

## Seismic Activity Change Preceding the Sumatra Giant Earthquake Series, 2004M9.0, 2005M8.6, and 2007M8.5

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The seismicity along the Sunda trench was examined from the viewpoint of whether or not any significant change preceded the major earthquakes. Based on the seismicity of M5 and greater earthquakes, a growth of activated zones with time approaching the final breakage was detected. Left two pictures in the attached figure show the seismicity change for the two periods, stage D from Jan. 2000 until Dec. 25 2004 (just before the 2004 M9.0 event), and stage E from July 2002 until June 2007 (most recent stage), which were compared with the standard from 1973 until 1989. Red (blue) corresponds to activation (quiescence). The numerals in the index are percentages. Seven blue ellipses in stage D mark the activated zones. Right-most picture indicates the actual asperities analyzed from seismograms by Yamanaka. It is recognized that the activated zones well predicted the positions of the actual asperities for the 2004 M9.0 (light greens), 2005 M8.6 (buish green), and 2007 M8.5 (dark greens). Such a feature in seismicity change can be explained by introducing an assumption that a quasi-static slip progressed on a weakly locked plate boundary prior to the final breakage, and resulted in an activation corresponding to the induced stress concentration. In stage E, a newly activated zone appeared (red ellipse), which corresponds just to the zone of the Mentawai islands, off the coast of Padang, known as a seismic gap at present. Including this, there are two activated zones yet unresolved (arrowed ellipses). Accepting the limit in validity of the above hypothesis, I would like to give warnings for imminent earthquake occurrences in these zones.

