

Public Abstract

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Title:QUATERNARY DEFORMATION ALONG THE NORTH WUTAISHAN FAULT IN THE SHANXI RIFT SYSTEM, CHINA

The Shanxi Rift System in northern China is a tectonically active area in an intraplate setting. This study used data from multiple scales to investigate the influence of tectonics on small and large scale features. It was found that paleostream profiles created from corresponding stream terraces generally follow the modern stream profile; however, there was evidence of converging profiles in the upper reaches of the Yangyan River. Offset stream terraces found on either side of a smaller fault splaying off of the Wutaishan Fault were calculated to have fault throw/uplift rates less than the main Wutaishan fault. Quaternary faulting rates were also calculated for the Wutaishan and it was found that fault throw/uplift rates were steady throughout history until more recently. Geomorphic indices of morphometric analyses were used to assess the tectonic activity in the area. The results suggest that there may be a correlation between higher morphometric indices and strain accumulation at a fault bend. An analysis of fault kinematic indicators found at an outcrop reveal NW-SE extension. A reanalysis of 13 earthquakes in North China reveal that the averaged movement in the region exhibits wrenching behavior. These two analyses suggest that the strain accumulation for the basins in the Shanxi Rift System is locally controlled by normal faults, and that the strain accumulation for region as a whole is accommodated by a "wrenching" type of deformation (i.e., a regional, horizontal shear) in response to tectonic forces. Research of the Shanxi Rift System's structural and seismological properties can supplement knowledge regarding similar intracontinental rifts such as the Baikal Rift or the Rio Grande Rift, or failed rifts in the case of the New Madrid Seismic Zone.