



## **New insights on multiple seismic uplift on the Main Frontal Thrust near the Ratu river, Eastern Nepal using high-resolution topography**

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The number of localities along the Main Frontal Thrust, between  $85^{\circ}49'$  to  $86^{\circ}27'$  E, where new data corroborates the surface emergence of the great  $M \approx 8.4$ , 1934 Bihar-Nepal and 1255 AD earthquakes has increased over the past years. Here we show new high-resolution, quantitative evidences of surface rupture and co-seismic uplift near the Ratu river area. We present a refined map of uplifted terrace surfaces and abandoned paleo-channels truncated by the MFT, obtained by the combination of newly acquired high resolution Digital Elevation Models from Total station, Terrestrial Lidar Scanner (TLS), Unmanned Aerial Vehicle (UAV) and kinematic GPS surveys. In the Ratu valley, using these new high-resolution topographic datasets, we identify six and possibly seven distinct terrace levels uplifted parallel to the riverbed, lying unconformably on top of folded Siwaliks. Several sets of measurements may be taken to imply broadly characteristic increments of throw during sequences of at least six to seven events of riverbed abandonment related to co-seismic uplifts. Newly collected detrital charcoals from several pits and from a rejuvenated paleoseismological wall will help assess more precisely uplift and shortening rates over the length of segments of the MFT east and west of Bardibas. A regional comparison of comparable long-term paleoseismological data at other sites along the 1934 rupture length is in progress.