The Emperor's New Stratigraphy: Calling Attention to Some Problematic Aspects of Exxon-style Sequence Stratigraphy

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ABSTRACT

Exxon scientists, led by Peter Vail, advanced stratigraphic analysis 25 years ago when they published the basics of Exxon-style sequence stratigraphy. A significant contribution of their work was the extension of the sequence boundary beyond the basinward termination of the subaerial unconformity.
This transformed a sequence into a much more useful stratigraphic unit that theoretically could be recognized and mapped over much of a basin.

Their work was based primarily on seismic data and, on such data, onlap often characterized the subaerial unconformity portion of the sequence boundary. In basinal areas apparent onlap was sometimes observed on seismic sections at the base of turbidite strata and, accordingly, the Exxon workers placed the sequence boundary at this horizon also. The low vertical resolution of seismic data allowed them to draw a through going sequence boundary that joined the subaerial unconformity with the base of the turbidite strata.

Because most of the turbidites were deposited during base level fall, Exxon scientists eventually placed the sequence boundary at the start of base level fall so as to be consistent with their assertion that sequence stratigraphy equated to chronostratigraphy. This fateful placement has led to a number erroneous and impractical methodologies as well as the concoction of an ill-defined and overblown jargon.

Unfortunately some major petroleum companies in Calgary have blindly adopted this flawed and misleading method of stratigraphic analysis. This can only have a negative effect on their exploration and exploitation programs that depend on scientifically sound methodologies for their success.