

## **Imaging Giant Stratigraphic Traps Using 3D Seismic Data in Brookian Lower Cretaceous Rocks, NPR-A**

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The Brookian sequence in the western Colville foreland basin records major subsidence followed by rapid sediment invasion. This rapid deposition is reflected by large >600 m (2,000 ft) clinoforms generally filling the basin west to east. Sands within these clinoforms are fine to very fine grained and are compositionally immature, shed from a mostly distal marine provenance. Brookian reservoir quality is determined by facies, grain size, rock composition and maximum burial depth. Lithic rock fragments in Brookian sandstones make these rocks sensitive to destruction of reservoir quality with increasing burial depth.

Turbidite and shelf-edge delta stratigraphic traps can be directly imaged in these clinoforms using seismic amplitude attributes. 5,700 km<sup>2</sup> (2,200 mi<sup>2</sup>) of 3D seismic data were processed and interpreted to image stratigraphic traps in the Brookian sequence. Far angle stacks (25°-45°) are a robust sand indicator highlighting channel fill and lobe deposits on the slope and basin floor. Amplitude variation with offset (AVO) class volumes characterize seismic anomalies and can be indicative of reservoirs with porosity.

Extensive turbidite traps likely represent fine grained and somewhat compacted sandstones that will require significant fracture simulation to produce. The extensive size of these turbidite traps, >12,000 hectares (30,000 acres), may compensate for their challenged reservoir quality making them potential drilling targets for industry.

Shelf-edge delta prospects located in outer shelf edges represent the most prospective oil play fairway in the NPR-A. Being relatively shallow, <2,000 m (7,000 ft) total burial, they maintain good reservoir quality and are stratigraphically positioned to potentially trap light HRZ oil. These untested prospects potentially rival or exceed the size of the Alpine Field discovery of 15 years ago.