The Mw 6.9 14 April 2010 Yushu Earthquake and a 10,000-Year Record of Paleoseismicity along the Guoqiong Segment of the Yushu Fault, Qinghai Province, China

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The Mw6.9 April 14, 2010 Yushu earthquake occurred in the central region of the Tibetan Plateau, within the Banyan Har Mountain Range along the Ganzi-Yushu fault system. The focal mechanism for the main shock indicated left-lateral, strike-slip movement along a WNW-ESE-striking, near-vertical fault. Near the village of Guoqiong (30km-NW of Jiegu town), a maximum of ~1.8m left-lateral surface displacement occurred along the Guoqiong Segment of the Yushu fault. In October 2011, we located a trench (CUG2011-1) along this segment across a Late-Pleistocene alluvial fan perpendicular to the surface rupture. A Holocene stream channel, incised 3m into the fan, was deflected left-laterally ~6m indicating substantial strike-slip displacement since incision. The trench-location was specifically selected to ensure excellent preservation of the Holocene sedimentary record. We then used both 14C and OSL dating-techniques to determine that only four major earthquakes produced surface ruptures along the Guoqiong Segment during the last 10,000 years. Within the trench, three buried A-soil horizons were preserved along the downthrown side of the fault. Line-length balancing and progressive retro-deformation for the 2010 event and three previous surface ruptures indicate ~2m of horizontal shortening perpendicular to the fault and ~1.2m of vertical displacement. If the 2010 event, with ~1.5m left-lateral displacement, was similar to the three earlier events, these 4 events could account for the ~6m of left-lateral displacement in the incised Holocene stream channel. Four events in 10,000-years indicates a much longer recurrence interval than previous estimates.

Key words: 2010 Yushu Earthquake, Paleoseismicity

References
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displacements determined from offset features and landform-restoration along faults associated with the 14 April, 2010 Yushu earthquakes, eastern Tibetan Plateau, Qinghai Province, China. *AGU, Abs. NH31B-1356 Poster presented at Fall Meeting, San Francisco, Calif., 13-17 Dec.*


