



Explore Geoteric

Powerful, fast analysis of your seismic data to
enable exploration and development workflows.

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INTRODUCTION

Decode. De-risk. Deliver.

Decode

Data volumes are growing, allowing analytical methods and attributes to constantly evolve and improve. By giving you significantly more information, Geoteric's interpretation modules let you extract large volumes of detail, as well as efficiently decode and intuitively manipulate geophysical data – helping you determine features of interest across exploration, production and development.

De-risk

Geoteric gives you the tools to apply your knowledge and experience in extracting the stories found within data. Working with your people and your data, Geoteric software gives you the confidence to effectively de-risk and develop resources safely.

Geoteric's AI fault interpretation service turbocharges the understanding of your assets. Providing increased resolution, it lets you identify hard-to-spot features that could have a negative impact on production or exploration – an expensive discovery to make by drilling.

Deliver

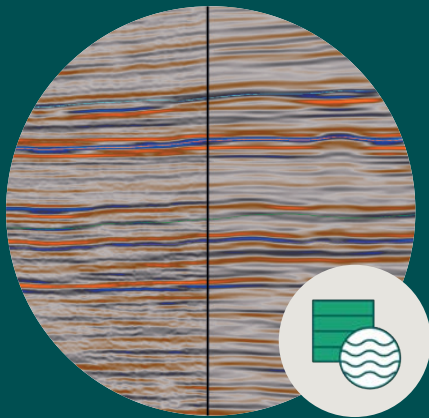
Time pressures and tight deadlines are often dictated by external factors such as licence rounds and rig availability. Geoteric can deliver results quickly, mitigating risk without sacrificing quality.

OUR MODULES

A picture paints a thousand words

Software designed to help you quickly and efficiently work from play to prospect, allowing you to rapidly build a diversified portfolio.

Geoteric's best in class geological evaluation software clearly visualises your subsurface, allowing interpreters to combine their knowledge with the best possible picture throughout exploration, development and production. Our suite of solutions has been designed to make the process of interpretation faster, more accurate and more insightful than ever before, supporting the delivery of safe and efficient operations.



Condition

Sharper and cleaner images

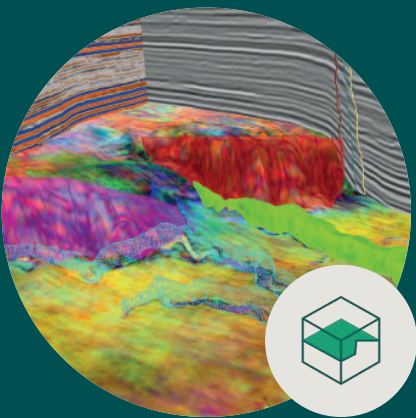
Produce industry leading data and sharper and clearer images. Improve signal to noise ratio for optimal structural interpretation and attribute analysis.



Reveal

Reveal the geology

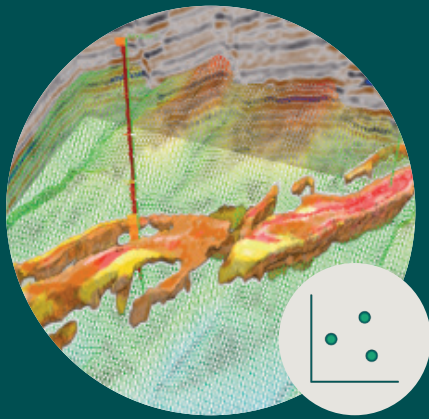
Intuitive colour blending of seismic attributes unlocks greater insights into the geology and allows geoscientists to focus on the subsurface rather than the process.



Interpret

Adaptive interpretation

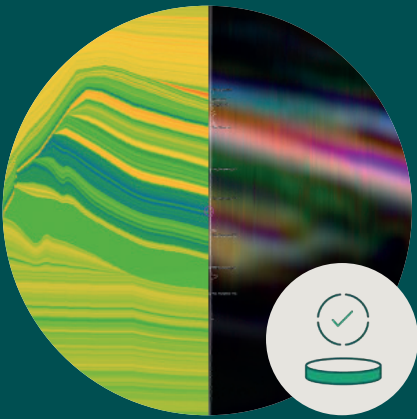
Adaptive interpretation delivers more accurate interpretation in less time. Incorporating the building blocks of machine learning.



Classify

Greater understanding

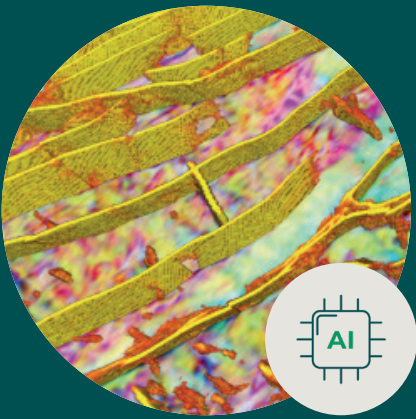
Using machine learning, identify different seismic classes and relate them to your geology. Directly transfer the learning and models to your favourite geocellular modelling package.



Validate

Reduce uncertainty

Efficiently validate your interpretation and model. Correlate synthetic seismic volumes generated from your geological interpretations with the original seismic data.



AI Fault Interpretation

Integrated Intelligence


With our artificial intelligence (AI) fault interpretation service, we are removing the hype from the machine learning and AI technology cycle and replacing it with delivery.

CASE STUDIES


Shallow Hazard

A detailed shallow hazard assessment reveals the possible constraints from man-made and geological features, to ensure appropriate mitigation practices are identified and adopted.

Geoteric modules

 Condition

 Reveal

 Interpret

 Classify

 Validate

 AI

Challenge:

The Browse Basin is located off Australia's West coast, and consists of over 140,000 Km2 of fluvio-deltaic sediments. This contains over 30 tcf of gas from the Jurassic Plover Formation. Areas like this are often associated with various drilling hazards, like carbonate build ups and polygonal faulting, so identifying and localising shallow hazards before drilling is essential for safely selecting an appropriate location for field infrastructure development.

Solution:

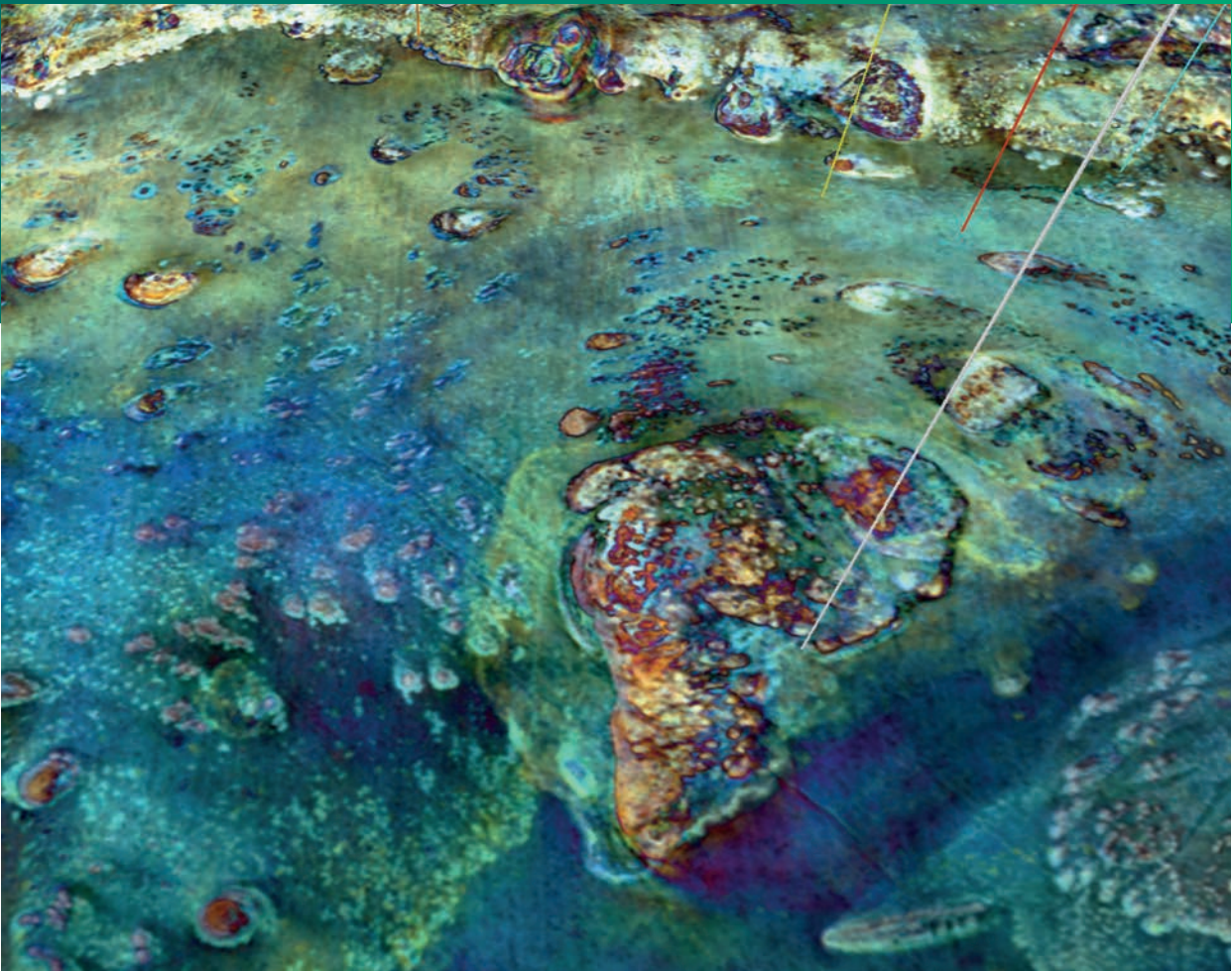
Geoteric's multi-attribute workflow was used to develop an effective shallow hazard assessment. Data conditioning involved noise attenuation to improve the signal to noise ratio and spectral enhancement. This allowed better lateral continuity of reflectors and overall vertical resolution of events, while preserving both stratigraphic and structural detail.

Using High Definition Frequency Decomposition with RGB colour blending of discrete magnitude frequencies, Geoteric revealed shallow hazard geomorphologies like carbonate pinnacle reefs and karstification. This was possible thanks to the algorithm's ability to preserve vertical resolution. RGB colour blending of angle stack data also helped to unmask geological elements in the basin by highlighting subtle features masked by full-stack data.

Geoteric's Fault Expression workflow was used to confidently delineate shallow fault networks using CMY colour blending of several different edge attributes that represent different seismic characteristics.

Result:

This multi-attribute approach allows for a rapid and detailed understanding of shallow hazards and is achieved in a significantly shorter timeframe compared to conventional methods.



We were able to identify and reveal shallow hazard geomorphologies such as carbonate pinnacle reefs and karstification with high confidence due to the algorithm's ability to preserve vertical resolution.

Image: Frequency Decomposition RGB Colour Blend mapped over a horizon surface highlighting carbonate pinnacle reefs and karstification from the Poseidon 3D Dataset in the Browse Basin, offshore Western Australia.

CASE STUDIES

Reservoir Heterogeneity

Accurate, high-resolution reservoir models are critical to a better understanding of the reservoir heterogeneity for enhanced oil recovery.

Geoteric modules

 Condition

 Reveal

 Interpret

 Classify

 Validate

 AI

Challenge:

Composed of thin sandstone surrounded by shales, the Stybarrow oil field is located in the Exmouth Sub-basin on the NW shelf of Australia and within the Macedon Member reservoir.

The reservoir is compartmentalised with a complex fault and fracture network so understanding their precise locations – as well as the presence of sand or shale – was critical to maximising both production and safety.

Solution:

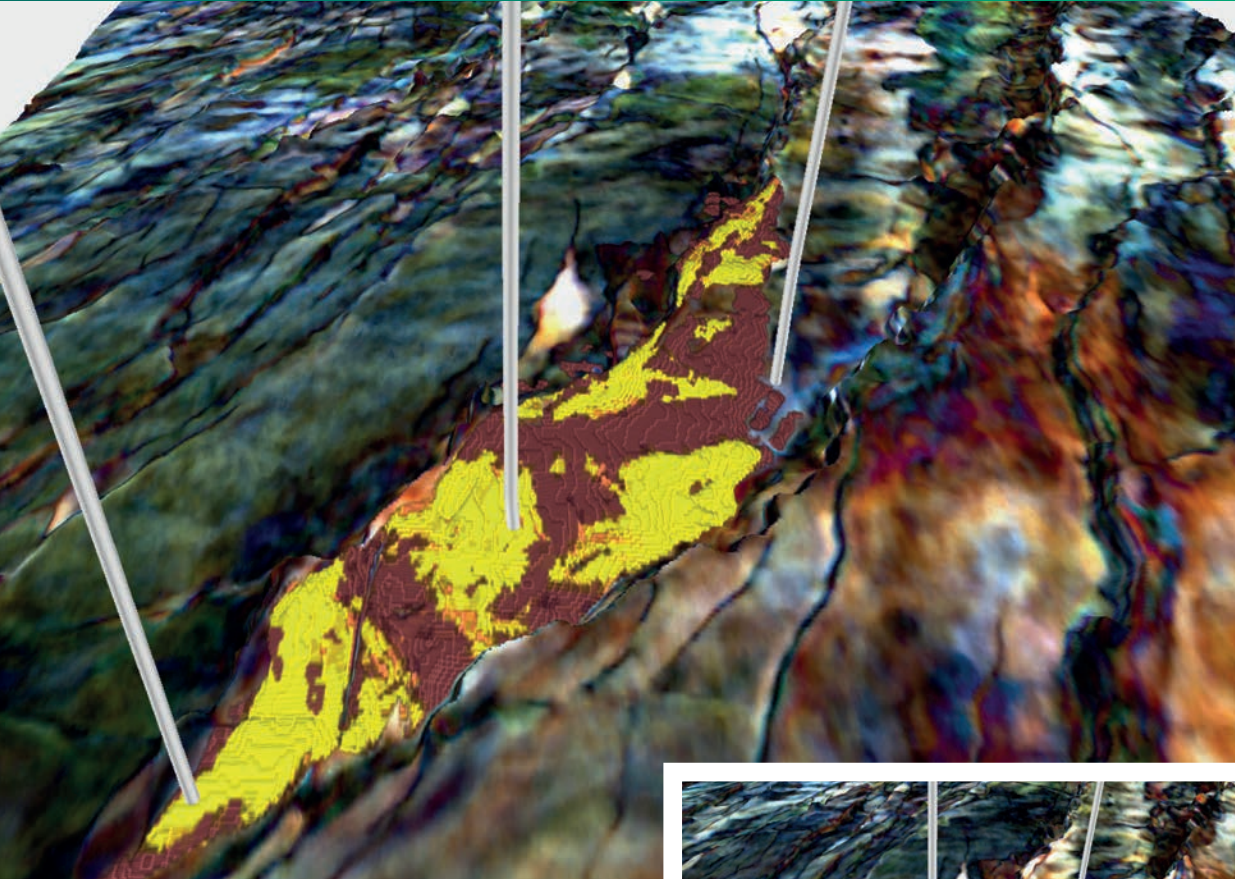
A reservoir heterogeneity study was conducted using Geoteric’s standard modules (see page 14). Geoteric’s Condition module was also used to improve the signal to noise ratio and frequency content, producing a conditioned volume that was used as an input for the following workflow.

Using Frequency Decomposition, Geoteric identified and unmasked features in the reservoir, highlighting areas with better reservoir properties. Fault Expression was applied to identify and delineate any faults and fractures that could cause compartmentalisation. The reservoir was extracted as a 3D geobody using Geoteric’s Adaptive Geobodies™ technology and an Interactive Facies Classification (IFC) was performed to classify the sand (denoted yellow) and shale (brown) within the reservoir.

Workflows can be tailored to the specific challenges that you are facing. Geoteric’s technology has been successfully applied in many different geological environments, ranging from clastic to carbonate reservoirs, not forgetting unconventional, and even basement.

Result:

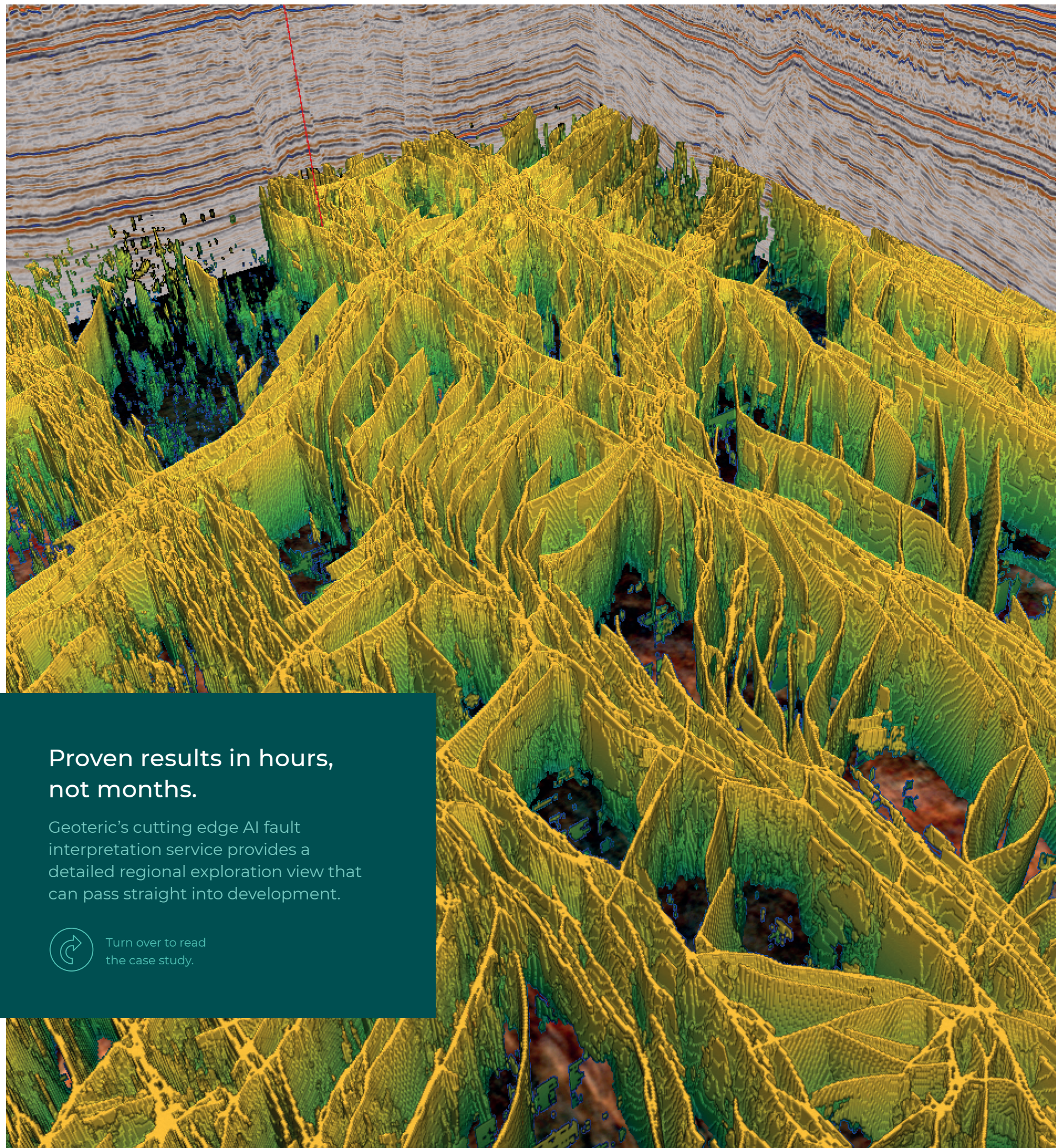
Clear identification of faults and location of reservoir facies has produced a greater understanding of the reservoir heterogeneity - essential to developing the resource effectively and safely. The clear illustration of depositional system has delivered an improved understanding of the field's reservoir compartmentalisation and can be used to identify hazards and aid well placement, avoiding costly surprises in the development stage.



Classification Key: Sand Shale

Large Image: IFC results showing the Stybarrow field classified in two different facies: yellow for the areas likely to contain sand and brown for the areas interpreted as shale.

Small Image: HD Frequency Decomposition colour blend. The blue feature in the blend has been interpreted as a shale-filled channel. Faulting is clearly imaged as black lineations.



ADVANCED CAPABILITIES

Revolutionary, not evolutionary

Works at development and exploration scale

Geoteric is a leader of technical innovation, committed to helping you to do things in a different way. Not for the sake of it, but because it helps and is now possible.


Our solutions go beyond the confines of traditional interpretation to remove restrictions from your workflow. Tight timelines should be no barrier in the delivery of a high-quality interpretation. Geoteric can provide you with the insight you need to optimise your assets.

AI Fault Interpretation Service

Developed by our team of geoscientists and software developers, our AI fault interpretation services address subsurface complexities by quickly and accurately identifying more events in a quicker time. This frees interpreters from tedious and repetitive clicking so they can focus their expertise on structural understanding and prospect scenario modelling. The service delineates the faults, leaving the interpreter to consider the implications of the interpretation and structural setting on risk, source, migration, trap, and recovery mechanisms.

Proven results in hours,
not months.

Geoteric's cutting edge AI fault interpretation service provides a detailed regional exploration view that can pass straight into development.

 Turn over to read
the case study.

CASE STUDIES

Structural interpretation & prospect generation

Informed decision-making relies on the integration of seismic data and interpreter knowledge. Interpreters' insight is crucial to optimise areas of high geologic potential and low economic risk.

Geoteric modules



Challenge: large uninterpreted volume

The Canning Basin is an underexplored Early Ordovician to Early Cretaceous Basin which has undergone several phases of tectonic deformation leading to a complex structural setting. In unexplored settings where the petroleum system is not well defined, it's crucial to understand the structural geology elements so you can discover successful hydrocarbon plays. The 100GB Canning TQ3D dataset covers an area of 4,466 Km2 with only two wildcat wells drilled within the survey area. Data analysis to understand the tectonic evolution, potential play fairways and identify prospects within such a large area can be a very time-consuming process if technology is not leveraged effectively.

Solution: Geoteric AI Fault Interpretation Service

Geoteric's new AI approach to fault detection was applied to understand:

- a) The regional structural trends, which provide indication of the timing of rifting events and formation of suitable structural hydrocarbon traps
- b) Identification of specific compartmentalised fault blocks which could constitute potential prospects.

The AI result for the full dataset was processed using a foundation AI network. This provided an excellent result by clearly highlighting both regional and small-scale faults. Clear faults were detected with high AI confidence values throughout. In this instance, no additional training of the network was required; though it is available as an option. The fault system was easily accessed thanks to Geoteric's 3D rendering capabilities, giving insight into fault connectivity and compartmentalisation.

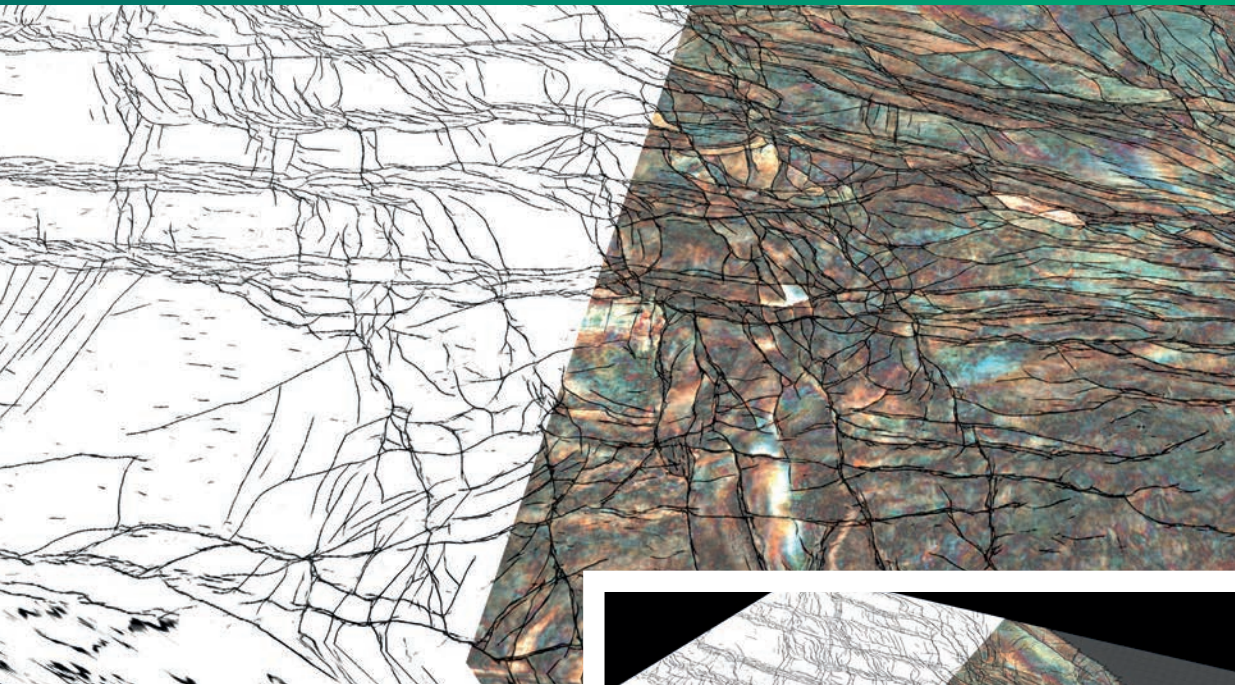
Additional processes like fault trends enabled identification of several different fault families based on their strike direction. Covisualisation of the result with other attributes such as a Spectral Decomposition RGB blend using opacity blending allowed structural and stratigraphic information to be simultaneously interpreted, with depositional features shown to be offset across fault blocks.

Result: very fast, extremely high quality fault interpretation of 100GB volume.

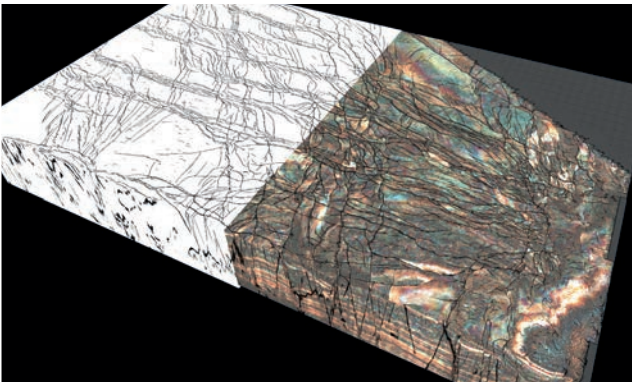
Faults of all scales were imaged and detected in a day. High resolution subtle offsets and cross-cutting of different fault sets provide evidence for the timing of fault movements and risks of potential associated trap leakages. The level of detail and clarity of the AI result exceeded what was possible with conventional seismic attributes.

The output allowed excellent regional structural interpretation, while analysis of the fault trends enabled several families of faults to be identified and isolated.

The interplay between structure and stratigraphy was assessed using Opacity Blending of the AI faults with Spectral Decomposition. This made identification of potential target fault blocks of material size very efficient. Overall the time for early screening to prospect generation is greatly reduced, at the same time, understanding of the regional structure and the implications of such on the hydrocarbon system was greatly increased.



Large Image: To test the result, Geoteric ran the data through two independent workflows to see how they marry up. RGB blending technology results distinctly supported the result from the AI technology. The quality and consistency between technologies is clear to see, the only point of similarity is the initial data.



Small Image: See structures that have been impossible to resolve until now. Combining data, people and cutting edge technology to get the best results.

We are using cutting edge AI technology to enable this information liberation. Combining this with human intelligence to deliver understanding of your reservoir that has never been possible before.

OUR OFFERING

Our Modules

The essential centrepiece of our suite of modules is Interpret, which enables full horizon, fault and geobody interpretation directly on colour blends. Our four additional modules can be accessed from Interpret, giving you powerful functionalities to solve the unique challenges you may face.

Base Module



Interpret

Data management

- Internal data management
- Data import & export
- 3rd party links (Petrel, DSG)

Visualisation

- Colour blend creation (RGB, CMY, HSV)
- Opacity blend creation
- 3D volume rendering

Utilities

- Volumetric calculator
- Horizon tools (flattening, cropping)

Seismic interpretation

- Automatic fault extraction
- Adaptive Faults™
- Adaptive Horizons™
- Adaptive Geobodies™

Additional Modules



Condition

Noise and spectral expression

- Noise attenuation
- Spectral whitening and bandpass filtering
- Easy to use parameter optimisation



Reveal

- High definition and standard frequency decomposition
- Fault expression
- Iso-proportional slicing
- 50+ seismic attributes & segmentation



Classify

- Interactive Facies Classification (IFC)
- Multi-attribute and colour blend based, semi-supervised classification
- Uses Machine Learning algorithms



Validate

- Forward modelling
- Model validation with synthetic seismic and RGB frequency blend
- Layer & wedge models
- Well log based rock properties
- Fluid substitution

WE ARE GEOTERIC

Expanding what's possible in the world of geological interpretation

Pioneering:

Industry leading software and service offerings.

Integrated:

Used as a standalone programme or in combination with third-party software.

Experienced:

Knowledgeable geoscientists delivering technical training and onsite support.

Knowledge transfer:

Innovation and advancement via technology transfer.



- A Houston
- B Newcastle upon Tyne
- C London
- D Kuala Lumpur
- E Perth

30+
Years of experience

With offices in Houston, Newcastle, London, Kuala Lumpur and Perth, and over 30 years experience, our teams have the passion to reveal the true value of your data.



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Geoscience Australia and New Zealand Petroleum & Minerals

