Missourian/Desmoinesian Boundary of Eastern Oklahoma

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ABSTRACT

A regional geologic study and high resolution surface map for the Missourian and Desmoinesian was constructed for Eastern Oklahoma's Tulsa Basin-Cherokee Platform. The MADEOS mapping project was designed to: 1) extend correlation for marine formational members across county boundaries, 2) correlate these lithic units across facies changes, 3) apply modern stratigraphic nomenclature and eustatic models, 4) provide accurate identification for these rock members at fossil bearing locations, 5) display the stratigraphic relationships within the various cyclothems and 6) increase the resolution of geologic mapping within the basin. The MADEOS map was constructed using nearly 100 years of research and data from paleontologists, stratigraphers, professors, field geologists, mappers and surveyors.

The map's main framework was compiled from Oklahoma Geological Survey county geologic surface maps and the Oklahoma digital geologic state map. These maps were digitized and the individual lithic unit polygons were corrected to fit a modern Oklahoma map grid and projection. Limestones, shales, and sandstones were extracted from their original formational groupings and mapped as individual lithic members. These new lithic boundaries were refitted into a modern sectional grid and these units were identified, spot checked and verified by using guide books, stratigraphers' field notes, cross sections, field observations, topo maps, modern satellite images, well logs, cross sections and fossil evidence.

Over 2,000 square miles throughout seven counties in Eastern Oklahoma have been mapped and correlated across the Tulsa Basin-Cherokee platform. This map directly applies cyclothemic sea-level models, nearly 500 paleontological data points as well as measured stratigraphic sections to create a new useable and practical high resolution field and research map.