

The North Group – A newly discovered multiple impact crater site in southwestern Nova Scotia?

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An approximately 0.4 km diameter elliptical structure was identified in southwestern Nova Scotia in 1987 during a regional airphoto survey. The structure was confirmed as an impact crater in 2009, and was named the Bloody Creek structure (BCS). In addition to the main crater, a cluster of discontinuous arcuate scarps located approximately 1 km north of the BCS was identified. These arcuate scarps have been called the North Group. The purpose of this study is to resolve the nature of the North Group in order to determine if this site represents a multiple impact event. This will be achieved through an integrated analysis of geomorphic, geophysical and petrographic data.

A detailed aerial photo analysis of the site reveals several discontinuous arcuate scarps (1 to 2 m high) sharply outlining flat depressed inner floors. Sonar and lake sediment probing across a few of the structures revealed a crater-like morphology beneath the depressed inner floor. The craters are interpreted to be infilled with lacustrine sediment and peat.

Bedrock samples for petrographic analysis have been collected from just outside one of the crater rims. Preliminary petrographic work revealed possible shock-metamorphic effects. These included kink-bands in feldspar and biotite and planar microstructures (PMs) in quartz and feldspar. The PMs consist of planar fractures (PFs) in both quartz and feldspar and possible planar deformation features (PDFs) in quartz. Of these features, the PDFs are considered uniquely diagnostic of shock metamorphism. These features will be further examined using a universal-stage petrographic microscope. A detailed morphometric analysis of the arcuate scarps remains to be completed; this will determine whether the structures exhibit elliptical symmetry.