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Accommodation succession method
Impact in petroleum exploration

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Summary

Accommodation succession is the sedimentary package resulting from changes in shelfal accommodation and sedimentary fill in response to changes in base level, observed from stratal patterns and facies stacking relative to key bounding surfaces, not defined by time duration or relative sea level position, placed into a hierarchy framework, and calibrated with age control. This method is proposed to clarify original definitions of systems tracts and sequence sets, moving away from terms that have a sea-level connotation to a terminology that is related to stratal geometries and stacking that is directly observed from seismic data. Thus, we are proposing the terms Progradation-Aggradation (PA), Retrogradation (R) and Aggradation-Progradation-Degradation (APD) to be used as an alternative to or better description of Lowstand, Transgressive and Highstand, respectively. We use classic terms for surfaces, with also a terminology that can help clarify the significance of the surface: Sequence Boundary, Transgressive Surface (or Maximum Regressive Surface) and Maximum Flooding Surface (or Maximum Transgressive Surface). The hierarchal framework here used is based on physical stacking divorced from order: parasequence, systems tracts, depositional sequence, sequence set, composite sequence, composite sequence set, and megasequence.

The method is tested in this study in different data quality, basins, ages and climate/latitude, as well as in different tectonic settings. The Pelotas Basin in SE Brazil (South Atlantic) is used as an example of a well-define composite sequence showing well-developed PA, R and APD sequence sets (SS's) forming a composite sequence. Main reservoirs are deepwater fans associated with the PASS that can be predicted occurring further downdip just by observing the geometry of the different prograding units. Other data sets include the Upper Jurassic and Lower Cretaceous of the Mesopotamian and West Siberia basins, the Paleogene of the North Sea, and the Cenozoic of the Beaufort Sea in Canada. Understanding sequence hierarchy is an important part of seismic sequence stratigraphy at several spatial and temporal scales. Placing your observations into a stratigraphic hierarchy will put local interpretations into a regional context for prediction away from well and seismic control.

***Keywords*:** sequence stratigraphy, accommodation, hierarchy, composite sequence