

Earthquakes weaken distant faults

The major 2004 earthquake in Sumatra may have weakened the San Andreas fault, 8,000km away in California.

This is according to scientists who took measurements from the fault over two decades. Reporting in the journal *Nature*, the team found that small "repeating earthquakes" became more frequent as the San Andreas Fault weakened. This pattern, they say, could help to forecast earthquakes in the future, something that is currently impossible.

The team, led by Taka'aki Taira, of the University of California at Berkeley, studied a section of the San Andreas Fault near Parkfield, which is sometimes called the "earthquake capital of the world".

The area has long been studied by earthquake researchers and it contains a fixed array of seismometers called the high resolution seismic network.

Dr Taira, who was based at Washington DC's Carnegie Institution when he carried out the work, used measurements from these highly sensitive seismometers, some of which are several kilometres below the Earth's surface.

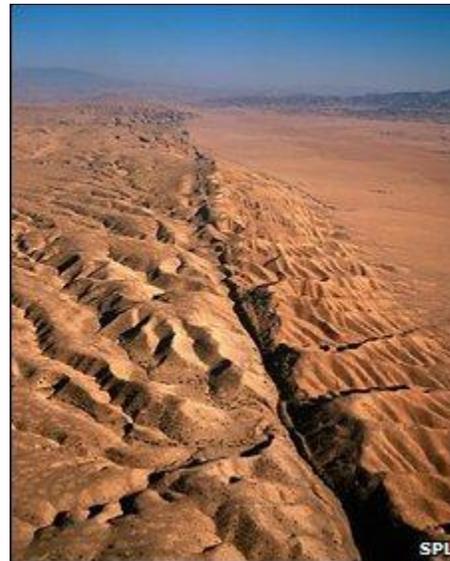
"The equipment is at depths where the noise level is very low, so it collects very good data," explained Dr Taira.

He and his team studied repeating earthquakes because they provided a "background frequency" against which changes in the fault could be compared.

"These events happen regularly and the size of the event is about the same," he told BBC News.

"But after Sumatra, the frequency changed - it increased - but the magnitude decreased.

"That is a signal of the fault weakening; you only have to push a little bit and the



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Fenglin Niu, Carnegie Institution

[Into Japan's earthquake zone](#)

fault fails."

Fenglin Niu from Carnegie, who also took part in the research, said: "So it is possible that the strength of faults and earthquake risk is affected by seismic events on the other side of the world."

The 2004 Sumatran earthquake was magnitude 9.3 - one of the strongest on record - and triggered the tsunami that killed more than 220,000 people.

The 30 September 2009 earthquake along the same fault line was measured at magnitude 7.6.