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GEOMETRY, CHRONOLOGY AND STYLE OF ARM FORELAND AND
INTRAFORELAND BASIN DEVELOPMENT: AN ASSESSMENT OF A "SOFT"
CONTRACTIONAL SOUTHERN MARGIN OF LATE PALEOZOIC NORTH AMERICA

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A broad swath of the North American continent underwent a brief, complex and varied deformational episode during the Pennsylvanian and Early Permian. Known both by its association with the Ancestral Rocky Mountains (ARM) and the Ouachita-Marathon thin-skinned orogenic belt, this tectonic event spawned strike-slip, transpressional and contractional deformation over a large portion of the intraforeland region during a brief 20-30 myr span. In contrast, the Meso-Cenozoic contractional event in the North American Cordillera affected a similar area, but over the course of 90 myr.

Although problems with unity in the late Paleozoic timescales hinder its certainty, the chronology of foreland and intraforeland subsidence in the greater ARM region was compiled and integrated into a tectonic model that depicts the temporal and spatial distribution of flexural, strike-slip, and mixed-mode subsidence in the region during the Pennsylvanian and Permian. These data suggest that the numerous basins of the greater ARM can be subdivided into regional domains of similar deformational style and that there may be spatial and temporal patterns of basin development within each domain, and between domains. This is dependent on resolution of controversies surrounding the late Paleozoic timescale.

Nonetheless, the abundance and magnitude of contractional deformation and flexural subsidence in the western (distal to the Ouachita-Marathon) section of the greater ARM is problematic for tectonic models that ascribe ARM deformation solely to well-contained coeval deformation along the southern margin. Moreover, paleotopographic and rheological evidence suggest that the Ouachita-Marathon region developed by convergent processes along a 'soft' contractional margin, likely hindering the ability of large magnitude stresses to be transmitted across such a boundary and deep into the foreland.

Flexural modeling and tectonomorphic analyses of the foreland basins and salients (respectively) of the Ouachita-Marathon thrust belt are used to assess the rheology and stress-transmission capabilities of the southern NAM margin during the late Paleozoic.