

Integrated 3D Volume Interpretation: keeping the end sharply focused

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Technology

The PaleoScan suite, together with tools available in GeoTeric, allow us to move traditional data sets seamlessly through:

PRE-CONDITIONING
STRATIGRAPHIC INTERPRETATION
WELL ANALYSIS
SEQUENCE ANALYSIS
STRUCTURAL INTERPRETATION
FACIES INTERPRETATION
3D PROPERTY MODELING
STATIC GEOCELLULAR MODELS



Well-log based 3D Property Models, guided by seismic data volumes and supported by cross-plot analysis, open up a spectrum of integrated workflows to the team.

Geology

Outcrops, Cores
 Surface geology
 Well-logs
 Structure & tectonics
 Sedimentology
 Stratigraphy
 Subsidence history
 Depositional models
 Source rock analysis
 Reservoir parameters
 Production data
 Horizons, Faults
 Seismic attributes
 Seismic facies
 Geostatistics
 Neural Networks

Geophysics

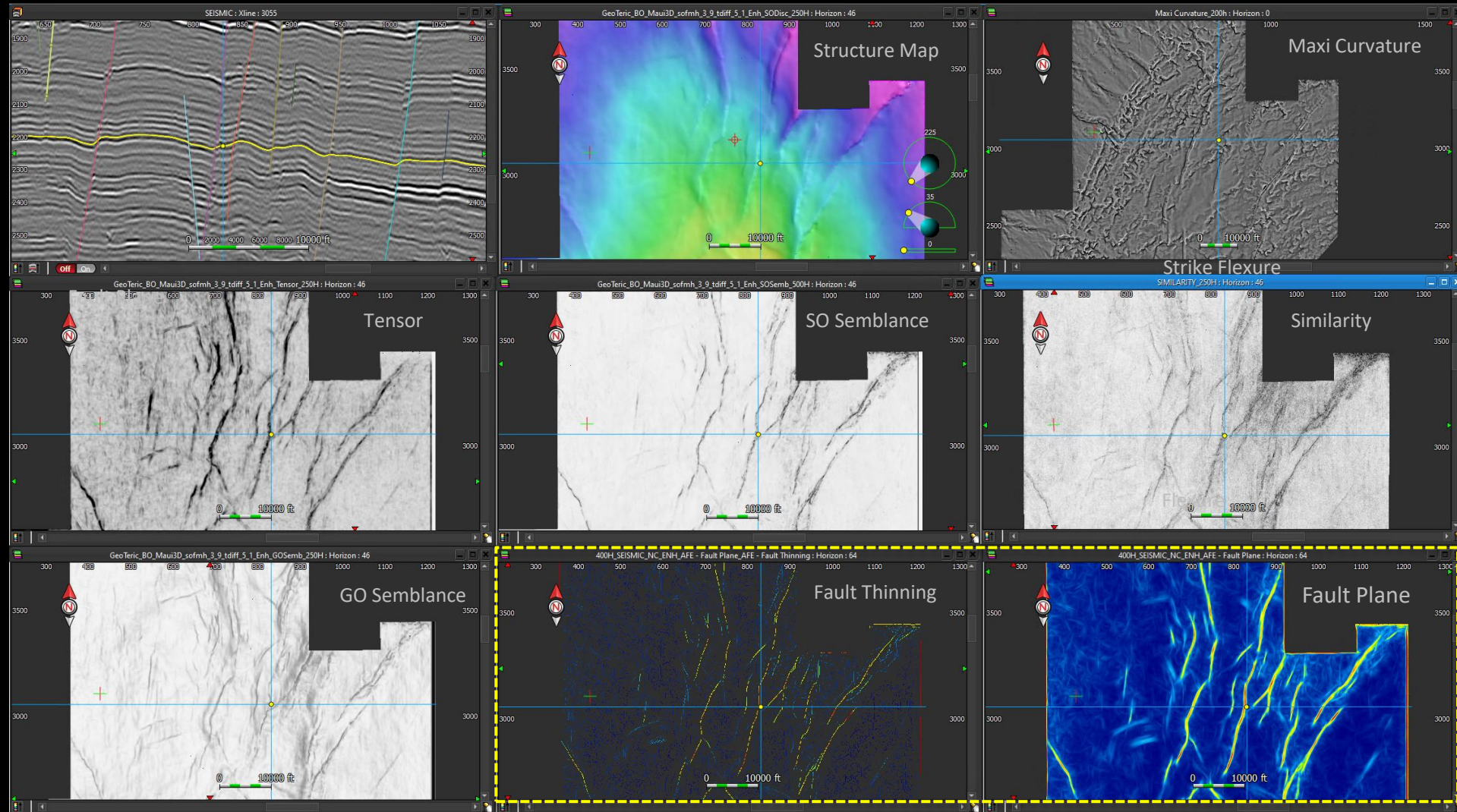
Horizons, Faults
 Seismic attributes
 Seismic facies
 Geostatistics
 Neural Networks
 AVO/AVA
 Rock physics
 Rock mechanics
 Post-stack inversion
 Pre-stack inversion
 $V_p, V_s, \rho, \lambda, \mu$
 Bulk modulus, K
 Young's modulus, E
 Poisson's ration, σ
 PI, SI, EEI, ψ

Petrophysics

Mineral models
 Lithofacies
 Rock physics
 Rock mechanics
 V_p, V_s
 λ, μ, ρ
 Bulk modulus, K
 Young's modulus, E
 Poisson's ration, σ
 TOC, Pressure, Temp
 Fracture gradients
 $S_w, S_w(irr), \phi_t, \phi_{eff}, \kappa, \eta$

Integrated
 Volume
 Interpretation

Static
 Geocellular
 Models



Volume Interpretation Workflows

PRE-CONDITIONING

STRATIGRAPHIC INTERPRETATION

STRUCTURAL INTERPRETATION

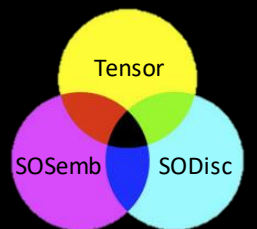
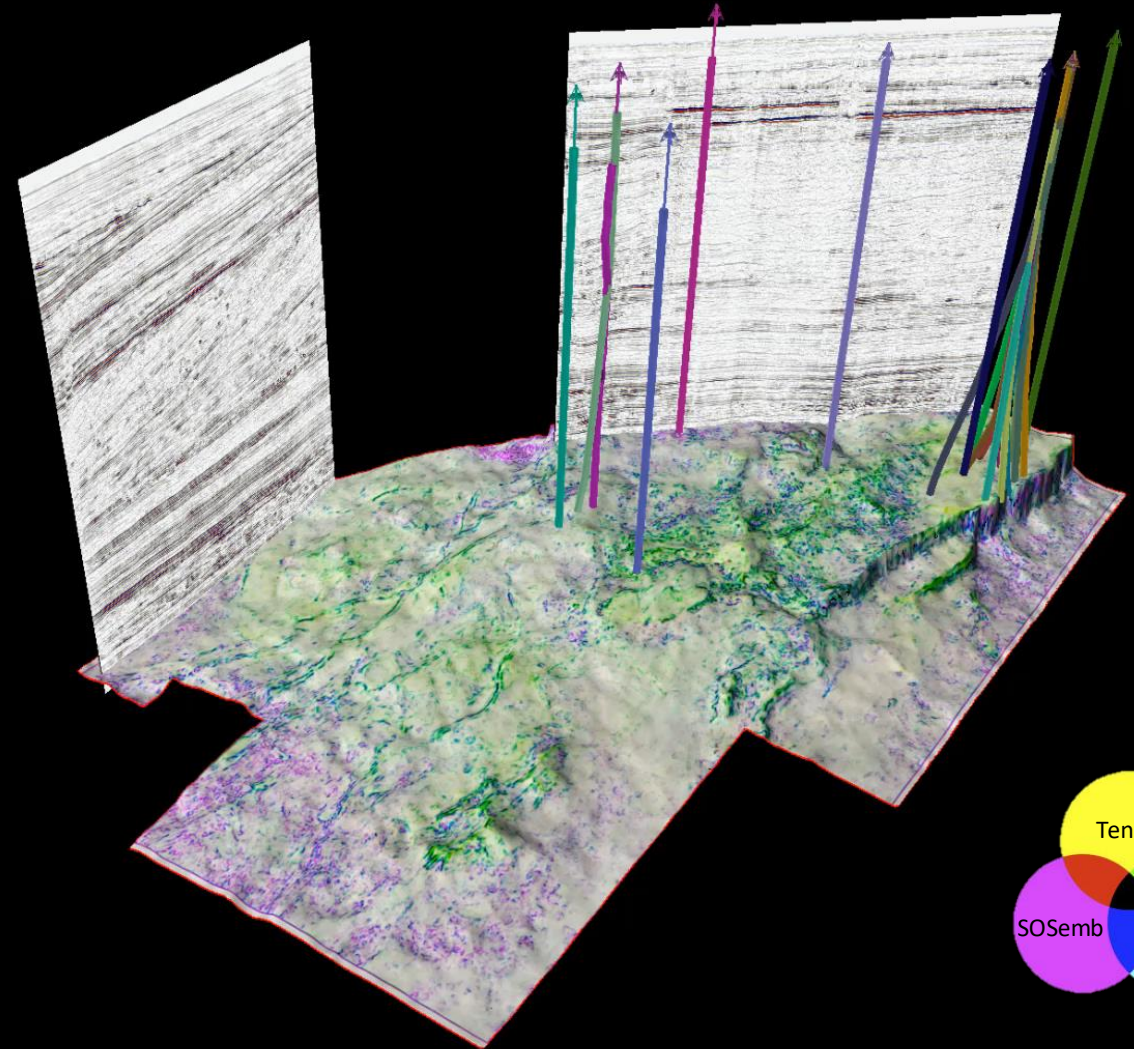
SEQUENCE ANALYSIS

FACIES INTERPRETATION

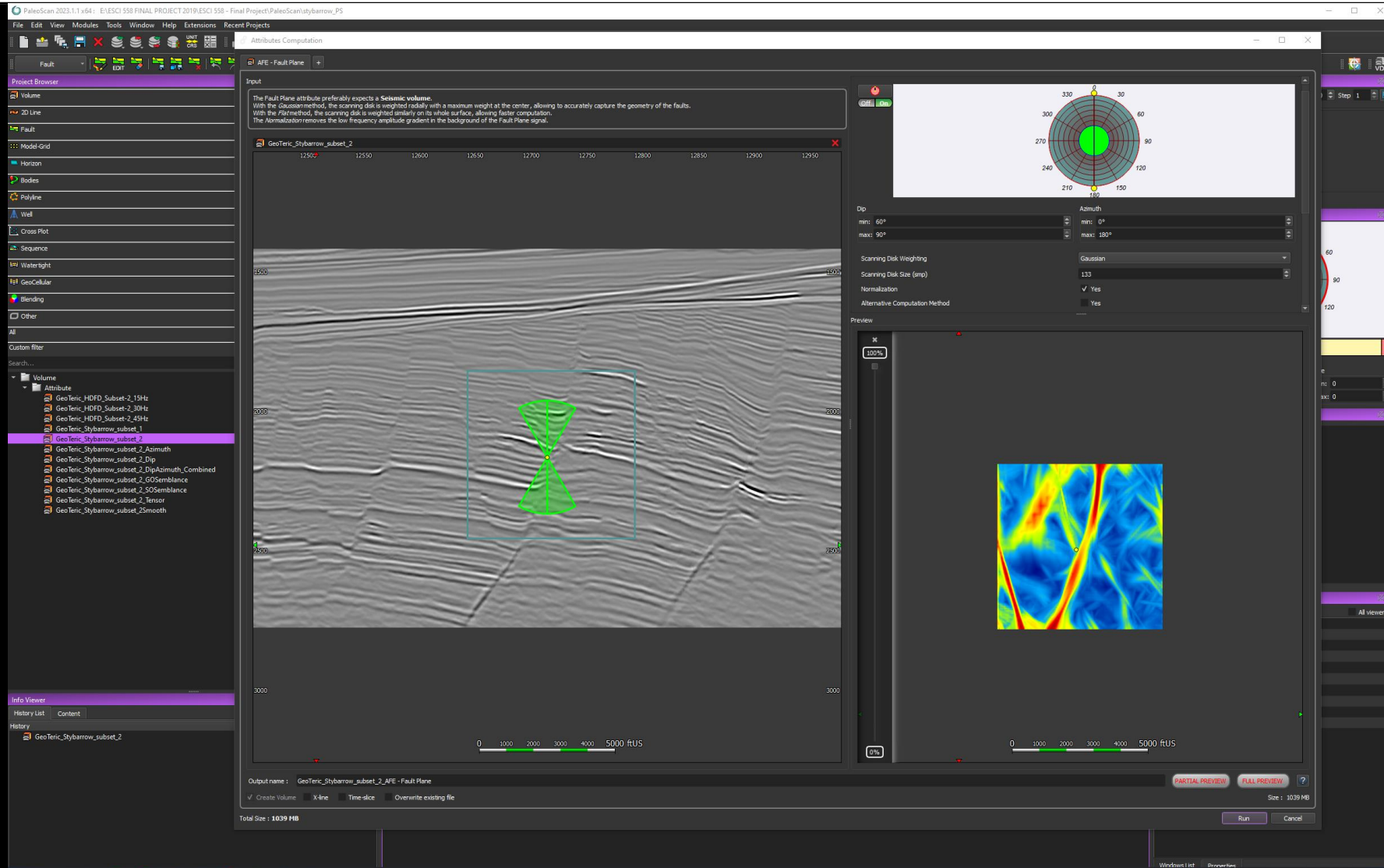
WELL ANALYSIS & CROSS PLOTS

3D PROPERTY MODELING

STATIC GEOCELLULAR MODELS



Fault planes



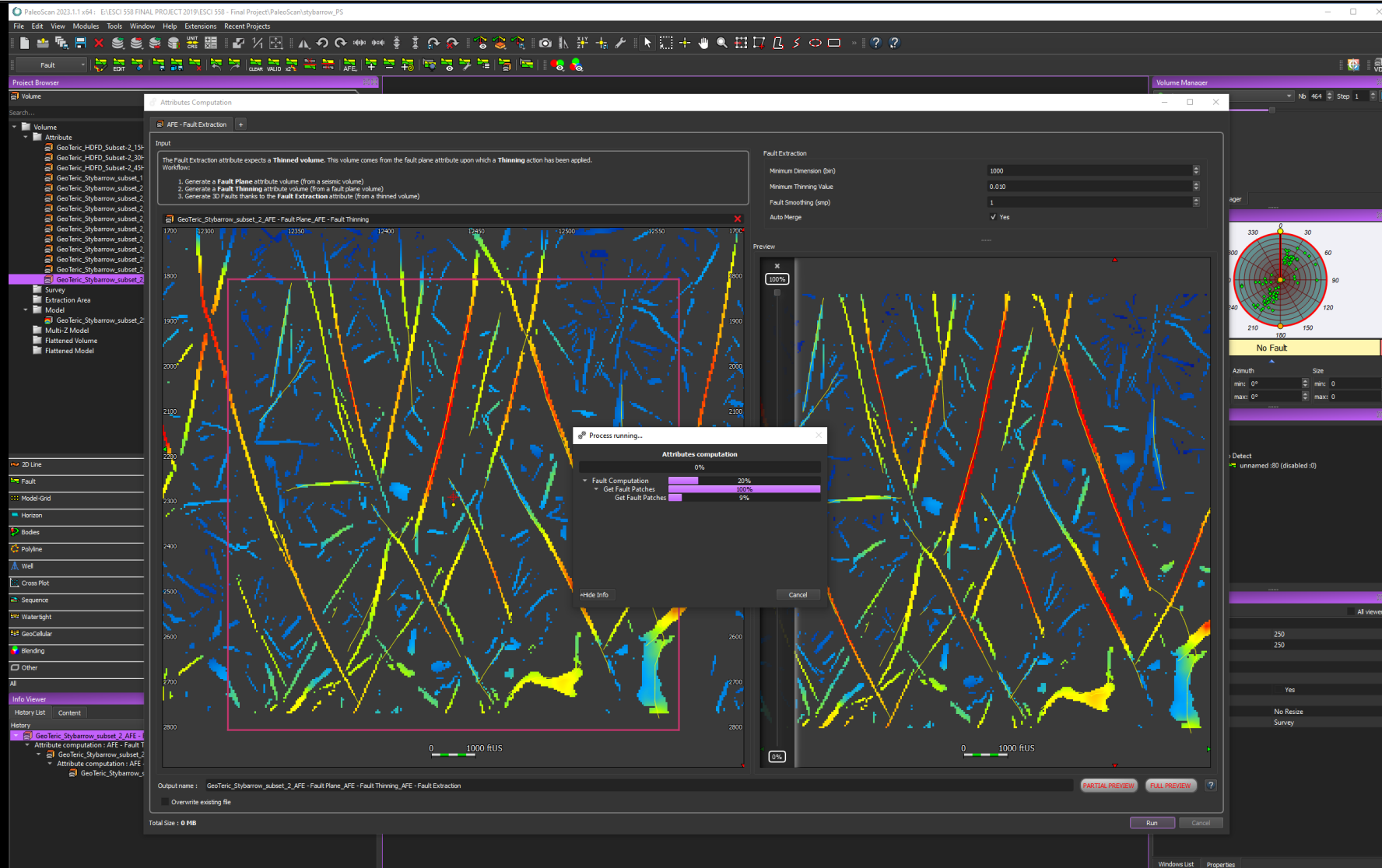
The screenshot displays the AFE (Automatic Fault Extraction) workflow in a software interface. The main window shows a seismic volume with a fault plane highlighted in green. The interface includes a Project Browser on the left, a central 3D view, and a right-hand control panel with a circular azimuth plot and various parameters like Dip, Scanning Disk Weighting, and Normalization. A preview window at the bottom right shows a color-coded fault plane extraction result.

Input:
The Fault Plane attribute preferably expects a Seismic volume.
With the Gaussian method, the scanning disk is weighted radially with a maximum weight at the center, allowing to accurately capture the geometry of the faults.
With the Flat method, the scanning disk is weighted similarly on its whole surface, allowing faster computation.
The Normalization removes the low frequency amplitude gradient in the background of the Fault Plane signal.

Parameters:
Dip: min: 60°, max: 90°
Azimuth: min: 0°, max: 180°
Scanning Disk Weighting: Gaussian
Scanning Disk Size (emp): 133
Normalization: Yes
Alternative Computation Method: Yes

Output name: GeoTeric_Stybarrow_subset_2_AFE - Fault Plane
Size: 1039 MB

*Fault thinning
followed by
fault extraction*



AFE - Fault Extraction

The Fault Extraction attribute expects a **Thinned volume**. This volume comes from the fault plane attribute upon which a **Thinning** action has been applied.

Workflow:

1. Generate a **Fault Plane** attribute volume (from a seismic volume)
2. Generate a **Fault Thinning** attribute volume (from a fault plane volume)
3. Generate 3D Faults thanks to the **Fault Extraction** attribute (from a thinned volume)

Input

GeoTeric_Stybarrow_subset_2 - Fault Plane_AFE - Fault Thinning

Fault Extraction

Minimum Dimension (bin): 1000
 Minimum Thinning Value: 0.010
 Fault Smoothing (mp): 1
 Auto Merge: Yes

Preview

100%

0% 1000 ftUS

Process running...

Attributes computation

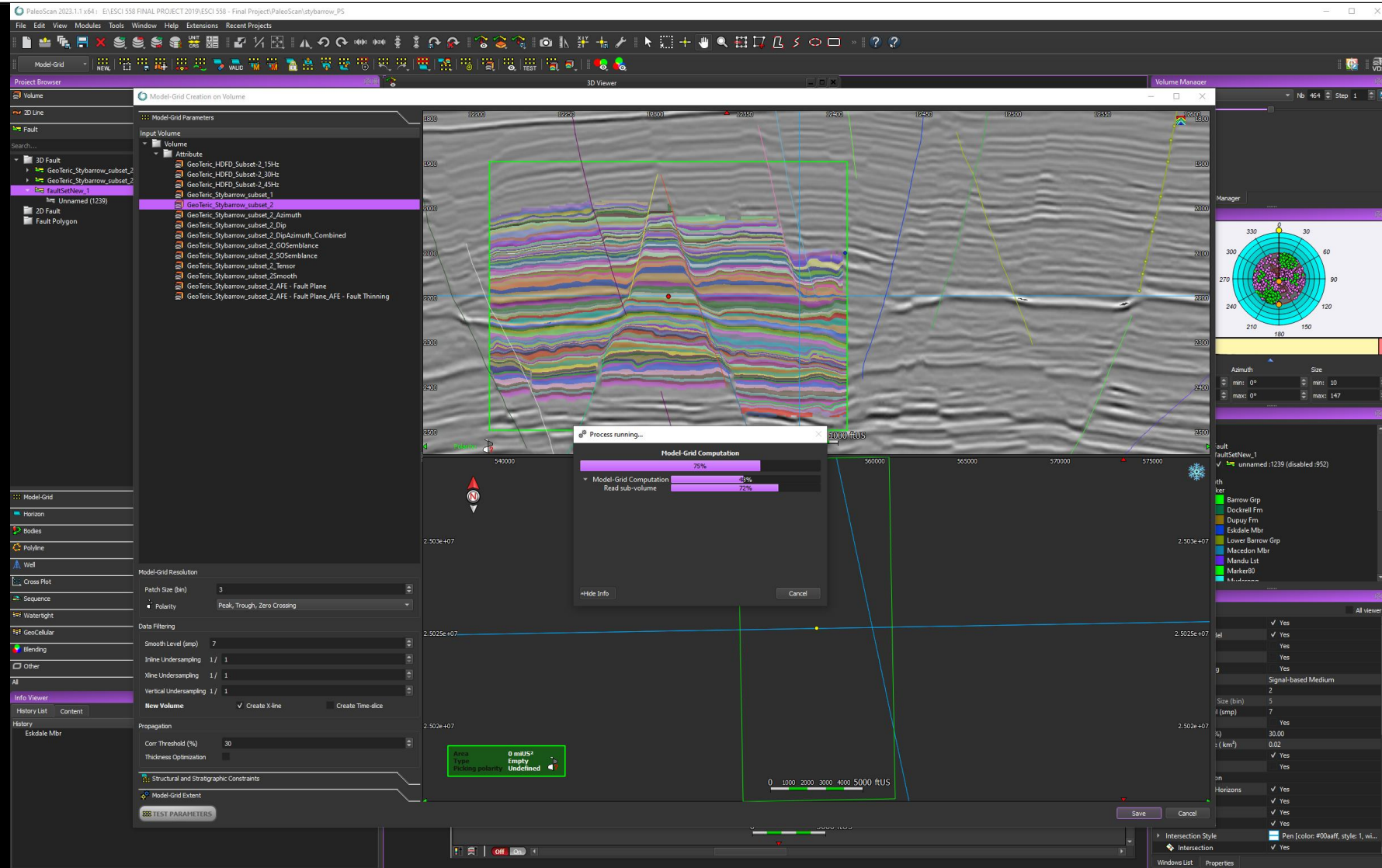
Fault Computation	0%
Get Fault Patches	100%
Get Fault Patches	9%

Output name: GeoTeric_Stybarrow_subset_2_AFE - Fault Plane_AFE - Fault Thinning_AFE - Fault Extraction

Overwrite existing file

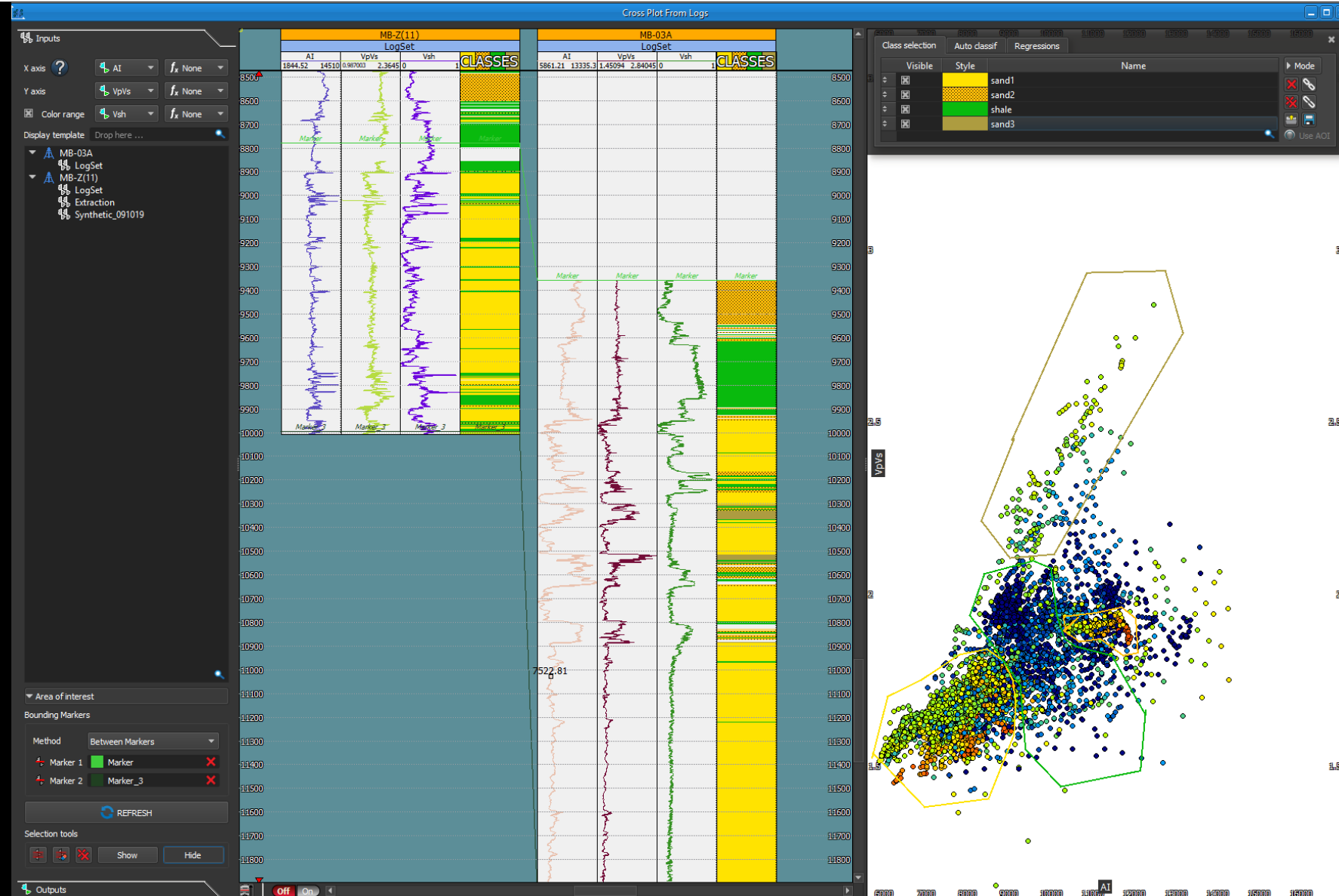
Total Size: 0 MB

Run Cancel



The screenshot displays a software interface for seismic interpretation. The main window shows a 3D seismic volume with a grid overlaid. A dialog box titled "Model-Grid Computation" is open, showing progress bars for "Model-Grid Computation" (75%), "Read sub-volume" (3%), and "Read sub-volume" (73%). The interface includes a Project Browser on the left, a Manager on the right, and a Properties panel at the bottom right. The Project Browser shows a hierarchy of volumes and faults. The Manager shows a list of volumes and faults. The Properties panel shows settings for the selected volume, including "Area" (0 m²), "Type" (Empty), and "Undeined".

Lithofacies shown here are defined based on well-log cross plots of Vp/Vs and AI

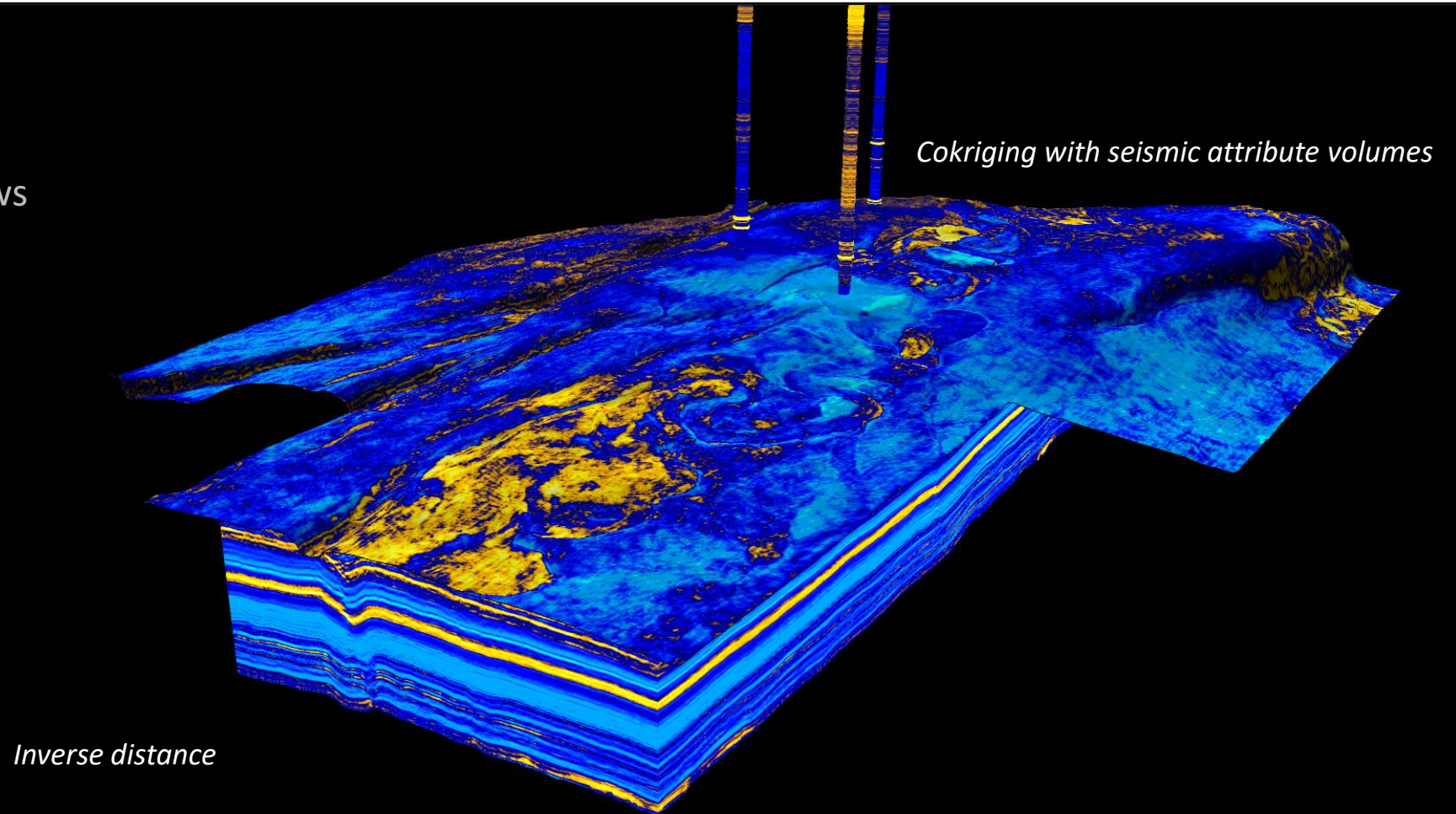


Volume Interpretation Workflows

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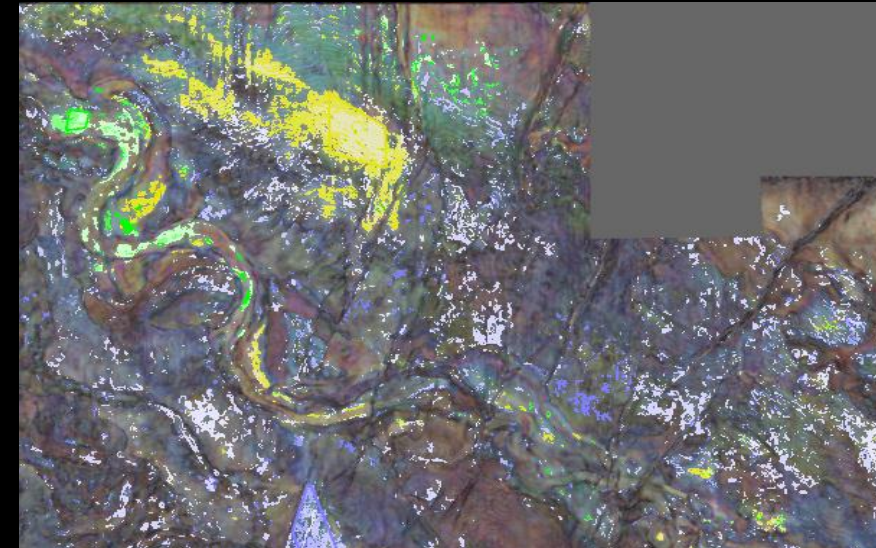
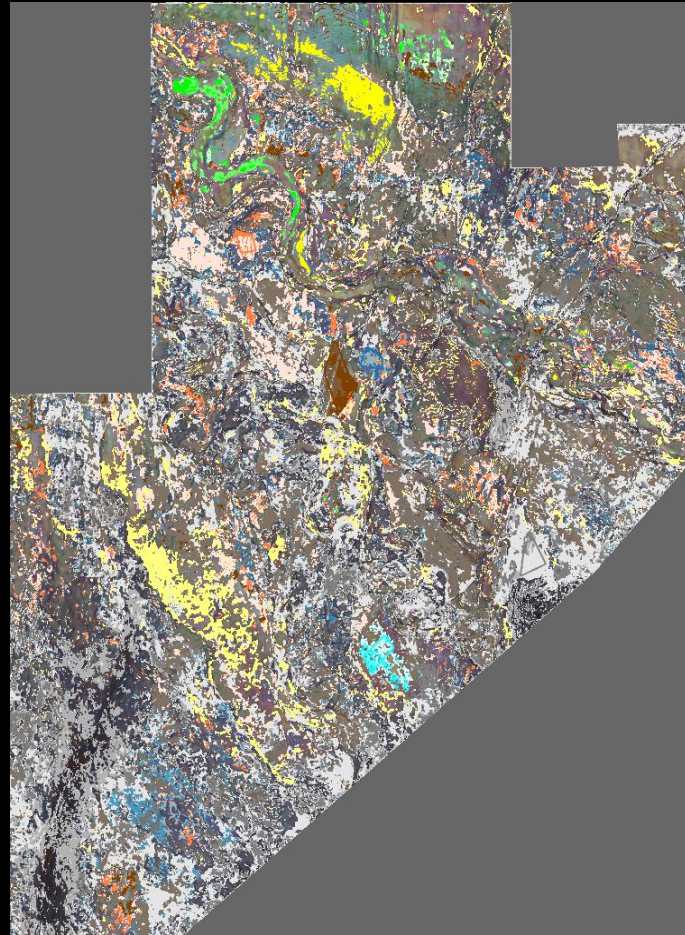
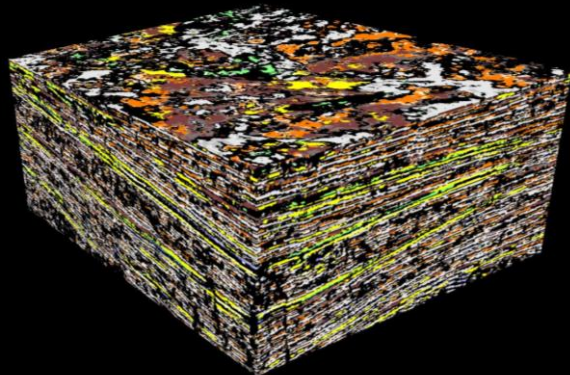
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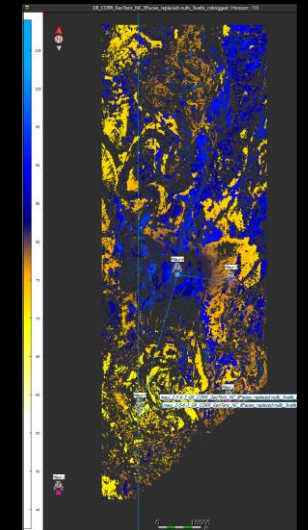
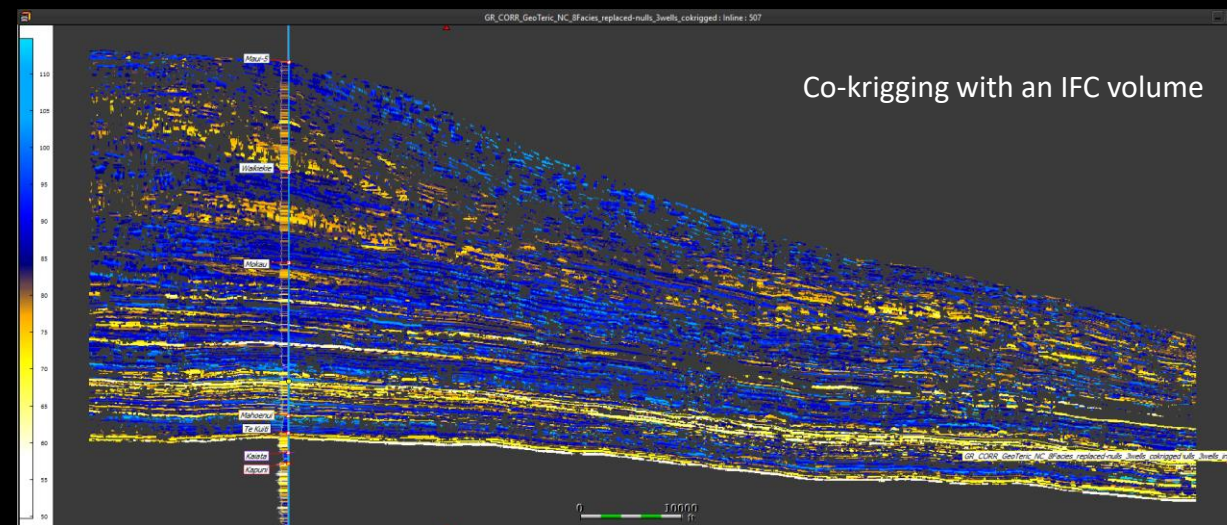
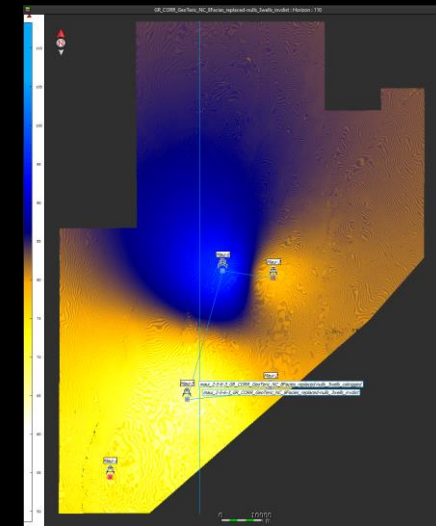
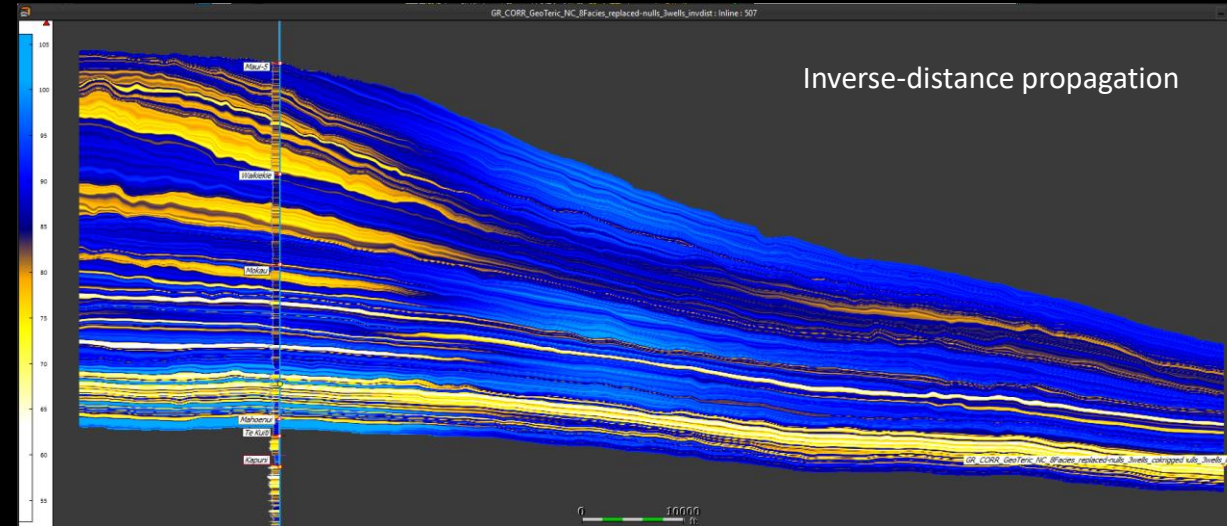
Volume Interpretation Workflows

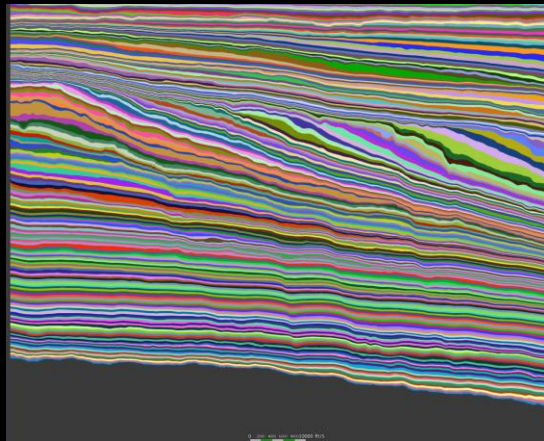
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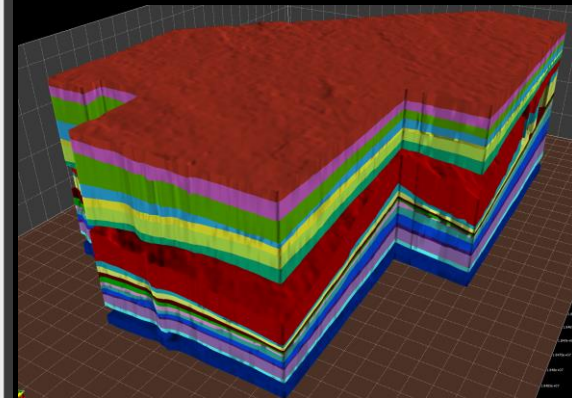
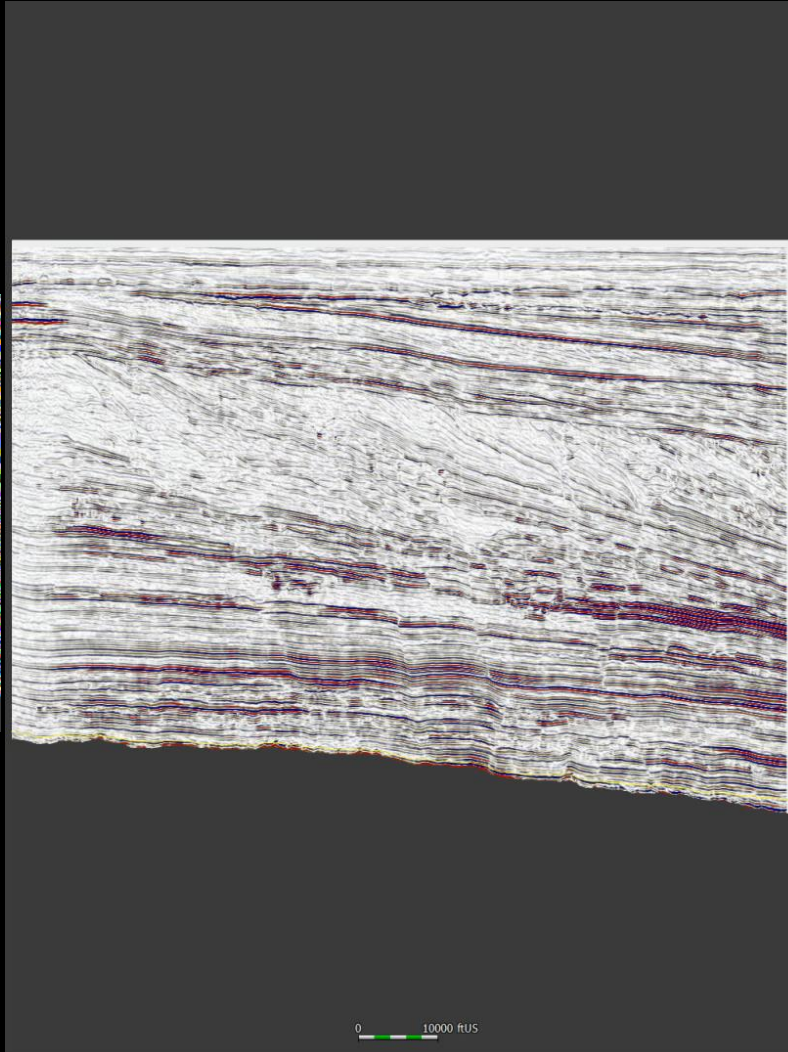
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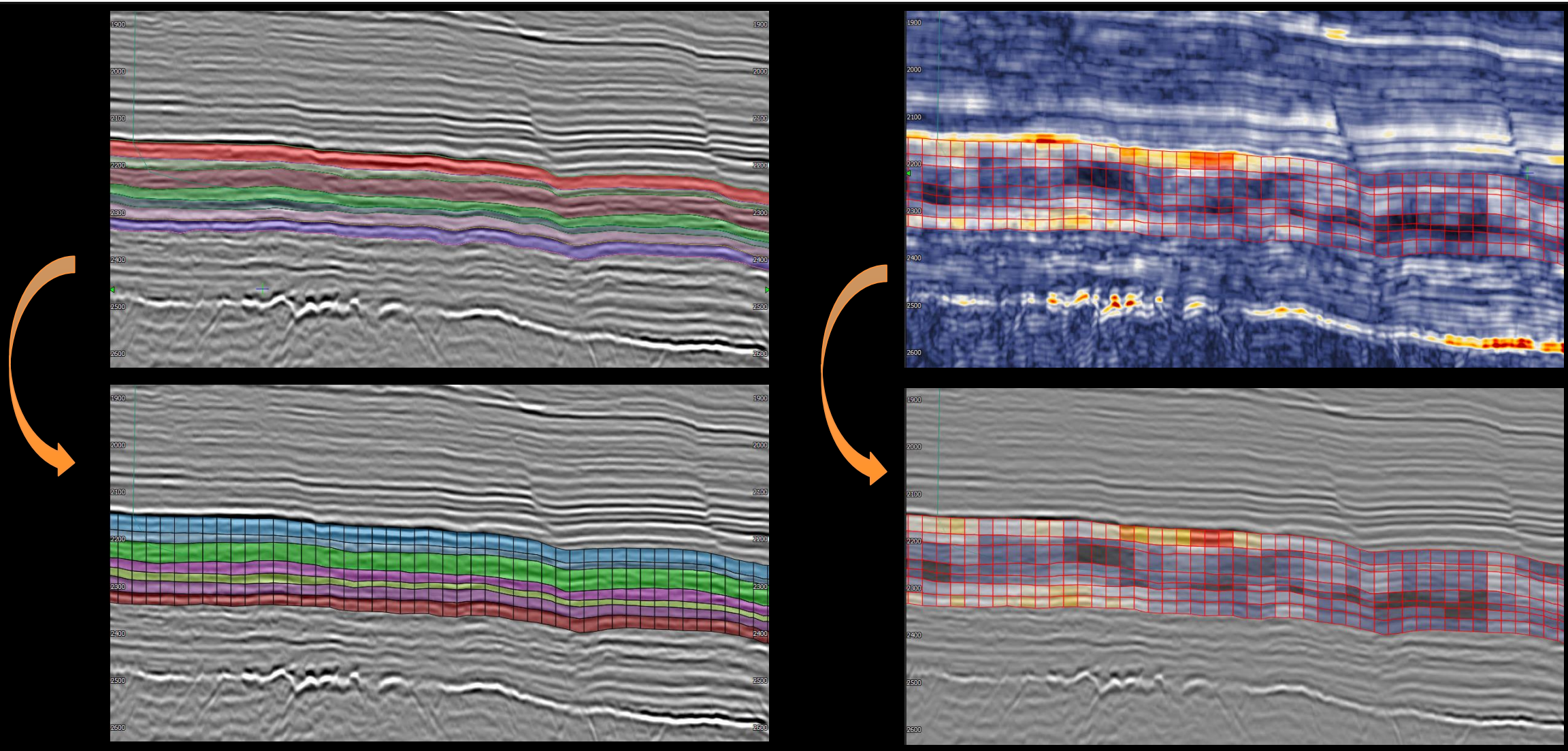


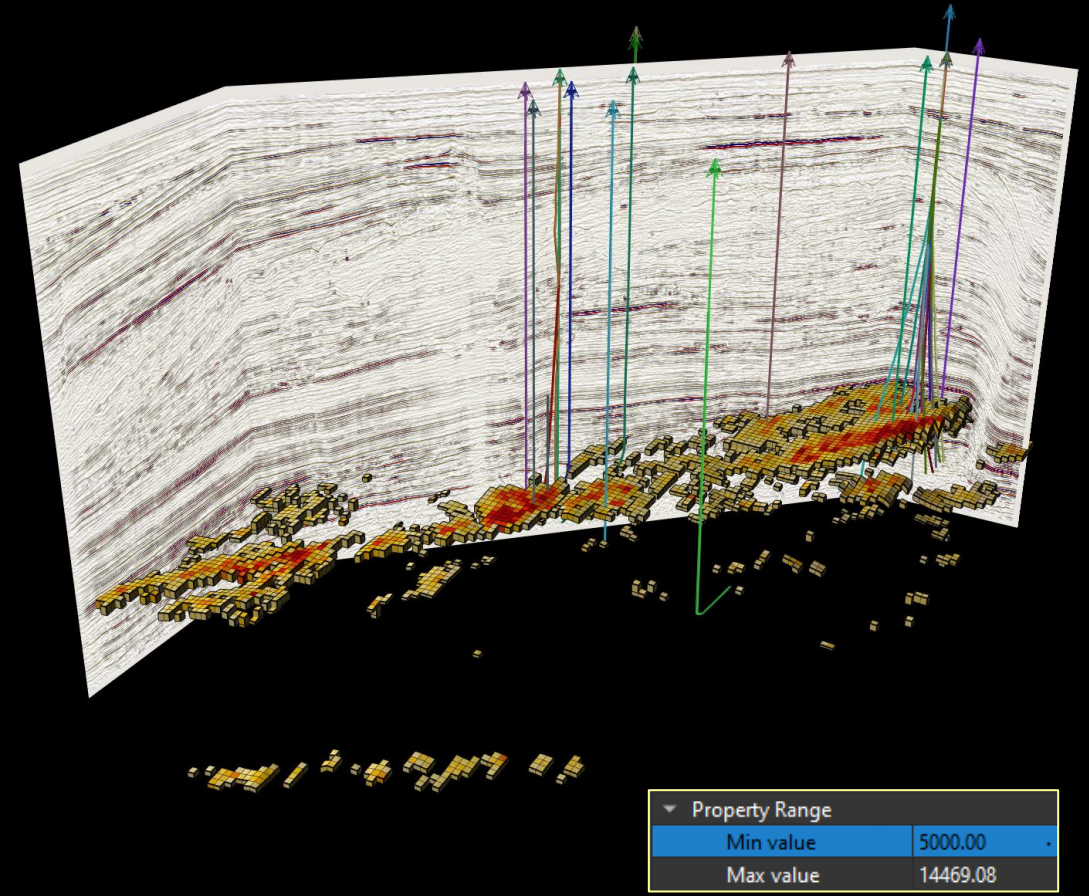
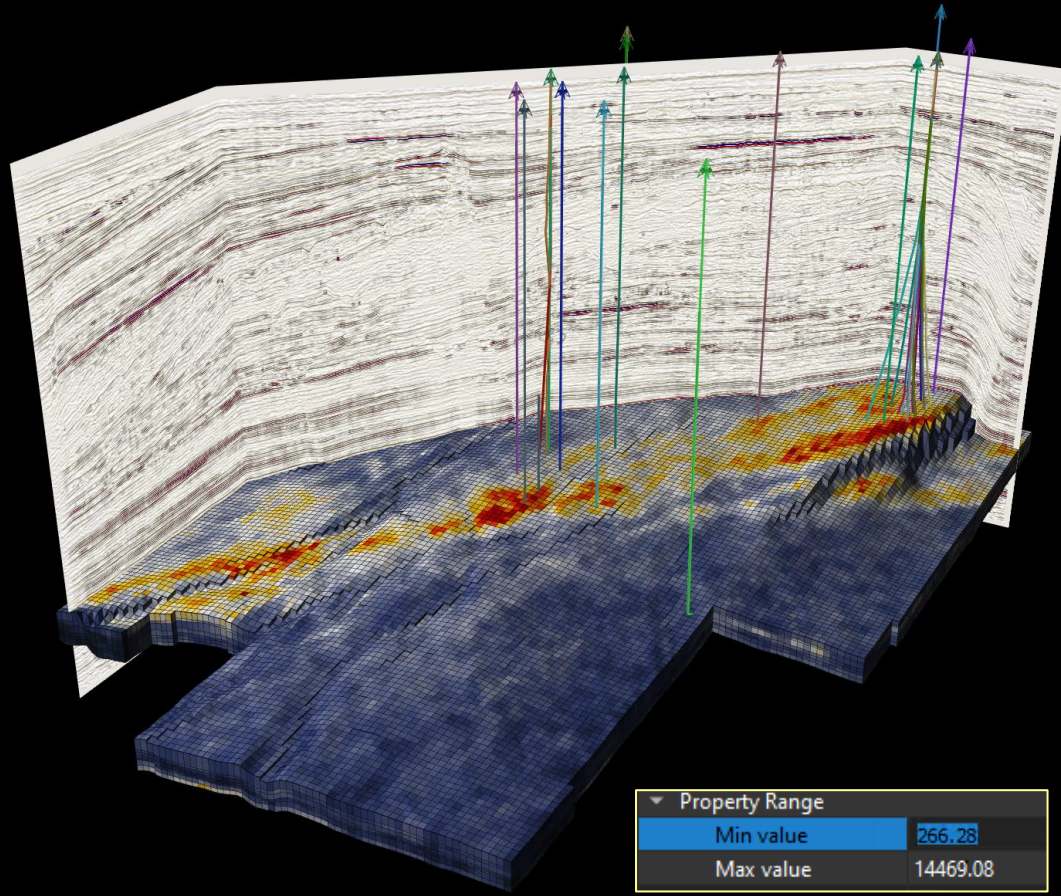


The Wheeler plot



Sequence isochores





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Thank you..!

