A Brief History of Sequence Stratigraphy

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Sequence stratigraphy consists of the recognition of stratigraphic surfaces generated by the interaction of sedimentation with shifting base level and the use of such surfaces for correlation and unit definition. It underwent a long gestation period from 1788 when James Hutton first recognized unconformities to 1949 when Larry Sloss used unconformities to define the boundaries of a sequence. During this long time period numerous geological luminaries made many empirical observations and theoretical postulates on the nature and origin of unconformities and the stratigraphic consequences of base level change.

As noted by Sloss, the introduction of the sequence had the ‘impact of a failed soap bubble”. One person who embraced the concept was Harry Wheeler who wrote a series of theoretical papers on the sequence stratigraphy in the late 50s and early 60s. Sequence stratigraphy received a huge boost in the late 70s when Peter Vail and his Exxon colleagues used regional seismic data to demonstrate the utility of the discipline. They also revised the definition of a sequence boundary to include a conformable portion and this allowed a sequence to potentially be correlated over most of a basin. Subsequently the Exxon scientists demonstrated how their sequence stratigraphic methodologies could be applied to outcrop and well log data.

Unfortunately the Exxon work contains some conceptual flaws and is accompanied by a mind-numbing jargon. In response to these problems, Bill Galloway and Ashton Embry proposed alternate methods of sequence definition. Debate continues regarding the most pragmatic methodology for sequence analysis.