

A Fresh Look at the Evolution of the Continental Margin Off Nova Scotia

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The Nova Scotia margin is characterised by an extremely deep sedimentary basin above a wide zone of significantly thinned continental crust. Faulting style and basin geometry vary laterally along the margin, reflecting differences in rifting history, heat flow, mechanical properties and sedimentation. These same factors have influenced the occurrence, trapping and maturity levels of hydrocarbons within the basin, and a better understanding of the margin evolution will aid in further exploration and development. Efforts are presently underway to improve our understanding of the structural and stratigraphic development of this margin. New stratigraphic and geophysical data and interpretations are being added to the substantial database collected by researchers and exploration companies over the past 40 years to produce a consistent model of margin evolution.

An aspect currently under study concerns lateral variations in crustal structure and subsidence rates. Linked to other observations of margin variability is the magnetic signature, which indicates a volcanic-style margin in the southwest that changes just east of Sable Island. Modelling suggests that rift-age volcanic flows responsible for similar signatures along the US margin may also be present off Nova Scotia, but at smaller volumes and much greater depths. The change in signature near Sable Island is being investigated to determine its links to heat flow and margin subsidence during and after rifting. Early results, supported by gravity data, highlight significant differences in the thermal regime and mechanical behaviour of the two sections of the margin during early development.