

## **TRIASSIC PROVENANCE ANALYSIS OF THE ROEBUCK BASIN, NORTH WEST SHELF OF AUSTRALIA**

*Megan Lech<sup>1\*</sup>, Chris Lewis<sup>1</sup>, Lloyd T. White<sup>2</sup>, Steve Abbott<sup>1</sup>*

<sup>1</sup>*Geoscience Australia, [megan.lech@ga.gov.au](mailto:megan.lech@ga.gov.au), [chris.lewis@ga.gov.au](mailto:chris.lewis@ga.gov.au), [steve.abbott@ga.gov.au](mailto:steve.abbott@ga.gov.au), <sup>2</sup>*School of Earth and Environmental Sciences, University of Wollongong, [lloydw@uow.edu.au](mailto:lloydw@uow.edu.au).**

The Roebuck Basin is on Australia's North West Shelf, between the Browse and northern Carnarvon basins. The basin consists of Paleozoic to recent fluvial to deep marine mudstones and sandstones, carbonate platforms and reefs, and volcanoclastics. Recent hydrocarbon discoveries in the Bedout Sub-basin have renewed exploration interest and changed existing perceptions about the regions prospectivity.

The interpretation of U-Pb detrital zircon dating from offshore petroleum well cuttings provides new information regarding the origin of sediments and changes in sediment provenance. This analytical work has the potential to better understand reservoir quality within the Triassic Upper and Lower Keraudren deltas (and equivalent sequences). A range of detrital zircon age spectra were obtained. Analyses of zircon grain shapes (i.e. roundness) somewhat supports transportation of some distance, but could also signify multi-phase recycling. However, the combined detrital age spectra and grain shape reveals that the Roebuck Basin deltas had multiple sediment sources. The Roebuck Basin's Triassic sediments appear to be derived from Australia's interior, potentially transported either directly via large rivers or from subsequent sediment reworking and transport via long-shore drift.

Seismostratigraphic interpretations have identified potential sediment transport mechanisms including clinofolds and submarine canyons. Significant landward uplift and erosion associated with the latest Permian-aged Bedout Movement supports the reworking of Permian sediments. Integration of additional samples, and linking these to palaeogeographic settings, will provide additional clarity of the potential Australian and non-Australian Triassic sediment sources. This study aims to provide further insight into the origin of the reservoir units in the Roebuck Basin.