

Unraveling sediment distribution in ancient shelf-slope-basin settings, Block SB302, offshore Sabah

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The study area lies within the south western portion of the Block SB302, about 80 kilometres offshore Northwest Sabah, East Malaysia. Geologically, the block straddles the inboard and outboard transition zone of the Northwest Sabah Basin. The basin was initiated by southeast ward subduction beneath NW Borneo, which led to the development of the Rajang-Crocker accretionary prism. The Middle Miocene Deep Regional Unconformity marks the end of subduction, and was succeeded by a series of unconformity bound, northwesterly prograding shelf systems (Stages IVA to G).

The aim of this study is to investigate the Pli-Pleistocene Stage IV F and IV G, which are extremely well imaged on 3D seismic data. A thorough understanding of these shallower shelf-slope-basin systems is essential in order to understand the deeper, more structurally complex intervals.

Major horizons that correspond to the top and bottom sets of the shelf progradational complexes were mapped based on internal seismic characters. Subsequently, strata slices and associated seismic amplitudes have been extracted from the 3D seismic data. The results reveal clear images of the paleo-drainage patterns, thought to have formed over the routes allowing sediment to be redistributed from the former shelf to deep marine settings. The key features identified in the area are shallow marine shelf top complex, shelf break, slope, slope channels and mini basins.

Mapping the depositional systems of the shallow section has revealed the changing relationship between relative sea level, paleo-environment and sediment transportation route. Recognising that “the present is the key to the past”, allows the results of the study to be applied to deeper, more structurally complex shelf-slope-basin systems.