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**Title: OUTSTANDING PROBLEMS IN THE PALEOGEOGRAPHY AND
TECTONIC EVOLUTION OF THE US-MEXICO BORDER
REGION**

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Abstract: Geologic investigations of the US-Mexico border region must transcend a major international political boundary that has long been an artificial barrier to geologic understanding of SW North America's Proterozoic-Cenozoic tectonic development. This region forms a southeast-oriented swath bounded on the north by a line that runs from Lone Pine, California (through Death Valley, along the Mogollon Rim, down the Rio Grande to Big Bend and across Mexico) to end at Boca Raton and on the south by a roughly parallel boundary that marks the poorly-known southern edge of Proterozoic continental lithosphere in NW Mexico and runs to Monterrey and the Gulf rim; the region must also include the western Mexico arc terrane of Baja California, Sinaloa and Sonora. In this region of superposed deformational events, eight key geologic problems must be solved to properly contest influential paradigms regarding SW Cordilleran development: (1) What is the extent of Proterozoic continental lithosphere in northern and western Mexico? This lithosphere is widely concealed beneath Phanerozoic strata and intruded by arc plutons; it will be identified using isotopic proxies in those plutons. (2) What is the spatial distribution of Proterozoic crustal ages in northern Mexico? Crustal domains that formed the basis for major structural features have proven to possess different distributions, more diffuse boundaries, and more complicated age characteristics than originally envisioned. (3) How were the Proterozoic-lower Paleozoic passive margin strata of Caborca and southern California region formerly distributed? Are California's strata truncated and displaced southwestward or do the respective outcrops occupy their original positions relative to Rodinia? (4) What was the tectonic setting of the late Paleozoic orogenic belts in Sonora and Chihuahua? If, like the Ouachita orogen, they resulted from continental suturing, it then combines with problem 1 to create a serious continental lithosphere disposal problem during Pangean breakup. (5) What mechanisms caused subsidence of latest Triassic to latest Jurassic sedimentary basins near the international border? These basins record a long history of extension or transtension in the context of arc magmatism, both offshore and along the indigenous continental margin. (6) What are the age and origin of SW Cordilleran shortening? "Laramide" deformation exploited older basement trends, inverted antecedent sedimentary basins, and overprinted pre-Laramide basement fabrics. (7) How was arc magmatism distributed from Triassic through Paleogene time? Interpretation of arc history is rendered

controversial by the overprinting of older arc systems by younger ones. (8) What were the patterns and timing of Cenozoic extension? These are required to establish a tectonic mechanism for the extension and to restore older geologic features to their correct pre-extensional geometries.