# Abstract

The Cumberland Basin contains the type sections of both the Cumberland and Pictou groups. Ryan *et al.* (1991) redefined these units based on the lithological characteristics of the type areas determined in this study. The stratigraphic nomenclature was simplified by abandonment of the term 'Riversdale Group' and the recommendation of adopting Belt's suggestion that the term 'Canso Group' should be replaced with the term 'Mabou Group'. Several new map units or formations were also defined, including: the Pugwash Mine and Lime-kiln Brook formations of the Windsor Group; the Polly Brook, Joggins, Springhill Mines, Ragged Reef and Malagash formations of the Cumberland Group; and the Balfron, Tatamagouche and Cape John formations of the Pictou Group.

Sedimentological study of the fluvial units in the Cumberland Basin has raised several important questions. The fluvial environments that deposited the bulk of these strata range in style from anastomosing to meandering streams. There are, however, many beds that do not conform to the established stream facies models. Strata deposited by these streams appear to have characteristics of several stream types. In this report we have suggested that the lateral and stratigraphic continuity of these deposits warrant the establishment of a facies model based on these beds, a 'composite stream model'.

This memoir documents the close relationship of sedimentary rock packages to the structural and tectonic evolution of the basin. The structures and sedimentary allocycles contained within the basin suggest that the basin developed as a result of alternating local and regional subsidence related to transform fault movements along the suture (Cobequid - Chedabucto Fault Zone) between the Meguma and Avalon terranes. The role of evaporite diapirism in the structural development of the basin has been clarified by the findings of this study.

Thermal studies have resulted in a better understanding of the thermochronological evolution of the basin. The most significant conclusion is that the Cumberland Basin was covered by 2-4 km of additional sedimentary strata in the Permian and that these strata were subsequently eroded. This observation helps to explain the organic maturation and mineral deposits in the basin.

The Cumberland Basin has significant potential for economic mineral deposits. The basin has had a long history of coal, copper and industrial mineral production. The thermal and economic geology studies carried out as part of this project place constraints on the timing of mineralization within the basin. In particular, these studies suggest that redbed Cu-Ag mineralization in the basin is related to exhumation of the strata (circa 270-200 Ma). These studies also indicate that if there were basin brine expulsion events, which may have resulted in as-yet undiscovered Pb-Zn-Ba deposits in the basin, they must have occurred prior to the onset of exhumation (before 280 Ma).