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Autostratigraphy: A Norm in Sequence Stratigraphic Analysis

During the last decades, sequence stratigraphy has revolutionized our view on how stratal successions are dynamically linked, and related to changes in sediment supply, tectonics and eustasy. However, in our enthusiasm for the effects of accommodation (rate $A$) and sediment supply (rate $S$) changes upon stratigraphic architectures, we may have seriously misunderstood or overlooked the potential and importance of the inbuilt or autogenic sedimentary responses to the steady dynamic forcing of basins. To emphasize our point we advocate the use of “Autostratigraphy”, as at least an initial analytical tool to explain or predict stratal-stacking patterns in data sets, before allocyclic controls are invoked. Autostratigraphy, involving stacking patterns inevitably built under steady forcing, has a logical basis in the theory of shoreline autoretreat, and we suggest that it can act as a norm in sequence stratigraphic analysis, until the introduction of allocyclic changes are absolutely necessary.

As an aid to this approach, we suggest that (1) more attention should be paid to the geometrical aspects of the depositional system; (2) more account should be taken of the characteristic magnitudes of length and time that are specified with $S$ and $A$ and are proper to the depositional system; and (3) that sea level be initially emphasized, not as base level, but as a control on the height of the subaerial-subaqueous interface along which different hydraulic processes can act to produce significant geometrical contrast.