Tectonostratigraphic Evolution of an Intracontinental Terrain: The Geological Evolution of The Frome Embayment, Eromanga Basin, Australia.

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Abstract

The Frome Embayment, in the south of the Eromanga Basin, is the southernmost lobe of an intracontinental basin that formed as a result of epeirogenic motion during the Late Jurassic through to the Early Cretaceous.

In the contemporary landscape, for the most part, the Mesozoic landscape has been buried by the Lake Eyre Basin. However, in the hinterland regions of the embayment, and sporadically within the embayment, remnants of the Mesozoic landscape are exposed, at least in part in their original context. Many marine shore lines, sedimentary surfaces and graded erosional terraces have remained exposed around the margins of the basin since the Mesozoic. These exposures have undergone weathering and erosion, and slight modification from contemporary regolith, such as colluvium and alluvium. Other exposures have been uplifted and exhumed such that they are now prominent features of the landscape. Localised sedimentological and structural studies indicate that the hinterland landscape at the time of basin formation consisted of erosional hills and rises surrounded by relatively flat low lying plains. In the west of the basin, shorelines, sediment profiles and structural relationships indicate uplift in access of 300 m in the basin bounding ranges during the duration of sediment deposition. Throughout basin formation, this landscape, previously thought to be a 'peneplain', was deformed by syn-depositional tectonics, which controlled the sedimentological distribution and characteristics. Localised tectonics resulted in variations in the basin evolution on different sides of the embayment, as greater tectonically controlled sediment accommodation in the west provided for deeper and more continuous sediment profiles.

Regional studies across the embayment indicate that the syn-depositional tectonism was prevalent in the basin margins where episodic reactivation of structures formed localised depocentres around the Flinders and Barrier Ranges. In these areas, the tectonic offset on structures exceeded 200 m. In places where there are surficial exposures of these structures, it is evident that they have been reactivated post-dating sediment deposition, such that overall throw on the structure exceeds 500 m. In contrast, syn-deposition tectonism basin-ward at the northern edge of the embayment was calm with open folding and tectonic offset on large structures typically less than 50 m. Core and rock mineralogical analysis provides evidence of some minor syn-deposition erosion and reworking of sediments.

Declaration

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Signature: Date:

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Firstly, let me just say life is about perspective, I started this project with a view of the Torrens and am finishing with a view of the Yarra; and to be honest, the Yarra actually looks stunning in the ill morning light on the day you intend to submit your thesis. However, it's like I said, that is more than likely a perspective thing.
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