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Large-scale mass-flows in the Magdalena Turbidite System

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Debris-flow can evolve into a turbidity current by means of capture of fine particles from the debris head into the ambient fluid. In our study, we show morphosedimentary features that result from debris-flow-derived turbidity currents, as well as the direct impact of the debris-flows against former seafloor morphology. The scenario where these sedimentary processes occur is located in the tectonically active continental margin off Colombia (Caribbean Sea) where several channel-levee complexes, related with the Magdalena Turbidite System, develop.

The narrow and uplifting continental shelf, the steep slope gradients and the amount of sediments available in the Galerazamba Delta produce large-scale mass-flows on the upper slope that evolve downcurrent into a channel-like feature which extends beyond the surveyed area into the abyssal plain. This feature probably results from debris-flow-derived turbiditic currents that erode the seafloor. The former interchannel lows seem to play an important role in the channelization of the debris-flow-derived turbidites that results in the channel-like feature.

Mass-flows produce erosion in the uppermost course of the channel-levee systems destroying totally or partially the former levee deposits. Downslope, in the places where channel bends are more exposed, the mass-flows breach the levees resulting in a local thalweg infilling. More distally, part of the derived-debris-flow turbidites breach a leveed-channel resulting in its reshaping as indicate local thalweg

entrenchment and channel widening.