Investigation of Ductile and Brittle Deformational Reorganization in the Northwestern Wind Mountain Quadrangle, Burro Mountains, New Mexico

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ABSTRACT

Preliminary investigation of the Bullard Peak metamorphic series (BPMS) in the northwestern Wind Mountain quadrangle within the Burro Mountains of southwestern New Mexico suggest a possible previously unidentified shear zone, prompting detailed (1:12,000) geologic mapping and collection of structural data. The study area has a complex tectonic history, including (1) ~1.65 Ga metamorphism during accretion of the Mazatzal terrane to Laurentia's southern margin; (2) ~1.4 Ga intrusion of Granite and Rhyolite province granitoids; (3) significant uplift during the formation of the Ancestral Rockies (~300 Ma) and the Rocky Mountains (~70–50 Ma); and (4) reactivation of compressional faults during extension related to the formation of the Basin and Range and the Rio Grande Rift starting at ~37 Ma.

Faults with slickensides found in the area are strike-slip (dextral or sinistral) with a component of oblique-slip (normal or reverse) motion. Structural orientation (strike and dip) data for faults and foliations were plotted on stereonets, poles to planes were contoured, and mean vectors were determined. The mean vectors of the mapped faults (054°/26°) and foliations exhibit a strong regional northeast trend, and shear sense indicators reveal top-to-the-northeast shearing. A regional positive flower structure was identified using Pumpelly's rule on a small scale flower structure and disparate fault relationships. We suggest internal reorganization of the Burro Uplift induced by Basin and Range extension.

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