THE PALEOPROTEROZOIC MAZATZAL PROVINCE OF SOUTHERN NEW MEXICO: INSIGHT FROM DETAILED FIELD MAPPING AND ISOTOPE GEOCHEMISTRY

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Analysis of Paleoproterozoic rocks exposed in southern New Mexico can provide key insight into the formation of the Mazatzal province and the assembly of southwestern Laurentia, including the type of crust involved, the timing of accretion, and the history of deformation. The San Andres Mountains in southern New Mexico contain Paleoproterozoic rocks that were exposed by a west-tilted normal fault block that is the result of Rio Grande Rifting. In the vicinity of Salinas Peak, previous mapping at 1:62,500 scale combined most of the Proterozoic rocks into one unit (Scholle, 2003). More detailed mapping at 1:6000 scale has revealed that this unit contains many different types of rocks including amphibolite, schist, gneiss, and several granites. The amphibolite unit is typically boudinaged and is interlayered with the schist. Schists typically strikes S45E and has a dip of 45° SW. The gneissic unit is highly deformed and shear sense data are being collected. A gray fine-grained granite contains 1-2 mm garnets and cuts the schist, amphibolite and gneissic units. A pink coarse-grained granite is less deformed, contains large potassium feldspar grains (1 to 10 cm), and cuts the gray granite. A pink granite dike cuts the schist and amphibolite units and is folded with an axial surface parallel to the foliation in the schist. Thus, field observations of the rocks around Salinas peak in the northern San Andres Mountains indicate a complex history of magnetism, deposition and deformation. We obtained whole-rock Nd isotope data from five 1.67–1.63 Ga felsic igneous rocks in the San Andres Mountains, Kingston District, Caballo Mountains, and Kingston District. They all had eNd ranging from -1.8 to +1.2. These values are close to Bulk Earth and indicate little contamination with or derivation from older crust, consistent with juvenile magmatism. Previous geochronology (Ottenfeld, 2015) indicated U-Pb zircon ages from 1684–1624 Ma throughout the southern Mazatzal province. We acquired preliminary Hf isotope data on zircons from 16 of these samples. These analyses had eHf values ranging from 5 ± 2 to 10 ± 1, close to depleted mantle values that are in agreement with Nd whole-rock isotope data.

References:
