

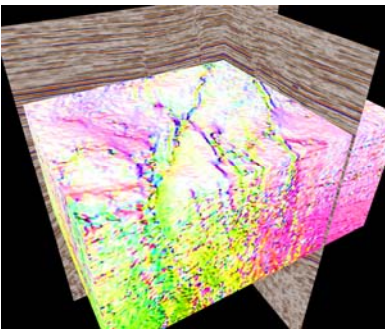
# Case Study: Leads & Prospects – Rapid Identification



## Background

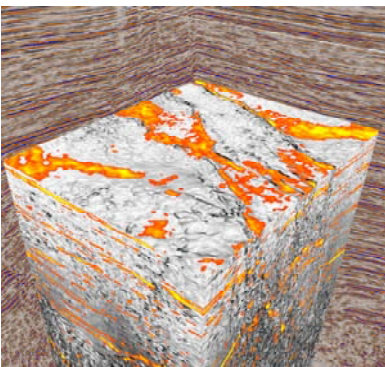
ffa were provided with approximately 400 square miles of onshore Texas data, from 3 separate surveys covering adjacent acreage. The aim was to identify new leads that could be rapidly worked up into prospects by objectively analysing and screening the 3D PSTM reflectivity volume. Neither wells nor horizons were provided to guide the processing, however both structural and stratigraphic traps were expected.

## Reconnaissance



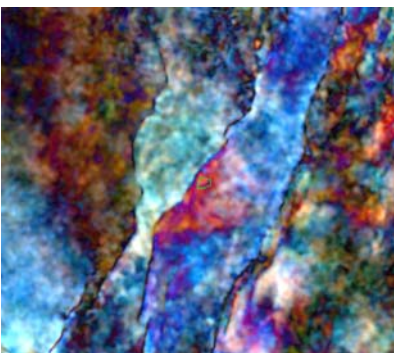
In this geological setting, areas of high amplitude with counter regional dip have proven to be successful targets. Rapid screening of the data using **Dip**, **Azimuth**, and **DipAzi Combined** volumes identified zones of anomalous dip, along with the major and minor faults.

[DipAzi Combined volume showing the green counter regional fault block.](#)



The relationship between areas of high amplitude and structure was investigated by combining the **Envelope** (Instantaneous Amplitude) volume with the **Dip** volume. In this combined **DipEnv** volume potential structural traps are indicated by areas in which high amplitude events (red/yellow areas) abut the faults (black lineations).

[DipEnv volume showing areas of high amplitude \(red/yellow\) and areas of high dip \(dark grey\).](#)



Subtle changes in the frequency expression of the data were highlighted using **3D Frequency Decomposition** and **RGB Blending**. This technique is especially adapted to analyse amplitude responses for stratigraphic traps as pinch outs and pore fill variations can be expressed as changes in frequency.

[RGB Blend of 3 frequency response volumes. The Red area, \(in the centre\) in this case, pinpoints a frequency anomaly that abuts a main fault. This anomaly was investigated as a potential target.](#)

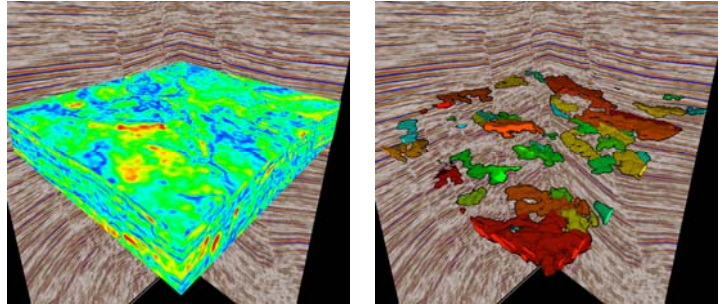
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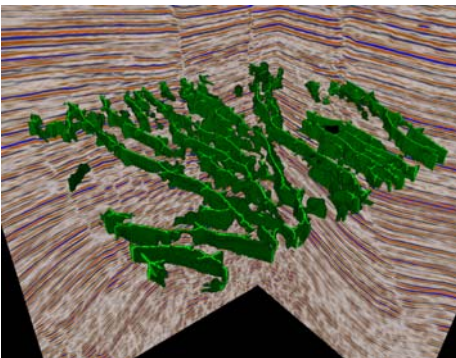
## Lead Identification

Identified leads were investigated further using geobody analysis. **Geobodies** were segmented from the **Envelope** volume and the Frequency Decomposition RGB blend using a connectivity analysis technique.

The **Envelope** volume (left) and 3D geobodies (right) extracted using connectivity analysis.

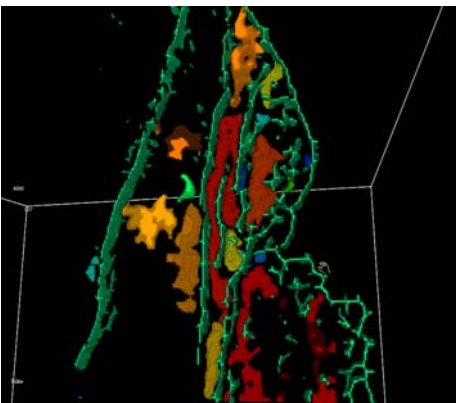


## Lead Ranking



Major and minor faults were identified and extracted as 3D volumetric fault planes (**Fault Detect** volume) using ffA's fault imaging techniques.

**Fault Detect** volume illustrating the network of faults in the data.



A rapid insight into the relationship between the identified leads and the faults was achieved by combining the **Fault Detect** volume with the **Geobody** volume. Structural traps then became easily identified.

Combined **Fault Detect** and **Geobody** volume showing the 3D relationship between structure and stratigraphy.

Leads were prioritised based on their geometry, size and frequency response.

## Conclusions

This combination of analysis and object segmentation enabled leads to become prospects in a matter of weeks.

- 18 leads were identified with the aid of the ffA reconnaissance volumes.
- 6 risked prospects have been developed from the 18 leads.
- To date, two of these prospects have been drilled and are commercially viable discoveries.