

Rupture Behaviour and Paleoseismicity of Intraplate Faults in Eyre Peninsula, South Australia

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Abstract

This abstract is a summary of a proposed Ph.D. research programme on the rupture dynamics and paleoseismicity of neotectonic fault scarps of north-eastern Eyre Peninsula in South Australia. The fault scarps appear as north-south trending linear features with smaller east-west trending segments. The scarps are parallel to the coastline of Spencer Gulf and serve as an evidence of Australia's neotectonic history of ground surface faulting earthquake. Seismicity in the vicinity of the faults is very low but the faults indicate recurring major (e.g., $M_w > 5.5$) earthquakes that could present a hazard to proximate infrastructure.

This research will address the importance of understanding the rupture behaviour of these faults along with their paleoseismic history in order to aid in seismic hazard assessment in Eyre Peninsula. The primary research questions that this study strives to answer are: What are the ages and magnitudes of late Quaternary earthquakes on these faults? What is the frequency -magnitude distribution of seismic activity on these faults? Are major earthquakes on these faults periodic or clustered (episodic) in time and space? How do processes such as static stress transfer and eustasy affect stress states and earthquake behaviours on the faults? Resolving these questions will help in understanding fault behaviour and improving seismic hazard model inputs in this and analogous stable continental regions. Drone-based digital topographic analyses, fault trenching and other field studies, and stress modelling will be undertaken in this research programme.

Keywords: Neotectonics; Paleoseismology; Rupture behaviour; Intraplate faults.