
Mass Transport Deposit in the Mozambique Channel: Implications for the Pleistocene Zambezi canyon activity

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Résumé

Submarine mass-transport deposits (MTD's) in passive margin setting can drastically change the seafloor morphology. These events are instantaneously on a geological scale and can have consequences on the equilibrium between passive margin – canyon – deep-sea domains. The study takes place in the Mozambican margin, which bounds the Mozambique Channel on its western side. The continental shelf sedimentation is fed by one of the largest rivers in southern Africa: the Zambezi River. During Pliocene-Pleistocene times, the increase in sediment flux triggered several MTD's in this margin. Thanks to 2D multichannel seismic data, we describe here the largest MTD in the northern Mozambican Margin, the Zambezi MTD (dated between 780 and 440 Ka). This object presents geometric and volumetric characteristics as follow: 3,100 km³, 23,450 km², 480 m (maximal thickness), and 790 km (maximal length). This quantification clearly places it in the 5 biggest MTD on passive margin in the world. The Zambezi MTD filled the paleo-Zambezi canyon and is interpreted to have provoked the disconnection between the proximal domain (passive margin – Zambezi delta) and the distal fan (Mozambique basin). This is demonstrated in the distal wells by the sudden stop of detrital sediments input in the deep-sea fan between 644 Ka and 550 Ka. Such a disconnection process occurring between upstream and downstream turbiditic deposits provides good analogy to the creation of depositional stratigraphic trap for fluids (e.g. hydrocarbons, stored CO₂) within sandy turbidites, as documented by subsurface data.

Mots-Clés: Mass transport deposit, Mozambic channel, canyon, Pleistocene

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