

Tectonic evolution of the Sackville sub-basin, New Brunswick: problems and possibilities

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The Sackville sub-basin of New Brunswick lies within the Maritimes Basin in Atlantic Canada. It is a structurally complex basin bounded by: the Caledonia Uplift to the west; the Hastings Uplift, the Harvey-Hopewell and Wood Creek faults to the south; and the Westmorland Uplift and Dorchester fault to the north, which separate it from the Moncton sub-basin. Orogen-scale dextral motion and strike-slip boundaries define movement of the region during the Carboniferous. Major movement in the Sackville subbasin occurred along the Dorchester and Harvey-Hopewell Faults. Throughout the Carboniferous, the Sackville subbasin experienced periods of subsidence, inversion, and extension. Carboniferous sedimentary rocks within the sub-basin include Albert Formation (Horton Group) oil and gas-bearing shales, Round Hill Formation (Sussex Group) conglomerates, Upperton Formation (Windsor Group) evaporites, Maringouin Formation (Mabou Group) red mudstones, Hopewell Cape Formation (Mabou Group) coarse conglomerates, and Boss Point Formation (Cumberland Group) sandstones.

Industry seismic profiles show an allochthonous thrust wedge of unknown origin dominating the geology in the subsurface. This thrust wedge appears to be inserted southeastward into Windsor Group evaporites low in the section. The wedge could represent subsurface equivalents of the nearby Caledonia Uplift, or of the adjacent Moncton sub-basin. Clues to the nature of the wedge are provided by rock chip well samples and surface correlation.

The upper surface of the wedge is probably correlative with the Harvey-