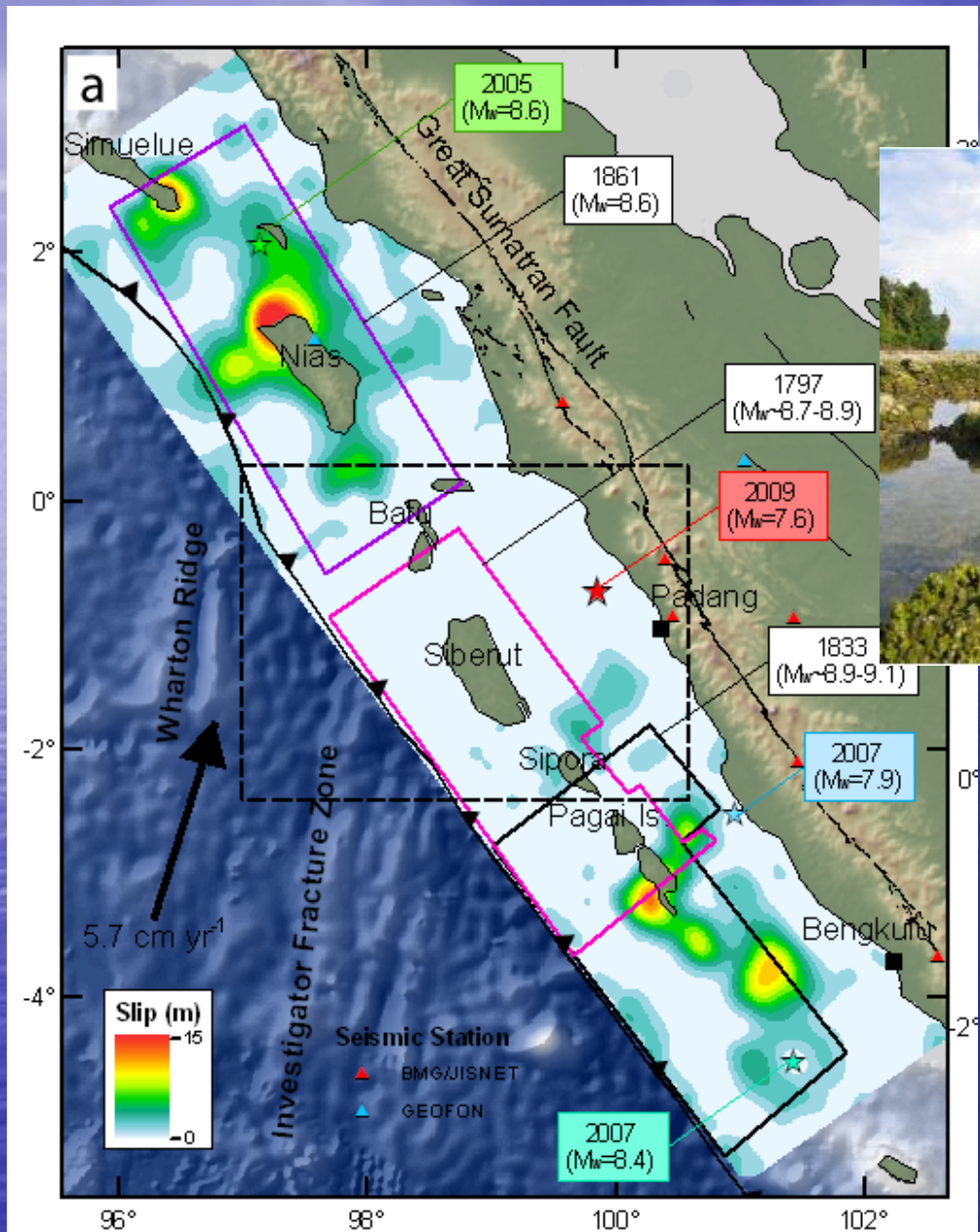


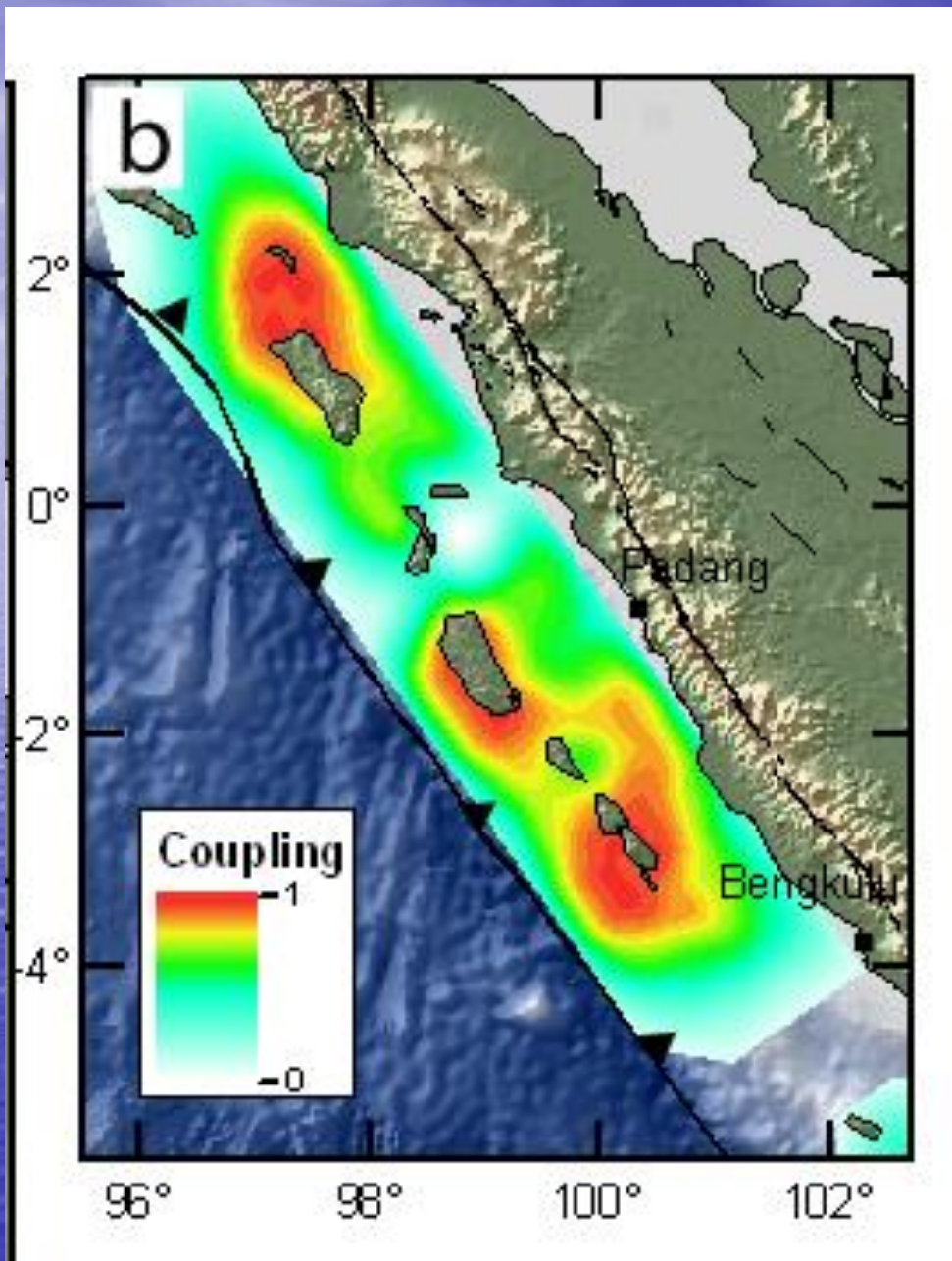
Geophysics Research Group

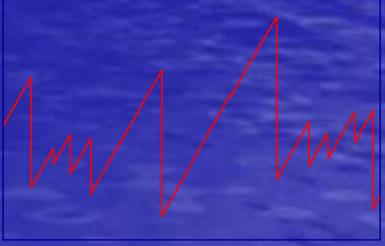
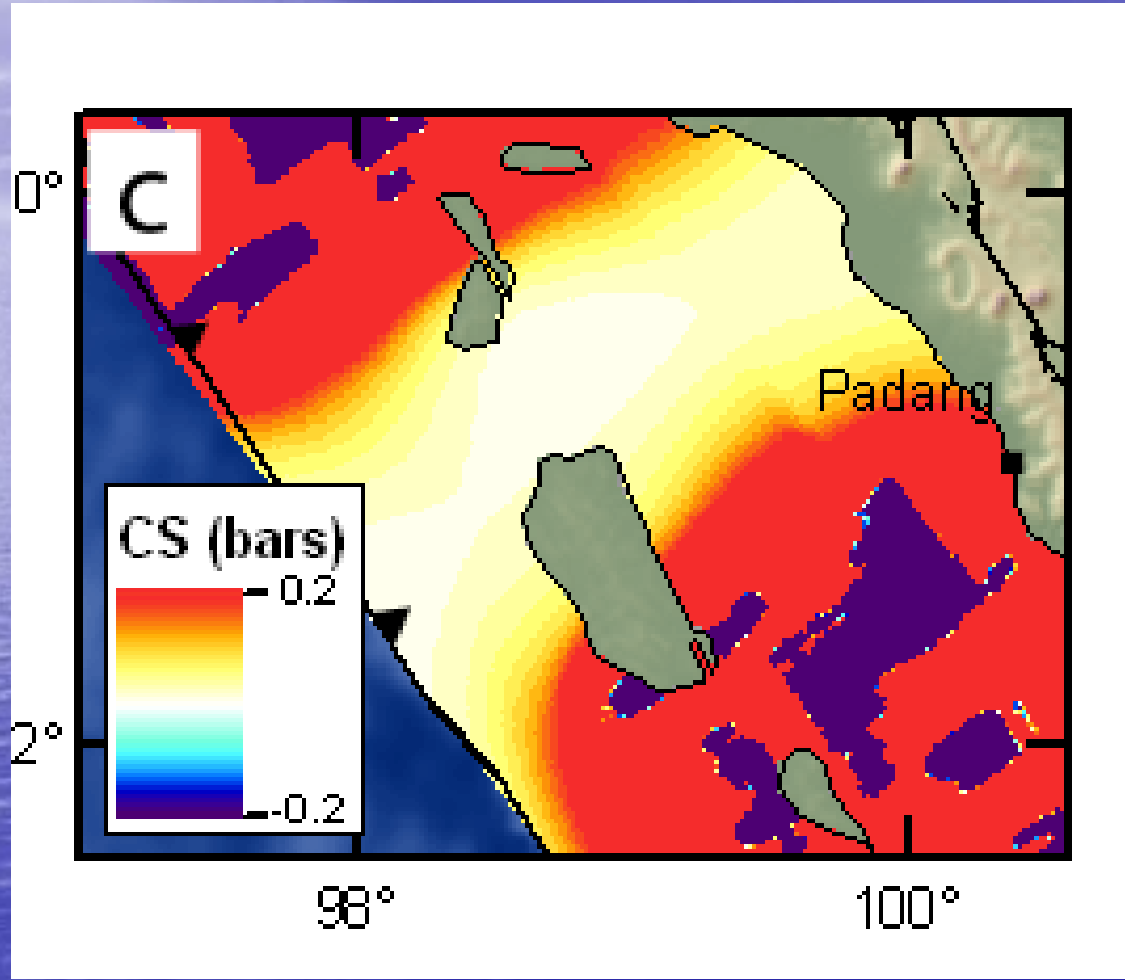


Geophysics Research Group









Old earthquakes: Under Siberut broke in 1797 and slipped about 10m

Modern measurements: Show under Siberut is locked tight.

Modern measurements: It takes about 200 years to accumulate 10m

Recent earthquakes: Have broken 2500km except for 300km under Siberut

Recent earthquakes: Have loaded more stress there

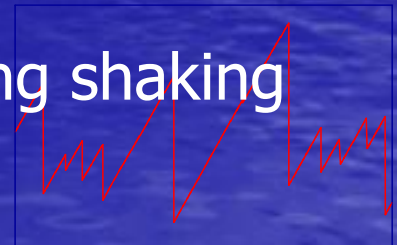
Under Siberut Island the stress is now probably higher than 1797,
this stress is not going anywhere,
The loading continues

Another earthquake is certain

To get rid of the strain it has to be $M > 8.5$
(here is the first disagreement among scientists)

Padang is under globally high threat of strong shaking
and tsunami inundation

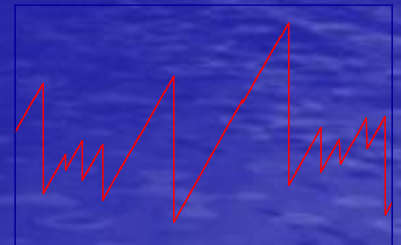
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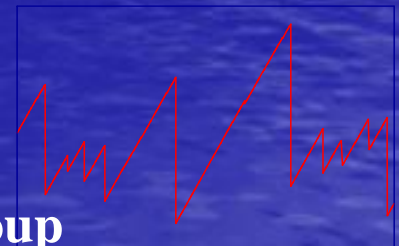
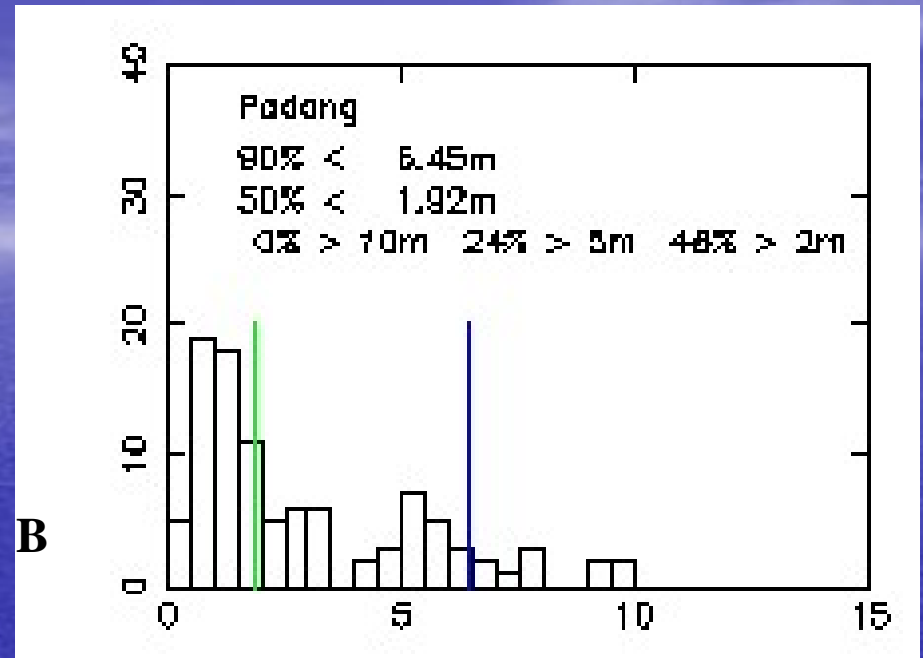
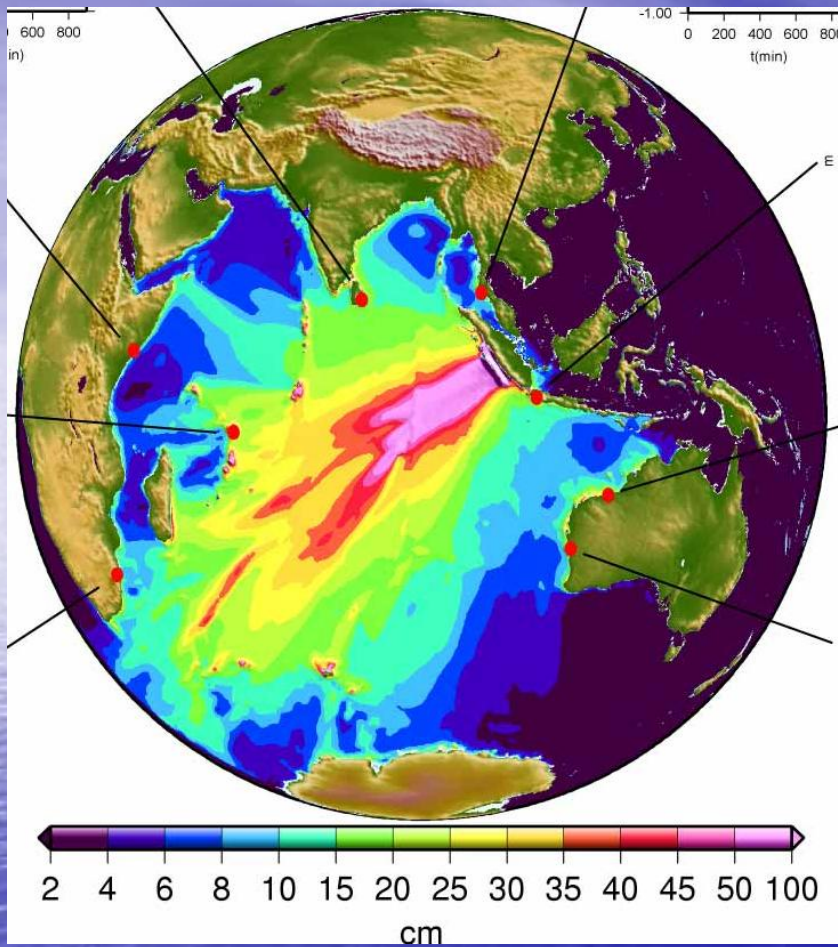


Another earthquake is certain

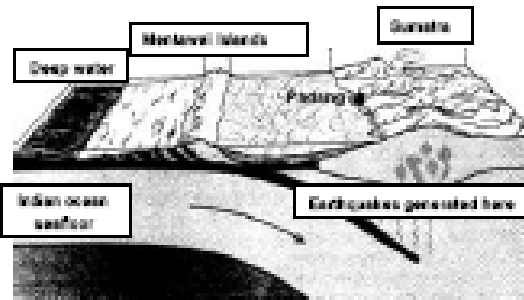
It will be very strong - probably $>M8.5$

Padang is under globally high threat of strong shaking
and tsunami inundation



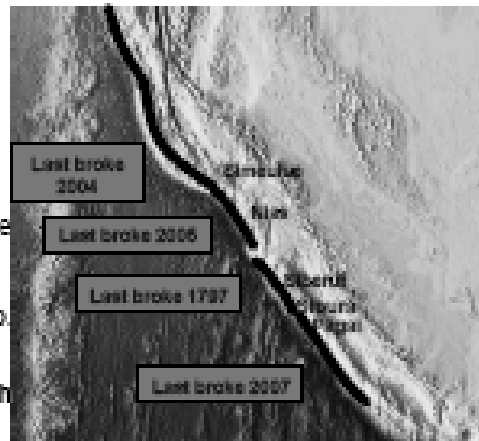


Earthquake and Tsunami Threat for Western Sumatra What you should know.



- The earthquakes west of Sumatra are caused by the Indian Ocean floor being forced under Sumatra
- During an earthquake the seafloor and the Islands move rapidly upward.
- This movement of the seafloor can cause a tsunami.

- Large earthquakes become more likely the longer it has been since the last one
- There has been no large earthquake under Siberut Island since 1797
- All the rest of western Sumatra has had recent large earthquakes
- An earthquake under Siberut could be of magnitude >8.
- Many such earthquakes do not generate large tsunamis but some do.



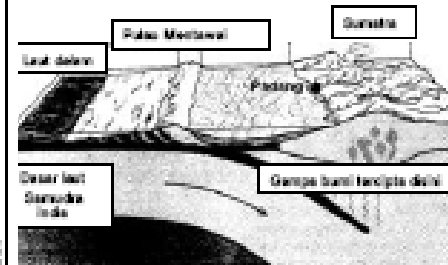
Conclusion: There is the risk of a large earthquake under Siberut which could produce a tsunami in Padang

What You Should Do.

- If the ground shakes strongly for more than 30 seconds move quickly to higher ground.
- Do not wait to see if the sea retreats.
- Do not wait for any other warning.
- Scientists think you might have about 30 minutes but you should move as quickly as possible.
- Stay on high ground for at least 3 hours

Organise yourself, your family, your community.
Preparation will save lives!

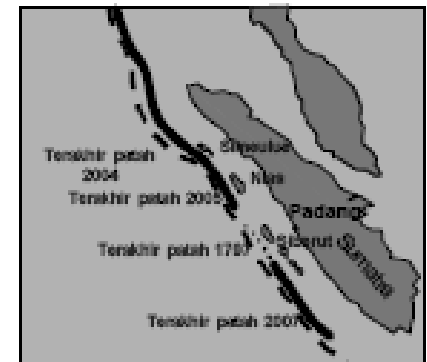
Ancaman Gempa Bumi dan Tsunami Untuk Sumatera Barat Apa yang Kamu Harus Tau



- Gempa bumi di Sumatra Barat disebabkan oleh dasar laut Samudra India yang berpusat di bawah Sumatra
- Selama gempa bumi, dasar laut dan pulau-pulau bergerak keatas dengan cepat
- Pergerakan dasar laut ini akan menyebabkan tsunami.

Gempa bumi besar sepertinya menjadi lebih lama sejak yang terakhir Tidak pernah ada gempa bumi dibawah pulau Siberut sejak 1797 Semua daerah di bagian barat telah erjadi gempa bumi besar Gempa bumi dibawah siberut nungkin berkekuatan magnitude >8. Banyak gempa bumi seperti itu tidak menghasilkan tsunami tetapi beberapa nya

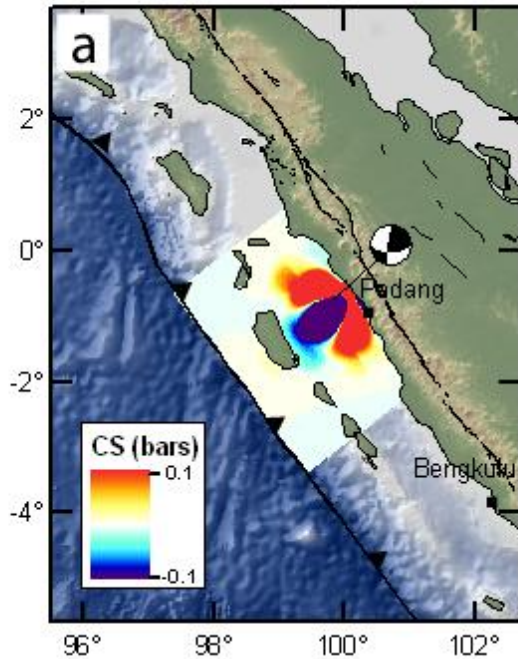
Kesimpulan: Ada resiko dari gempa bumi besar dibawah Siberut yang dapat menghasilkan tsunami in Padang



Apa yang Harus kamu lakukan.

- Jika tanah bergoyang dengan kuat lebih dari 30 detik pindahlah secepatnya ke daerah yang lebih tinggi.
- Jangan tunggu untuk melihat jika laut menyusut.
- Jangan menunggu untuk peringatan manapun.
- Para ahli berpikir kamu mempunyai sekitar 30 menittetapi kamu harus pindah secepat mungkin.
- Tetaplah di tempat tinggi setidaknya selama 3 jam

Atur dirimu, keluargamu, lingkunganmu.
Persiapan akan menyelamatkan jiwa!



- Press Releases
- Case Study
- Photos
- FAQ

Latest Appeal

In one week from Saturday 26 September the East Asia region was hit by 3 separate natural disasters; Typhoon Ketsana swept through the Philippines that day and onto Vietnam on the 29th causing extensive damage and flooding; on 30th September in Indonesia an earthquake registering 7.6 on the Richter scale struck western Sumatra followed by an aftershock of 6.6 a day later.



Well over a 1000 people are thought to have died in Sumatra but this is likely to be a low



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It will be very strong - probably > M8.5

Padang is under globally high threat of strong shaking and tsunami inundation

