Geophysical Research Abstracts
Vol. 18, EGU2016-801-1, 2016
EGU General Assembly 2016

Earthquake-ponded sediments as a high-resolution archive of Anthropocene climate change on the Fuyun Fault (Xinjiang, China).

Stephen Chua (1,2), Chris Gouramanis (1,2), Marie Etchebes (3), Yann Klinger (4), Mingxing Gao (1), Adam Switzer (1,2), and Paul Tapponnier (1)

(1) Earth Observatory of Singapore, Nanyang Technological University, Singapore, (2) The Asian School of the Environment, Nanyang Technological University, Singapore, (3) Schlumberger Stavanger Research Center, N-4068 Stavanger, Norway, (4) Institut de Physique du Globe de Paris, Paris

High-resolution, late-Holocene climate patterns in arid central Asia, in particular the behaviour of the Asian Monsoon and occurrences of precipitation events, are not yet fully understood. In particular, few high-resolution palaeoenvironmental and palaeoclimate studies are available from the Junggar-Altay region in the Xinjiang Province, northwestern China. This area is tectonically active and the last large earthquake (M_w 7.9) occurred along the Fuyun strike-slip fault in 1931, resulting in ∼6m of right-lateral movement. South of the epicentre at Karaxingar, this earthquake resulted in the construction of large scarp-bounded ponds (46^{o}43'N, 89^{o}55'E) now filled with sediment. Sediment samples were collected every centimetre at a two-meter deep trench where the main pond was the deepest. The majority of the AMS ^{14}C ages of charcoal and plant fibre samples are modern (56±34 to 171±34 yr BP) with the exception of a few much older carbon (842±26 to 2017±26 yr BP) at the base of the trench. The post-1931 age of the pond is validated by the ^{137}Cs and ^{210}Pb age-depth chronology. Each sediment sample was analysed for organic, carbonate and clastic contents and particle-size. This high-resolution analysis revealed eleven upward-fining sequences, with three prominent grain size peaks at depths of 1.7m, 0.95m and 0.6m below ground surface, suggesting three major modern precipitation events. The 11 grain-size peaks since 1931 in the pond coincide with 11 periods of increased precipitation measured in high-elevation tree-ring records ∼50 km north of the pond. Thus, low-altitude post-seismic sedimentary depocentres provide excellent high-resolution palaeoclimate archives that can fill a significant data gap where other proxy records are not available.