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Autocyclic Versus Allocyclic Control on Delta and Incised Valley Fill Deposits, Alberta Foreland Basin

Over the past two decades, stratigraphic and facies analyses, with respect to interpretation of marginal marine successions, have been dramatically altered by the unfettered acceptance of two paradigms, "sequence stratigraphy" and the "incised valley fill (IVF)" model. The IVF model for interpreting ancient estuary deposits implies an allocyclic control which is an inherent characteristic of sequence stratigraphic doctrine. Thus, when several IVF deposits are interpreted in marginal marine successions, the tendency is to propose concomitant allogenic breaks which reflect the presence of multiple sequences that may not even exist. This tendency has adversely affected our ability to recognize autocyclic controls within depositional systems.

Several Cretaceous marginal marine deposits in the Alberta Foreland Basin have been interpreted to consist of multiple stacked "sequences" formed due to "yo-yo-like" eustatic controls. In fact, in several of these deposits it can be demonstrated that autocyclic controls related to deltaic/interdeltaic settings may be more probable than many of the existing allocyclic interpretations. The Alberta Basin examples, when compared with modern delta/estuary depositional systems, suggest that sediment- supply rate and rate of change of accommodation (both of which can be autogenic in origin) can effect basinwide stratigraphic signatures without invoking extra-basinal(allogenic) controls.