

## **Origin of Meter-Scale Cycles in an Upper Ordovician (Cincinnatian Series) Mixed Siliciclastic-Carbonate Unit: The Kope Formation, Southern Ohio and Northern Kentucky**

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No broadly applicable model has been developed for meter-scale cycles in the Kope or similar units, such as the Triassic Upper Muschelkalk of Germany and the Devonian Hamilton Group of New York.

The Kope Formation is ideal for study of meter-scale cyclicity. It is complexly cyclic, with mudstones and thin bundles of shelly carbonates. Much work has been accomplished on delineating meter-scale cycles and the lithologies that constitute them. A meter-scale stratigraphy has been established in the Cincinnati, Ohio region that links surface exposures of proximal facies with subsurface distal facies providing a sound framework for sampling over the entire Kope depositional setting. Three models have been developed to explain meter-scale cycles in the Kope. They invoke water depth change and variations in storm intensity as the controls on cycle architecture. Testing of these models requires analysis of the unit across its depositional setting, especially along proximal-distal transects, as the models being assessed all involve processes that operate on a regional scale across the entire depositional setting. The present study will use the new high-resolution subsurface stratigraphy to sample and analyze individual meter-scale cycles across many tens of kilometers, and construct proximal-distal transects to evaluate taphonomic and sedimentologic variations indicative of cycle origin.