

THE SULU SEA, A SOUTHEAST ASIAN NEOGENE MARGINAL BASIN WITH OUTCROPPING EXTENSIONS IN SABAH

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Although marginal seas are an outstanding feature of Southeast Asia, their stratigraphy and tectonic evolution has to be interpreted exclusively from oceanographic geophysical surveys and a few well selected DSDP sites. The S.E. Sulu Sea was no exception until it was drilled in 1989. The published details allow a correlation with eastern Sabah geology, where the Miocene and younger geology may be successfully correlated with the DSDP sites. The early stages of the opening of the Sulu Sea were characterized by explosive volcanic activity, and the rifting resulted in large scale melange formation. These events are seen in the onland geology as the Ayer and Tungku formations, and the Kuamut and Garinono formations respectively. Uplift of the Crocker Formation to the west could have provided the only possible source for major quartz sands deposited in Sabah as the Tanjong Formation, and major delta flowing northeasterly near Sandakan would have been the source of the continentally-derived turbidites that were drilled in the deep Sulu Sea.

Since the ophiolitic complex of Sabah pre-dates the late-Early Miocene opening of the Sulu Sea marginal basin, it must therefore represent the ocean floor upon which was built the volcanic arc, rifting of which gave rise to the Sulu Sea. Remnants of this Palaeogene and older ophiolitic basement therefore underlie and outcrop within the NW margin of the S.E. Sulu Sea (Labuk Valley through the Cagayan Ridge), as well as along the Sulu Archipelago, extending into Darvel Day and Utu Segama.

Offshore exploration and drilling by several petroleum companies in the Sulu Sea, both in Malaysian and Philippine waters, was unsuccessful. The thick Miocene successions were misinterpreted by them as having been deposited in fore-arc basins. The trend of these basins is northeasterly and therefore unrelated to the inferred trench, which trends northwest parallel to the east coast of Sabah. This trench is a figment of the imagination. The lack of understanding of the tectonic setting undoubtedly contributed significantly to the lack of success by the petroleum companies.