

Quantitative Characterisation of Fractured Cretaceous Reservoir Units, Kurdistan

Product Summary

Incorporating in-depth analysis of ninety thousand fractures from 125 high quality exposures, this data-rich study provides you with a full range of carefully constrained, comprehensive, quantitative fracture parameters. These are optimised to give you direct inputs to support robust modelling of Cretaceous fractured reservoirs.

Study sites were carefully selected throughout Kurdistan to focus on key reservoir formations: **Shiranish, Aqra-Bekhme, Kometan (+/- Dokan), Qamchuqa (+/- Garagu),** and **Chia Gara**. Other formations are also included to provide constraint on the mechanical stratigraphy for the entire Cretaceous sequence.

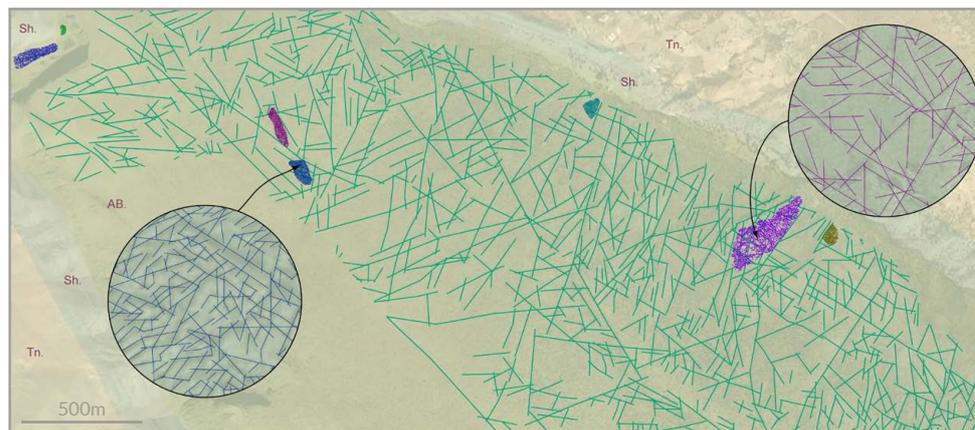
Direct Relevance to E&P Challenges

The outputs of the study are specifically aimed to provide you with:

- In-depth understanding of the most significant factors affecting fracture porosity, permeability, and reservoir connectivity.
- Conceptual understanding of the fracture systems for each formation – and a clearer basis for establishing high case and low case scenarios.
- Potential improvements in development strategy: new insights to optimise well planning and maximise fracture intersections with the wellbore.
- Quantitative parameters suitable for Discrete Fracture Network (DFN) and other fracture modelling.
- Detailed insight into intensity drivers needed when upscaling to create full-field predictive models.

“Excellent! We simply took values direct from your report straight into our fracture models ... easy!”

Fractured reservoir expert from a European supermajor in 2016, following purchase of our Kurdistan Triassic-Jurassic study.



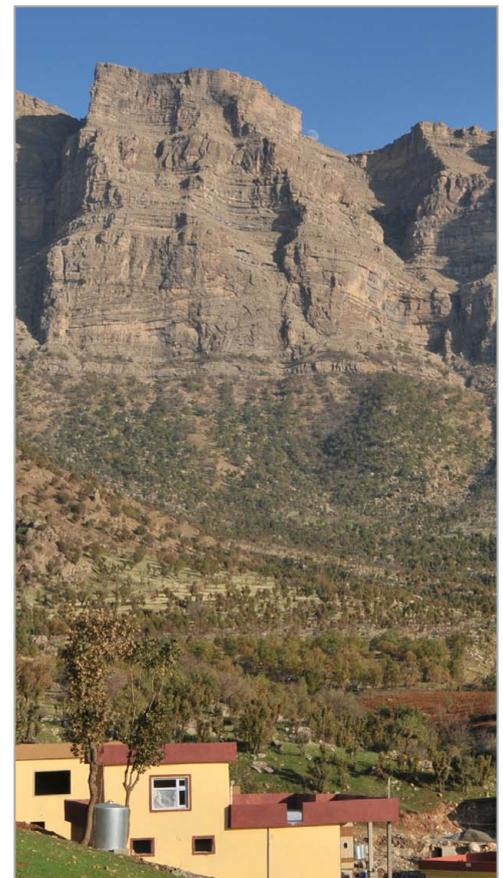
Map view of examples of interpreted fracture data from pavement sections, analysed at various scales. Data are overlain on GRL's Zagros-wide digital geological map (available separately).

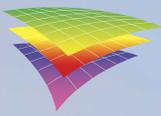
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Fracture Analysis

Integrated Geoscience from Fieldwork, Satellite and Sub-Surface Data

Product Details

Product deliverables are focused towards a set of conceptual fracture network models (CFMs) derived for each of the main reservoir formations. Each CFM is structured in terms of seven parameters that are central to fracture modelling:

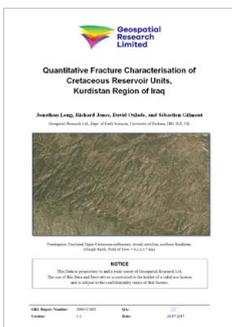
- Fracture **orientation**, including allocation of fracture sets, analysis of the orientation of fractures relative to local bedding and large-scale four-way closing anticlines, and regional variations across Kurdistan.
- Linked fracture **size-intensity**, to predict multi-scale length and height distributions, and aspect ratios.
- **Spatial clustering**, to assess scale-dependant background fracture distributions, and fracture corridors.
- Vertical and horizontal **connectivity**, based on analysis of ca. 200,000 fracture intersections and terminations, including scale-dependant node analysis and branch analysis.
- New insight into fracture **apertures** and **morphology**.
- **Mechanical stratigraphy** of the Cretaceous units and implications for fracture size distributions and connectivity.
- **Intensity drivers**, including the effects of map-scale folds and faults on background fracture intensity.



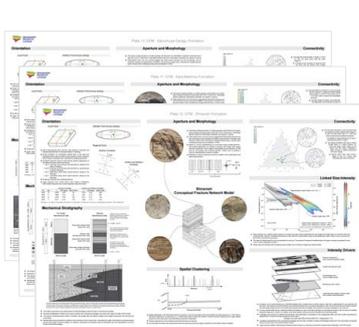
Fracture characterisation is based on detailed outcrop studies, analysis of Cretaceous cliff-sections, and multi-scale satellite image analysis.

Product Contents

- Detailed 200-page report, with top-down summaries, detailed description and discussion of results, implications for E&P, explanation of methodology and limitations; richly illustrated with 134 figures.
- Summary plates detailing the Conceptual Fracture Model (CFM) for each reservoir formation.
- Summary plates illustrating the key characteristics typically observed in outcrop for each Cretaceous formation, particularly with regard to mechanical stratigraphy and its implication for the fracture network.
- Excel spreadsheets with comprehensive metadata and quantitative fracture parameters.
- Five appendices containing the underlying data to support the conclusions and interpretations of the main report (in total over 350 pages with 583 graphs and figures).
- User support including hands-on workshops to ensure effective transfer of knowledge and optimal incorporation of the product into your E&P workflow.



Report



CFM plates for each formation



Appendices

Find out more
geospatial-research.com/zagros

Discuss your needs
richard@geospatial-research.com