ABSTRACT

The intracontinental Atlas Mountains of northwest Africa are prominent tectonic elements in the broader, diffuse plate boundary zone between the converging African and Eurasian plates. This study focuses on constraining the recent shortening rate across the NE-SW striking Middle Atlas Mountains, which are obliquely oriented to the NNW-SSE direction of Late Cenozoic plate convergence. In the southwestern part of the Folded Middle Atlas, fault scarps of Quaternary alluvium, including a 4 meter composite scarp and a 1 meter single event scarp, attest to recent faulting along the mountain front. Detailed topographic mapping of the scarps provides a basis for geomorphic analysis and degradation modeling. To place these active tectonic observations in a larger context, the fault and fold geometry has been assessed by completing a 12.5 km balanced cross-section. Degradation modeling results suggest the Middle Atlas Mountains are shortening at a rate of 0.03 – 0.05 mm/yr, which is lower than the geodetic estimates. This implies that shortening at a regional scale is being accommodated by an alternative mechanism such as strike-slip motion.