
**Mercury in till and bedrock,
Kejimikujik National Park, Nova Scotia**

B.M. CULGIN¹, T.A. GOODWIN², AND D.L. FOX¹

*1. Department of Earth Sciences, Dalhousie University, Halifax, NS B3H 4J1,
Canada ¶ 2. Nova Scotia Department of Natural Resources, P.O. Box 698, Halifax,
NS B3J 2T9, Canada*

Loons in Kejimikujik National Park have the highest levels of mercury (Hg) concentration in blood of any loon population in North America. For the past several years, a multi-disciplinary team of research scientists has been attempting to identify the potential Hg source(s) and process(es) responsible for the anomalous Hg levels. One component of this research involves the collection and geochemical analysis of till and bedrock samples in order to quantify the geogenic contribution of Hg from glacial sediments and bedrock sources. Health Canada provided funding for the project through the Toxic Substance Research Initiative (TSRI).

A total of 39 C horizon till samples were collected at 100 to 200 m intervals from three NW-SE transects that cross the inferred contact between the Halifax and Goldenville formations immediately south of the park boundary. Samples were collected from depths ranging from 70 to 120 cm. Geochemical results for the <63 microns size fraction were determined by Cetac CV-AA and indicate Hg ranges from a minimum of 6.6 ppb to a maximum of 158.5 ppb (mean = 44 ppb).

Nine bedrock samples of slate and meta-sandstone were collected along the same transects. Geochemical results for the <105 microns size fraction of the bedrock samples also were determined by Cetac CV-AA with Hg values ranging from 0.2 to 3.4 ppb (mean = 2.5 ppb). Strict QA/QC protocols were followed in the collection, preparation, and analysis of all samples.

Within the study area, results from bedrock mapping indicate that the actual contact between the Halifax and Goldenville formations is located north of the contact indicated on the most recent published geological map. This interpretation is supported by a detailed (12.5 m) ground magnetometer survey along the same transects that suggests placement of the contact 500 to 1000 m further to the north. This is significant because a previous study has suggested a spatial correlation between Hg in soil gas and the contact between the Halifax and Goldenville formations. Proper identification and placement of the contact is imperative for the interpretation of the Hg content of the <63 microns till geochemistry.