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**Interpretation of Incised Valleys, Deltas and Estuaries in the Alberta Foreland Basin
- Stratigraphic Implications and Constraints**

SPEAKER

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With respect to facies analysis, the last 15 years could be considered as the "Age of Incised Valley Fill (IVF)". Furthermore, estuary deposits have become synonymous with IVF. Published papers identifying ancient estuary sequences and incised valleys, based on a rigidly applied tripartite model, are commonplace and often misleading. The problem arises from the "force-fitting" of the tripartite model based on the assumption that it is definitive for all ancient estuary successions. On the contrary, it represents but one of the stages in a continuum ranging from the drowned river valley estuary to the delta estuary. Estuary deposits can occur in vastly different depositional settings, (i.e.: incised valley or classical delta), but because of the current paradigm it is erroneously accepted that drowning of an incised valley must be a prerequisite for estuary formation.

The recognition of estuarine deposits does not require the presence of an incised valley or bayhead delta, or even the presence of a significant bounding surface at the base. Adherence to the tripartite model involves the need to identify estuarine point-bar deposits with attendant IHS beds, when in fact such deposits constitute a very small proportion of many estuary fills. Laterally extensive muddy bay-fill facies, accumulated during coastal inundation, are often overlooked because of the constraints imposed by the rigid application of the model. At the facies analysis level, particularly when interpreting cored sequences, it is difficult to distinguish between a distributary bay-fill of a delta complex and an estuary bay-fill of a drowned "incised-valley" complex. That is because both sequences display similar physical and biological signatures, which are representative of brackish environments. It is important to recognize that a range of estuary system types is present in the Alberta Foreland Basin, and the principal factors effecting system types are variations in rate of sediment supply and rate of change of accommodation. Several examples can be shown to illustrate this including the McMurray/Wabiskaw, Ostracod, Glauconitic, Viking, Dunvegan, and Belly River reservoir units.

Finally, it is evident that in many cases we geologists have misinterpreted autocyclic changes within delta complexes of the WCSB as regional shifts in sea level, primarily because of the current "in vogue" IVF paradigm. From an exploration perspective, it is very important to recognize these two fundamentally different processes in the rock record, since the model we ultimately select constrains our mapping and steers our exploration efforts.

BIOGRAPHIES

Gerry Reinson received his Bachelors and Masters degrees from the University of Saskatchewan, Saskatoon, and his Ph.D. in sedimentology from the Australian National University in Canberra. He has extensive experience in the fields of petroleum geology, environmental geology, and marine geology, having worked in both the public and private sectors as an applied research scientist, manager, and petroleum explorationist. He is currently an independent consultant specializing in reservoir facies mapping at both regional and field/pool scales. Gerry's professional interests encompass both clastic and carbonate sedimentology as applied to basin analysis, stratigraphy and reservoir characterization, petroleum resources evaluation, and technical management. He has published numerous articles on the above and related topics.

Dennis Meloche received his Bachelors and Ph.D. degrees in Geology from the University of Western Ontario. He has over 20 years of petroleum geology experience primarily in the Western Canada Sedimentary Basin, but also in Canada's frontier areas and internationally. His work experience includes employment with both major and junior oil companies, as well as a brief tenure as an independent consultant. More than half of this has been in an advisory or technical support role. His expertise lies in the fields of clastic stratigraphy, petrography, sedimentology and facies characterization related to basin analysis, petroleum exploration and reservoir modeling. Dennis is currently geological advisor (clastics) with Devon Canada Corporation.