

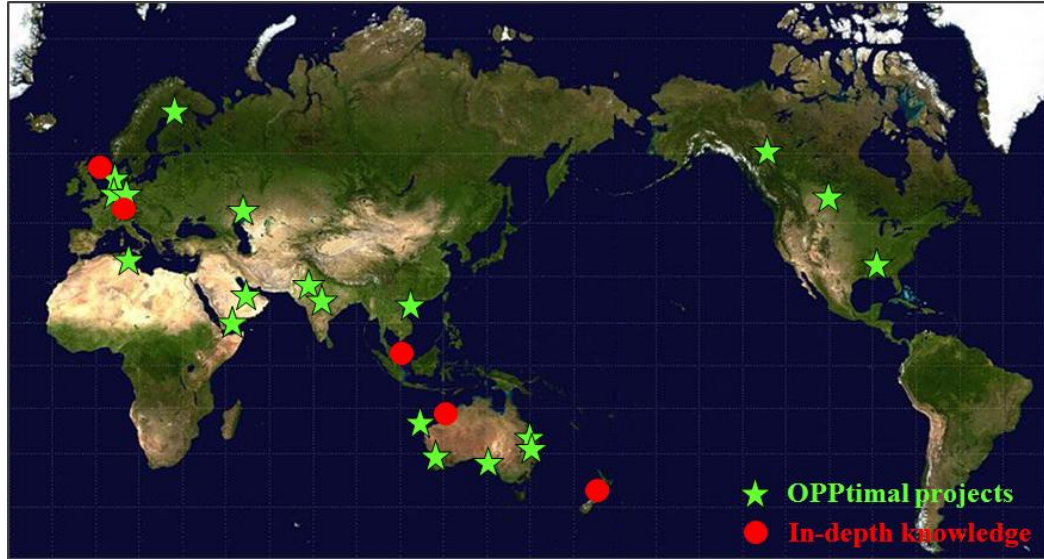


OPPtimal Resource Evaluation Services

OPPtimal Exploration & Development Pty Ltd is an independent technology service company with broad international experience and activities, delivering innovative, leading-edge and profitable solutions to the Resource Industries:

- Oil & Gas
- Unconventional:
Tight Gas, Shale Gas & Oil,
Coal Seam Gas / CBM
- Coal Mining
- Minerals
- Geothermal
- Groundwater
- Geosequestration
- Underground Gas Storage

OPPtimal is focused on delivering unique consulting services for resource clients around the world.



In addition to providing general Exploration & Development consulting services, OPPtimal is specialized in seismic reservoir characterization. OPPtimal utilizes the very latest seismic volume interpretation methods, and has developed its own innovative & proprietary techniques and workflows for the visualization of fracture networks from seismic data at extremely high resolution.

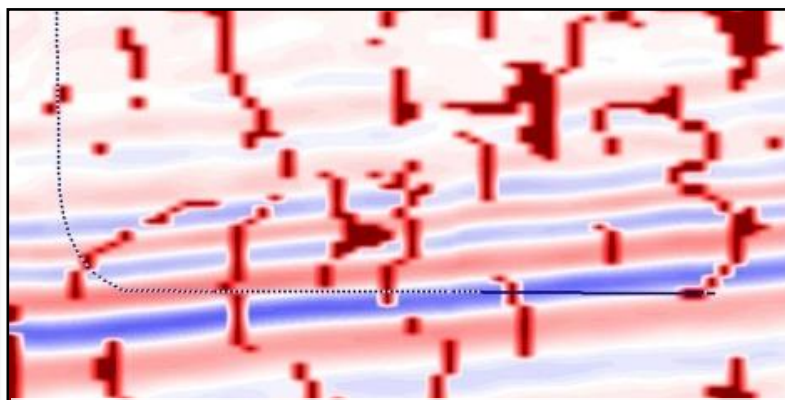
By integrating hi-res seismic fracture networks with drilling, mining and production data, fluid barriers, fluid conduits, fault-related mineralizations or drilling & mining hazards are identified, predicted and incorporated into new exploration and development optimization workflows.

Through this, exploration and development risks and costs can be reduced, fracture intersections in existing wells can be identified, 'sweet spots' can be directly targeted in future wells and resource production can be significantly increased, particularly from fractured, unconventional, compartmentalized and structurally complex resources, as well as mining or other resource assets.

Horizontal well targeting fractures in Chalk & Shales

Seismic Section

No seismic faults identified or predicted from Reflectivity data: 'sub-seismic' faults "hit and miss" fracture development drilling



Fault identification: multiple seismic faults penetrated by well: 'sub-visual' faults targeted fracture development possible !

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Leading-edge, high quality & profitable solutions for the resource industries





OPPtimal™ Fracture Network Characterization

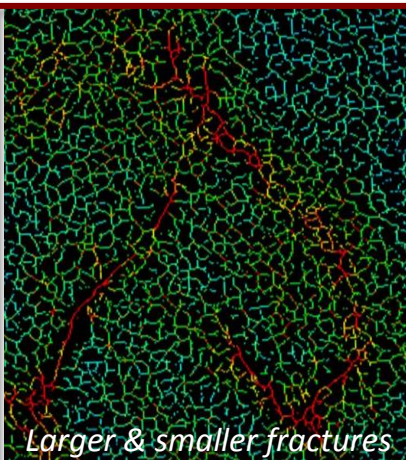
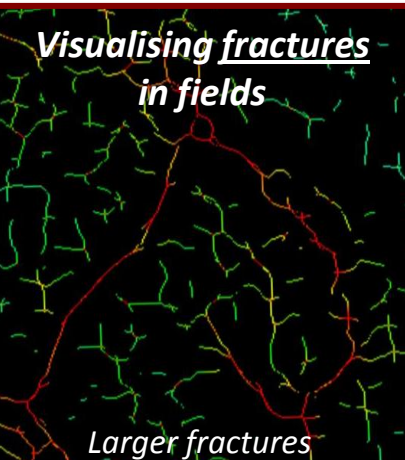
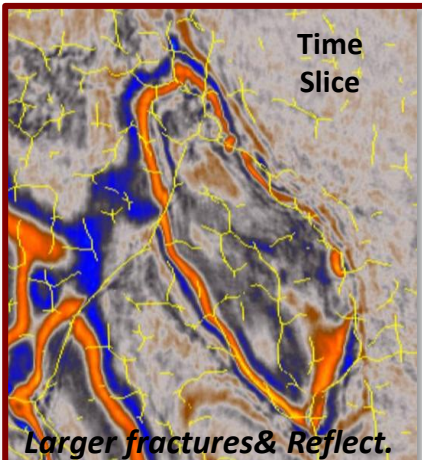
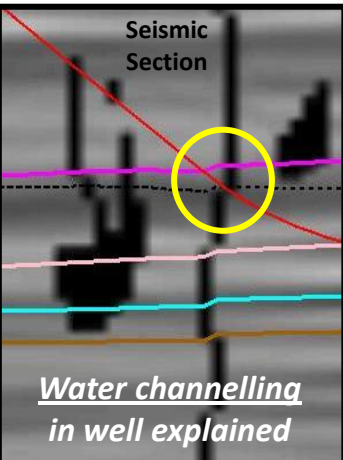
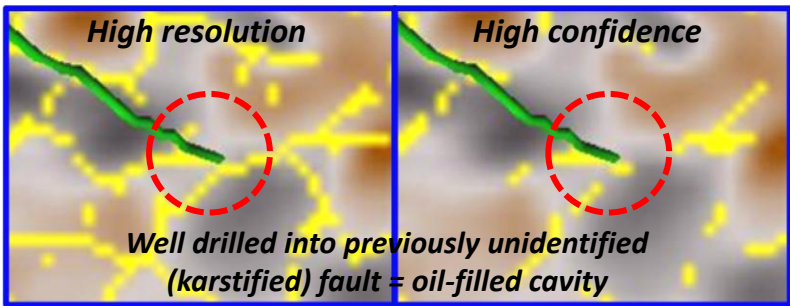
Seismic-based identification of natural fracture networks

OPPtimal's unique and fully integrated fractured reservoir analysis approach generates calibrated and fully deterministic fracture network volumes which are subsequently utilized to optimize the drilling, mining and production of resources.

The following benefits can be achieved with *OPPtimal™* workflows:

- ✓ automated extraction delivers higher objectivity, quality, reliability, repeatability and resolution compared to traditional (manual) fault mapping
- ✓ significantly faster fault/fracture mapping and improved structural definition & understanding of structural geometries and fault/fracture populations
- ✓ proper quantification of fracture certainty/confidence and fracture properties (size, orientation, throw, aperture, frequency and fracture density)
- ✓ identification or verification of fracture intersections in existing wells or mines
- ✓ improved understanding and prediction of fracture-related drilling or mining issues: fluid losses/gains, wellbore stability/integrity, break outs, local stress variation, total well losses, gas kicks, roof collapse, rock bursts, tunnel/mine losses, water inflow, outbursts, fault reactivation, microseismic events etc.
- ✓ improved understanding and prediction of fracture-related production issues: fracture productivity, flow enhancement, mine gas drainage, water or gas channeling along fractures, boundaries/baffles to flow, compartmentalization, juxtaposition, coal seam offsets etc.
- ✓ optimal placing of future wells with respect to fluid boundaries or fluid conduits:
 - designing wells to stay clear of faulted or fractured zones if these could cause drilling or production problems (drilling & production risk mitigation)
 - direct targeting of 'sweet spots' (productive fracture networks, undrained fault compartments)
- ✓ **decreasing exploration and development risks & costs**
- ✓ **increasing resource recoveries**

What our clients think:
"Simply incredible results, very impressive !"
"Breaking new ground in sweet spot identification and targeting !"



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Fracture visualization and drilling & production optimization workflows

