

A Regionally Extensive Pliocene Mass Transport Complex in Deepwater West Africa: Characteristics and Causal Mechanisms

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Mass Transport and gravity flow deposits have been documented in deepwater passive margins worldwide and are acknowledged as a major depositional element on continental slopes. The occurrences of these deposits are related to slope instabilities due to sea-level changes, structural oversteepening, seismicity or bolide impact imposed on pre-existing slope sediments with alternations of weak and strong layers and pore fluids including brine, oil and gas and clathrate hydrate. Utilizing a 3,000 km² 3D seismic volume from the continental slope offshore Angola we have analysed the seismic stratigraphic and geomorphologic expression of a regionally extensive Mass Transport Deposit in the Pliocene interval. Seismically the MTD is identified as a transparent, discontinuous facies with predominantly contorted reflections and some tabular blocks of sub-horizontal strata entrained within the overall chaotic sequence. The deposit directly overlies and incises into the Miocene stratigraphic interval, with the basal shear surface marked by radiating “cat-like” scours with a predominantly NE-SW orientation. In section view, the basal surface is characterized by a continuous grooved high amplitude reflection, while it is capped by a markedly irregular top reflection. The areal extent of the deposit is about 1442 km² with a TWT-thickness between 30-140 ms giving an average volume of 90 km³ for the studied MTD. WE sediments. charged gas with limbs fold of oversteepening to slope the failure initial for mechanisms triggering attribute We area. study our updip deformation related salt major a result as originated it that hydrates presence and structures cored flanks onto onlap marked its MTD, emplacement level stratigraphic on based infer