
**Geochemical data applied to
geohazard mapping in Nova Scotia**

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Geohazard maps of geochemical data are tools that can be used in assessing environmental risks associated with elemental abundances that occur in nature. During a two-year, seasonal survey, soil samples were collected by the Nova Scotia Department of Natural Resources (NSDNR) as part of the North American Soil Geochemical Landscape Project (NASGLP). Pebbles and geochemistry data from the C- horizon were provided by NSDNR to Dalhousie's Environmental Geology class (ERTH 3140) for further study. Based on preliminary hand sample evaluation, pebble rock types were identified and counted, and site bedrock geology was determined from NSDNR maps. Of the 72 original samples, 48 represented a common suite and were selected for further analysis. Pebbles matched bedrock in the majority of samples, and at sites where a mismatch occurred, pebble rock types were found to correspond to "up-ice" geology. Assessment of the geochemical data indicated that 8 elements (As, Cr, Ba, Ni, Zn, Cu, V and Pb) exceeded the Canadian Council of Ministers of the Environment Soil Quality Guidelines (SQG). Among elements with a SQG, exceedence concentrations for As (26 sites), Cr (16 sites), and Ba (11 sites) were most common. In particular, arsenic levels exceed the SQG of 12ppm in over half the sites studied. Although a SQG for Mn is not specified, Mn occurrences at 8 sites exceed the US Environmental Protection Agency's (EPA) draft regional screening guideline level (1800ppm) for residential soils. Most element pairs did not display strong correlation patterns; however, Fe:Cr, Fe:Co, and Fe:Zn did show strong positive correlation ($r^2 > 0.7$). The geochemical analysis in this study quantifies the environmental distribution of potentially

hazardous element occurrences in Nova Scotia, and provides spatial data that may be used in the production of provincial geohazard maps.