

GeoFile 9-2026 ReadMe

Manitoba till-matrix geochemistry compilation: inductively coupled plasma–mass spectrometry and inductively coupled plasma–optical emission spectroscopy data after a fusion digestion



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Abstract

This GeoFile provides a digital dataset for till-geochemistry surveys carried out in Manitoba, where the till matrix (silt plus clay [$<63\ \mu\text{m}$] or coarse sand [1–2 mm]) was analyzed by inductively coupled plasma–mass spectrometry after fusion digestion. This compilation of 18 projects includes 1357 till samples and will be updated on a biennial basis. This data can be brought into GIS software, and integrated with other geoscience data, to generate new exploration targets and design follow-up exploration programs.

Résumé

Ce géodossier offre un ensemble de données numériques provenant de levés géochimiques du till réalisés au Manitoba, où la matrice de till (limon et argile [$< 63\ \mu\text{m}$] ou sable grossier [1–2 mm]) a été analysée par spectrométrie de masse à plasma à couplage inductif après digestion par fusion. Cette compilation de 18 projets comprend 1 357 échantillons de till et sera mise à jour une fois tous les deux ans. Ces données peuvent être téléchargées dans un logiciel SIG et intégrées à d'autres données géoscientifiques afin de générer de nouvelles cibles d'exploration et de concevoir des programmes d'exploration de suivi.

DIGITAL DATA

Zip file geofile9.zip contains the following content:

- GeoFile_9-2026_ReadMe.pdf (this file)
- GeoFile_9-2026.xlsx:
 - Table 1: Detection limits.
 - Table 2: Till-matrix geochemistry by fusion digestion and ICP-OES and ICP-MS analysis.
 - Table 3: Summary statistics for the till-matrix fusion digestion and ICP-OES and ICP-MS analysis.
 - Table 4: References.

Introduction

This GeoFile captures Manitoba till-matrix geochemistry data analyzed between 2009 and 2025, totalling 1357 samples, where the silt plus clay (<63 µm) or coarse sand (1–2 mm) size fraction was analyzed by inductively couple plasma-mass spectrometry (ICP-MS) or by inductively couple plasma-optical emis-

sion spectrometry (ICP-OES) after a fusion digestion (Figure 1). These surveys generally have accompanying surficial mapping, paleo ice-flow mapping and till composition studies. Compilation of till-geochemistry data from these surveys is useful in generating exploration activity, as well as providing 'background' baseline values.

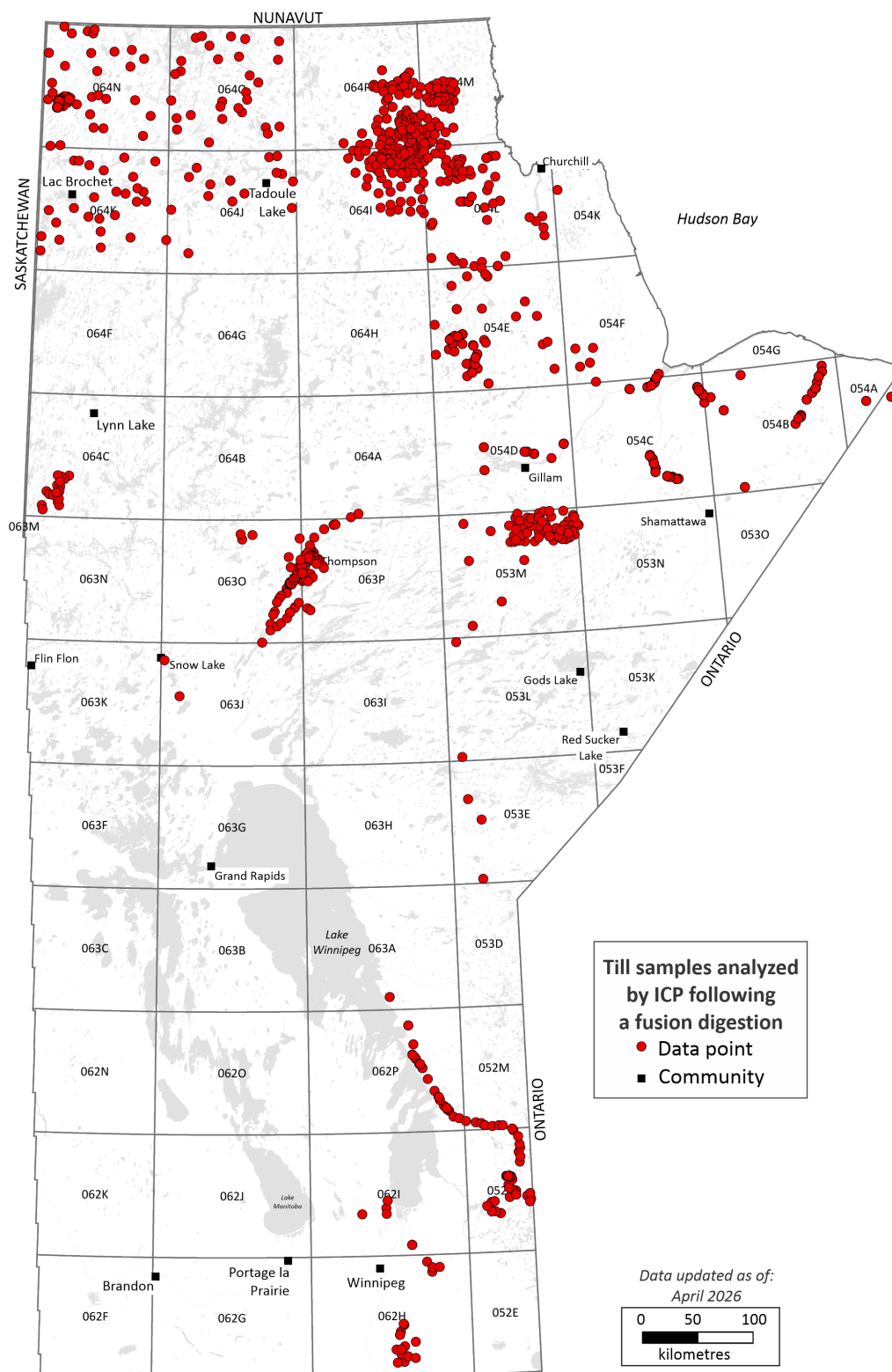


Figure 1: Till sample locations where the silt plus clay (<63 µm) and/or coarse sand (1–2 mm) size fraction of the matrix was analyzed by inductively coupled plasma–mass spectrometry and inductively coupled plasma–optical emission spectroscopy after a fusion digestion.

Methods

Collection methods

Till samples were collected from hand-dug pits, roadcuts, Dutch-auger holes, natural exposures, and quarries. To reduce the effects of post-depositional weathering processes, most samples were taken from the C-horizon. To obtain the silt and clay (<63 µm) or very coarse sand (1–2 mm) size fractions, the samples were sieved prior to analysis. The dataset comprises all information directly relevant to each till sample, including publication number, laboratory, project name, spatial coordinates, sample depth, and other essential attributes. More information about the sample methods used for individual projects can be found in the associated publications.

Sample locations

Sample locations were collected by GPS in the field and are provided for each till sample, along with the depth sampled. Manitoba spans three different UTM zones (14–16). For ease of display in GIS, all data have been re-projected into zone 14; hence, all coordinates herein are reported as UTM zone 14, NAD83.

Analytical methods

This compilation focuses on till matrices that were analyzed by inductively coupled plasma–optical emission spectrometry and inductively coupled plasma–mass spectrometry after fusion digestion. The till samples were prepared for geochemical analysis at several different labs over time. For this compilation, the labs included are Activation Laboratories Ltd., Bureau Veritas Commodities Canada Ltd., and Saskatchewan Research Council Geoanalytical Laboratories. A comprehensive list of the projects in this compilation, along with the elements analyzed, is presented in Table 4.

Compilation methods

The data for 1357 samples were compiled from 18 projects spanning from 2009 to 2025. Not all elements were analyzed in every study. The elements not analyzed in a particular project were denoted with an “NA” for “not analyzed”. For values below the detection limit, the less than symbol (<) is placed in front of the lowest detection limit (e.g., for Al_2O_3 , the limit is 0.01; if it were under this limit, it would be <0.01). Detection limits are listed in Table 1.