Xcalibur
SMART MAPPING

FALCON®

The world´s highest-resolution and highest-sensitivity airborne gravity technology

Exclusive to Xcalibur Smart Mapping

FALCON®

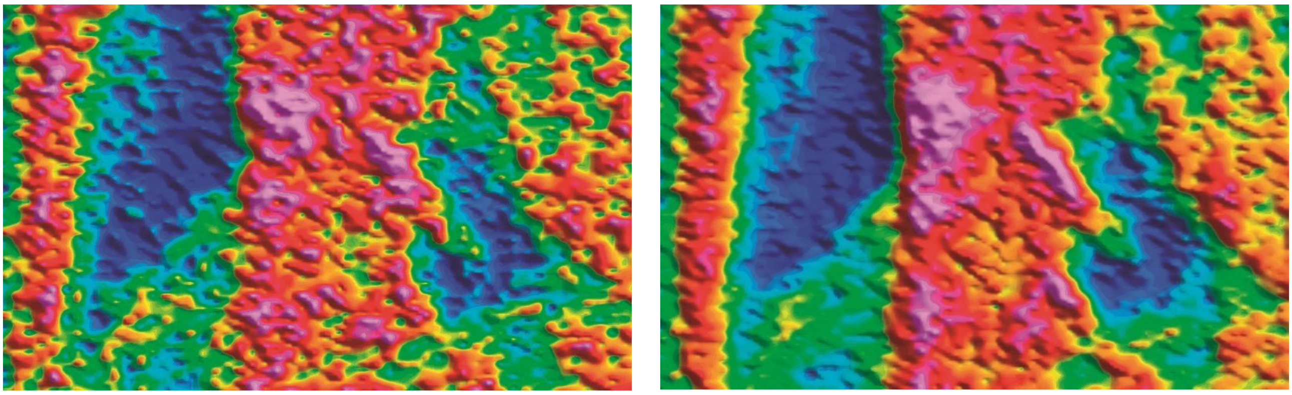
FALCON® is the only airborne gravity gradiometer system purpose-built to operate in turbulent conditions. It's unique noise rejection technology allows acquisition of the highest-quality gravity data from a range of aircraft in a variety of conditions.

FALCON® is the only AGG technology capable of operating from light, efficient turbine aircraft, and from helicopter platforms.

FALCON Plus builds on this technology advantage and the extensive global operational experience of Xcalibur Smart Mapping, to offer the lowest noise level of any airborne gravity system available. FALCON Plus is ideal for detailed mapping of near surface geology, particularly for velocity and thickness variations, which plays a major role in the accuracy of seismic static corrections.

Xcalibur Smart Mapping operates six FALCON® systems globally, on both fixed-wing and helicopter platforms. FALCON® surveys feature:

- The highest data quality available, backed by the lowest contractual noise specifications in the industry.
- Globally proven technology backed by published ground gravity comparison datasets.
- High quality data in turbulent conditions – More production, less standby.
- Smaller, more efficient aircraft – Lower cost.
- No ground access required - 100% coverage over topography, vegetation, water bodies, restricted areas.
- Rapid acquisition and processing – Fast track your exploration.
- All FALCON® surveys acquire magnetic data as standard.
- Industry-leading technical, operational and interpretation personnel.
- Safety, Quality and Project Management expertise.

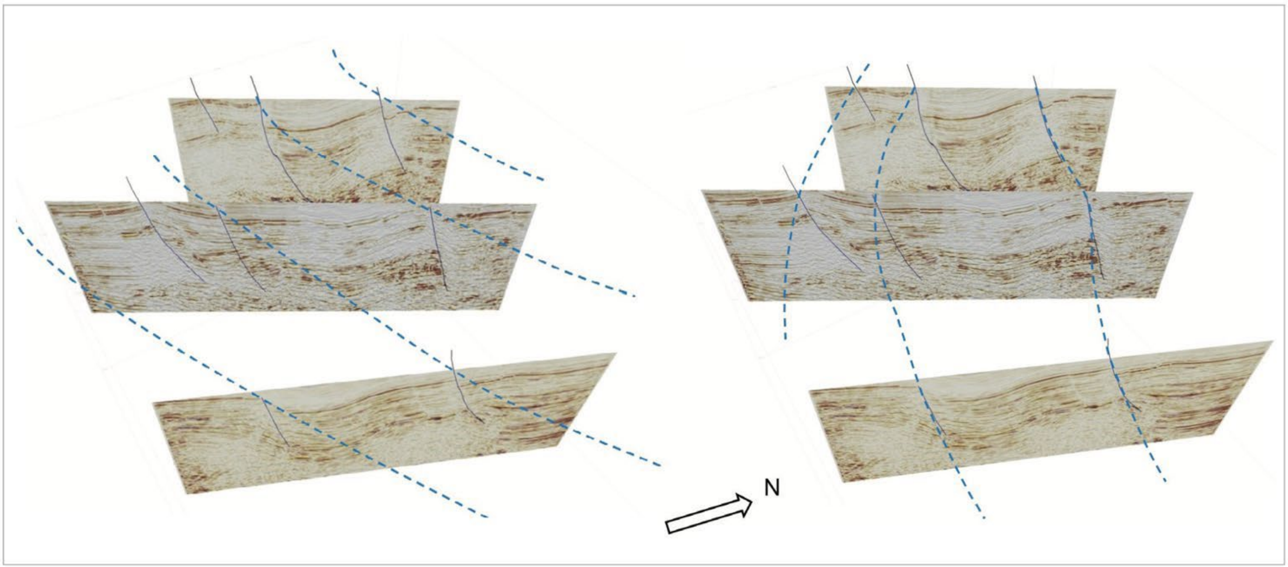


Vertical gravity gradient response from near-surface geology and deeper basement sources. (left image) FALCON® and (right image) FALCON Plus – lowest noise AGG available

FALCON® removes ambiguity in correlation of structures between 2D seismic lines:

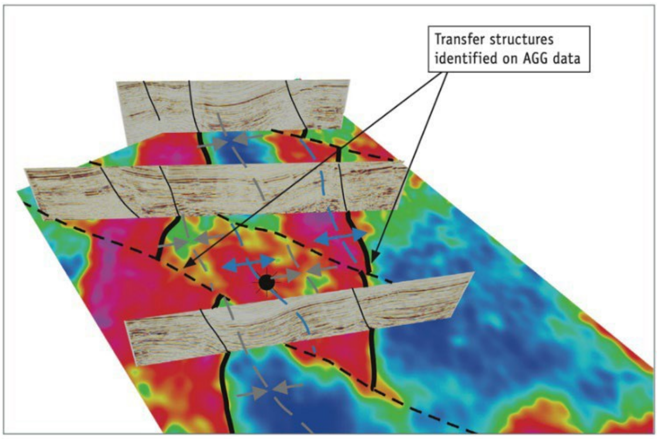
Identification of transform structures, Ungani North, Australia

The figure below shows two alternative and equally valid correlations of structures on adjacent seismic lines. It is not possible to determine which of the NW/SE or N/S orientation of structures is correct using the seismic alone.



Ambiguity in the interpretation of wide-line-spacing 2D seismic data

When the seismic interpretation is considered in conjunction with the FALCON® data, the correlation of the structures becomes clear. Transfer structures not previously recognized from seismic data become obvious.
FALCON® provides valuable input into the interpretation of seismic data, effectively turning 2D seismic into 2.5D seismic for a fraction of the cost of the original seismic survey.



FALCON® data removes ambiguity in seismic interpretation

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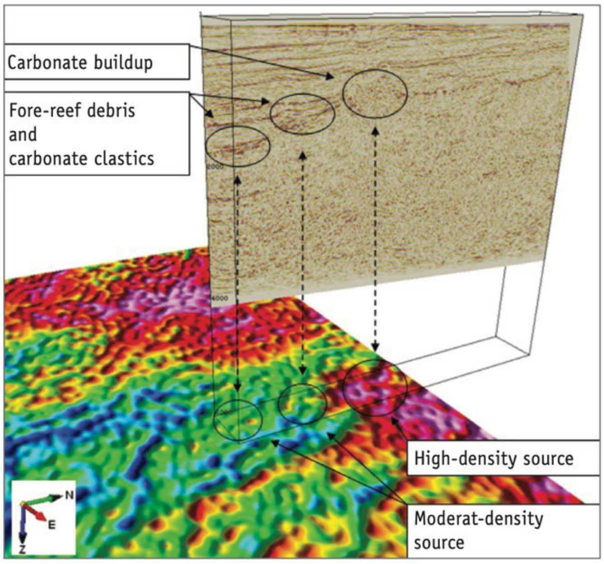
3D integrated basin model with FALCON®:

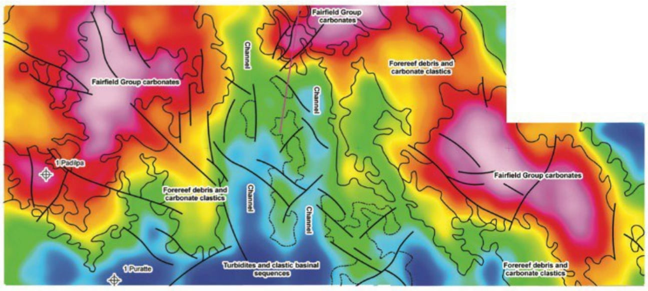
Join interpretation of FALCON®, magnetic, 2D seismic and well data, King Sound, Canning Basin, NW Australia.

An integrated interpretation of FALCON®, magnetic and seismic data was used to generate a 3D geological model of the sediments and basement in the King Sound region of the Canning Basin in northern Western Australia.
The area comprises carbonate, carbonate clastic and siliciclastic rocks. Comparison of the FALCON® data with the 2D seismic profiles shows that the high-density areas coincide with carbonate buildup on the margin of the shelf, the intermediate density areas coincide with fore-reef debris and carbonate clastic, and the low-density areas coincide with siliciclastic and turbidites.

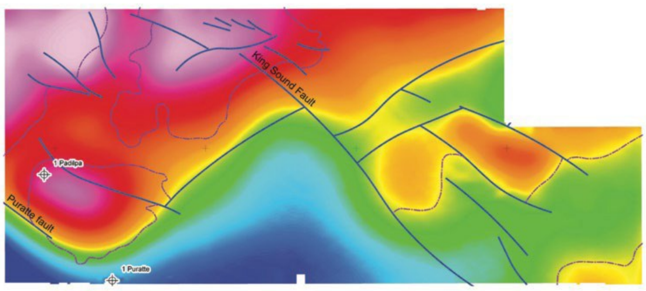


Lithotypes match between 2D seismic and vertical gravity gradient (GDD) FALCON® data

Therefore, the distribution of carbonate, carbonate clastic and siliciclastic rocks along with intra sedimentary structures were mapped. Basement structures were mapped using the magnetic data collected concurrently with FALCON® data.



Geological interpretation of gravity gradiometer data based on the information from the 2D seismic data.



Geological Interpretation of the Total Magnetic Intensity image, reduced to Pole.

A 3D geological model was built by integrating the 2D seismic profiles with the intra sedimentary and the basin information from the potential field data. In particular, the 3D distribution of the sediments was defined via a voxel model. Carbonate.

Forward modeling and 3D inversion of the FALCON® GDD data were performed to provide geologically realistic updated densities which minimize the misfit between the computed and the observed data. The final 3D model was then printed by making use of modern 3D printing technologies.

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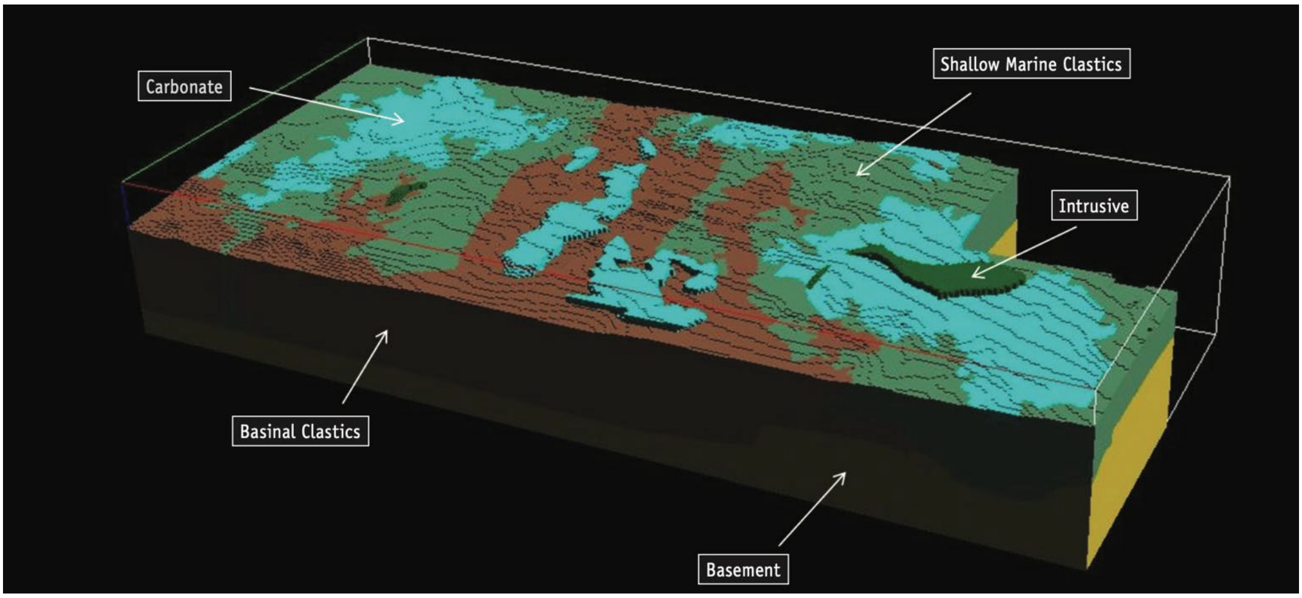
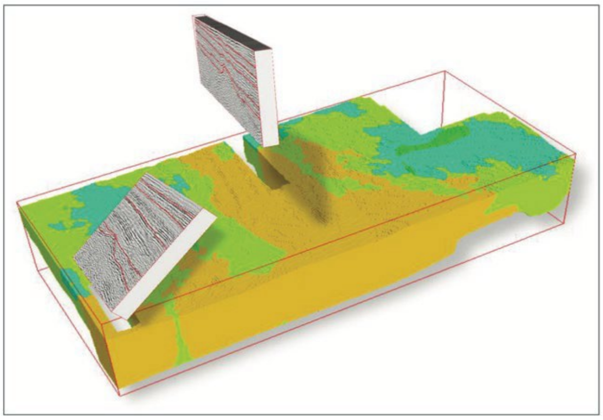


3D voxel model: each voxel is attributed with a lithological code.



Printed 3D geological model for an additional visual and tactile experience.

The 2D seismic profiles are inserted into the model.

With thanks to Buru Energy for granting permission for the data to be published.

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