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**Marine Processes in the Northern Lobe of Mahakam Delta and Marangkayu Spit Bar:
Implication on Paleogeography Model in the Subsurface**

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The morphological components of northern lobe of Mahakam Delta combined with adjacent shore-line of Muara Badak and Marangkayu Spit Bar to the north of the delta is being investigated to reveal the interplay between fluvial and marine processes in their making. These specific areas are hypothetically considered as analogues to the paleo-geography of the reservoir sections in the subsurface of Semberah Field, which is located 15-20 KM inland to the west and parallel to the shoreline. Bathymetric survey, bottom grab sampling, and shallow sediment coring are conducted in 4 locations representing upper delta plain, lower delta plain, upper shore-face and fore-shore. Surface sediment observations are also performed in the spit bar area.

The present-day current direction measurement and the grain-size distribution along the shorelines suggest at least two terrestrial sources of sediment provenance filling in the area. In the northern lobe of Mahakam Delta the tidal effect is more pronounced than the wave, while in the Marangkayu Spit Bar the wave action is the most dominant one. In both areas, fluvial processes can still be seen acted on certain sub-environments dominantly. Brackish water, clay drapes, flaser and wavy ripple lamination and suspension feeder burrows characterizing the delta plains of the northern lobe of Mahakam Delta. Saline sea water, trough cross bedding, low angle parallel bedding and sand burrows are typically observed in the Marangkayu Spit Bar area.

Analogizing the present-day shoreline of Northern Lobe of Mahakam Delta – Marangkayu Spit Bar to the Miocene subsurface environment in Semberah field, we found a very pronounced one-to-one matching, which needs further works on mapping and comparing the sand body geometry between the two realms.

Comparison of Miocene Semberah Paleogeography with Mahakam-Marangkayu Shoreline Model

