

Steacy, S., Nalbant, S., McCloskey, J., Antonioli, A., Piatenesi, A., Sieh, K., Cocco, M., (2007) **Stress, triggered earthquakes, and modelled tsunamis on the Sunda Trench**, Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract#U51A-0010

The current earthquake sequence off the coast of Sumatra illustrates both the potential, and the difficulties, of using stress based models to assess the likely location of future large earthquakes. Following the 26 December 2004 event, we showed that stress had increased on the Sumatra Fault as well as further south along the subduction zone, and published concerns that both structures had the potential to experience large triggered earthquakes. The 28 March 2005 event occurred in the area of concern on the Sunda Trench although the Coulomb stress changes at the hypocenter were only on the order to 0.1 bar. The 2005 earthquake, in turn, increased stress along a large extent of the Sumatra Fault as well as further south on the subduction zone. The latter is of particular concern as paleogeodetic data show that the last large event under the northern Mentawai Islands was in 1797, while to the south the trench last ruptured in 1833. In order to assess the tsunami hazard in the region we modelled 100 possible earthquakes, and their tsunamigenic potential, along the subduction zone; all models had the common feature that they involved slip under Siberut Island in the northern Mentawais. On 12 September 2007, an $M=8.4$ earthquake occurred along the Sunda Trench. The hypocenter was south of the Mentawai islands and its location had not experienced a significant stress increase from the 2005 event. The earthquake re-ruptured a portion of the trench that failed in 1833 but did not propagate as far north as Siberut Island. Here we present an updated view of the Coulomb stresses along the Sunda Trench and discuss the potential for a further large event under Siberut Island; this area has now been loaded from both the north and the south. Additionally, we show results for modelled tsunamis resulting from possible future earthquakes in this region.