



Reconstruction of sediment transported patterns since the late Miocene in the Qiongdongnan Basin, northern South China Sea

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Late Miocene-to-present sedimentary succession, consisting of deep-water channels, submarine canyons, shelf-edge delta and clinoform, mass transport complex (MTC), turbidites, pelagic sediments and so on, has accumulated in the Qiongdongnan Basin (QDNB) and supplied from several sediment potential provenances, including surrounding tectonic uplifts and drainage system (e.g. Hainan island, Red River system and Shenhu Uplift). This multiple sediment source system with a variety of space-time distribution is more likely to result in different transported pathways to connect with accumulated zone of the QDNB. To investigate spatial and temporal variation of sediment transported patterns since the late Miocene, the primary dataset in this study is high-resolution 2D seismic profiles that are used to interpret several types of sedimentary features and to determine the distribution within the basin. Integrated analysis of core samples and well log data summarized from previous studies is allow for acquiring high-resolution vertical information about physical and chemical properties of different types of sedimentary features. Depended on characterization and spatial distribution of depositional models, the sediment delivered pattern could be classified into three major types. (1) the downslope transports suggest that sediments were transported by gravity flows and slope failures from high topographic areas to deposit at the basinfloor, and basinward prograding deposition at the shelf or tectonic uplifts, channels/canyons developed along the slope and submarine fans formed at the lower slope are the products of downslope transports shown in the SE-trending seismic profiles; (2) the canyon-axial transports are associated with geomorphology of the Central Canyon System (CCS) across the QDNB from SWW to NEE. Abundant sediments originated at the Red River system were supplied from the west, resulting in dominantly onlap-filling turbidites with a series of erosional discordance within the head area and western segment of the CCS; (3) the combined transport is a mixture of downslope and canyon-axial sediment transports. A large volume of MTDs source from the Hainan Island in the north was transported southward and impeded by the Southern Uplift, so they tended to widen the canyon and continuously deliver eastward along CCS. These three types of sediment transported patterns since the late Miocene in the QDNB might be helpful for predicting distribution of different sedimentary characteristics, which has economic significance in the industrial field.

