GEO Teric from ffA

West Siberia Case Study

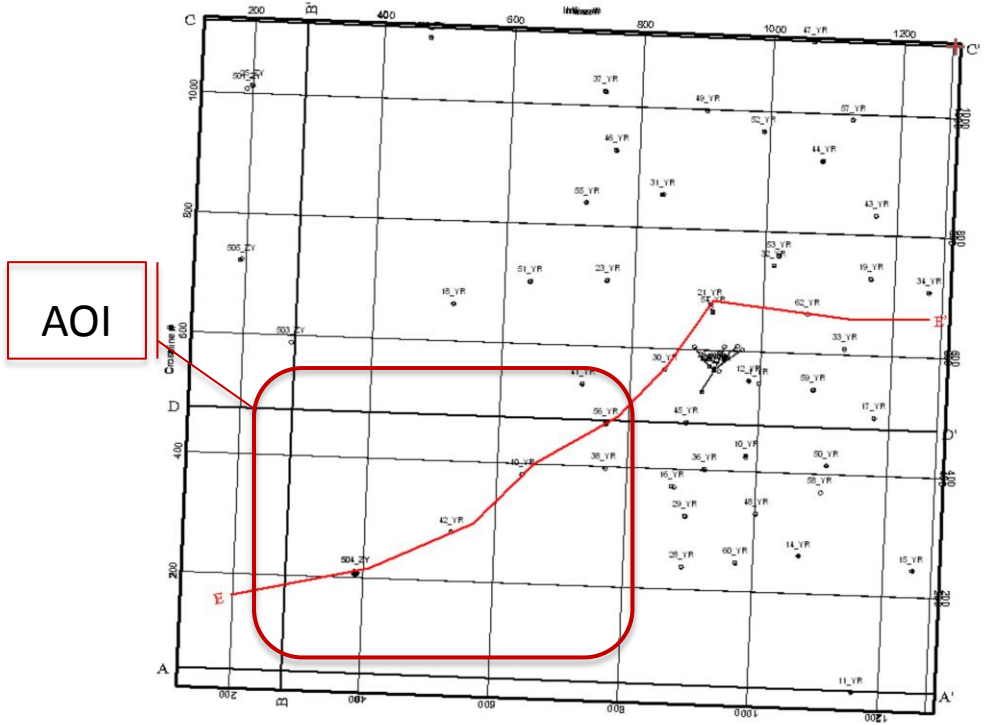
poweron with GeoTeric

Geological Background

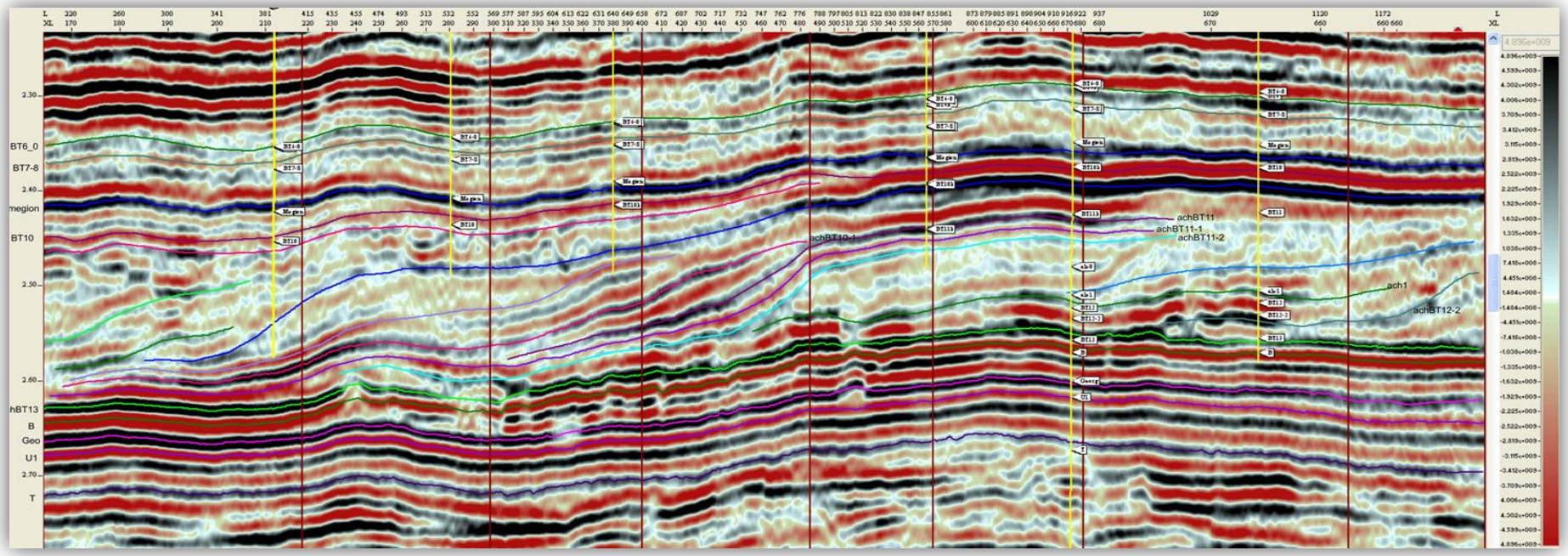
- The important stage in tectono-stratigraphic development of the Western Siberian basin was formation of a deep-water sea in Volgian–early Berriasian time. The sea covered more than one million km2 in the central basin area. Highly organic-rich siliceous shales of the Bazhenov Formation were deposited during this time in anoxic conditions on the sea bottom. Rocks of this formation have generated more than 80 percent of West Siberian oil reserves.

- Neocomian sandstones (reservoirs of the Achimov Formation) are developed on slopes of the clinoform bodies and in the toe-of-slope turbidite fans. Porosity is commonly 18–20 percent, but permeability is low, varying from several millidarcies to a few tens of millidarcies. Sandstone beds, 1–2 m to several meters thick, alternate with shales. Sandstones are laterally discontinuous and form lens-like bodies. Yields of wells at early stages of field production commonly were 100 to 200 b/d or less. Many discovered oil pools in Achimov sandstones remain undeveloped.

Area of Interest for potential drilling



Arbitrary Line through 3D Survey

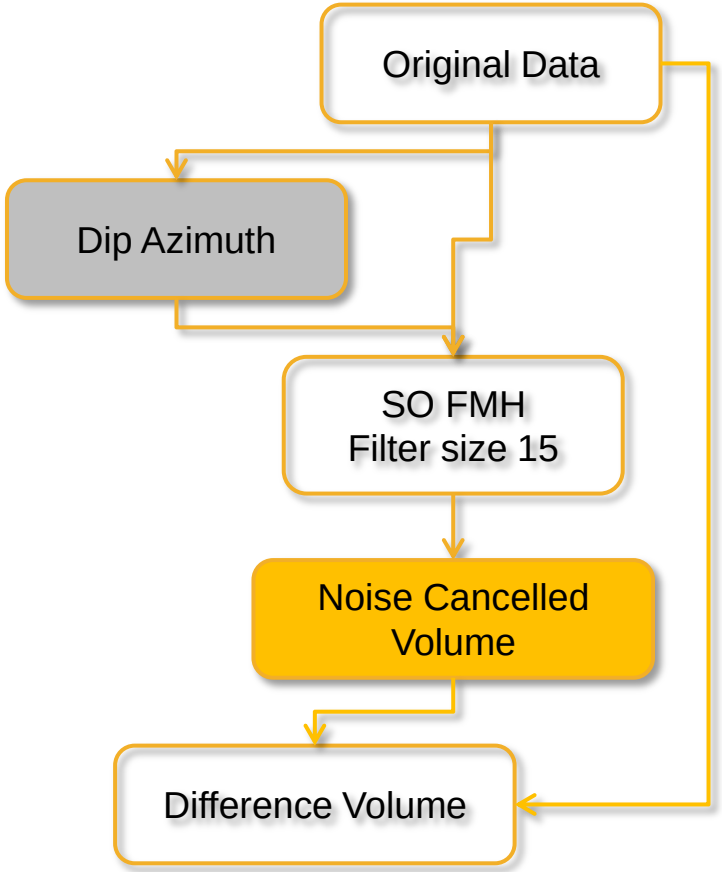


Noise Cancellation

The noise cancellation process improves the signal to noise ratio of the data, reflector continuity and breaks/contrasts in amplitude. The SOFMH (Structurally Oriented Finite Response Median Hybrid filter) uses Dip and Azimuth steering volumes which aligns the filter along geological structure, rather than a grid.

The Difference volume is calculated as a QC process to visualise the noise that has been removed from the data and assess the severity of the filter that was applied.

The result of this noise cancellation workflow improves reflector continuity and preserves subtle features such as fault breaks and amplitude contrasts.



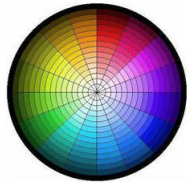
Structural Imaging

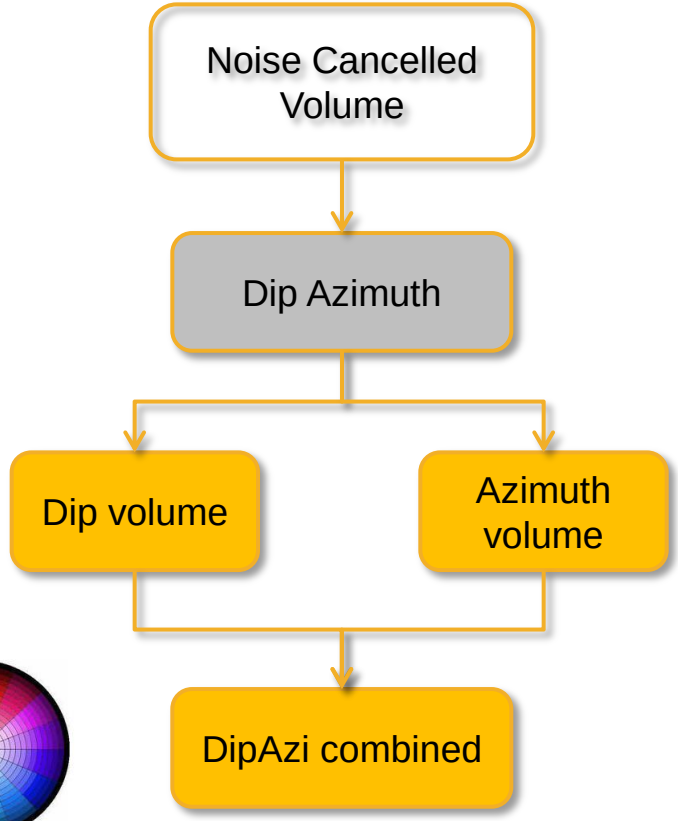
Individual Dip and Azimuth volumes and the DipAzi combined volume provide information about the reflector orientation.

The results of the Structural Imaging workflow is very useful in getting a rapid overview of the area of interest. These volumes can highlight both subtle and regional structural as well as stratigraphic features.

The Dip volumes shows the angle of reflector orientation, the Azimuth volume shows the direction of reflector dip.

Combining both volumes into one DipAzi combined volume allows the information in both volumes to be viewed simultaneously.



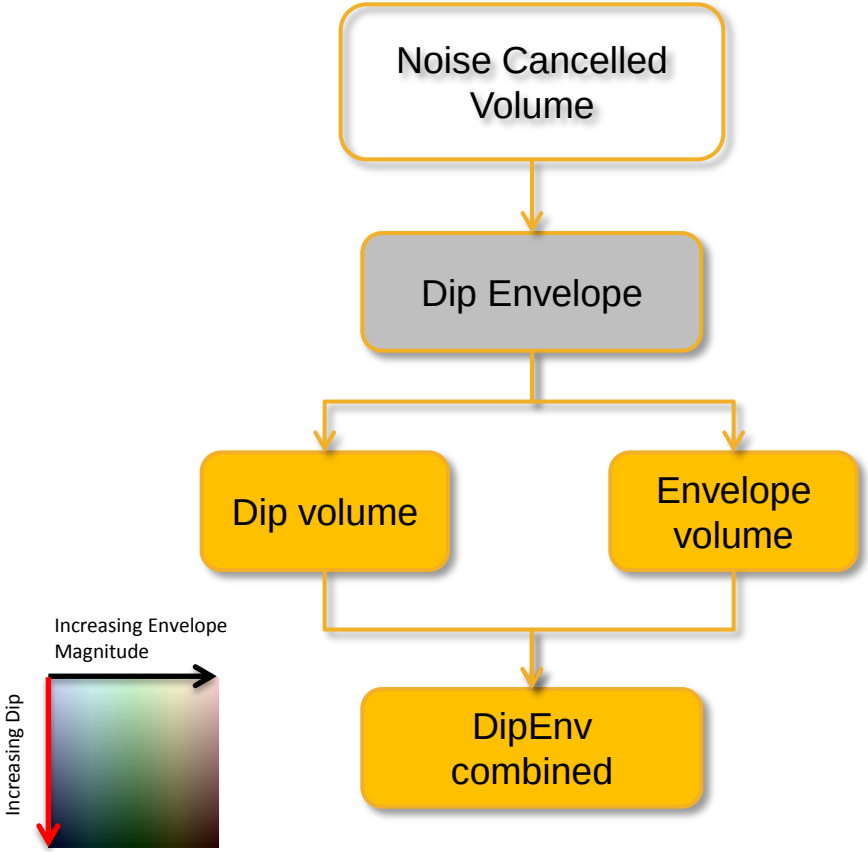


Volume Combos

Combination attributes can be particularly useful in interpreting stratigraphic boundaries and structure/sediment interaction.

Envelope, also known as *Reflection Strength*, is used as a basic indicator of Lithology/porefil. It shows steady lateral resolution and also the amplitude variation within the reflectivity data once the phase has been removed.

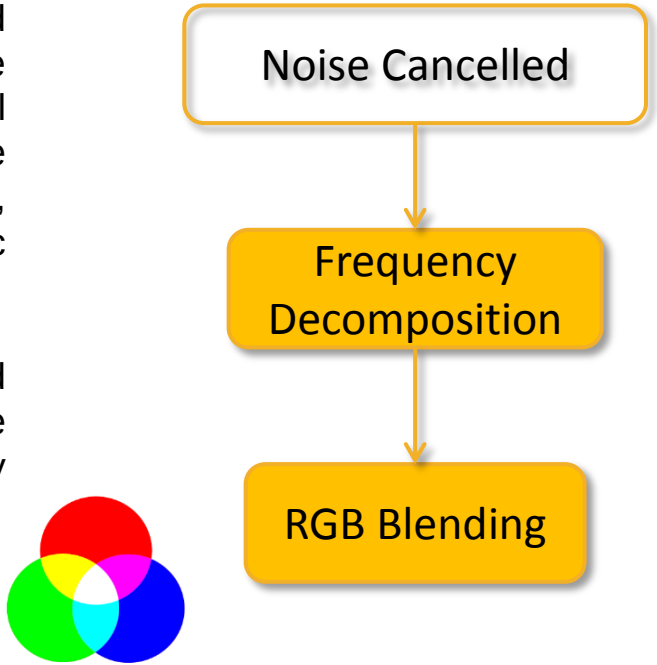
The Dip Envelope combined volume shows the amplitude in the Envelope while using the Dip to highlight structural variations. This volume helps to give us an idea of the relative structure/sediment interaction.



Standard Frequency Decomposition

Frequency Decomposition extracts band limited versions of the data and offers a much more sensitive method of analysing seismic data than the full frequency amplitude response. It can provide information about stratigraphic facies boundaries, structural and stratigraphic geometries, stratigraphic heterogeneity and bed thickness.

When 3 frequency magnitude responses are combined in a RGB (Red-Green-Blue) colour blend, the relationships and interplay between the frequency responses can be investigated.



Standard Frequency Decomposition