

The Seismic Image of Devonian Reefs in the Canning Basin, Australia: An Historical Review

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The Devonian reefs of Australia's Canning Basin have been a source of inspiration and frustration for petroleum explorers for nearly half a century. The analogy to major oil and gas fields in similar reef complexes, especially Alberta, has underwritten several cycles of exploration, largely unsuccessful.

The form of the reef, as envisaged in the subsurface has evolved over time, in terms of both geological model and seismic 'image'. The geological model has been based on the world-famous outcrops along the basin margin. On seismic data, a wide variety of features have been interpreted as reef margin or atoll complexes, based on analogy to either those outcrops or to seismic features proven to be reefs in other basins. Some interpretations, such as the Blina and Needle Eye Rocks reefs, proved remarkably accurate, but many seismically defined 'reefs' proved unrelated to reefing and were commonly not of Devonian age. For instance, wells drilled for Devonian objectives in the Fitzroy Trough invariably encountered only Permo-Carboniferous sediments. Early efforts to interpret porosity trends in, for example, the fore-reef zone were unsuccessful and wells invariably encountered tight platform carbonates. A large number of seismic 'moundform' anomalies drilled as reefs proved to be processing artefacts, erosional and glacial features, and velocity anomalies.

The potential remains unrealised.