

### **Getting the Most out of Drill Hole Data: Meaningful and Robust Boundary Detection Tools**

**Ryan Manton**<sup>1</sup>, Gerhard Visser<sup>1</sup>, Lequn Zhang<sup>1</sup>, Rebecca Montsion<sup>1</sup>

<sup>1</sup>Csiro, Perth, Australia

A diverse range of geoscientific data is collected to represent geological features and processes relevant to deposit formation. However, tools for identifying features in drill hole/core data are limited due to complex data relationships and geologist confidence in machine learning methods. Data Mosaic, a multiscale boundary detection tool from the CSIRO has been re-designed to identify tricky geologic features amidst multidisciplinary data noise. Various use cases are being tested to assess the suitability for different geological questions and data types. Boundaries like lithologic contacts, alteration zones, ore grade domains, and metallurgical domains have unique statistical requirements based on their context. Data types such as hyperspectral, geochemical, petrophysical, and electrical scanning technologies have inherent biases and appropriateness based on analytical methods and correlations. Using complex systems mathematics, Data Mosaic integrates information across scales, providing quantitative support for decision-making and higher confidence constraints for modelling workflows.