

# **Allogenic and Autogenic Controls in Appalachian Basin, Middle Pennsylvanian Allegheny Formation, Central – Northern West Virginia**

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## **ABSTRACT**

Allogenic controls, including paleoclimate, tectonics and glacio-eustasy, have long been debated as dominant controls in the deposition of cyclic coal-bearing strata. However, recent research has questioned the validity of this cyclicity and may indicate influence from autogenic controls that dominantly influence depositional patterns. To further investigate allogenic controls on stratal order, we will analyze the facies architecture, geomorphology, and the stratigraphic framework of the Middle Pennsylvanian Allegheny Formation (MPAF), a classic “cyclic” coal bearing interval in the Appalachian basin, to test for the dominant allogenic and/ or autogenic controls during deposition.

Two outcrop locations of the MPAF preserved in high and low accommodation areas of the Appalachian basin in central WV were selected for facies architectural analysis. Measured sections and 3D photogrammetry will be used to acquire sedimentary data and document stratigraphic architecture of the MPAF outcrops. Paleohydrology estimates will be used for paleo-geomorphological analysis of MPAF fluvial transport systems. Data from surface exposures of the MPAF and subsurface data such as well logs, driller’s logs and core, will be used to develop a regional stratigraphic framework for the MPAF. Depositional environments interpreted from the sedimentary and sequence stratigraphic analysis of the MPAF will be compared with a proposed modern analogue in the Magdalena River area, northeast of the Andes in Columbia. Knowledge from this study will improve understanding of allogenic and autogenic controls on the sedimentologic, geomorphologic, and stratigraphic characteristics of terrestrial depositional elements comparable to those observed in the MPAF. Outcrop-based modeling of the MPAF for allogenic versus autogenic influence on fluvial deposits can serve as an analog for subsurface fluvial reservoirs.