

GeoFile 8-2024 ReadMe

Manitoba till-matrix geochemistry compilation: visible gold grains in the heavy mineral (<2 mm) size fraction

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Abstract

This GeoFile provides a digital dataset for till-geochemistry surveys carried out in Manitoba, where the heavy mineral (<2 mm) size-fraction was analyzed for visible gold. This compilation of 27 projects includes 3864 till samples, and will be updated annually or bi-annually. 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 jeu de données numériques pour les relevés de géochimie du till effectués au Manitoba dans lesquels la fraction granulométrique de minéraux lourds (<2 mm) a été analysée pour évaluer la quantité d'or visible. Cette compilation de 27 projets comprend 3864 échantillons de till et sera mise à jour une fois par an ou 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 geofile8.zip contains the following content:

- GeoFile_8-2024_ReadMe.pdf (this file)
- GeoFile_8-2024.xlsx:
 - Table 1: Till-matrix visible gold data for the heavy mineral (<2 mm) size fraction.
 - Table 2: References.

Introduction

This GeoFile captures till-matrix gold grain data collected from surveys on the heavy mineral (<2 mm; –10 mesh) size fraction of tills, carried out in Manitoba since the 1980s (Figure 1; Table 2). This GeoFile will be updated as new data is released.

Methods

Updates

Continued fieldwork by the Manitoba Geological Survey (MGS) has resulted in the addition of new data gathered along part of the Gods River (Mesich et al., 2023; Gauthier et al., 2024) and in southeastern Manitoba (Hodder, 2024).

In addition, material type was edited for some of the samples from Fedikow et al. (2000), based on examination of original field notes.

Collection methods

Till samples were collected from road cuts, borrow pits, ditches, natural exposures, hand-dug holes, Dutch-auger holes and boreholes across Manitoba. Wherever possible, till samples were collected from the C horizon in order to minimize potential weathering effects. To learn more about the characteristics of individual till samples, the reader is encouraged to view the original publications.

Data captured include all data immediately relevant to the till sample (Table 1). This includes publication number, laboratory used, project name, spatial coordinates, depth of sample and other important information. MGS project numbers are only assigned to some projects, as this is a 2019 internal initiative designed to better track projects from year to year. The user should note that the compilation includes samples taken at depth, in some cases by drilling and in others accessed by natural river sections.

Sample location

Sample locations are provided for each till sample. Technically, Manitoba crosses three UTM zones (14 to 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. Some older samples may be misplaced by as much as 200 m, as it is unknown when recording methods switched from NAD27 to NAD83. While coordinates were compiled from the original reports, some projects were pre-GPS and the locations were digitized from hand-drawn field maps. Again, the coordinates of these older till samples are to be used as a guide rather than a precise location. This is why the data table includes the column 'Year_sampled' instead of the publication year (Table 1).

Analytical methods

Till samples were processed for visible gold at Overburden Drilling Management Limited (ODM; Ottawa, Ontario). Samples were disaggregated and sieved to obtain the <2 mm size-fraction,

and then processed using a double-run across a shaking table. The table preconcentrate was then panned to recover any gold minerals.

All data are included herein, and no efforts have been made to compare methods. Problematically, the table-feed weight and/or the nonferromagnetic weight has been lost for some samples, which makes comparison between samples difficult. The calculated ppb visible gold (Table 1, column AD) is a proprietary calculation conducted by ODM using the dimensions of the gold grains.

Supporting data

The original files for each project can be found through the Bibliography of Manitoba Geology and Resource Centre catalogue (Manitoba Geological Survey, 2020). To help with analysis, the following data is also available:

- Manitoba till-matrix geochemistry compilation: total carbonate of the silt plus clay (<63 µm) size fraction (Gauthier, 2023)
- index of Manitoba surficial geology maps (Manitoba Geological Survey, 2022)
- compiled digital surficial materials maps (Manitoba Geological Survey, 2017)
- digital compilation of surficial point and line features, including ice-flow data (striations, streamlined landforms) and bedrock-outcrop locations (Gauthier et al., 2022a)
- the current understanding of ice-flow history in Manitoba (Gauthier et al., 2019; Gauthier et al., 2022b)

References

- Fedikow, M.A.F., Nielsen, E., Conley, G.G. and Lenton, P.G. 2000: Operation Superior: multimedia geochemical and mineralogical survey results from the southern portion of the Knee Lake greenstone belt, northern Superior province, Manitoba (NTS 53L); Manitoba Industry, Trade and Mines, Manitoba Geological Survey, Open File Report OF2000-2, 2 v. + 1 CD-ROM.
- Gauthier, M.S. 2023: Manitoba till-matrix geochemistry compilation: total carbonate of the silt plus clay (<63 µm) size-fraction; Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, GeoFile 7-2023, Microsoft® Excel® file.
- Gauthier, M.S., Breckenridge, A. and Hodder, T.J. 2022b: Patterns of ice recession and ice stream activity for the MIS 2 Laurentide Ice Sheet in Manitoba, Canada; *Boreas*, v. 51, no. 2, p. 274–298, URL <<https://doi.org/10.1111/bor.12571>>.
- Gauthier, M.S., Santucci, A. and Keller, G.R. 2022a: Digital compilation of surficial point and line features for Manitoba, including ice-flow data; Manitoba Natural Resources and Northern Development, Manitoba Geological Survey, GeoFile 1-2022, 5 p.
- Gauthier, M.S., Mesich, L.N. and Hodder, T.J. 2024: Till heavy mineral analysis (gold, MMSIM, visual KIM) from eight sections near the confluence of the Hayes and Gods rivers, northeastern Manitoba (parts of NTS 54C2, 7); Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, Data Repository Item DRI2024001, Microsoft® Excel® file.

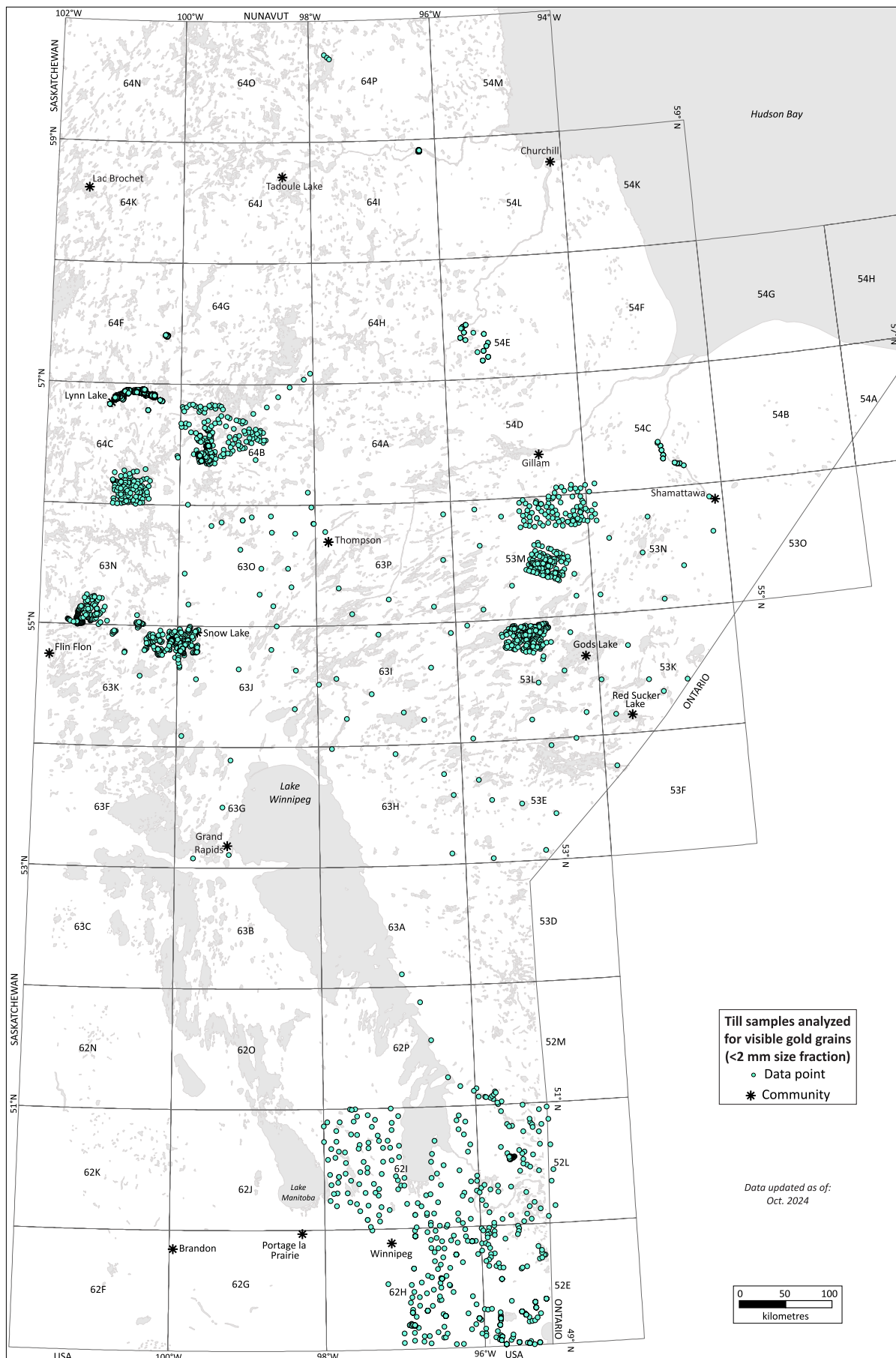


Figure 1: Till-sample locations where the heavy mineral (<2 mm) size fraction of the matrix was analyzed for visible gold grains in Manitoba.

- Gauthier, M.S., Hodder, T.J., Ross, M., Kelley, S.E., Rochester, A. and McCausland, P. 2019: The subglacial mosaic of the Laurentide Ice Sheet; a study of the interior region of southwestern Hudson Bay; *Quaternary Science Reviews*, v. 214, p. 1–27, URL <<https://doi.org/10.1016/j.quascirev.2019.04.015>>.
- Hodder, T.J. 2024: Gold and indicator-mineral data derived from glacial sediments (till) in southeastern Manitoba (parts of NTS 52L, 62P, 63A); Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, Data Repository Item DRI2024004, Microsoft® Excel® file.
- Manitoba Geological Survey 2017: Surficial geology compilation map series (SGCMS); Manitoba Growth, Enterprise and Trade, Manitoba Geological Survey, URL <<https://manitoba.ca/iem/geo/gis/surfgeomap.html>> [January 2022].
- Manitoba Geological Survey 2020: Introduction to the Bibliography of Manitoba Geology and Resource Centre catalogue (BMG); Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, URL <<https://manitoba.ca/iem/info/library/bmgintro.html>> [January 2022].
- Manitoba Geological Survey 2022: Surficial geology map index; Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, URL <https://manitoba.ca/iem/geo/surficial/sg_gf.html> [January 2022].
- Mesich, N., Gauthier, M.S., Hodder, T.J., Hathaway, J., Schaarschmidt, M., Lian, O.B. and Ross, M. 2023: Quaternary stratigraphic investigations along the Gods and Yakaw rivers, northeastern Manitoba (parts of NTS 54C2, 7); *in* Report of Activities 2023, Manitoba Economic Development, Investment, Trade and Natural Resources, Manitoba Geological Survey, p. 120–123.