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Rapid Lateral Facies Change in an Upper Ordovician Depositional Sequence (Central Kentucky): Evidence for Synsedimentary Reverse Faulting Along the Northern Margin of the Rome Trough?

High-resolution stratigraphy of a single depositional sequence within the Lexington Limestone along an 80 km north-south transect in northern Kentucky has revealed strikingly rapid lateral lithofacies change. Surprisingly, fundamental characteristics, such as bed thickness and color are similar between closely spaced outcrops, facilitating correlation. For example, the Salvisa Beds (transgressive systems tract) of the Perryville Member grade abruptly from fenestral micrites to grainstone shoal deposits near the Kentucky River Fault Zone. Similarly, the overlying Cornishville Beds (condensed section) grade from wavy, nodular, stromatoporoid-bearing, skeletal packstones in the south, to pyrite-rich brachiopod coquinas in the north. Rhythmites of the Brannon Member (highstand) show parallel lithofacies change from shaly-nodular calcisiltites and wackestones in the south, to tabular calcisiltites and shales in the north. Thus, the paleotopography of this transect was roughly stable throughout this sequence. Additionally, rapid facies change seems to be coincident with the Kentucky River Fault Zone (northern margin of the Cambro-Ordovician Rome Trough). However, in this instance, the shallower (peritidal) facies are coincident with the "trough", requiring reversal along the fault zone. This suggests that during the later Taconic Orogeny the Rome Trough became a positive rather than a negative topographic feature. Finally, despite claims that this interval represents a facies mosaic, distinctive marker horizons traced between closely spaced outcrops suggests allocyclic control on sequence development. Lateral facies trends within the sequence, however, infer lithospheric flexure in response to far-field tectonics generated by the Taconic Orogeny.