



Preservation of Holocene Earthquakes, Sungai Pinang, Western Sumatra

Tina Dura (1), Charles Rubin (1,2), Harvey Kelsey (3), Ben Horton (4), Andrea Hawkes (5), Candace Grand Pre (4), Mudrik Daryono (6), Tyler Ladinsky (3), Christopher Vane (7), and Sarah Bradley (8)

(1) Department of Geological Sciences, Central Washington University, Ellensburg, WA., USA, (2) Earth Observatory of Singapore, Nanyang Technological University, Singapore, (3) Department of Geology, Humboldt State University, Arcata, CA., USA, (4) Sea Level Research, University of Pennsylvania, Philadelphia, PA., USA, (5) Woods Hole Oceanographic Institute, Woods Hole, MA., USA, (6) Indonesian Institute of Sciences, Bandung, Indonesia, (7) British Geological Survey, Nottingham, UK, (8) Department of Earth Sciences, Durham University, Durham, UK

Two coseismic subsidence events are preserved within the coastal sediment of western Sumatra. Each subsidence event is preserved as a sharp contact between soil and overlying mud and records a sudden transition from a mangrove to tidal flat depositional environment. Stable carbon isotopic composition ($\delta^{13}\text{C}$) and the ratio of total organic carbon (TOC) to total nitrogen (C:N) in bulk-organic sediments constrained depositional environments between freshwater to brackish to marine settings. This is the first documentation of a subsidence stratigraphy record of great earthquakes along the Mentawai segment (0.5° - 3°S) of the Sunda megathrust. Radiocarbon dating of woody and herbaceous fragments and seeds constrain the times of subsidence to ~ 4100 and ~ 3200 cal yrs BP. Our data do not capture any post 3,000 cal yrs BP earthquakes, including the historical earthquakes of 1797 and 1833 due to gradual decrease in RSL during the late Holocene at ~ 0.3 mm/yr.