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Shelf to Slope Depositional Systems of Santos Basin, Offshore Brazil

A 80x40 km 3D survey centered on the present shelf edge of the Santos Basin (offshore Brazil) allowed detailed tridimensional visualization of complete depositional systems of Cretaceous age and their integration in a sequence stratigraphic context. The method used was 3D visualization of seismic time-structure surfaces draped with horizon amplitudes, interval extractions and isochrons. Biostratigraphic and paleoenvironmental control was provided by wells located on the shelf as well as in deep-water. Very-high amplitude Albian features are likely to represent volcanic flows. Throughout the Late Cretaceous, high sedimentation rates led to massive expulsion of the Aptian salt resulting in a migrating salt wall. This geologic feature probably corresponded at the water bottom surface to a topographic high located at the base of the slope that accounts for a sharp termination of the toe-of-slope fans. Within a Cenomanian-Turonian sequence the amplitude patterns indicate a deep-water depositional system with intra-slope basin fills and toe-of-slope fans. The same method used for a Lower Maastrichtian third-order sequence revealed a series of extensive depositional systems including shelf-edge canyons affecting the middle and outer shelf, massive slope slumping, slope canyons, toe-of-slope fans and basin-floor fans. Significant intra-lowstand erosional surfaces are associated with fourth-order sequences and display distinct distributions of depositional systems. The location of the shelf edge during the investigated Lower Maastrichtian third-order sequence is indicated by the presence of shelf edge delta clinoforms at the top of the low-stand. The same visualization methods are applied to illustrate and interpret Tertiary large-scale depositional and erosional features related to shore-parallel currents.