

A Geodetic Study of Strain Distribution on the Sundaland Plate

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Abstract: We use continuous GPS data from 1999 to 2014 to examine the interseismic strain rate from the 2004 M_w 9.1 Aceh, 2005 M_w 8.6 Nias and 2007 M_w 8.5 Bengkulu and 2012 M_w 8.6 and 8.2 northern Sumatra earthquakes. These data have captured the process of pre-, inter- and postseismic deformation of a series of great earthquakes, which are mainly concentrated on the western margin of the Sundaland plate. Our analysis suggests that a 100 km long segment of the Sunda megathrust (1.43°N – 2.15°N) has a fairly low rate of shear strain accumulation after the 2012 northern Sumatra strike-slip earthquakes compared to the pre-earthquake period. This segment is approximately one-third of 2005 Nias northern rupture segment, which also produced earthquakes M 8.5 in 1861 and \sim M 7.8 in 1907. The comparison of shear strain rate before and after 2012 earthquake suggest that this segment, which was locked in the past, is now freely creeping. This study also identified non-tectonic deformation in the Malaysia hinterland, particularly in Kuala Krai, Tanah Merah, and Sri Aman, that are subjected to localise land subsidence. Thus, the interseismic strain rate in this study demonstrates the spatiotemporal strain distribution of Sundaland plate.

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**L1 Lecture Theatre
School of Surveying
310 Castle Street**

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