

### **Structural elements and sedimentation patterns in the Magdalen Basin**

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We compiled a large amount of industry seismic reflection data together with Lithoprobe deep seismic reflection data to study the main structural elements in the Magdalen Basin. Pre-Horton Group basement rocks in the western part of the basin can be subdivided into three upper crustal blocks. Structures in the Laurent and Bradelle blocks appear to be the southeastward extension of structures observed in Gaspé. The northeast trending structures in the Shediac block appear to be parallel to the offshore extension of faults occurring in New Brunswick: the Belleisle, Fredericton and Catamaran faults.

In the central part of the Magdalen Basin, we identified a large unit beneath extensive salt intrusions that we call the sub-salt high. The sub-salt high has a complex structure as revealed by generally poorly defined seismic reflections with

highly variable dips. The nature and the origin of the sub-salt high are unknown; however, Horton Group rocks, overlying Mississippian or older volcanic rocks, were drilled at the top of the sub-salt high.

In the Cabot Strait between Cape Breton Island and Newfoundland, a complex northeast striking fault system affects both basement and sediments.

A series of maps summarize the main sedimentation patterns in the Magdalen Basin. An isopach map shows that the Horton Group was deposited in small elongated half-grabens. An isopach of the Windsor and Canso (Mabou) groups combined indicates uniform deposition in a broad subsiding trough. We interpret the isopach maps in terms of two distinct tectonic environments, a crustal extension phase followed by thermal relaxation.