

# TEMPORAL EVOLUTION OF SEDIMENT SOURCES INTO THE DELAWARE BASIN, WEST TEXAS

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## ABSTRACT

The Delaware Basin was formed during the collision of South America plate and Laurentia in the Late Paleozoic. The basin is situated within the foreland of the Marathon-Ouachita orogenic belt, allowing unique opportunities for both hydrocarbon exploration and tectonic reconstruction in the area. Despite significant hydrocarbon production in the Barnett Shale, Wolfcamp and Permian formations in the Delaware Basin, vertical and lateral distribution of sediments and basin subsidence remains inconclusive. Previous siliciclastic sediment transport studies each offered different provenance interpretations. The studies touched the surface but failed to provide compelling evidence describing the evolution of the basin due to limited data analyzation. This research will use detrital zircon U-Pb geochronology, heavy mineral analyses, and thin section petrography as provenance techniques to provide a well-rounded basin subsidence history of the Delaware Basin. Fifteen samples were collected in the West Texas, Delaware Basin area. Mineral separation and thin section petrographic modal point counting are in progress. Integrated provenance studies can improve all stages of exploration and production moving forward. This regional-scale study has broad implications for the role of tectonics on unconventional petroleum exploration in the Delaware Basin and other analogous basins. Better constraints on the origin and paleodispersal patterns of siliciclastic sediment input will improve our understanding of basin evolution through time, enabling the quantification of overburden for the basin throughout the Phanerozoic.

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