



Beyond below-ground geological complexity: Developing adaptive expertise in exploration decision-making

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The declining discovery rate of world-class ore deposits represents a significant obstacle to the future of global metal supply. To counter this trend, there is a requirement for mineral exploration to be conducted in increasingly challenging and uncertain search spaces. Faced with such an increase in task complexity, an important limitation from an exploration perspective is the human behavioural aspect of information interpretation and decision-making. By adapting and developing upon existing research from a broad range of disciplines, the author discusses how organisations and individuals can develop the capacity to become proficient at creative problem solving, making balanced judgements and accurately assessing uncertainty.

A model of learning and decision making is presented. The model accounts for behavioural and motivational aspects of the individual, as well as the wider context and complexity in which the individual and the decision-making behaviour are embedded. This model can be used as a diagnostic tool for situational analysis and to inform learning interventions. The model can also be used for designing working environments to promote learning and adaptive decision-making, to improve success rates in the mineral exploration industry. An exploration project evaluation workshop was conducted, combining quantitative information with expert judgement. Application of the model to this task highlights important findings, regarding the role of experience in the ability of experts to make subjective assessments in complex environments and accurately assess the uncertainty in their estimates.