
Site-Specific Sequence Stratigraphic Sections (S⁵ Benchmark Charts); Practical Tool for Correlating Chronostratigraphic Units in the Texas Gulf Coast Tertiary Section

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ABSTRACT

Subregional stratigraphic correlations within the complex depositional architecture of Texas Tertiary sandstones are difficult because of extensive growth faulting and similar-appearing diachronous systems tract sediment packages. Time correlation, rather than lithologic correlation, is necessary to ensure stratigraphic equivalency. Site-specific sequence stratigraphic sections (S⁵ benchmark charts) are a simple stratigraphic tool to help ensure correct chronostratigraphic correlations. S⁵ benchmark charts are based on composite wireline logs in a specific area so that the most complete stratigraphic section can be assembled. All relevant lithostratigraphic, chronostratigraphic, sequence stratigraphic, paleontological and tectonic data are integrated within the composite chart. A series of S⁵ benchmark charts can be correlated such that chronostratigraphic boundaries are not violated, leading to an accurate stratigraphic architecture of an area.

Correlation of a series of S⁵ benchmark charts for the Frio interval from the Corpus Christi region of Texas allowed construction of the sequence stratigraphic architecture of this area. Off-shelf, third-order, lowstand systems tract sediment packages are isolated within growth-fault controlled subbasins. Subbasins become younger seaward. Overlying these third-order lowstand systems tracts are on-shelf transgressive and highstand systems tracts that can be correlated across several subbasins, although younger, on-shelf, highstand systems tracts pinch out progressively seaward relative to older ones.

A sequence stratigraphic architectural framework is a basic data element necessary for production or exploration projects. Such a framework can be derived from S⁵ benchmark charts, whose assembly should be considered a fundamental task similar to preparing isopach or structure maps.