

SEA-LEVEL AND GAS HYDRATE CONTROLLED CATASTROPHIC SEDIMENT FAILURES OF THE AMAZON FAN

Maslin, M.A. and Vilela, C.G. UCL, London, UK; Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brasil

The architecture and Quaternary history of the Brazilian continental margin and Amazon fan has been reconstructed using sediment recovered by Ocean Drilling Program Leg 155. Huge regional mass-transport deposits make up a significant component of the Amazon Fan. These massive mass-transport deposits each cover an area over 15, 000 km² (approximately the size of Jamaica), reach a maximum thickness of 200 m, and consist of ≈50, 000 Gt of sediment. Analysis of both benthic foraminiferal fauna and the sediments indicates that the mass-transport deposits originated at a water depth of between 200 and 600 m 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. Two different mechanisms initiated these catastrophic slumps, 1) rapid drops in sea level destabilized continental slope gas hydrate reservoirs causing slope failure and the glacial mass-transport deposits, and 2) deglaciation of the Andes and the consequent flushing of Amazon River sediment to the continental slope caused over-burdening and the deglacial mass-transport deposits.