LARGE-SCALE MASS-TRANSPORT DEPOSITS: A MAJOR ARCHTECTURAL ELEMENT IN THE CENOZOIC SEDIMENTARY CONSTRUCTION OF THE OFFSHORE AMAZON BASIN, BRAZILIAN EQUATORIAL ATLANTIC

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ABSTRACT: Numerous geological-geophysical studies carried out across the Amazon offshore basin (Foz do Amazonas marginal basin), Brazilian Equatorial Atlantic, identified the occurrence of large-scale mass-transport deposits (MTDs). These studies, based mainly on analyses of acoustic imagery, include those of the Brazilian Continental Shelf Survey Programme (LEPLAC) and the more recent CAPES-IODP project "*Stratigraphic and structural Cenozoic evolution of the Foz do Amazonas basin: a coupling system between depositional, gravitational and fluid migration processes*" - a collaboration project between UFF, UERJ, PUC-RS and foreign universities. Such studies evidence that the occurrence of large-scale slope instabilities has been pervasive across the entire margin spanning the late Miocene to Modern. MTDs all together attain a total area of nearly 315,000 km² and involve a total volume of allochthonous masses of ~128,000 km³, constituting thus essential architectural elements for the margin sedimentary construction. MTDs can be grouped into three main gigantic regional megaslide complexes (MTCs) spreading downslope off the NW, the Central and the SE slope settings of the basin, respectively: the northwestern Amapá Complex, the Central Amazon Fan Complex and the southeastern Pará-Maranhão Complex. In each MTC, individual MTDs can mobilize up to kilometre-thick sedimentary series as allochthonous masses with distinct flow directions, degrees of sediment disruption and internal coherence, attaining dimensions comparable to the world's largest megaslides. Allochthonous masses can spread either as frontly-confined or as unconfined sediment slides, depending on the region or the stratigraphic interval considered. Unconfined MTDs can present internal seismic facies indicative of large downslope modification of their original stratification, varying from upslope slide and/or slumped blocks to dominant downslope debris flows, suggesting that these MTDs may have been generated by sudden catastrophic events. On the other hand, kilometre-thick frontly-confined masses, reflected by frontal imbricate thrusts as wide as 50 km, normally involve higher remobilized sediment volumes, probably as a result of multiphase slope failures which may have encompassed a large time span and progressively incremental volumes of eroded sediments. Active gravity tectonics is assumed to be one of the major preconditioning factors inducing slope failures across the offshore Amazon basin, since the main upslope slide scars seem likely to have been initiated by movements of gravity-related structures. However, a variety of other preconditioning causes for submarine mass-wasting process are also present across this margin, such as rapid sediment accumulation in the head area of the slide complexes, together with destabilization of gas hydrates. In this realm, the Amazon offshore basin stands thus as an excellent site for the investigation of preconditioning factors that generate an excess of pore pressure conditions able to trigger the initiation of submarine gravity-driven depositional processes in passive margin settings.

KEY WORDS: *Submarine megaslides; Triggering mechanisms; Geohazards.*