

Coral Reef Morphology and Growth History, Northwest Shelf, Australia

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The North West Shelf is a tropical ramp with Cretaceous-Tertiary carbonates and clastic reservoirs at depth. Coral reef systems, discontinuously developed during the Late Tertiary-Quaternary, vary from fringing reefs to isolated reefs rising from deep-ramp settings. Quaternary evolution was documented seismic imaging, coring and U-series dating, and sea level data from the Houtman Abrolhos carbonate platforms (at 28-29 deg S).

The Ningaloo fringing reef at 20-22 deg S, records Holocene and Last Interglacial phases of reef growth overlying Tertiary carbonates of the Cape Range, which is flanked by uplifted Plio-Pleistocene terraces and reefs. Scott Reef (at 14 deg S) is an isolated reef which overlies a carbonate platform and a major gas discovery. Seismic profiles reveal a Last Interglacial (ca. 125,000 year) reef system, but reefs which apparently grew to sea level are 30m below present sea level, indicating significant subsidence in the Late Quaternary. Holocene reefs grew in the accommodation space provided by subsidence. The Rowley Shoals (15-17 deg S) comprise a morphological series of emergent, annular reefs rising from depths of 200-400 m. Seismic profiles suggest Late Quaternary differential subsidence has influenced reef morphology.

As the spatial association between reef systems and hydrocarbon seeps and the reservoir potential of the Tertiary section receive attention, further exploration and development in and around coral reefs will require better understanding of human and natural impacts, and bio- geological controls on reef growth and development.