

Architecture of the Late Paleozoic Maritimes Basin in New Brunswick, Canada

Clint St. Peter

New Brunswick Department of Natural Resources and Energy, Geological
Surveys Branch, P.O. Box 6000, Fredericton, New Brunswick, E3B 5H1

Clint.St.Peter@gnb.ca

The Upper Devonian and Carboniferous strata of eastern New Brunswick represent the western erosional margin of the Maritimes Basin. The architecture of the Basin in New Brunswick, as elsewhere in the Maritimes, can be divided into two elements. The early element comprises several, 1000-8000 km², more-or-less isolated, fault-controlled depocentres separated by crystalline source areas. These depocentres in New Brunswick, the Moncton and Sackville subbasins, contain two thick depositional sequences. The lower depositional sequence, the Famennian to Tournaisian Horton Group, is 3-5 kilometres thick and comprises coarse redbeds of the basal Memramcook Formation, an overlying grey lacustrine complex of the Albert Formation and a succeeding red alluvial and fluvial assemblage of the Weldon Formation. The Horton sections in the depocentres were inverted and variably eroded prior to deposition of the unconformably overlying Windsor Group. The upper depositional sequence in the subbasins consists of two groups, the Visean Windsor marine limestones, sulphates and chlorides and the overlying Visean to early Namurian Mabou terrestrial redbeds. Mabou deposition ended with a second inversion of the subbasin sequences and a resulting basin-wide mid-Namurian unconformity.

The upper architectural element of the Maritimes Basin comprises two sequences. The lower sequence is the late Namurian to early Westphalian Cumberland Group, which in New Brunswick comprises mainly grey, mature to sub-mature fluviatile sandstones, and red to grey overbank mudrocks. Cumberland strata and all older Carboniferous units are disconformably to unconformably overstepped by the regionally distributed Pictou Group of late Westphalian B to Early Permian age. The Pictou beds in New Brunswick consist of multiple stacked cycles of fining-upwards grey and red, fluvial, channel conglomerate and sandstone units capped by mainly red overbank mudrocks with rare thin coal seams.

A petroleum system has been known in the lowest depositional sequence of the Maritimes Basin for more than one hundred years. For example, commercial oil and gas were discovered in the Albert Formation at Stoney Creek in the eastern Moncton Subbasin in 1909. After many years of inactivity or sporadic exploration, renewed interest in the Albert has led to the discovery of an oil field in 2000 and an exciting new gas play, which is presently being drilled in the Sussex area.