

Late Quaternary River Systems of Sarawak Shelf: Geomorphic Features from Near Surface 3D Seismic Data

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Near surface data of multi vintage seismic surveys from Continental shelf of Sarawak offshore are analyzed to identify and characterize depositional features in the shallow section. The studied section which could be correlated to late Quaternary period is characterized by presence of well-defined fluvial-estuarine geomorphic features. Prominent fluvial systems consisting of rivers, incised valleys and tidal channel inlets have been interpreted from time slices of 3D seismic data. This study is first of its kind on the Sarawak shelf which uses extensive seismic data for interpretation and characterization of geomorphic features in the region. Present day water depth in the study area ranges from less than 20 m to more than 200 m.

Conspicuous channelized features, with major trunk valley associated with dendritic tributaries are identified (Figure1). These features referred here as incised valley extends for more than 200 m trending South-North.

Presence of incised valley could be correlated to sea level fluctuation in the late quaternary time in the region, which have been reported by various authors before. Although the actual amount of sea level lowering could not be calculated from seismic data set, it could be said that because of the low gradient of the Sarawak shelf even a smaller sea level change could have exposed the whole self-area. Interestingly the major channel systems identified in the study could be spatially correlated to present day river systems of Sarawak.

Understandings from this study could be used as an analogue to features in deeper stratigraphy, which are deposited in similar environment and potential hydrocarbon exploration targets. Study of these depositional features give a better understanding about the paleogeography of the area in very recent past as well as how far the Sarawak shelf was exposed, which has bigger impact on various geologic studies.

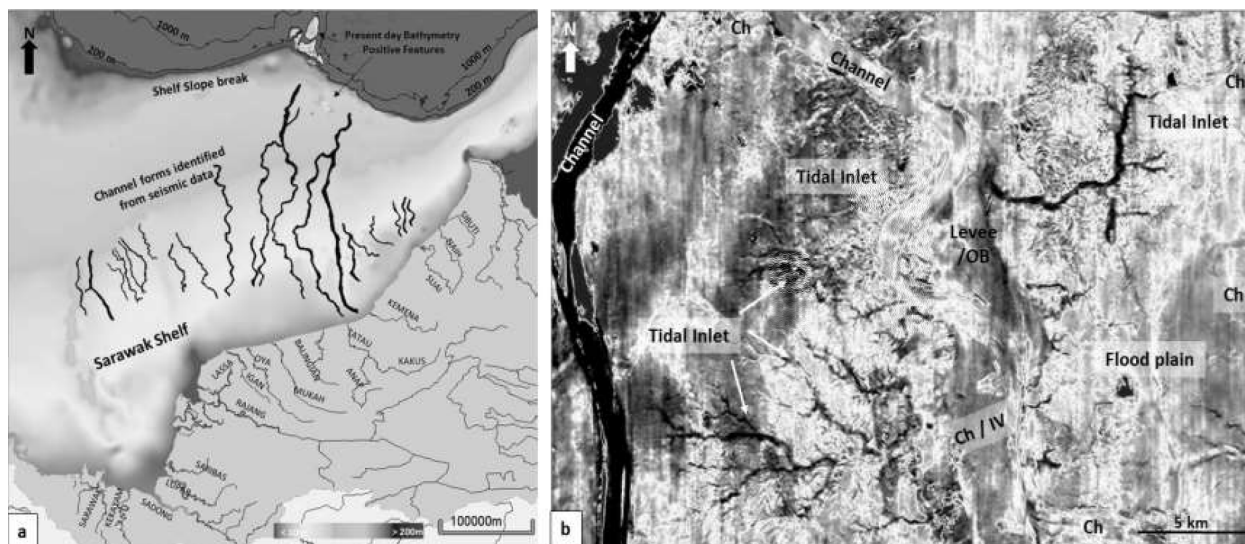


Figure1: (a) Identified channelized features overlaid on present day bathymetry map. Extent of interpreted channels are constrained by the availability and quality of seismic data. The above channelized features could be well correlated to present day major rivers of Sarawak. (b) A time slice near to sea bottom shows very prominent geomorphic features like wide channel/incised valley (?), tidal inlets/tributaries, smaller channels etc. Sea level fluctuation during late Quaternary time caused exposure and drowning of the shelf in the region leading to formation of these features. Ch-Channel, OB- Over Bank, IV-Incised Valley.