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### **Probabilistic Fault Seal Assessments Northwest Australia: Data Elicitation Versus Data Mining**

The risking of fault seal in many prospect and field appraisals is often conducted in an empirical manner. A rigorous methodology for rapidly estimating the probability of a fault sealing or non-sealing is presented using a data and observations of a basin in North Western Australia.

The study discriminates between faults that: -Seal, -Act as conduits for across fault flow -Form up fault breaches or conduits for reservoirs

Assessing whether faults seal or not requires knowledge of stratigraphy, lithology, fault geometry, past and present stress state. Often this information is poorly understood or incomplete. In an effort to deal with the uncertainty, a probabilistic approach has been applied to the problem.

The workflow relies on a mathematical fault displacement model (MFDM). This describes an abstracted faults geometry, and damage zone. Superimposed on the fault is a stratigraphic succession and stress state. Finally, a displacement field is overlain.

Using the MFDM a range of commonly used fault sealing indices have been trialed using Monte Carlo simulations. Many of the geological distributions required were mined from a comprehensive well database or publicly available data. In an effort to explore the impact of data and experience a second set of distributions were elicited from observations of workers in the study area.