

## **The Saglek Basin in the Labrador Sea: Past Exploration History, Current Estimates and Future Opportunities**

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### **Abstract**

New interpretations of industry seismic data in northeast Labrador Sea have been produced to develop a 3-D Petroleum System Model for the Saglek Basin. Improved palynological analysis has provided better age constraints on the timing and geometry of basin in-filling and subsidence. Exploration well cutting samples have been re-analyzed to improve the details of thermal maturity and kerogen source type. A 2-component heat-flow model has been adopted based on the tectonic history of the Labrador Sea and the timing of significant volcanic extrusions each producing significant heat pulses. The new petroleum model explains the origins of the discovery at Hekja 0-71 and provides an explanation for the dry Raleigh-N18 well only 25 km away. The revised seismic mapping used for the model building shows the presence of very large structural closures that could represent significant future exploration targets; one very large structure mapped is over 10 times the size of the Hekja structure.

The Saglek Basin is a very large sedimentary basin (over 100,000 km<sup>2</sup>) on the northern end of the Labrador Margin. The 2 Tcf Hekja 0-71 discovery in 1979 lies at the northern end of the Saglek Basin near the mouth of Frobisher Bay offshore Nunavut. The southern half of the basin is within the offshore jurisdiction of Newfoundland & Labrador. The basin contains over 9 km of strata mapped by regional 2-D seismic data.

A basin-wide seismic reflector that is interpreted as basalts in the north leads into a regional unconformity in the south. These basalts have been sampled from the exploration wells, and are believed to be part of a major subareal Paleocene volcanic event corresponding with the initiation of sea-floor spreading (Chron 27N).