

Strike-slip and salt tectonics in the development of the Cumberland and Sackville subbasins, Nova Scotia and New Brunswick, Canada

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A compilation of industry subsurface data permits correlation of major stratigraphic surfaces, in three dimensions, across the Late Paleozoic Cumberland subbasin and adjacent subbasins of the Maritimes Basin in northern Nova Scotia and adjacent New Brunswick. The boundaries of major groups: Pictou, Cumberland, Mabou, Windsor, Sackville and Horton - show increasing deformation down section, indicating that the Maritimes Basin was tectonically active throughout much of its development.

The Horton Group is only clearly resolved in subsurface data in the Sackville subbasin of southern New Brunswick, where it is cut by faults that show variations in their sense of offset within the Horton Group. These repeated inversion events are most reasonably interpreted as resulting from strike-slip motion, which continued during and after deposition of the Mississippian Sackville and Windsor groups, producing a south-propagating flower structure in southern New Brunswick. In the Cumberland Basin, salt expulsion began in the east, probably during the Middle Mississippian, whereas in western sections the major episode of salt expulsion occurred in the Pennsylvanian, providing accommodation for the rapidly deposited Cumberland Group in the area of the Joggins World Heritage Site. At several places in the Maritimes Basin, expulsion of salt during transpression appears to have produced a distinctive geometry involving tectonic wedges described here as a "wilted" positive flower structure. This geometry may be characteristic of tectonic settings where strike-slip motion and salt tectonics are active simultaneously.