

CAUSATION OF THE QUATERNARY CATASTROPHIC SEDIMENT FAILURES OF THE AMAZON FAN

¹VILELA, C.G. and ²MASLIN, M.A. ¹UFRJ, Rio de Janeiro, Brasil; ²UCL, London, United Kingdom

The architecture and Quaternary history of the massive and highly structured Amazon Fan has been reconstructed using sediment recovered by ODP Leg 155. Huge regional mass-transport deposits make up a significant component of the Amazon Fan. Analysis of both benthic foraminiferal fauna and the sediments indicate that the mass-transport deposits originated on the continental slope, which is at least 200 km laterally and 1500 m above their present position. Each mass failure-event was formed by the catastrophic failure of the continental slope and has been dated and correlated with climate-induced changes in sea level. Studies of the benthic foraminiferal assemblages in the Amazon Fan mass transport deposits has been essential to our reconstruction of the origin and cause of these failures. The glacial mass transport deposits referred to as Bottom MTD and Unit R MTD contained rare shelf species and dominant upper-middle bathyal species (cassidulinids and buliminids). We conclude that originated between 200 and 600 m water depth, approximately the same zone in which gas hydrates occur. We suggest that rapid drops in sea level destabilized continental slope gas hydrate reservoirs causing slope failure and the glacial mass-transport deposits. However an alternative explanation is required for the MTDs which occur as sea level is rising during Termination I. We suggest from sedimentation rates and carbon isotopes that the deglaciation of the Andes and the consequent flushing of Amazon River sediment on to the continental slope caused over-burdening and thus the deglacial mass-transport deposits.