

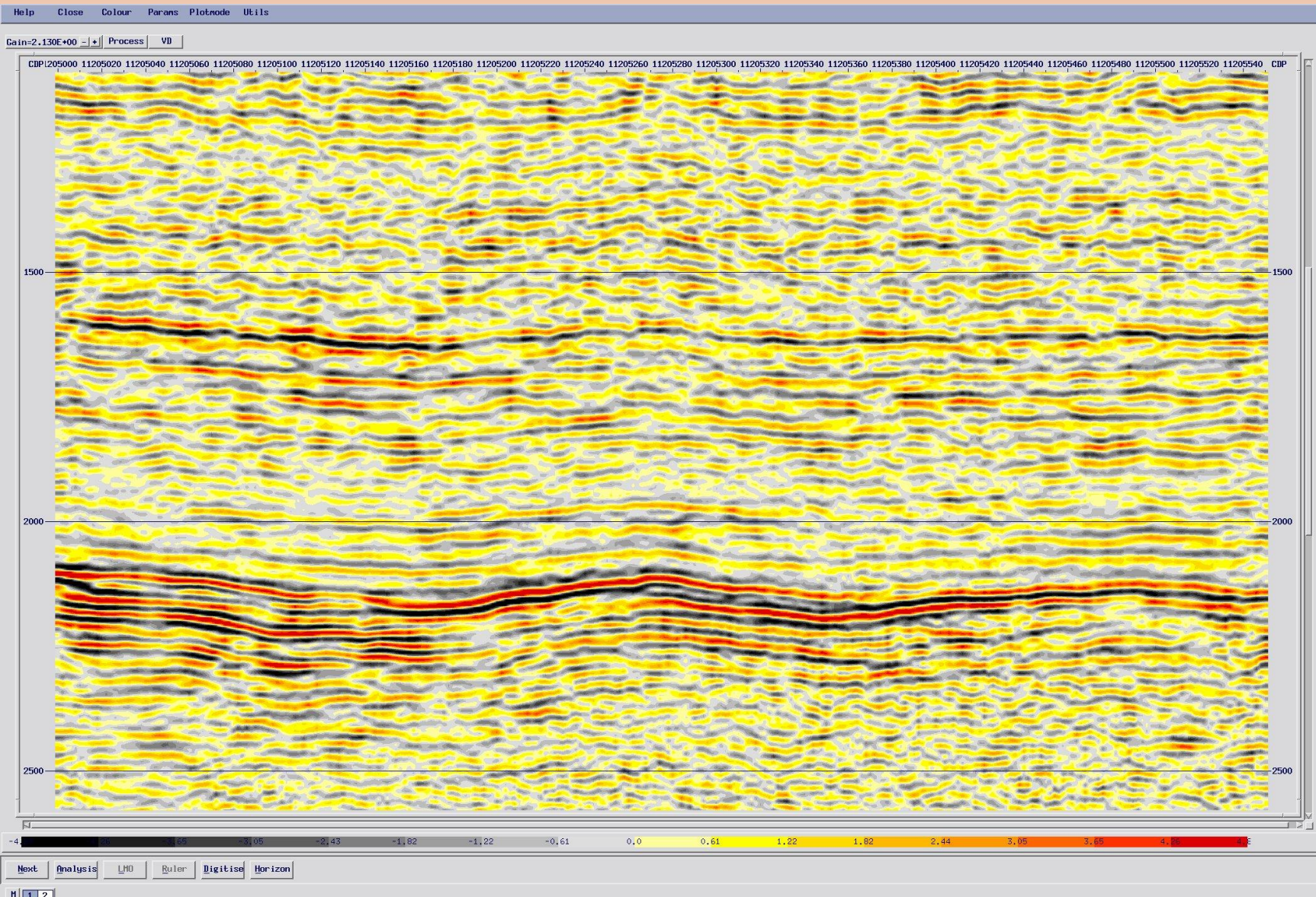
Cooper Basin 3D reprocessing

Verona 3D

Processing flow summary

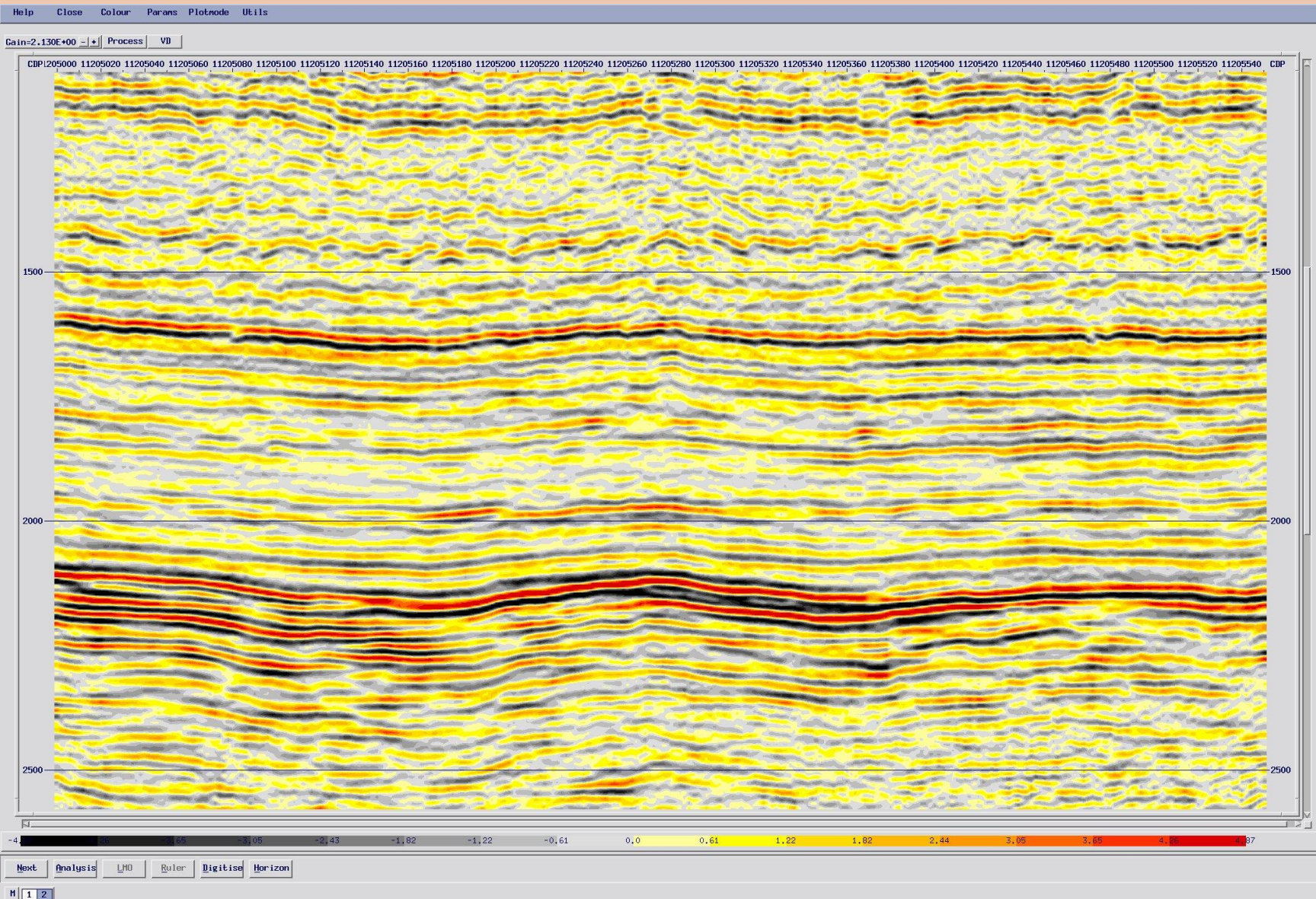
- Reformat from SEG-D and add geometry
- Noise attenuation
- 3D refraction statics
- Surface consistent residual statics
- Fourth order NMO corrections applied to account for differences between vertical and horizontal velocity
- Pre-stack time migration (using AusGeos Proprietary EOM processing) with geometry-linked migration aperture to reduce noise
- Migrated to 25m x 25m output grid
- High density velocity analysis for sharper imaging (25m x 25m / every trace)
- Spectral balancing, filter and scaling tailored to acquisition parameters

Comparison with Kirchhoff PSTM



AusGeos EOM processing

Same velocity field



AusGeos Processing Results

- Seismic data with excellent horizontal and vertical resolution
- Faults are sharper and better defined
- Final result has good signal to noise making it possible to produce a more reliable interpretation in less time
- Improved quality means auto-tracking works better - allowing user to converge on a quality interpretation in less time
- Interpretation-ready (SEG Y format) delivered

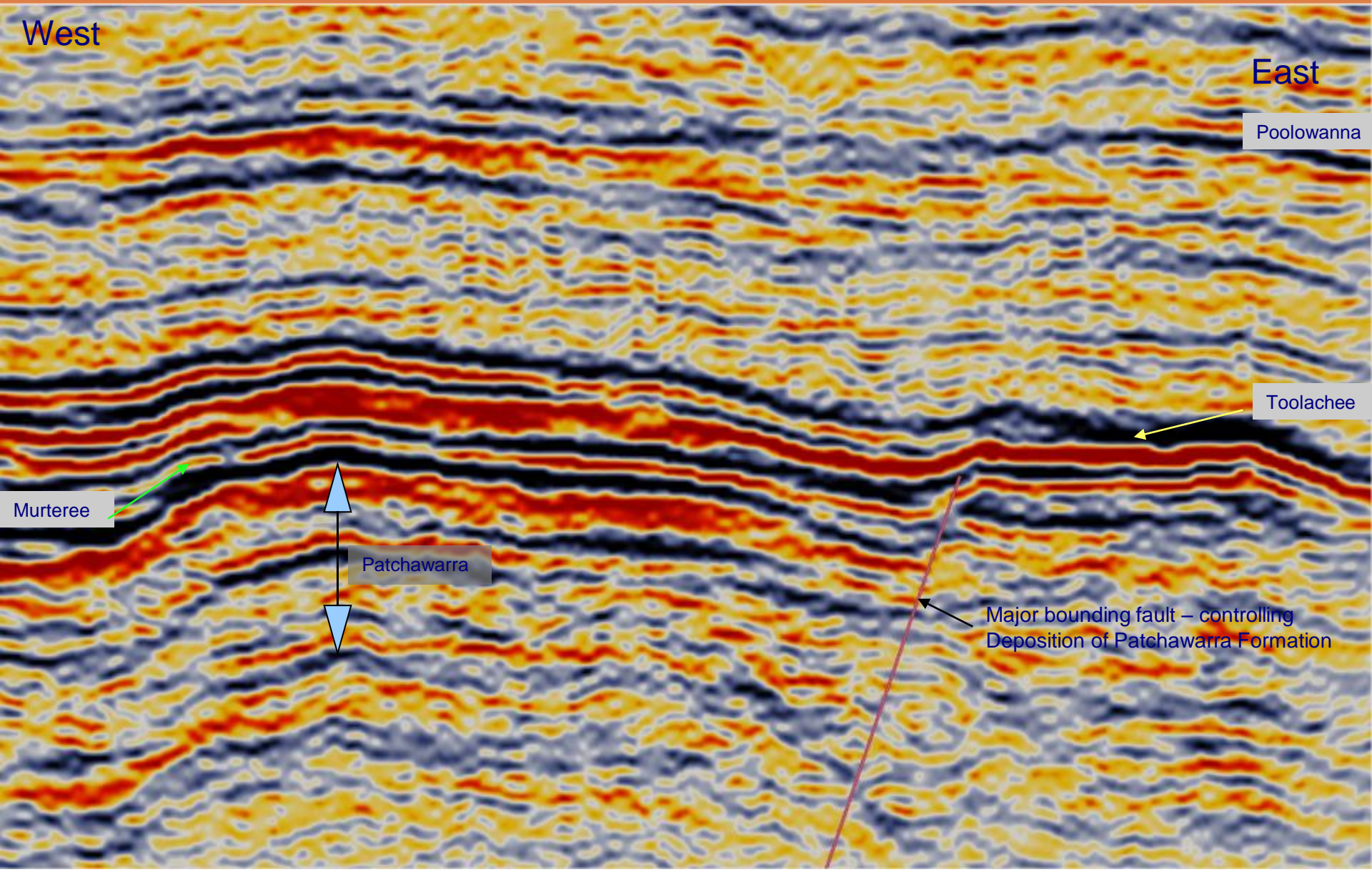
Preliminary observations - Interpretation

- Cadna-owie, Namur and Birkhead can be auto tracked with minimal editing required. Channel features in the Birkhead – Hutton are visible on amplitudes extracted from EOM-processed data on horizon slices
- Interpretation of the Toolachee shows depositional lobes with basement controlled fault terraces controlling their distribution
- Permian deposition is fault-controlled on a less regional scale, but at the reservoir scale discontinuities are dominantly stratigraphic. Preliminary interpretation shows that it should be possible to define reservoir continuity within the Permian using EOM processing

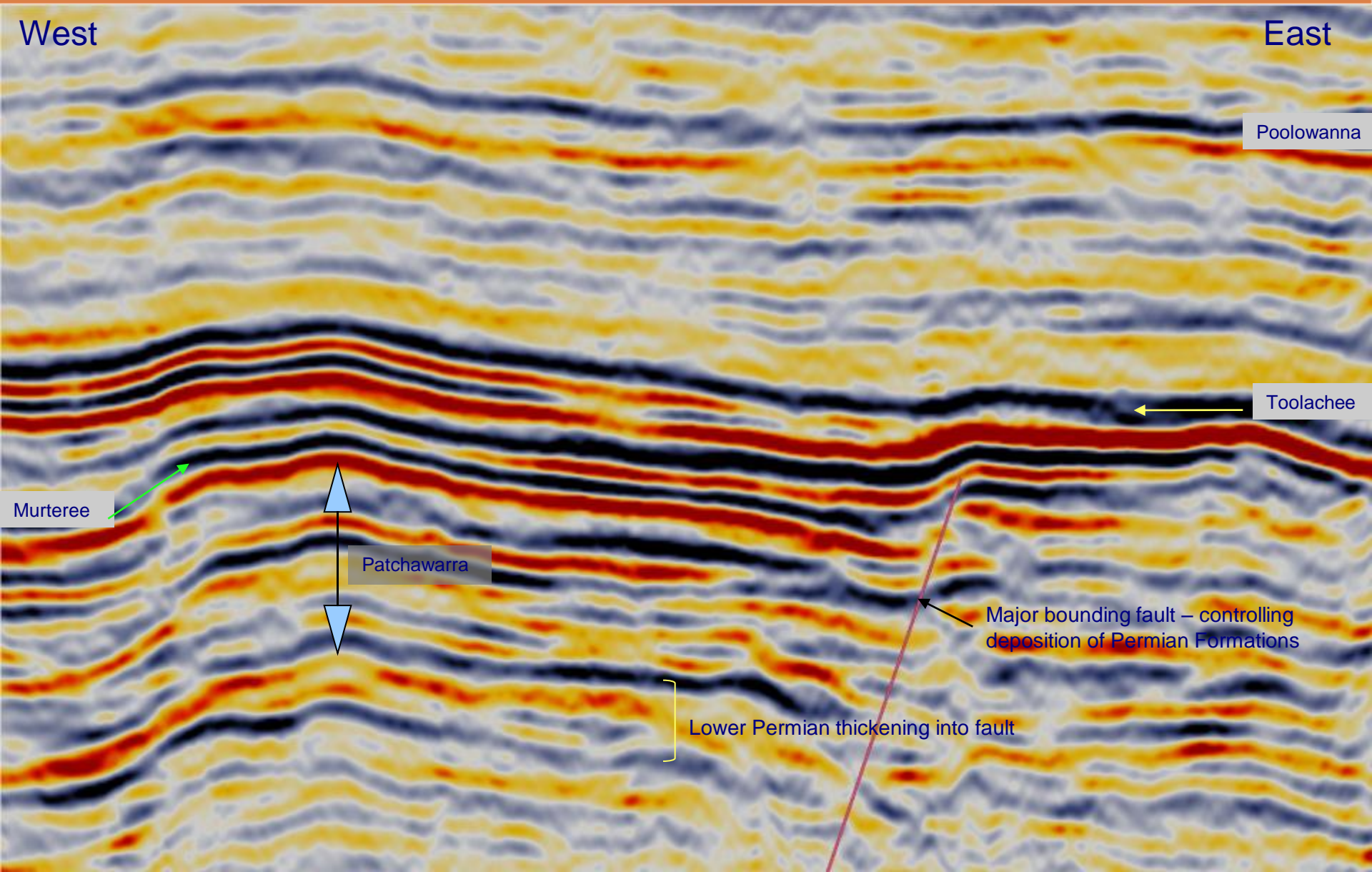
Analysis of the existing data shows

- Kirchhoff migration artefacts, low signal to noise combined with unrealistic spectral whitening has resulted in signal break-up up which could be misinterpreted as faulting

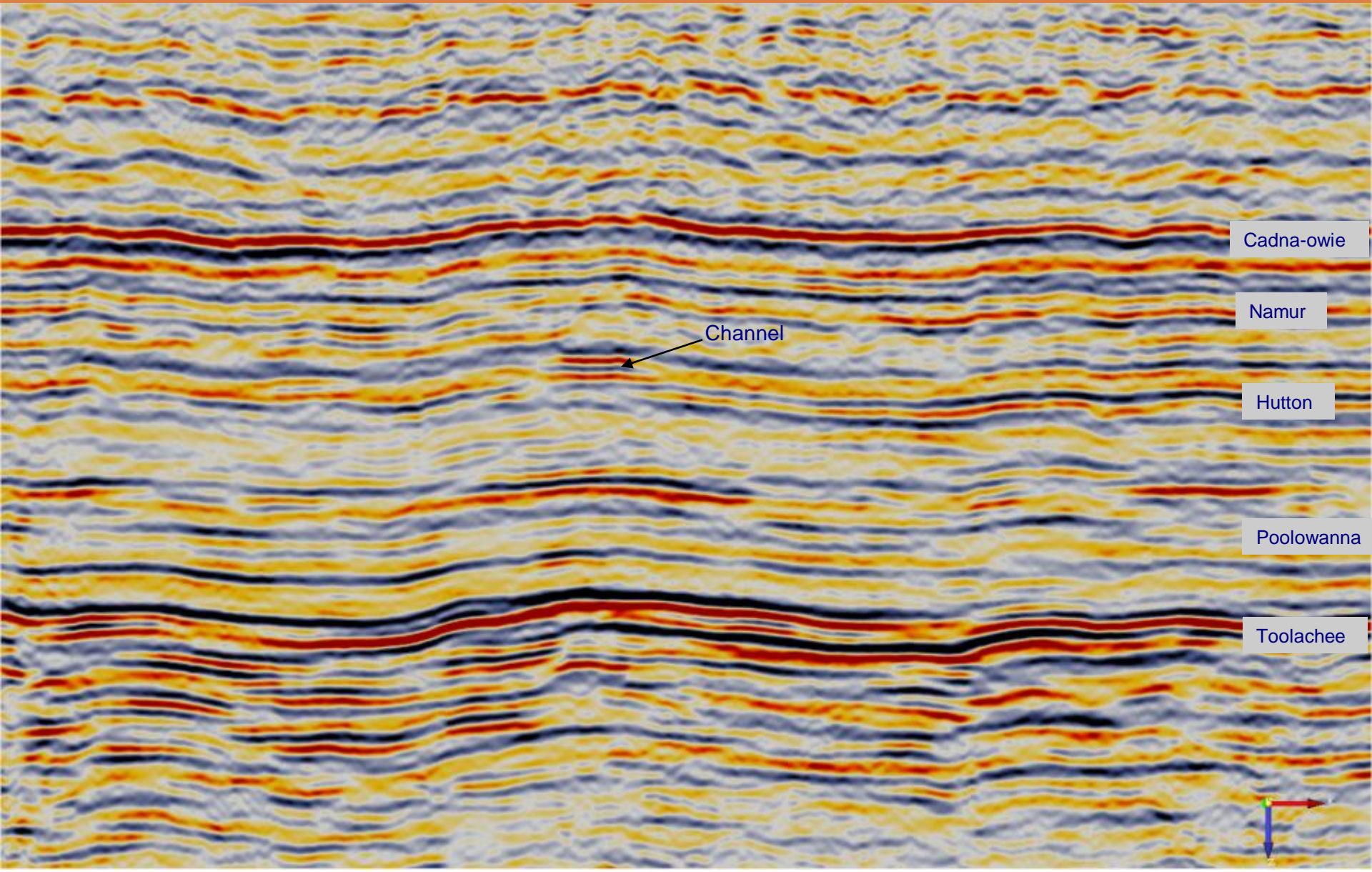
Inline – across Verona - existing data



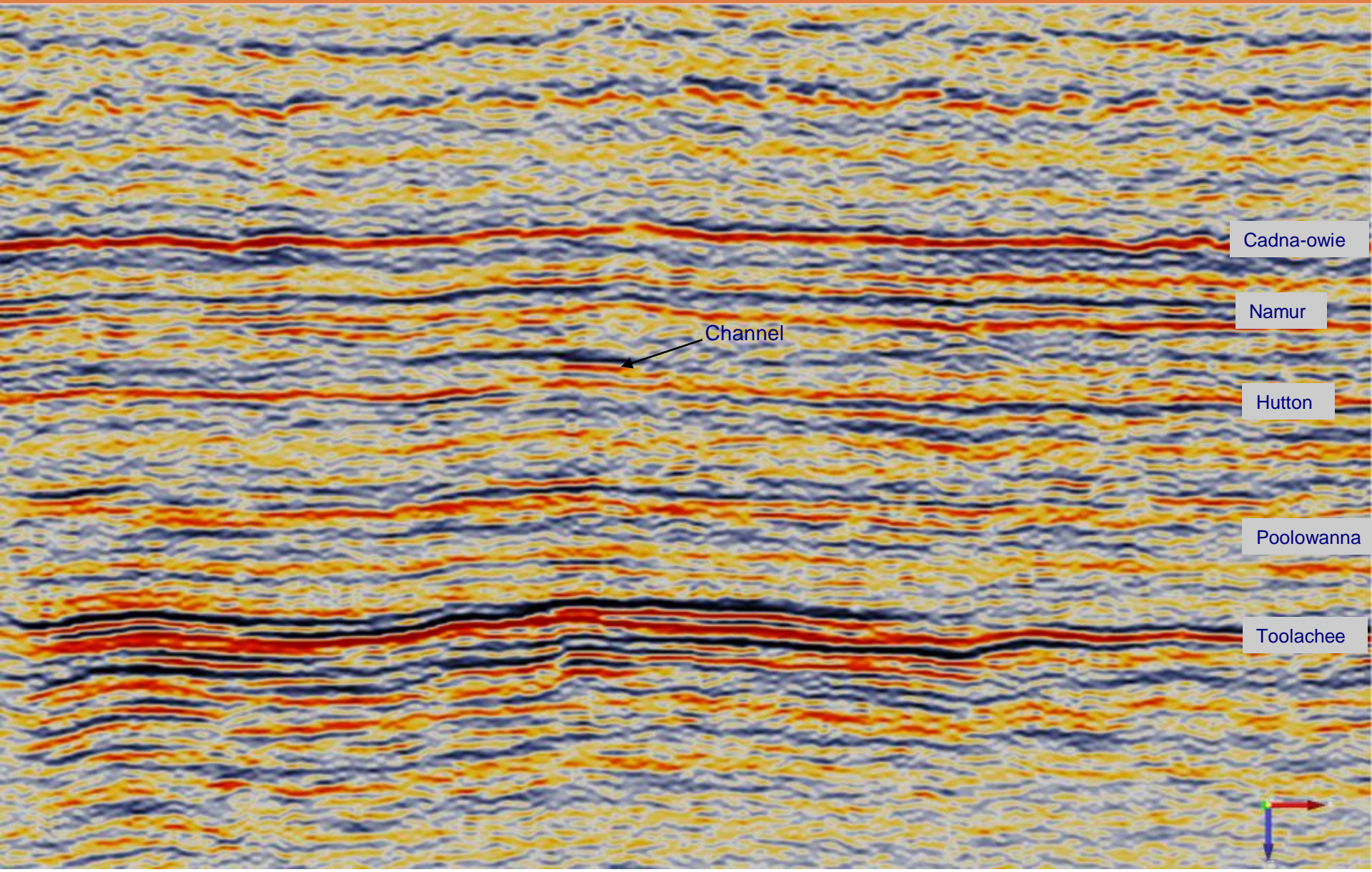
Inline – across Verona – EOM processing



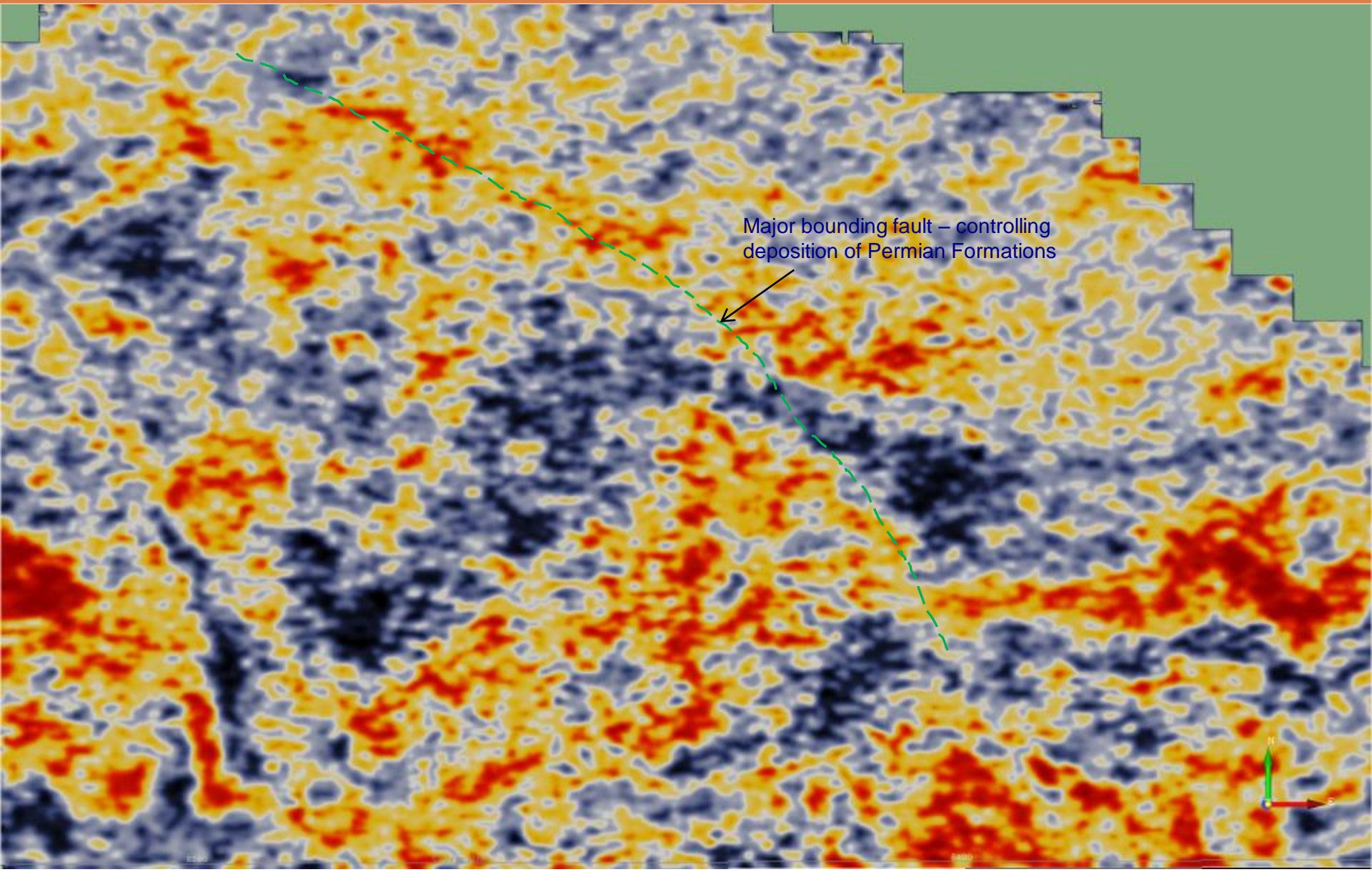
Inline AusGeos EOM processing



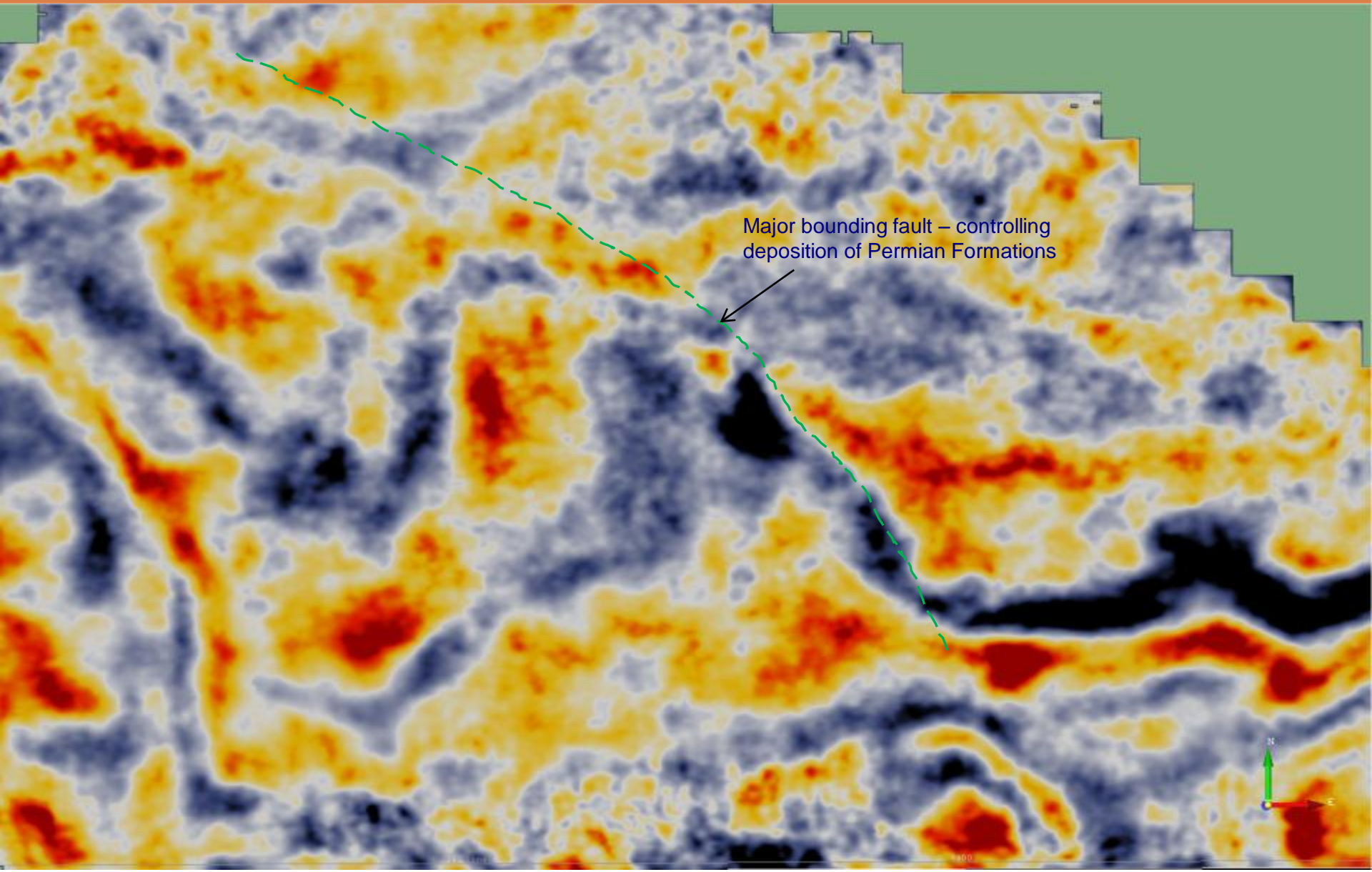
Inline – Existing seismic data



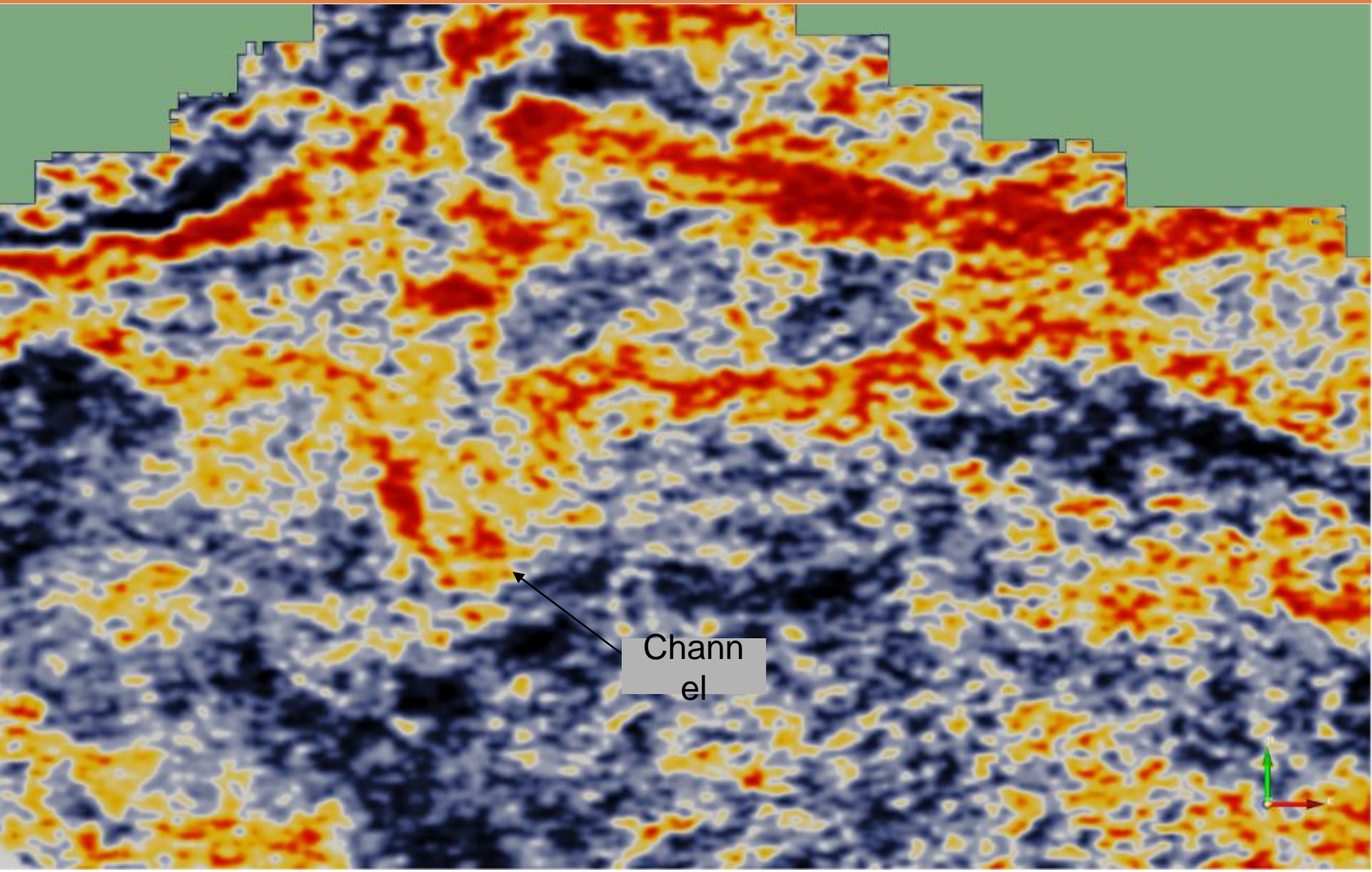
Time slice 2300ms (within Patchawarra)



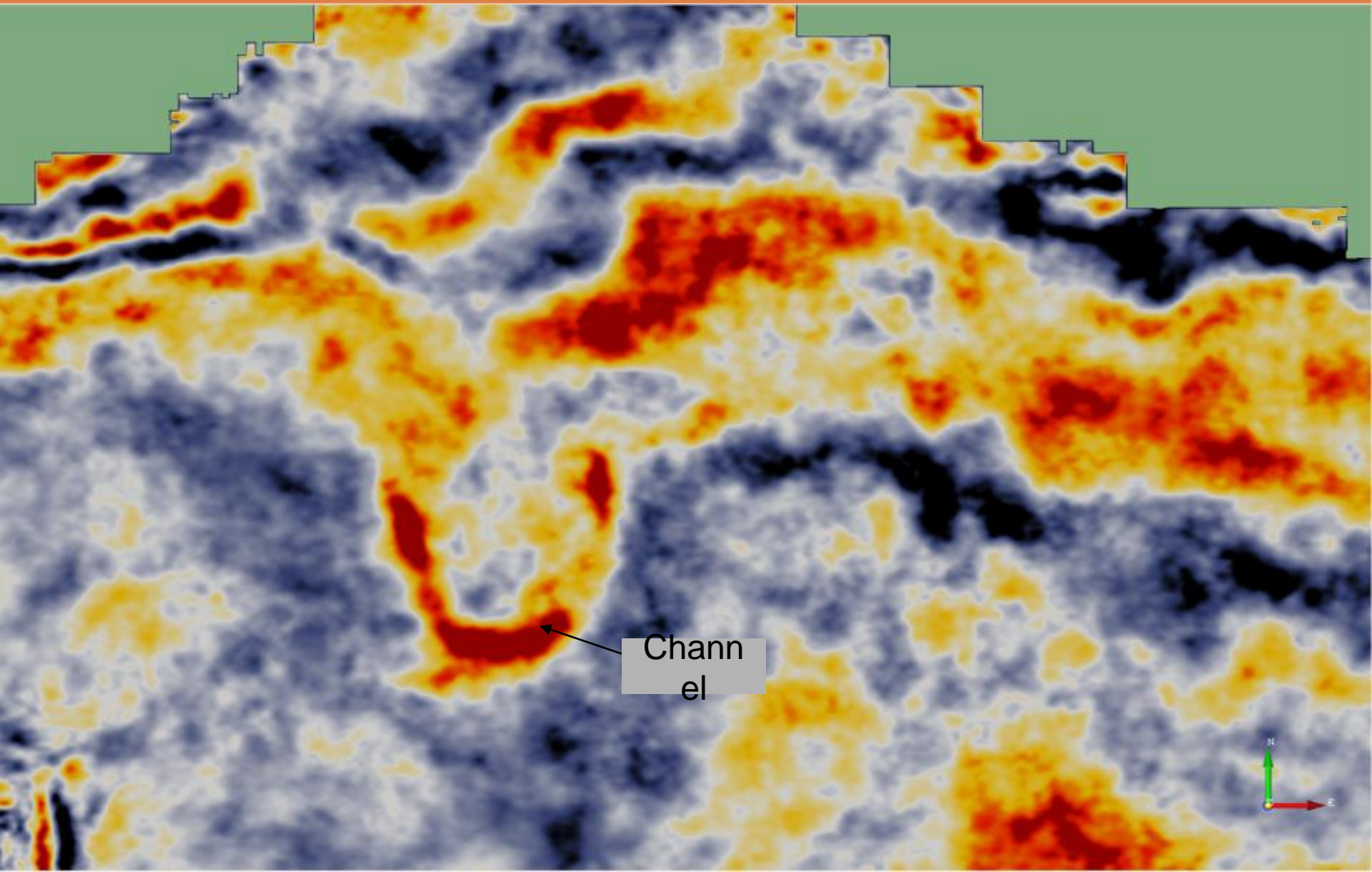
Time slice 2300ms EOM



Time slice 1800ms (near Hutton) – existing data

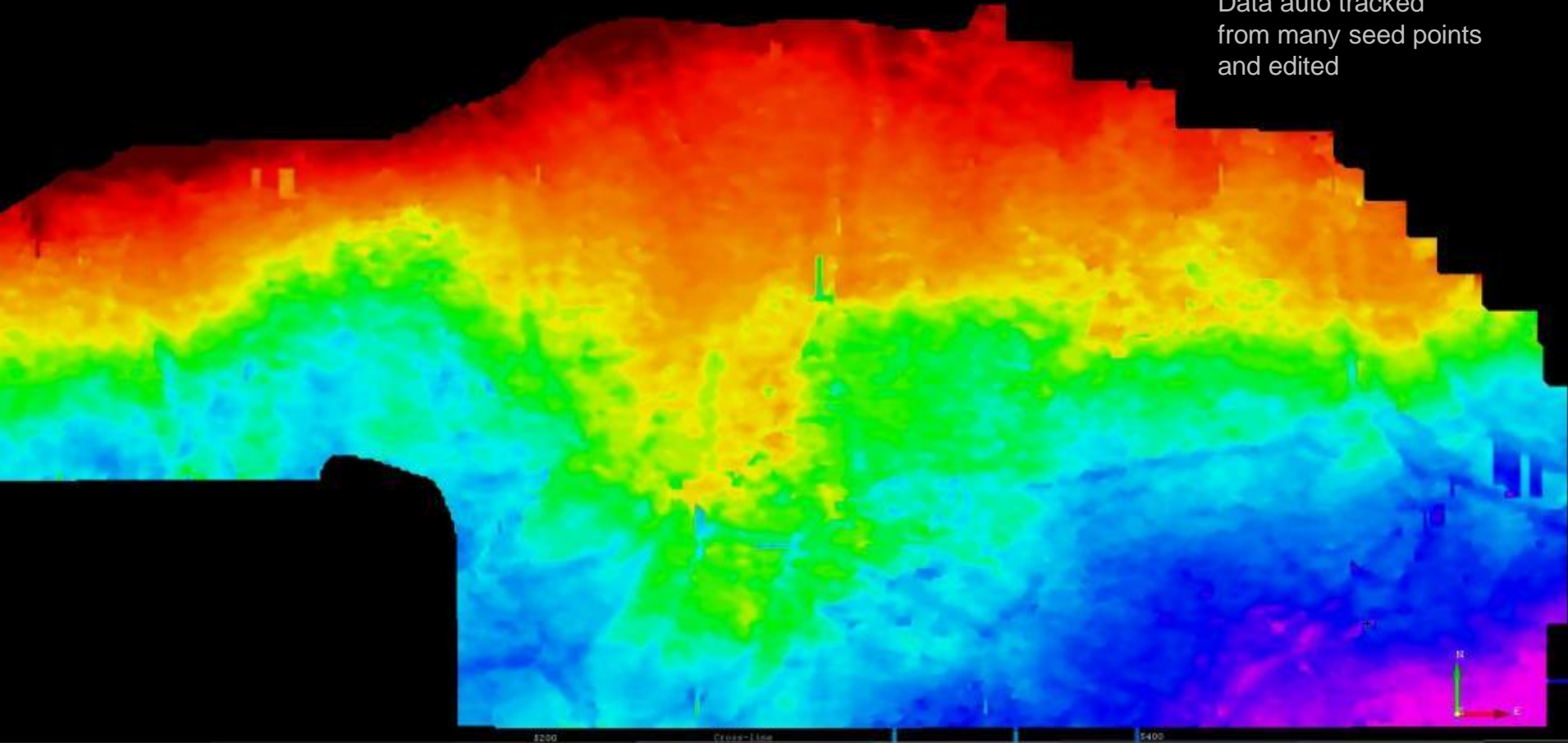


Time slice 1800ms (near Hutton) – EOM data

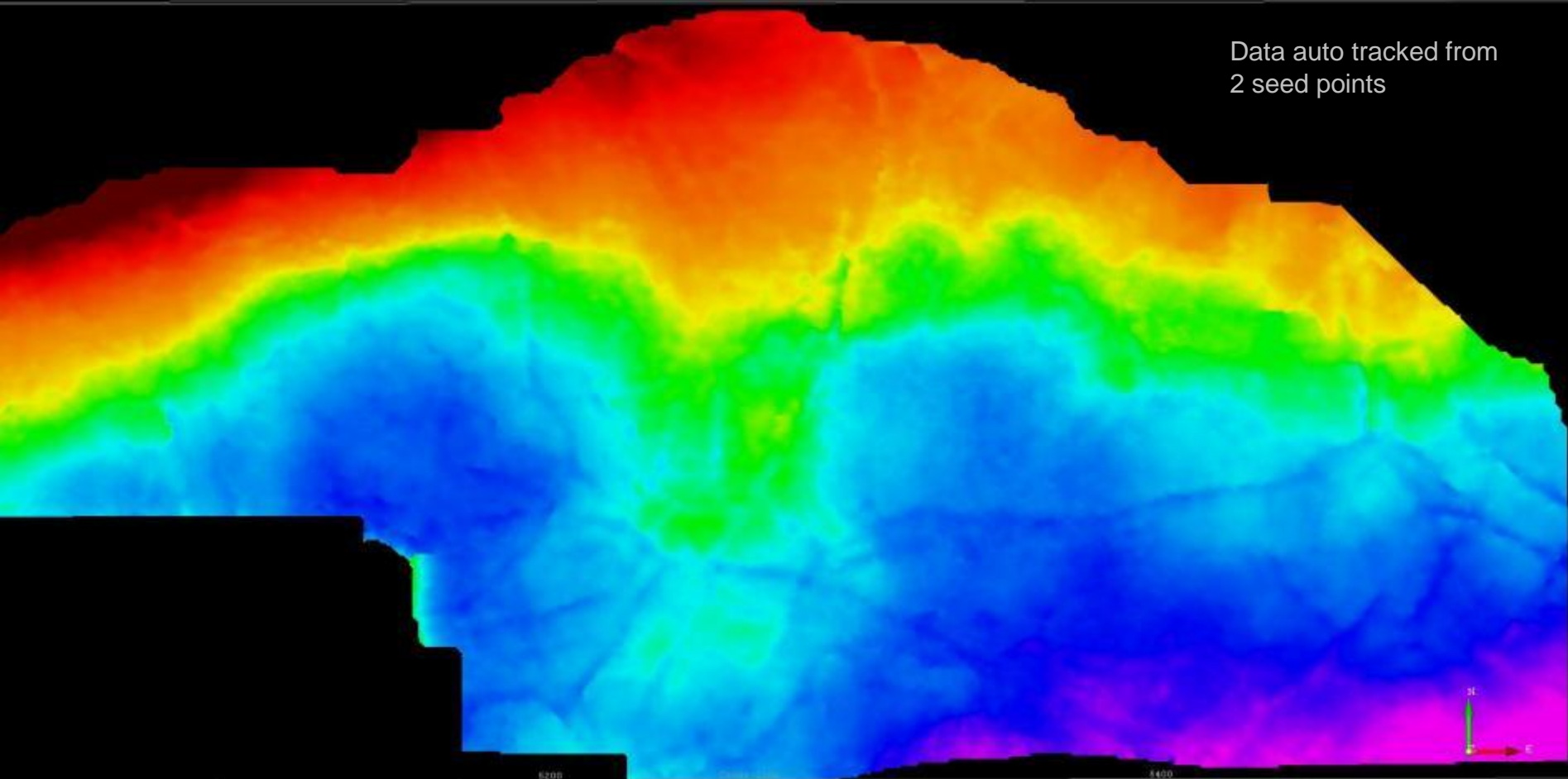


Two Way time – Cadna-owie (existing data)

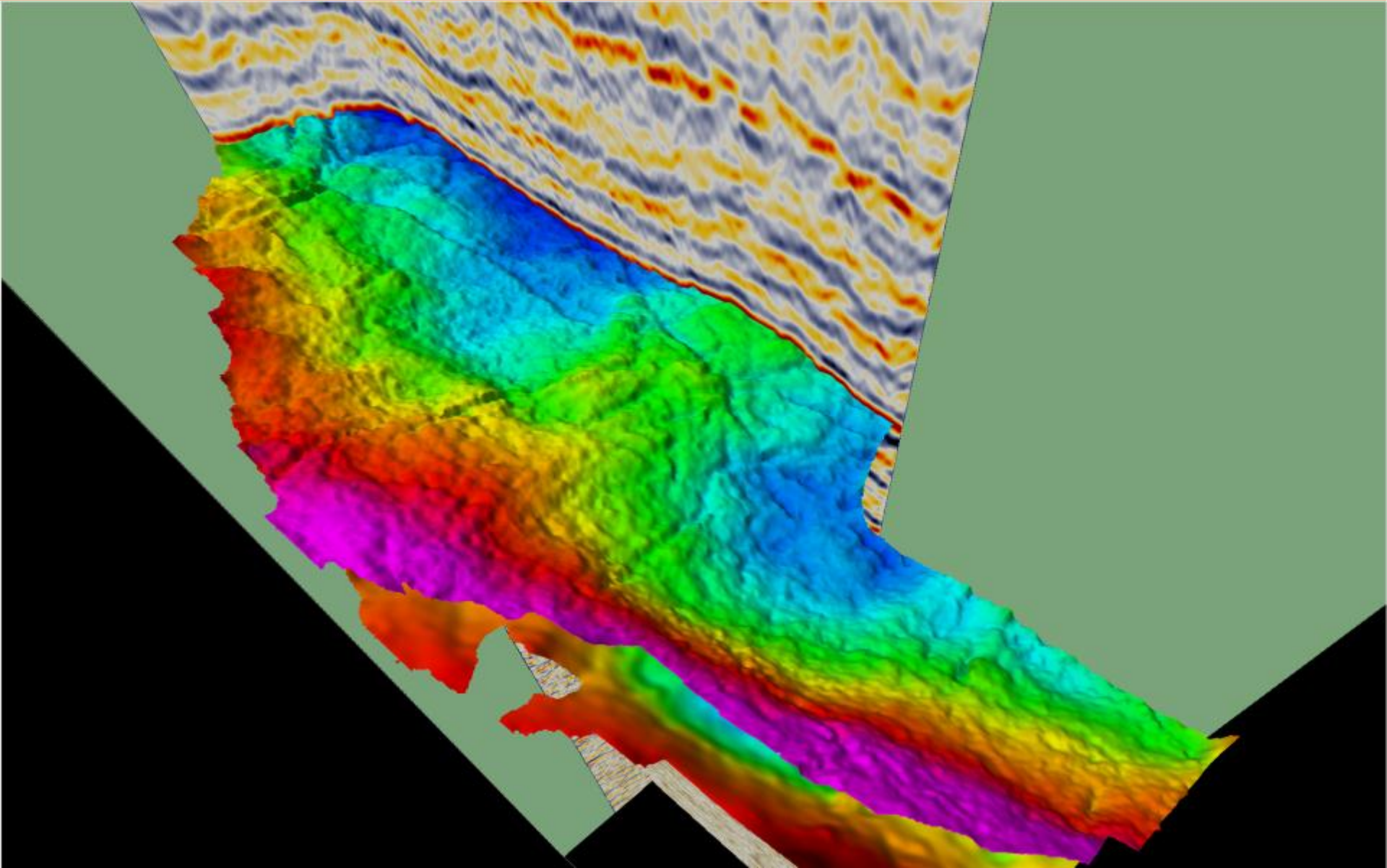
Data auto tracked
from many seed points
and edited



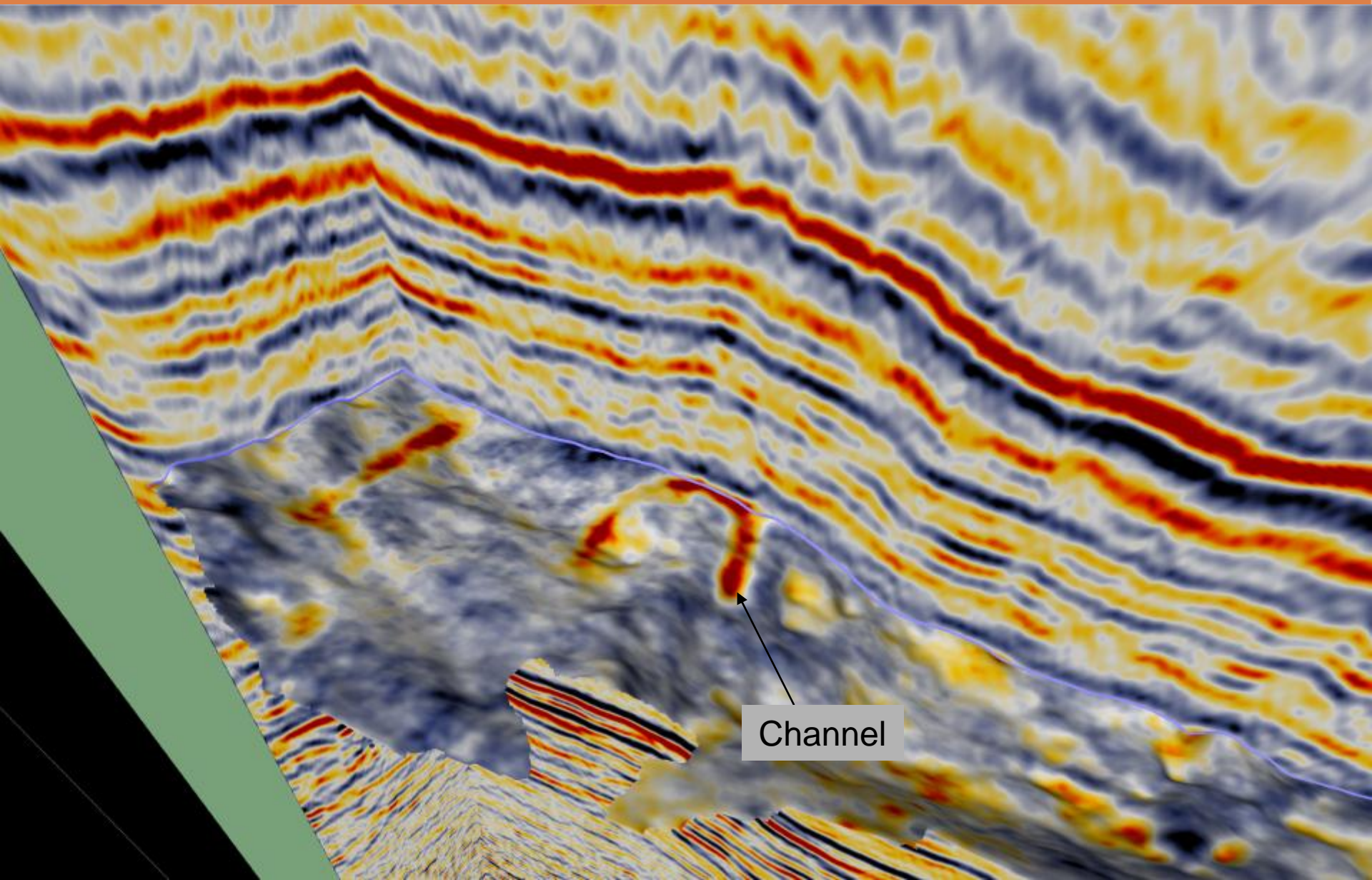
Two Way time – Cadna-owie (EOM data)



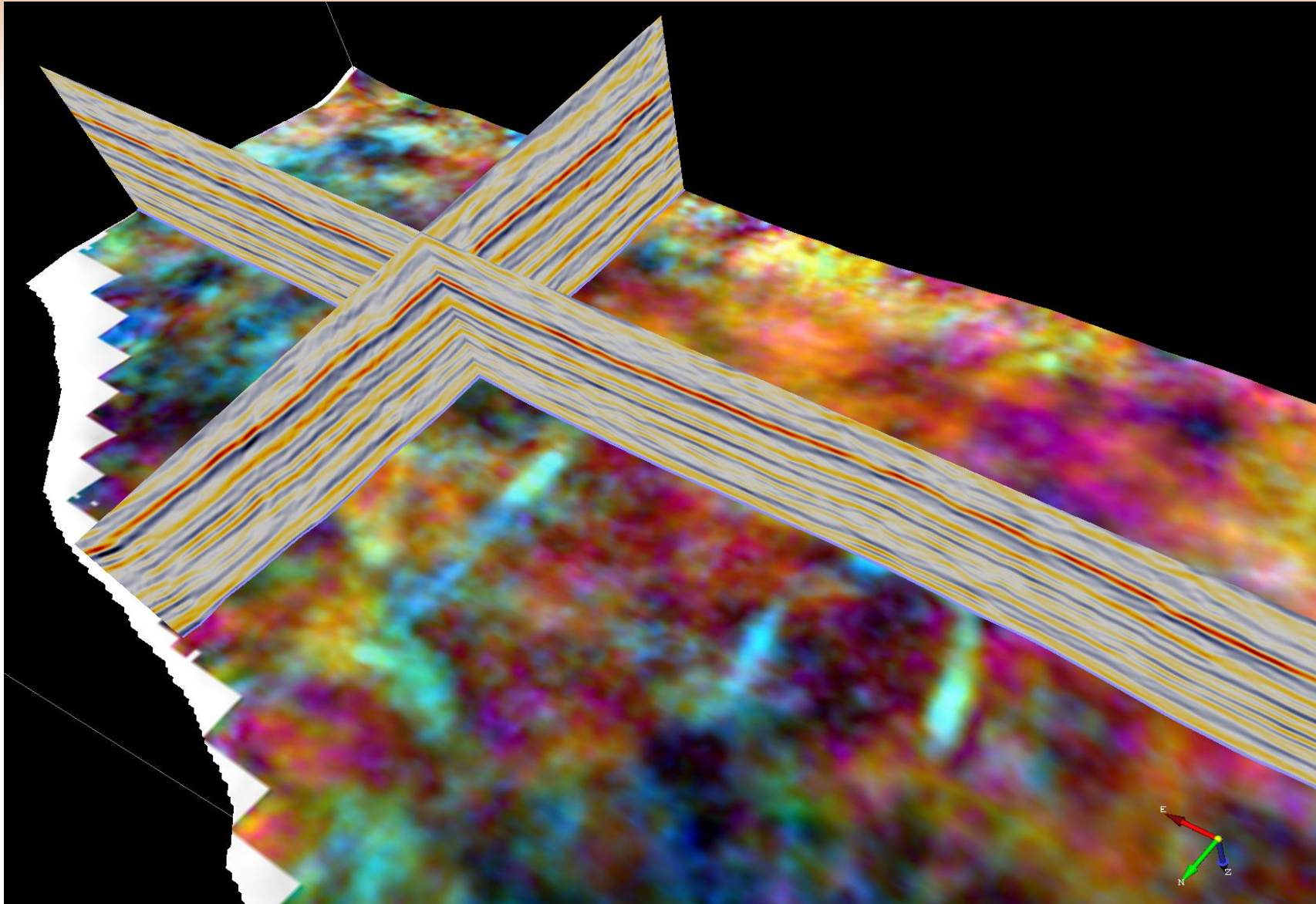
Two way time to Cadna-owie (3D view)



Horizon slice showing channel in Birkhead Hutton interval



Hutton channels from spectral decomposition



Summary

- Verona 3D selected to highlight improvements in data quality possible using latest EOM processing
- Showcases results of AusGeos detailed seismic processing capability
- Fully processed final volume is available for purchase (data on USB disk)
- Processing time for similar sized 3D surveys is between 6 and 8 weeks
- Costs approximately \$600/sq km

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