



Tectonic vs. eustatic control on the 3D sedimentary architecture of a carbonate succession from the Browse Basin, NW-Australia: An integration of well logs, 2D- and 3D-seismic data

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An extensive and multivariate dataset from the Browse Basin on the Australian NW-shelf provides the opportunity to gain a comprehensive picture of the area by combining the benefits of several data types.

From the Early to Middle Miocene onward, the carbonate sediment system of the Browse Basin is characterized by tropical reef growth. Reef growth terminates during the earliest Late Miocene by stepwise drowning, preceded by a subaerial exposure event.

3D-seismic data from two adjacent multichannel seismic dataset covering more than 1000 km² provide valuable insights on the geometries and timely development of the reef system, thus contributing to a better spatial understanding of such systems. The analysis of seismic attributes and facies allows further constraints on the distribution of rock fabrics.

The regional context of the sedimentary system is provided by a large –scale network of 2D-seismic lines, documenting the tectonic framework for the evolution of the sedimentary succession. This allows to determine the influence of subsidence, respectively uplift caused by the approach of the NW-shelf to the Sunda-Banda arc subduction zone.

Additionally, wireline logs, isotopic records and core material from two wells provide stratigraphic control and additional paleoenvironmental information from microfossils and isotope data.

The integration of these data allows a correlation of features of the Browse Basin carbonate shelf to global events and thereby an estimation of the proportional influence of tectonics and eustasy on the evolution of the tropical reef system. Generally the succession of the depositional features in the Browse Basin conforms to a pattern recognised in several other carbonate sediment systems from the Indo-pacific region, both tropical and non-tropical, implying a strong impact of eustatic changes, despite the active tectonic setting.