

# SEG 2023 Conference: Resourcing the Green Transition

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## Copper-Hosting Basins at the Edge of Cratons – the Yeneena Basin in Western Australia as a Case Study

Weronika Gorczyk<sup>1</sup>, Fariba Kohanpour<sup>2, 1</sup>, Ian Tyler<sup>1, 2</sup>

1. University of Western Australia, Perth, WA, Australia, 2. CSIRO, Perth, WA, Australia

Basins, orogens, and associated magmatic bodies at the edges of Archean cratons often host significant deposits of strategic (including green) metals (such as Cu, Zn, Pb, Ag, Au, and REEs). Considering that sediment-hosted stratiform copper deposits (SSC) represent one of the most important source of copper in the world, besides porphyry copper deposits, and account approximately for 20-25% of the global production and reserves, understanding the development of ancient basins and their metal potential is of utmost importance. The Yeneena basin—a Neoproterozoic basin deposited at the margin of the Pilbara craton in Western Australia—is a significant example of a mineral-rich (mainly Cu, Au, and U) basin. Until now only a vague understanding of the deposition of metals and processes leading to their enrichment is known, largely due to the scarcity of geological data. In order to obtain a better understanding of the basin, a holistic multi-disciplinary system workflow approach was applied. Novel analytical and numerical techniques were utilized with drill core information and geophysical, geochronological, and spectral data sets to unveil the development history and metal potential of the highly prospective Yeneena basin. With this holistic approach, we were able to link lithospheric-scale architecture and associated mineral systems with the development of basins and sub-basins as well as reactivation of major tectonic boundaries during inversion of the basin.