
**Applications of Quaternary geology and till
geochemistry projects in northeastern New Brunswick**

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Quaternary mapping and till sampling in the Pointe-Verte and Bathurst areas provides baseline geological data for mineral exploration, environmental applications, land use planning, and forest management, and assists in locating sources of aggregate and clay-rich basal till. The study area is located in northeastern New Brunswick and includes part of the Jacquet River Gorge protected area, a significant amount of private land, municipalities, including the city of Bathurst, and the Port of Belledune.

A total of 369 basal till samples were collected, and surficial mapping was done to develop a model for glacial dispersion and to assist mineral exploration. Glacial striations, roches moutonnées, and drumlinized topography indicate ice flow in an east-northeast direction in the Pointe-Verte area and western part of the Bathurst map area. Ice flow in the central part of the Bathurst sheet is towards north-northeast, along

the Curventon–Bathurst Valley towards the Bay of Chaleur. Approximately 75 pebbles were collected at each site to determine glacial transport distances. Most pebbles are locally derived but dispersal in an east-northeastward direction is indicated away from well-defined point source lithologies (Antinouri Lake, Nicholas Denys, Pabineau and Nigadoo felsic intrusive rocks).

In the Pointe-Verte area, particular attention was paid to field tests for texture, coarse fragments, consistency etc. in order to compare the accuracy of the standard field methods with detailed lab. analyses performed on bulk till samples collected at the same sites. At 105 sites that met the field tests for approximate percentage of clay material, a 10 kg bulk till sample was collected to outline areas of clay-rich till in the Port of Belledune area. The bulk samples were sieved to define the percent of the sample from 9 size fractions ranging from 8 cm down to <3.5 μm . They were also processed like other till samples that have been collected in the past, to define the sand/silt/clay ratio of the fine fraction and added to the province-wide database. In the samples that contain more than 10 percent clay (<3.5 μm) by the sand/silt/clay ratio lab. tests, the field tests also are relatively accurate in terms of indicating potential sources of clay-rich till. Initial mapping revealed that the till was more clay rich north of the Antinouri Lake Granite and west of the village of Pointe-Verte and in the eastern part of the Bathurst map area where the till has a primary source in Devonian and Carboniferous sedimentary rocks.

Till geochemical data for New Brunswick, including this survey, are part of a joint Geological Survey of Canada/New Brunswick Geological Surveys project to look at background trace metal concentrations in basal till. This is part of the federal government's Metals in the Environment program. New Brunswick has a large dataset (>10 000 samples) well-distributed over the province (all bedrock geological units). Some re-analyses will be required to assist in the levelling process. Till samples collected in the eastern part of the Bathurst map sheet will be used to further define background till geochemical concentrations over Carboniferous sedimentary rocks which underlie most of eastern New Brunswick.