STRUCTURAL EVOLUTION OF CRATER FLAT BASIN, SOUTHWESTERN NEVADA, USA

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Crater Flat, in southwestern Nevada, USA is an intermountain basin that developed in response to Basin and Range extension. The basin is a half graben, controlled by displacement along the north-trending and east-dipping Bare Mountain Fault. From bedrock mapping, the plan-view trace of the Bare Mountain fault is undulatory, exhibiting two bedrock promontories and embayments. Along strike, gravity and magnetic data indicate a connecting fault that transfers displacement from the Bare Mountain fault range front to a parallel strand approximately 1 km within CF. Geophysical data provide additional evidence for eastward en echelon step of the Bare Mountain fault in southern CF. This en echelon geometry is consistent with models of normal fault growth observed elsewhere in the Basin and Range. In the present study, geological and geophysical data are used to develop a 3D interpretation of the Bare Mountain fault. Our model depicts the corrugated Bare Mountain fault as listric to a subhorizonal detachment at a depth of 10-15 km. Based on this geometry, combined with other geological constraints of fault slip and slip tendency analyses, we show that the southern limbs of the promontories are likely nucleation points for fault rupture and loci for maximum fault displacement (throw). This kinematic interpretation of Bare Mountain fault slip helps explain observed alluvial fan sedimentation along the fault and the overall pattern of Crater Flat basin subsidence. * Work supported by the U.S. NRC (Contract NRC-02-97-009). This work is an independent product of the CNWRA and does not necessarily reflect the views or regulatory position of the NRC.