

BeaufortSPAN

INTEGRATED SEISMIC SOLUTIONS

Program Overview

The Beaufort-MacKenzie Basin, located in arctic Canada, is a petroliferous province in relatively early stages of exploration. Three decades of exploration to date have resulted in 48 significant oil and gas discoveries with total resources estimated to be approximately 1.7 billion boe and 11.7 trillion cf of natural gas in the basin's shallow waters (< 50m). Additionally, undiscovered resources in the basin outside the deepwater areas (> 100m) are currently estimated at approximately 14.5 billion boe and 86.6 trillion cf of non-associated and associated gas.

To better characterize the potential of this promising region, more than 16,250km of multi-client 2D seismic data has been acquired in three phases.

Beaufort Phase 1, completed in 2006, covered over 3,500km. The survey was designed to image down to the base crust with a 9,000 meter cable and 18 second record intervals with final depth processing (PSDM) to 40 km. This data enabled the regional mapping of the ocean-continent boundary to the top of the MOHO discontinuity, as well as the identification of major stratigraphic sequences. The data acquisition was executed in open water with depths ranging from 20m to more than 2,000m and as far north as sea and ice conditions allowed.

Beaufort Phases 2 and 3 were completed in 2007-08, acquired over 12,500km, and were executed to the same parameters as Phase 1. The seismic datasets show that the offshore MacKenzie Delta system is underlain by a thick wedge of sediments estimated to be approximately 15km thick in places. Complex folds, faults and thrusts have formed as a result of interaction between compressive folding, wrenching, extension, inversion and gravity-induced loading, essentially all occurring at approximately the same time within various segments of the region.

The Beaufort-MacKenzie Basin datasets are the only datasets of their kind available for this prospective region. Primarily, in the shallow waters (< 100m) the upper tertiary horizons (Miocene to recent) are tied to well control. Deeper horizons are tied either to outcrop data (e.g. in the east) or by extrapolations from onshore wells. This extensive regional study has established that regional tertiary stratigraphic sequences are confirmed beyond the shelf edge and also provides a perspective of the depositional lobes marking the seaward progradation of the Mackenzie River sedimentary wedge and the associated reservoir and source rock intervals.

Program Objectives

- To deliver an accurate and more comprehensive understanding of the geologic structure of the greater MacKenzie Delta area
- To provide a regional 2D seismic framework that spans the area from west of David/Banks Island to the Canadian/U.S. boundary
- To reveal how the complex basin tectonics are controlled by the Mesozoic and older structures and Tertiary deformation of the Brooks Range-Cordilleran Orogen



About BasinSPANS™

Integrated Seismic Solutions BasinSPANS™ interpretation packages or "SPANS" provide E&P companies with the ability to better understand the petroleum systems in regions of interest. SPANS are geologically inspired, basin-scale, ultra-deep, seismic data programs acquired and depth-imaged using the most advanced geophysical technology available. They provide upstream companies with the ability to evaluate the geologic evolution, deep basin architecture and depositional and structural histories of entire petroleum systems in the region.

Unlike conventional multi-client seismic surveys, SPAN programs are custom designed in collaboration with GX Technology (an ION Company), regional experts and the O&G companies. Once the program objectives are agreed upon, GXT serves as Project Manager and applies the best survey design, acquisition and processing technologies with a proprietary mindset that adds value and achieves exceptional results. Such in-depth data and the associated interpretation tools greatly assists asset managers with portfolio management and provides significant risk mitigation as they develop exploration and appraisal programs with greater confidence.



BasinSPANS
Imaged by GXT



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Key Components

- Program design and layout are driven by known geology and client input providing a consistent seismic regional framework that ties into existing seismic lines
- 18 second records, 9,000 meter cables
- Integrated geologic and geophysical interpretation
- Improved understanding of key geologic features, placing them in a basin-wide context
- Applies technical specifications of acquisition, data processing and depth imaging of the seismic data

Deliverables, with Full Participation, Include

- Raw navigation merged shot gathers (SEGY)
- Final Kirchhoff PSDM and PSTM stacks (SEGY)
- Final PSDM depth-interval velocity model (SEGY)
- Final PSTM velocity model (SEGY)
- Gravity and magnetics data
- Structural and stratigraphic interpretations (faults and horizons)
- Final acquisition, processing and interpretation reports

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