What can we say about the next Sumatran Tsunami?

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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:
\[ \frac{d\theta}{dt} = 1 - \frac{V \theta}{L} \quad \text{"ageing"} \]
\[ \frac{d\theta}{dt} = -\frac{V \theta}{L} \ln \left( \frac{V \theta}{L} \right) \quad \text{"slip"} \]
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
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!

For further information contact KOGAMI at:
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.
Another earthquake is certain

It will be very strong - probably > M8.5

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