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**Structural geology and basement-cover relations in  
the southeastern Cape Breton Highlands, Nova Scotia:  
preliminary results**

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AMY M. TIZZARD

*Department of Geology, Acadia University,  
Wolfville, Nova Scotia, B4P 2R6, Canada*

The southeastern Cape Breton Highlands consist of various pre-Carboniferous plutonic, volcanic and metamorphosed basement rocks of the Bras d'Or terrane, with Carboniferous sedimentary material in the adjacent valley and coastal regions. Field investigations in the past have shown the geological irregularity in this area of Cape Breton Island that the older basement rocks lie at equal, if not higher, topographic elevations than the nearby Carboniferous sedimentary units. This study attempts to resolve the structural relations between the Carboniferous sedimentary units and adjacent pre-Carboniferous basement rocks in this area using geological mapping with an emphasis on lithological contact configurations, structural data constructions such as cross-sections, three-point problems and stereoplots, thin section petrography to decipher a potential provenance source of many of the sedimentary units, and the degree of alteration of parts of the basement material, and a comparison of these data with geophysical maps and satellite imagery.

Mapping of the area around the basement-cover contact has shown faulting, shearing and unconformities. Structural analyses confirmed the field mapping in the Goose Cove – St. Ann's area, showing that the dip of the contact plane between the basement and sedimentary units is shallow, with an average dip angle of 14.8°. Thin section petrography has revealed a wide range of basement conditions from completely unaltered to mylonitic. Interpretation of gravity data in the southeastern Highlands suggests that the basement has no root, particularly in the Goose Cove – St. Ann's field area.

These observations have several implications for the development of the southeastern Highlands, the most significant being that a thrust sheet of basement material appears to have been transported over the younger sedimentary units verging eastward in this area of Cape Breton Island. Potentially a large part of the Cape Breton Highlands may be allochthonous.