

## **Morphometric attributes to understand palaeogeomorphological controls on mass-transport deposits offshore Brazil**

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Mass-transport deposits form a significant part of the stratigraphic record of ancient and modern deep-water basins worldwide. Three-dimensional (3D) seismic data is used to analyse two different types of buried mass-transport deposits offshore Espírito Santo Basin (SE Brazil). Both types are developed within Early Miocene to Holocene stratigraphic units composed of sandstones, calcarenites, turbidite sands and marls. The high resolution images provided by the interpreted 3D seismic data allowed a detailed analysis of the seismic stratigraphy and internal structure of mass-transport deposits. In addition, improvements in visualisation techniques were used to compute simple morphometric attributes of buried mass-transport deposits in continental slopes.

This study classifies the interpreted mass-transport deposits in two different types according to the relationship between the morphology of mass-transport deposits and the surrounding topography. Locally confined mass-transport deposits are laterally constrained by non-deformed strata that surrounds the mass-transport deposit and by the local topography of the depositional surface. Their dimensions are relatively small (area of  $\sim 5.251$  km<sup>2</sup>). Unconfined mass-transport deposits show a much larger volume compared to the previously type ( $\sim 87.180$  km<sup>2</sup>), and local topography does not have control on their geometry. The analysis proves that local topography and geometry of the depositional surface are key controlling factors on the spatial distribution and dimensions of the two types of mass-transport deposits. However, the two types differ in size, geomorphological expression, local structural controls and run-out distance.

This work importance is relate variations in the character of the depositional surface with the morphology mass-transport deposits and run-out distance. As a result of the methodology used, two different styles of mass-transport run-out are identified and local factors controlling their morphology are addressed, such as roughness and local morphology of the depositional surface. Separating these two styles, or types, of mass-transport deposits it is of critical importance to understand their mechanisms of gliding, downslope spreading and emplacement.