

# **Stratigraphic Framework of the Cenozoic Carbonates of the Northern Carnarvon Basin, Northwest Shelf, Western Australia**

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The North West Shelf extends 2400kms along the Western Australian margin and is divided into the Carnarvon, Canning, Browse, and Bonaparte sedimentary basins. Significant quantities of carbonate were deposited on this shelf during the Cenozoic. These carbonates are the dominant cover sequence to the hydrocarbon-producing Mesozoic successions and cause considerable problems in the seismic interpretation of structural traps due to strong lateral variations in sonic velocity. Despite their large distribution, stratigraphic thickness and interference with seismic interpretation, these carbonates have remained poorly documented. Using seismic properties, geochemical analyses (carbonate and elemental), well log data, petrological data and foraminiferal analyses, this study establishes the stratigraphic framework of Cenozoic carbonates in the Exmouth-Barrow sub-basins, Northern Carnarvon Basin.

These carbonates were divided into six lithological facies, from oldest to youngest; basinal facies, slope facies, shelf facies, planktonic ooze/canyon fill facies, sand barrier facies, and ramp facies. The sequence represents a shallowing upwards sequence from Eocene to Early Pliocene age. The base of the sequence is dominated by deep basinal facies, overlain by prograding Oligocene-Miocene shelf and slope sediments. These are in turn overlain by quartz-rich sediments interpreted to represent a sand barrier. A transgression during the Pliocene altered the depositional environment and formed a prograding ramp. This study is one of the first to concentrate on both the stratigraphy and the geological controls on sonic velocity in Cenozoic carbonates of the North West Shelf.