

Paleoseismic geomorphology of the Main Frontal Thrust between 85°49' and 86°27' E

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Our recent fieldwork in eastern Nepal has shown that the $M \approx 8.4$, 1934 Bihar-Nepal earthquake ruptured the surface. Traces of that rupture and of more ancient ones are clear along the Main Frontal Thrust between at least 85°49' and 86°27' E. We document and quantify the amounts and ages of relative uplift - including co-seismic - on the thrust using geomorphic markers and OSL, ¹⁰Be cosmogenic and radiocarbon dating. Our systematic mapping and sampling of uplifted terrace surfaces and abandoned paleo-channels truncated by the MFT at an increasing number of localities is based on extensive field observations, with interpretation of stereoscopic air photos and high-resolution (HR) satellite images, topographic maps and newly acquired Digital Elevation Models from Total station and Terrestrial Lidar Scanner (TLS) surveys. Our long-term goal is to build a synoptic comparison, over as long a stretch of the mega-thrust as feasible, of the heights and ages of potentially coeval co-seismic and cumulative scarps. We present here a preliminary assessment of the extension of the co-seismic ruptures between the Mahara and Khutti Khola, ~ 65 km apart. We discuss the geomorphic correlation between the sites to better determine the seismic behavior of the MFT and its relationship with underlying tectonic structures. A few sets of measurements may be taken to imply characteristic increments of throw during sequences of 2 to perhaps as many as 8 earthquakes.