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Sequence Stratigraphy and Its Application to Hydrocarbon  
Exploration

Peter R. Vail, Scott A. Bowman, Malcolm I. Ross, and  
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Application of sequence stratigraphy concepts and sea level changes to sedimentary rocks has the potential to provide a unifying concept for stratigraphy much as plate tectonics has provided a unifying concept for structure. In essence, sequence stratigraphy provides a predictable repetition of stratal pattern and lithofacies for different tectonic and rock system settings. This knowledge offers a better approach for discovering subtle hydrocarbon traps and describing reservoir rocks by building a stratigraphic framework of discontinuity-bound genetic units that relate to particular depositional systems, lithofacies and hydrocarbon occurrences. Use of sequence stratigraphy concepts and procedures greatly improves the explorationists' and production geologists' ability to interpret and correlate seismic sections and well logs. As a result, the geoscientist can and better locate subtle hydrocarbon traps and more accurately describe reservoir rocks.

In this paper we will demonstrate these concepts with applications from the Miocene to Pleistocene section of the Gulf of Mexico and the Permian Basin of west Texas. We will show the procedure for picking depositional sequences and systems tracts in both a siliciclastic and a mixed carbonate siliciclastic rock system. The siliciclastic examples are from both a listric growth fault setting and a deep water setting from the Gulf of Mexico. The mixed carbonate siliciclastic example is from the Permian Basin. Using seismic and log control we will demonstrate the relationship of depositional systems and lithofacies to the different types of Systems Tracts within Depositional Sequences.

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AUTHORS:

Pete Vail and Roice Nelson are members of the EAEG and are older than 31 years of age.

Scott Bowman and Malcolm Ross are not members of the EAEG and are younger than 31 years of age.

Roice Nelson will present the paper.