3-D seismic data in the Newfoundland and Labrador offshore area

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Effective exploration for hydrocarbons in remote offshore areas has been made possible by improvements in seismic technology, computing and positioning. The first 'moving seismic collection' in the U.S. occurred in 1961. By 1964, 2-D seismic data was being collected by Amoco Petroleum in the Newfoundland and Labrador Offshore Area.

The concept of 3-D seismic data collection was tested by Gulf in 1974 and the benefits were quickly recognized. Following the discovery of the Hibernia field in 1979 Newfoundland and Labrador's first 3-D survey was recorded. Since then several large surveys have been recorded in the offshore area. Under the Atlantic Accord legislation non-exclusive data collected under an Authorization granted by the Canada-Newfoundland Offshore Petroleum Board (C-NOPB) becomes 'non-privileged' five years after completion of the work. Several large 3-D data sets, acquired in the late 1990s are now released and have been used by the C-NOPB for regional geoscientific studies, a part of the C-NOPB's mandate.

Over 3000 sq. km. of industry 3-D seismic data, have been interpreted and merged to show the superimposition of the tectonic expressions of the last two rift stages that affected the Grand Banks of Newfoundland. Evidence of changing palaeodrainage patterns is also seen. A late Jurassic/early Cretaceous northerly trending system deposited the fluvial reservoir unit for the Terra Nova oil field, while in the Tertiary an easterly trending system deposited submarine fans, which now contain hydrocarbons in such fields as Mara and Springdale.

The northwards opening of the northern Atlantic Ocean separated the Grand Banks of Newfoundland from the Iberian

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Peninsula in late Jurassic-early Cretaceous. This was the second rift phase to affect the Banks and resulted in a strong north-south overprint on the original northeast-southwest fabric of the initial basins. The third and final rifting phase to affect the Banks, also related to the opening of the Atlantic, started in mid-Cretaceous when the British Isles separated from the Grand Banks and the Labrador rift opened.