



## **Restoration of original 3D sedimentary geometries in deformed basin fill supporting reservoir characterization**

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A large progradational clastic system centred on Brunei Darussalam has been present on the NW Borneo margin since the early middle Miocene. This system has many sedimentary and structural similarities with major deltaic provinces such as the Niger and Nile. It differs from these systems by being affected in the hinterland by contemporaneous compressional tectonics. Uplift partially forced strong progradation of the clastic system, but also folded older deltaic units. Erosion and the exhumation of folded strata in the area of the Jerudong Anticline resulted in the exposure of large-scale prograding clinoforms and syn-sedimentary deltaic faults of middle Miocene age along a natural cross-section of several tens of kilometres in extent.

Westward of the key outcrop sites on the Jerudong Anticline, the middle Miocene deltaic units are overlain by late Miocene, Pliocene and Quaternary clastics up to 3 kilometres thick. Both, the middle Miocene target units of this study as well as the late Miocene to recent overburden are recorded in the subsurface of the Belait Syncline on regional 2D seismic lines (total line length around 1400 km) and at 7 well locations. In this study, we integrate the available geophysical subsurface information with existing structural, sedimentological and geomorphological field data of the “classic” Jerudong Anticline exposures (e.g., Back et al. 2001, Morley et al. 2003, Back et al. 2005) into a static 3D surface-subsurface model that provides quantitative constraints on the structural and stratigraphic architecture of the Miocene Belait delta and the overlying units in three dimensions, supporting basin-scale as well as reservoir-scale analysis of the subsurface rock volume. Additionally, we use the static surface-subsurface model as input for a tectonic retro-deformation of the study area, in which the 3D paleo-relief of the middle Miocene Belait delta is restored by unfolding and fault balancing (Back et al. 2008). This kinematic reconstruction ultimately provides a detailed view into the stratal architecture of middle Miocene delta clinoforms, indicating a close relationship between delta-lobe activity, clinoform morphology, and the generation of slumps and turbidites.

### Literature

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