

CERAMAH TEKNIK TECHNICAL TALK

Tectono-stratigraphic framework & tertiary paleogeography of Southeast Asia: Gulf of Thailand to South Vietnam shelf

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Abstract: The structure and stratigraphy for many of the rift basins in the Gulf of Thailand and southern Vietnam shelf are individually well understood. However, the understanding of the region as a whole, and the relationships from one basin to another, is less clear. Regional paleogeography maps, help portray the structural and stratigraphic evolution of the basins, and when constructed with precise chronostratigraphic control, provide a constraint to the interpretations of the facies distributions in individual basins.

This paper presents a series of palaeogeographical maps for the Oligocene and Miocene extending from the Gulf of Thailand to the Vietnam Shelf, based on the succession of sequences of Morley Swiecicki and Dung (2011).

Deposition during the Early Oligocene (~31 Ma) and 'mid' Oligocene phase (~28 Ma), including the Tien Cau (Nam Con Son Basin), Belut and Gabus (West Natuna Basin), and Seismic Groups M and Formation 0 (in South and North Malay Basin) consisted of extensive freshwater lakes and/or swamps with widespread alluvial, fluvial, and lacustrine shoreface systems developed along rift basin margins.

In Late Oligocene (~26 Ma), a brackish incursion related to onset of higher sea levels of the Late Oligocene thermal maximum, extended from the Nam Con Son Basin of Southern Vietnam, and resulted in deposition of extensive brackish water coals in that region (Cau Formation), and of widespread brackish lakes in West Natuna and the Southern Malay Basin (Udang and Seismic Group L). Widespread latest Oligocene flooding (~24 Ma), due to the sea level rise of the Late Oligocene thermal maximum, resulted in deposition of a marine shale that extended through the Nam Con Son (Lower Dua) and West Natuna Basin (Barat), into the North Malay Basin (Seismic Group K and Trengganu Shale).

The Early Miocene was characterized by slow intermittent transgression, with marine influence extending to the Southern Malay basin at ~22 Ma (Dua and Arang and Seismic Groups J and I) but extending to the northern Malay Basin by ~18 Ma.

In the Middle Miocene, coinciding precisely with the highest sea levels of the 'Middle Miocene thermal maximum', open marine conditions were widespread from offshore Vietnam (Mang Cau Formation) and throughout West Natuna (Arang) and the Southern Malay Basin (Seismic Group H and F) with restricted tidally influenced marine conditions extended northward through to the North Malay Basin (Seismic Group H and F).

