

Human Bias in Geological Interpretation – How Much Uncertainty Does It Introduce?

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To quantify the range in interpretations of geological data by professionals, we have asked over 200 geoscientists to interpret a seismic section. Our aim was to assess the impact of interpretation on structural models and, ultimately, on prospectivity. A crucial element of the project was to create a known geological scenario, to compare interpretations against, a 'catch 22' situation if using 'real' seismic. We have created our data-set in the structural modelling and restoration program 2-DMove in which we determined the input parameters for the model. Synthetic seismic was 'shot' across the model to create an image for interpretation. Individuals were asked to interpret the image and provide information on their level of experience in: years, tectonic regimes, industry, academia etc.

Initial findings suggest that people's previous experience affects both their approach and the outcome of their interpretation. Differing interpretational styles have resulted in interpretations of the single data-set ranging from salt to inversion tectonics. We have quantified the range in interpretation of the seismic data set for style and tectonic regime, and consider the impact this has on potential prospectivity. Our initial results show that those that have worked predominantly in a particular tectonic regime have in many cases brought their experience from that regime to play in their interpretation. Their prior knowledge has biased their interpretation. Can we quantify the bias of individuals in the generation of this range of interpretations and modify industry workflows to minimise the impact on prospectivity?