Outcrop-Based Conodont Biostratigraphy of Meramecian-Chesterian Rocks in Oklahoma

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ABSTRACT

Exposures of Middle to Late Mississippian (Meramecian-Chesterian) rocks along the western edge of the Mississippian outcrop belt in northeastern Oklahoma are important and cost-effective sources of geologic data, but accurate time-constrained correlation with their subsurface counterparts is required to realize their full potential. Moreover, recent investigations highlight the local (i.e. field-scale) and regional complexity of these strata, including multiple unconformities and facies changes. This presentation includes recent results of conodont biostratigraphic evaluation of Meramecian through middle Chesterian strata in northeastern Oklahoma. Four provincial conodont biozones, including three subzones, are recognized in the outcrop area and are potentially recognizable in the subsurface given the recovery of key taxa. Biozone 1 and Biozone 2 are present in the upper Boone Group (Meramecian) and are locally separated by an unconformity. The base of Biozone 3 (latest Meramecian) coincides with a significant regional unconformity that separates the Mayes Group from older strata ranging in age from Ordovician through Meramecian. The base of Biozone 4L marks of the base of the Chesterian, whereas the top of Biozone 4U coincides with the contact between the Mayes Group and overlying Fayetteville Shale. Outcrop-based conodont biostratigraphy was critical in resolving these complex stratigraphic questions and serves as the foundation for more accurate temporally-constrained surface-to-subsurface correlations.