NEW INSIGHTS INTO EARLY TRIASSIC RIFTING IN THE NW SHELF HELP EXPLAIN REGIONAL STRUCTURAL STYLES AND ASSOCIATED DEPOSITION MODEL

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The offshore Canning is an amazingly complex and unexpected piece of geology. Large seismic geometries appear to be lava deltas associated with a rift volcanic complex. Gravity and magnetic modelling can be shown to support this geological model and its apparent thickness of up to 8km in places. This is therefore volumetrically comparable to global end-Permian flood basalts analogs such as the Siberian and Emeishan traps.

The location of this outpouring can potentially be associated with a failed triple junction. The impact of this rifting is felt regionally. Syn-rift growth faulting is easily identified and can be shown to extend along a Northern rift arm up to the proto-Barcoo and proto-Caswell sub-basins. Strike-slip motion, previously known as the Fitzroy movement, along the eastern rift arm propagates through the Fitzroy Trough creating the numerous trans-pressional and trans-extensional features. Uplift along the third Western rift arm, to the north of Wombat plateau, sets up the elliptical bowl like geometry of the Northern Carnarvon basin that is clearly visible from an isopach of the early Triassic. This uplift also helps to explain the long-lived shallow marine Cossigny limestone and the expected sudden influx of eroded clastic sediment into the Northern Carnarvon basin can be tied to a large prograding Triassic shelf visible on 2D regional seismic data.

This large volcanic province may help explain the small percentage of Triassic-aged detrital zircons found throughout the Triassic Mungaroo formation.

This paper highlights Woodside's view that a regional approach, incorporating data from multiple sources, geographical areas and formations, assists with our broader understanding of tectonic history of the North West Shelf during the Early Triassic to Middle Triassic