



Changing Neogene deposition in the Malay-Tho Chu basin: effects of local and regional tectonism and paleoclimatic variations

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Shifting depositional environment characterizes the Gulf of Thailand during the Neogene, reflecting local and regional tectonism, isostatic sea level fluctuations and super regional climatic changes. The Malay- Tho Chu Basin, located mainly offshore Vietnam, is one of the largest Cenozoic basins in the Gulf of Thailand. It contains a thick Cenozoic succession and holds substantial petroleum potential. The basin formed during Paleogene pull-apart induced rifting followed by Neogene post-rift subsidence and moderate rift re-activation. In order to investigate the depositional development of the basin and throw light on the mechanism controlling deposition in the Gulf of Thailand, the Neogene was subdivided into six intervals based on 2D seismic lines and well data. Facies maps, representing the six intervals illustrate the Neogene depositional development in the area. During the latest Oligocene-earliest Miocene, rifting was vaning and deposition mainly took place in depocenters above former grabens/half grabens, whereas structural highs, inherited after the Oligocene rifting, remained elevated. Deposition was dominantly lacustrine with some fluvial sedimentation. During the Early Miocene, fluvial, lacustrine and estuarine deposition prevailed in the northwestern part and alluvial and delta plain deposition in the central part of the area. Further southwest, a coastal and fluviomarine setting developed. During the Middle Miocene, alluvial and delta plain deposition prevailed. The northwestern part was predominated by fresh water sedimentation with some marine/estuarine influence whereas marine to coastal marine deposition took place in the southwest. During the late Miocene, a relative sea-level fall lead to more a dominance of alluvial and delta plain deposition over most of the Malay-Tho Chu Basin. Even so, some estuarine/marine influenced sedimentation persisted in the western half of basin and coastal to holomarine interludes even established in the southernmost part of the area. Alluvial and fluvial deposition dominated during the Late Miocene- Early Pliocene. In the southwest, alluvial deposition was interspersed with estuarine and coastal to holomarine sedimentation. Since the Early Pliocene, alluvial/fluvial deposited along the flank of the basin whereas coastal to holomarine deposition have prevailed in the more central part of the basin.