

Geologist narrows down location of S-E Asia's 'next big quake'

BY GRACE CHUA & VICTORIA VAUGHAN

THE next big earthquake to rock South-east Asia can be narrowed down to a 400km stretch off the west coast of Sumatra, says geologist and Earth Observatory of Singapore head Kerry Sieh.

The expected 8.8 magnitude quake will probably occur in the next three decades, with "10-to-one odds", Professor Sieh said yesterday.

This quake, which could set off a tsunami and threaten more than a million people living along Sumatra's coast, will be nearly as large as the one off Aceh, which unleashed the Indian Ocean tsunami on Dec 26, 2004.

Prof Sieh was speaking at the 6th annual meeting of the Asia Oceania Geosciences Society, held here this week at the Suntec convention and exhibition centre.

His prediction is based on global positioning system information, which measures horizontal movement, and historic data from coral.

The earth's crust is made of plates that are constantly moving, grinding apart or into each other, and the growth patterns of coral reefs reflect the movement of the plates they sit on, the professor explained.

Earth Observatory researchers studied such reefs off the west coast of Sumatra, along a fault line called the Sunda megathrust.

There, Prof Sieh and his colleagues found a pattern of large quakes every 200



Prof Sieh predicts a quake of 8.8 magnitude along a 400km stretch off the west coast of Sumatra in the next 30 years. ST FILE PHOTO

years on a section of the west Sumatra coast and that the area was subject to tremendous strain.

An 8.4-magnitude quake there in 2007 relieved only some of the tectonic tension, and is but the first in a predicted series of earthquakes in the same area.

"We've begun the failure sequence. We've begun the countdown," Prof Sieh said.

The Singapore researchers are working with their Indonesian counterparts and non-governmental organisations, such as tsunami preparedness organisation KOG-AMI, to inform residents in affected areas of the risks.

Prof Sieh added that even if the west Sumatra earthquake does occur as predicted, the effect felt in Singapore will be small, as most buildings here are on bedrock or thin soils and are unlikely to shake much.

Dr Kenji Satake of the University of Tokyo's Earthquake Research Institute said the forecast was convincing, but that "there is a possibility that slow earthquakes (without causing strong shaking or tsunamis) could also generate similar phenomena, particularly for the shallower offshore parts of northern Sumatra.

"More geological evidence of ground shaking or tsunamis would make the forecast even stronger, but at this moment, I fully endorse his proposal and people should take his caution seriously," Dr Satake added.

Yesterday's 7.6-magnitude Andaman Islands earthquake, across the Bay of Bengal east of mainland India, lies near the same fault line as the 2004 Aceh quake.

But it was different from the 2004 quake, which resulted from the India and Australia tectonic plates moving beneath the Burma and Sunda plates.

The US Geological Survey reported yesterday that the Andaman quake was likely caused by the Indian plate bending as it moved beneath the Burma plate.

After an earthquake of that magnitude, there is a 5 per cent chance of bigger earthquakes within 72 hours, Prof Sieh said.

He added that the Andaman tremor is not related to the forecast Sumatra quake, as the sites are too far apart.

■ FORECASTING FUTURE QUAKES

The world's most active place for earthquakes is a 2,000km stretch along the Sunda Megathrust from Myanmar to Sumatra. Director of the Earth Observatory of Singapore at Nanyang Technological University Prof Kerry Sieh predicts a big earthquake during the next 30 years.

2004 9.2Mw Sumatra/Andaman
Long recurrence - possibly every 600 years. A suggestion there may be another one this century.

2005 8.7Mw Nias and southern Simeulue
Short recurrence and multiple earthquakes per episode. This quake could be the first in a series.

2039
Prof Sieh predicts in the next 30 years the 400km section which has not yet ruptured, adjacent to Padang in Sumatra, from Siberut to the Pagai Islands, will do so having the potential to cause an earthquake of 8.8Mw.

Research tools

■ Prof Sieh and his team use corals to learn about past earthquakes. A coral records the sea level and by dating this it's possible to discover a shift in the land indicating an earthquake. This data goes back 700 years.

■ Global Positioning Systems show how the land has shifted vertically as well as horizontally during earthquakes. Combining the two provides a picture of land movement during an earthquake.

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A portion of the Mentawai patch off South Pagai broke causing a series of three quakes measuring up to 8.4Mw. This could be the first in a series. The data shows these occur every 200 years.

*Richter v Magnitude

■ Scientist no longer use the Richter Scale to measure earthquakes as it is less accurate at recording earthquakes higher than 7Ml. The moment magnitude work (Mw) correlates with the Richter Scale but can measure beyond 7Ml.

