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Brief Summary

Intracontinental reworking is considered to be a far-field response to forces transmitted from active plate margins, but in the Proterozoic the drivers are challenging to decipher because the active plate boundaries responsible for propagating far-field stresses are likely to have been overprinted by subsequent events. The Gascoyne Province in the Capricorn Orogen, is a long-lived zone of weakness in the West Australian Craton shaped by at least five Proterozoic tectonic events. Monazite and zircon U–Pb geochronology plus metamorphic studies are used to determine the duration of metamorphism along with the prevailing geothermal gradients for the enigmatic c. 1.7 Ga tectonism. Younger, Grenvillian-aged reworking was associated with leucocratic granite and Li-Cs-Ta pegmatite intrusion; however, the age and origin of this magmatism has remained unknown. Phosphate geochronology is used to provide constraints on the timing and duration of the leucocratic magmatism. These data will be used to formulate a petrogenetic model for this style of magmatism. Although the Gascoyne Province is divided into structural corridors the history of reactivation and uplift is almost entirely unknown. This project will also examine the reactivation history of major shear zones by integrating microstructural observations with $^{40}\text{Ar}/^{39}\text{Ar}$ mica geochronology. Collectively, the results will enable the causes of reworking and reactivation in the West Australian Craton to be understood within the context of Proterozoic Australia.

Education: BSc, Applied Geology, Curtin University of Technology

Research interests: Tectonics, geochronology

Thesis title: The tectonothermal evolution of the Gascoyne Province and its role in Proterozoic Australia

Supervisors: Prof. Birger Rasmussen, Dr. Stephen Sheppard, Prof. Ian Fitzsimons, Dr. Jian-Wei Zi

Publications:

Piechocka, A. M., Gregory, C. J., Zi, J., Sheppard, S., Wingate, M. T. D, Rasmussen, B., 2017, Monazite trumps zircon: applying SHRIMP U-Pb geochronology to systematically evaluate emplacement ages of leucocratic, low-temperature granites in a complex Precambrian orogen: *Contributions to Mineralogy and Petrology*, 172: 63. <https://doi.org/10.1007/s00410-017-1386-5>.

Conferences:

2017: Specialist Group in Tectonics and Structural Geology (SGTSG) (Denmark, WA); Goldschmidt (Paris, France); TIGeR Conference (Bentley, WA); GSWA Open Day (Fremantle, WA)