

Sequence-stratigraphic interpretations of alluvial-lacustrine basins: Uinta Basin, Utah, as an analogue of the Moncton Basin, New Brunswick

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Sequence stratigraphy has proved to be a powerful approach to the modeling of stratal successions in increasingly diverse types of sedimentary basins. However, only limited work has yet been done in lacustrine basins. Models are of low resolution, and case studies are rare. New data from the recent Shell Canada drilling program in the Mississippian of the Moncton Basin will provide an opportunity to apply a sequence stratigraphy to the Albert and associated formations and to aid in the development of higher resolution models. Of interest is how the succession might compare to the analogous Uinta Basin of Utah.

Both basins have the typical five-part succession that spans the entire lifespan of intermontane lacustrine basins and which reflects the general tectonic control over basin initiation and fill. Alluvial strata associated with basin initiation is followed by a sediment starved, lacustrine dominated succession where tectonism is deepening the basin faster than sediment is infilling. Changing tectonic controls and, or, increased sediment supply causes sediment to accumulate as deltaic and ultimately fluvial successions before the basin

itself is filled and bypassed.

The three-dimensional facies distributions developed at each stage are controlled by the long term climatic belt the basin was situated in. Both basins have lithofacies associations indicative of a wet to seasonally dry climate, the Moncton Basin being the wetter (the Gautreau evaporite being very localized). Wet climates maintain high lake levels and high relief, highstand deltas, whereas more seasonal climates produce highly fluctuating lake levels containing deltas with low preserved relief, and some evaporites toward the basin centre.

Work in the Uinta Basin is further advanced and may indicate what the Moncton Basin study might reveal. A cyclic climatic control and irregular tectonic control on higher frequency, low relief sequences has been identified in the lower Green River Formation (Dawson Settlement Member equivalent). An overriding climatic control influences the high relief sequence of the Uinta Formation (Hiram Brook Member equivalent).