

## Uncertainty Analysis of Geological Interpretations

Macrae, Euan<sup>1</sup>; Bond, Clare E.<sup>2</sup>; Shipton, Zoe K.<sup>1</sup> (1) Department of Geographical and Earth Sciences, University of Glasgow, Glasgow, United Kingdom. (2) Midland Valley Exploration Ltd, Glasgow, United Kingdom.

Models of sub-surface geology are created from data sets that sample a limited volume of the subsurface and at a limited resolution; therefore, even with modern data collection techniques, the final model is highly dependent on the interpreter's conceptual framework. Uncertainty in data measurement, collection and processing can be accounted for; however, assigning risk due to the possibility of applying the wrong concept has rarely been studied before. Interpreters from diverse educational backgrounds, or with experience in a range of oil field settings, can come up with very different results for the same data [1]. The ambiguity in the model choice is known as 'conceptual uncertainty'; it is the uncertainty in the geological concept chosen for the data. Bond et al. found that experts starting with the same dataset produced very different interpretational results; this ultimately affects the final geological model, and different geological models may have very different economic viability. Understanding why interpreters see particular aspects of a dataset as being important to an interpretation is essential. The Freyja Project will statistically investigate the factors that contribute to conceptual uncertainty and then develop industry-based workflows that mitigate against, or account for, conceptual uncertainty and hence risk.

The Freyja project will use a combination of questionnaires and workshops to collect large volumes of data for statistical analysis. Questionnaires will sample the full range of the population including professional geoscientists from academia and industry, as well as those in education. The statistical analysis of questionnaires will be complemented by interpretation workshops that will allow focused discussion with geoscientists on the factors they believe influence their interpretation.

In this talk slot you can take part in the Freyja project. We will give out a questionnaire and seismic image to each member of the audience and will collect in the responses at the end. To maximise the benefits of the survey a large sample size is needed - your participation with Freyja is greatly appreciated. All participation is voluntary and you can choose not to take part.

1 - Bond et al., 2007, What do you think this is? "Conceptual uncertainty" in geoscience interpretation, GSA Today, v17, 4-10. doi: 10.1130/GSAT01710A.1