

Figure DR1. Cross section of field area with predicted and measured vertical velocity fields. Predicted vertical velocity fields derived from structural geometries and fault slip rates. Dashed line above Meiyuan Fault represents possible vertical component if the structure is active as suggested by Yanites et al. (Yanites et al., in press). Cross section A-A' is denoted on Figure 1 of main text.

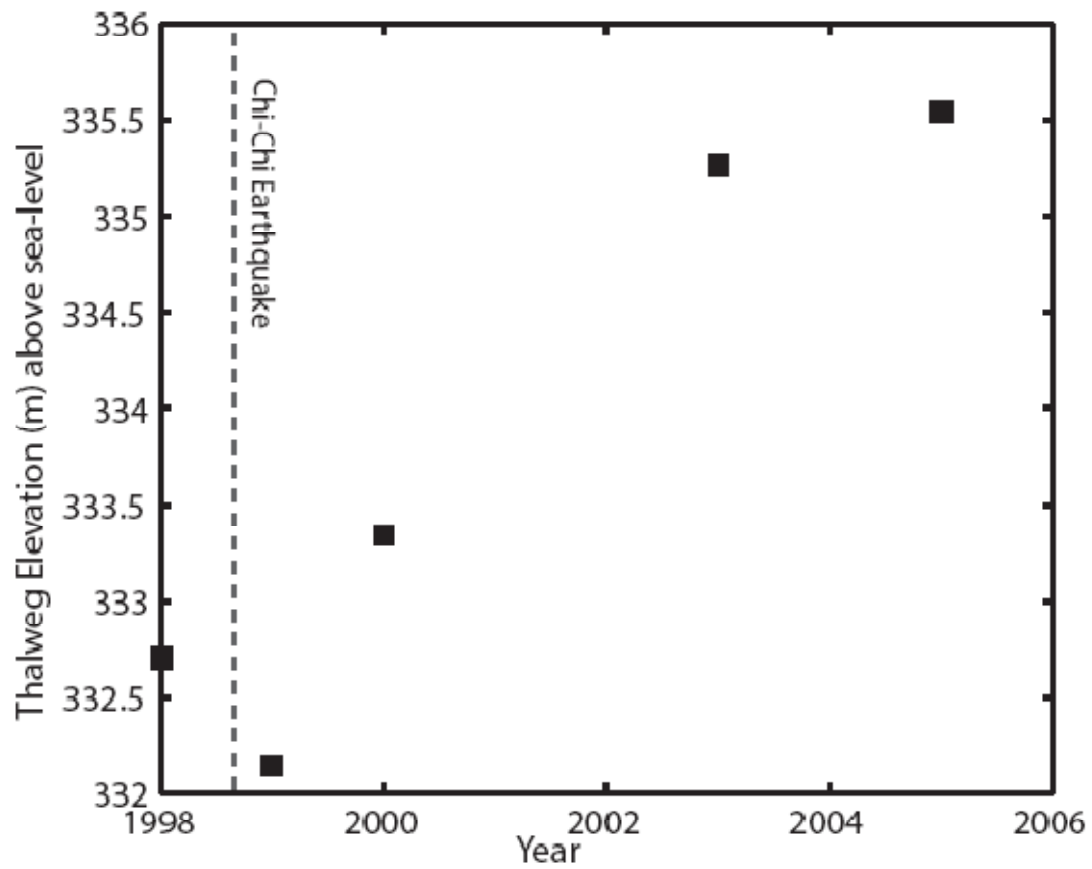


Figure DR2. Thalweg aggradation at gauging station H01430 following the Chi-Chi earthquake. By 2006, 3.4 m of sediment has aggraded and observations suggest that this high sediment cover has persisted.

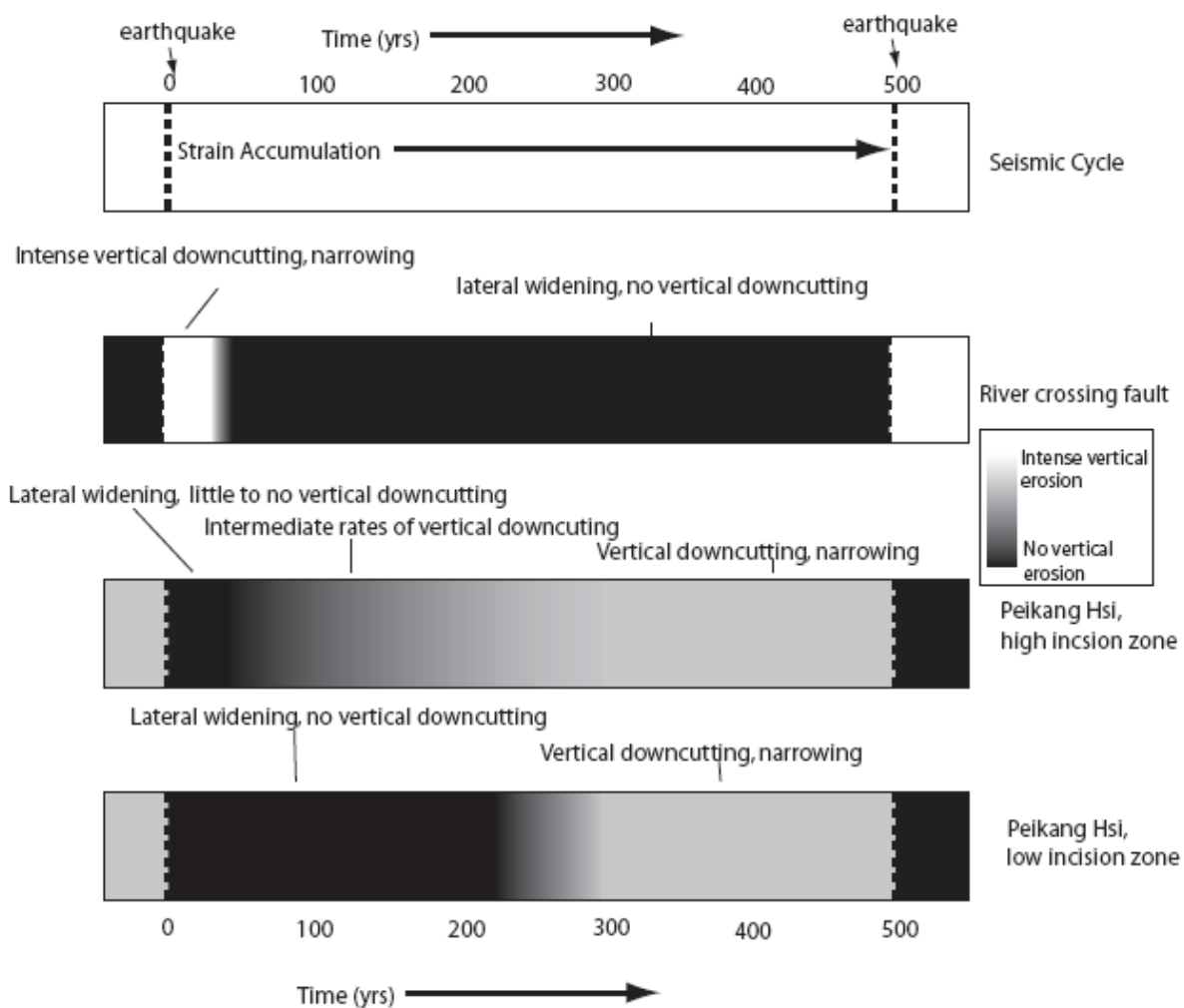


Figure DR3a. A schematic of the spatial and temporal dynamics of river incision during a simple seismic cycle of periods of strain accumulation separated by a seismic event. For rivers reaches just upstream of the fault, vertical incision occurs immediately following an earthquake. For reaches distal to the surface rupture, incision is slow or stopped following an earthquake due to a sudden influx of landslide derived material. Vertical incision occurs along a relatively high capacity reach after the river is able to transport out locally derived material. For relatively low transport capacity reaches, vertical incision cannot occur until it has removed the cumulative upstream volume of landslide material.

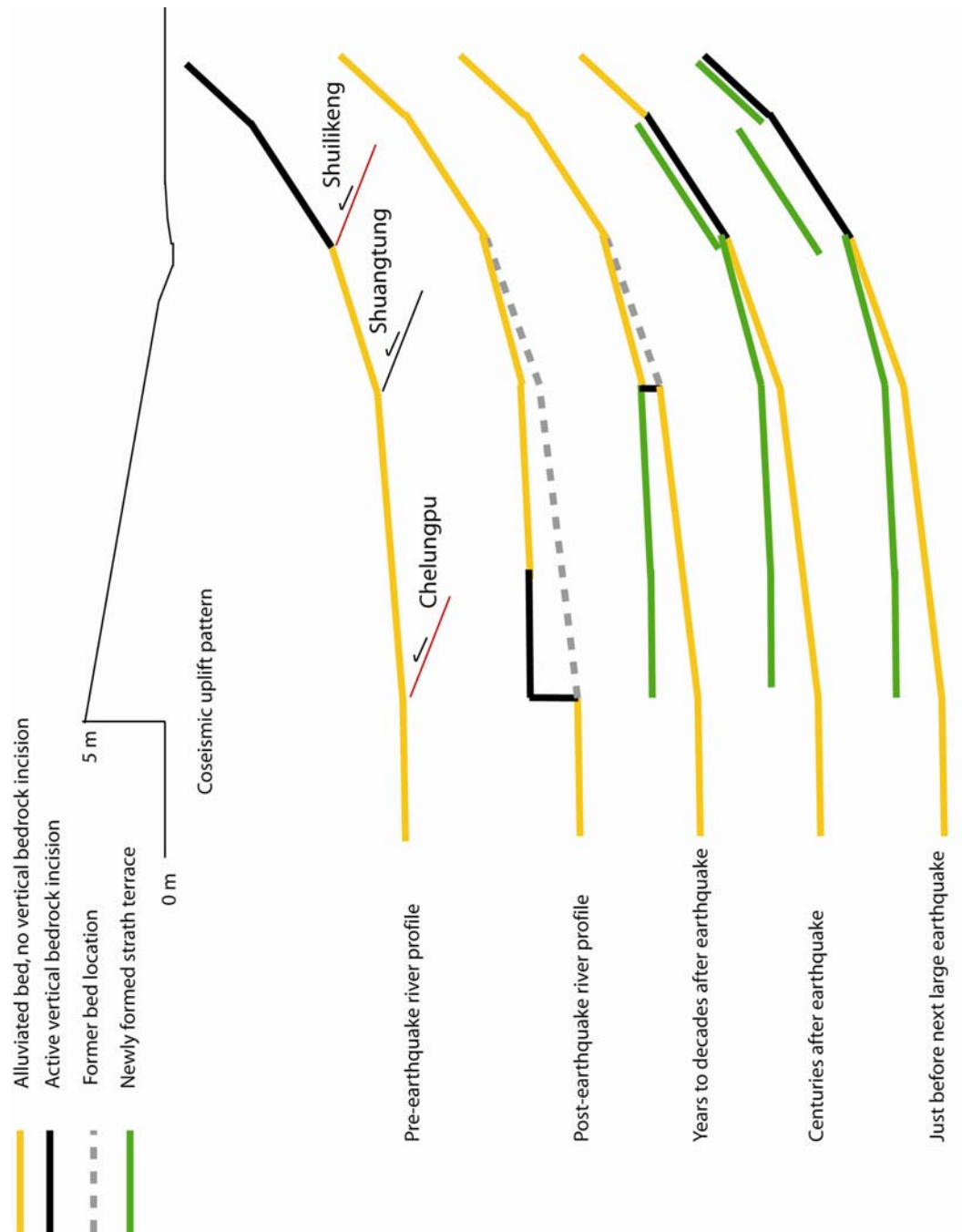


Figure DR3b. Schematic of the spatial variability of bedrock incision in long-profile view. Timing between profiles are not equally spaced. For the river reach immediately upstream of the fault scarp and elevated by coseismic deformation, all vertical incision occurs very soon after the earthquake and due to a migrating knickpoint. At reaches distal to the fault, incision can only occur after the landslide material has been evacuated or a large enough surface rupture occurs on a further in-board fault, such as the Shuilikeng.

Yanites, B.J., Tucker, G.E., Mueller, K., Chen, Y.G., Wilcox, T., and Huang, S.Y., in press,
Incision and channel morphology across active structures in the Peikang River, central
Taiwan: Implications for the importance of channel width: Geological Society of
America Bulletin.