

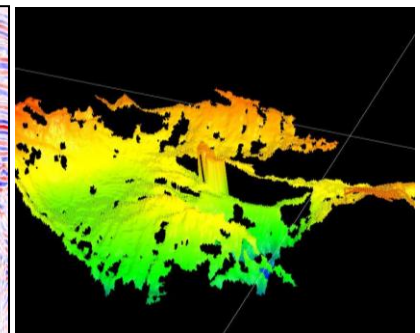
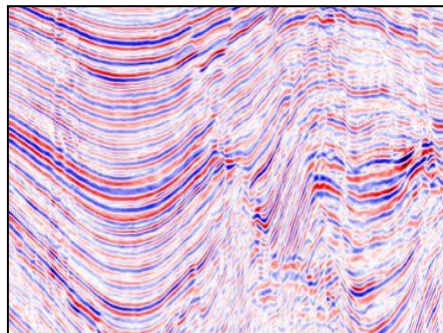
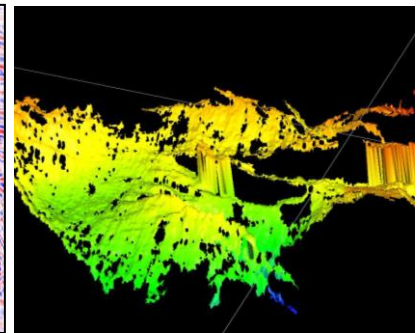
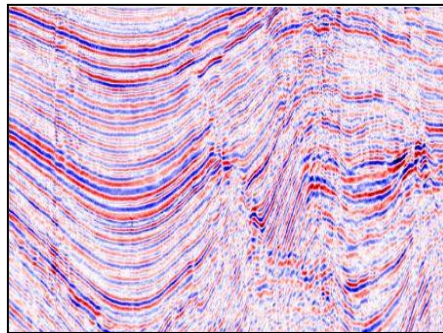
## Background

At ffa, we provide flexible and tailored workflows that address the challenges encountered in different geophysical and structural environments. This post stack process, available in **2D** and **3D**, is carried out using our unique noise reduction and spectral enhancement techniques.

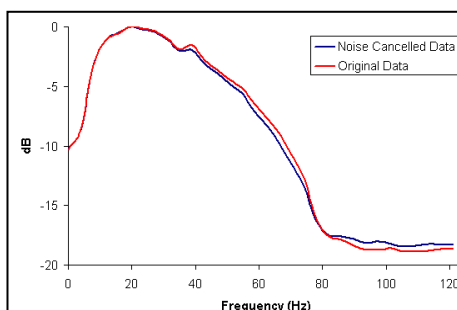
## Noise Reduction

Noise reduction is the process of removing or attenuating responses that mask the information the geoscientist needs to see and interpret.

To tackle the challenge of improving the data quality without distorting the genuine signal, ffa has developed sophisticated noise reduction processes based on adaptive anisotropic filtering techniques. The algorithm, workflows and parameter selection are tailored to each data set and interpreter's objectives therefore enabling extensive flexibility to achieve the best results.

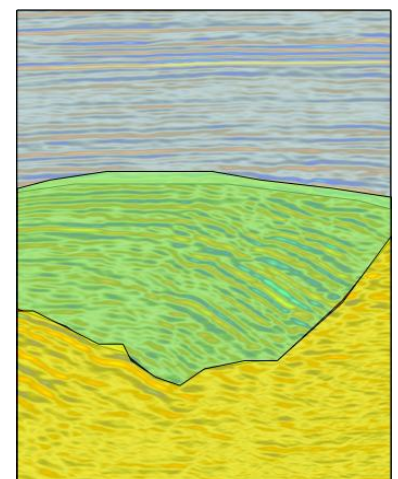
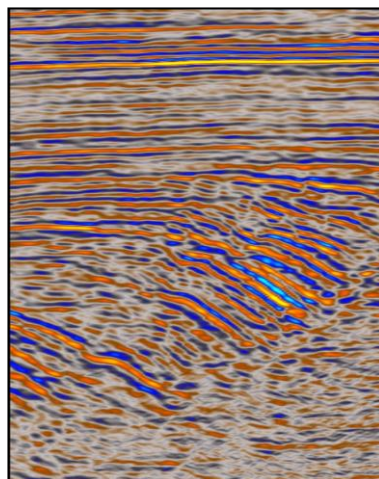


In this example the horizon generated from the noise reduced data (lower images) is smoother and contains less holes than the non-noise reduced generated horizon.



This graph has the frequency spectrums of the original data and the noise reduced data shown above. It shows that the noise reduction applied has kept the mode frequency of the original data. The strength of the higher frequencies (80Hz plus) is reduced, it is at these frequencies that noise was dominant.

As geology and noise vary with depth, noise reduction workflows can be optimised to address the geological and structural variations at each layer independently whilst providing a high quality output for the full time/depth range.



Strata specific noise reduction applied to a US Gulf coast data set.

*ffa's Noise Reduction workflows are available through  
ffa Services or within ffa's Software: SVI Pro and SEA 3D Pro*

*'We were pleased with the results of the ffa Spectral Enhancement workflow, which aided picking the reservoir units and improved resolution of small-scale faults'.*

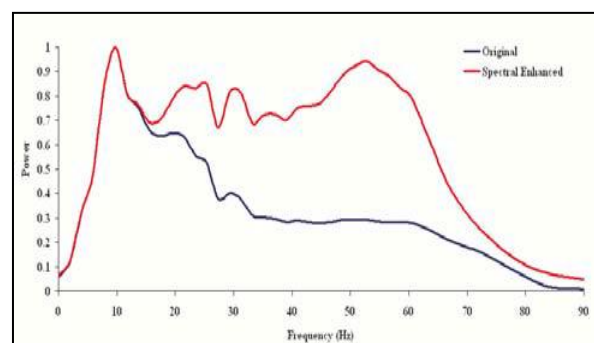
**Reg Robertson, Senior Geophysicist,  
Fairfield Energy Limited.**

## Spectral Enhancement

ffa's spectral enhancement workflow combines volumetric frequency analysis techniques with 3D adaptive noise reduction filtering to enhance the spectral content of seismic data whilst increasing the signal to noise ratio. The workflow can be applied to post-stack data and provides full control over the degree of spectral enhancement to meet your resolution needs.

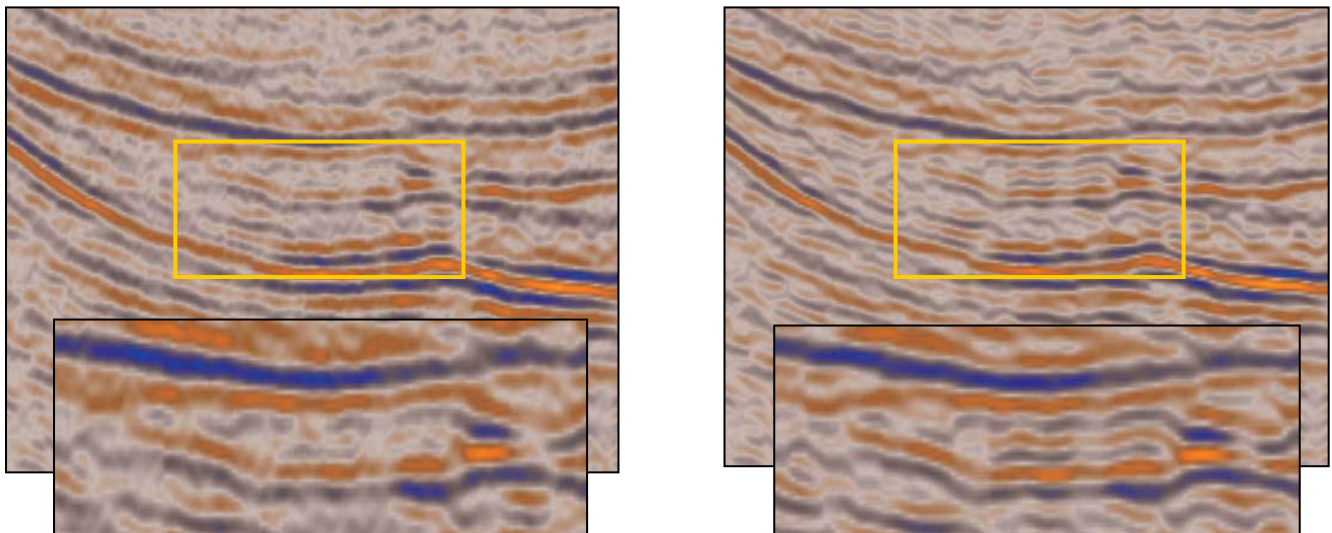
Our spectral enhancement workflow improves event continuity and produces a more detailed seismic image for:

- Enhanced imaging of large and small scale faults
- Improved attribute extraction and analysis
- More accurate event thickness estimation



## Results

Following spectral enhancement and noise filtering, improved vertical resolution enables identification of thin stratigraphic layers, increases definition of faults and fractures, and genuine low frequency responses remain unchanged.



The left hand images show the original North Sea data and the right has the results of the spectral enhancement workflow.

## Acknowledgements

Data courtesy of Seitel Data Inc. and StatoilHydro.