Drift Exploration Resources in Manitoba

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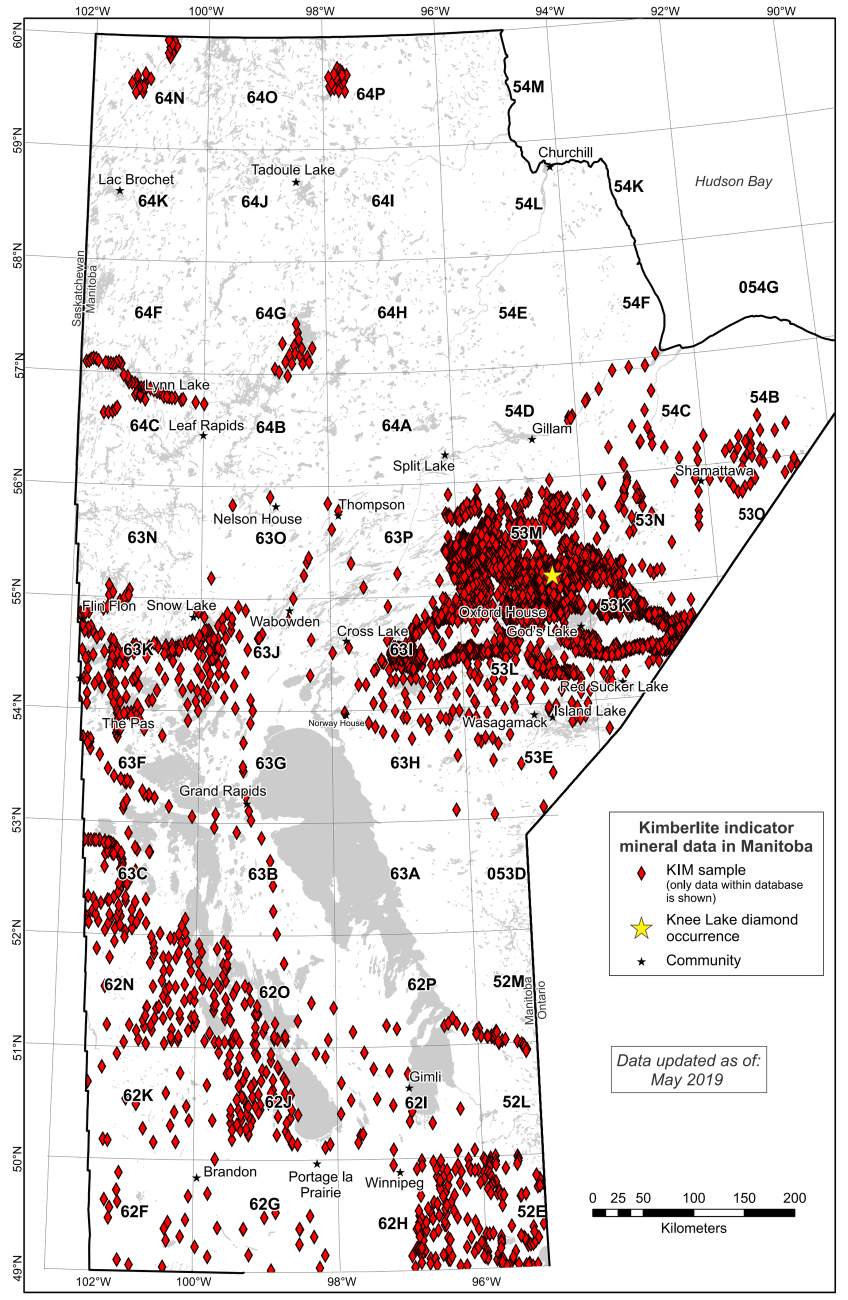
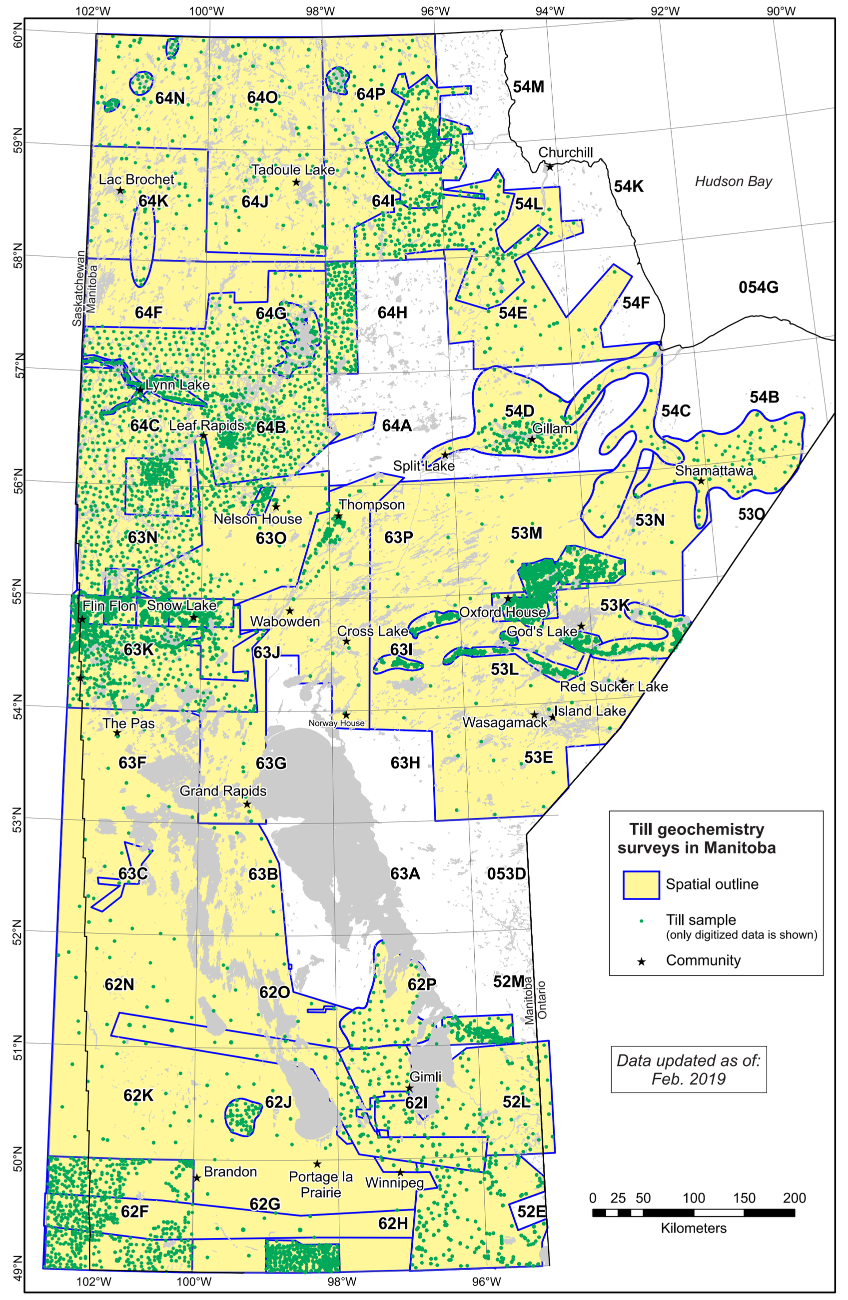
Kimberlite indicator mineral database



https://www.manitoba.ca/iem/geo/diamonds/index.html

This searchable database contains a compilation of the results from all available, non-confidential, KIM surveys completed in Manitoba.

Till-matrix geochemistry survey index

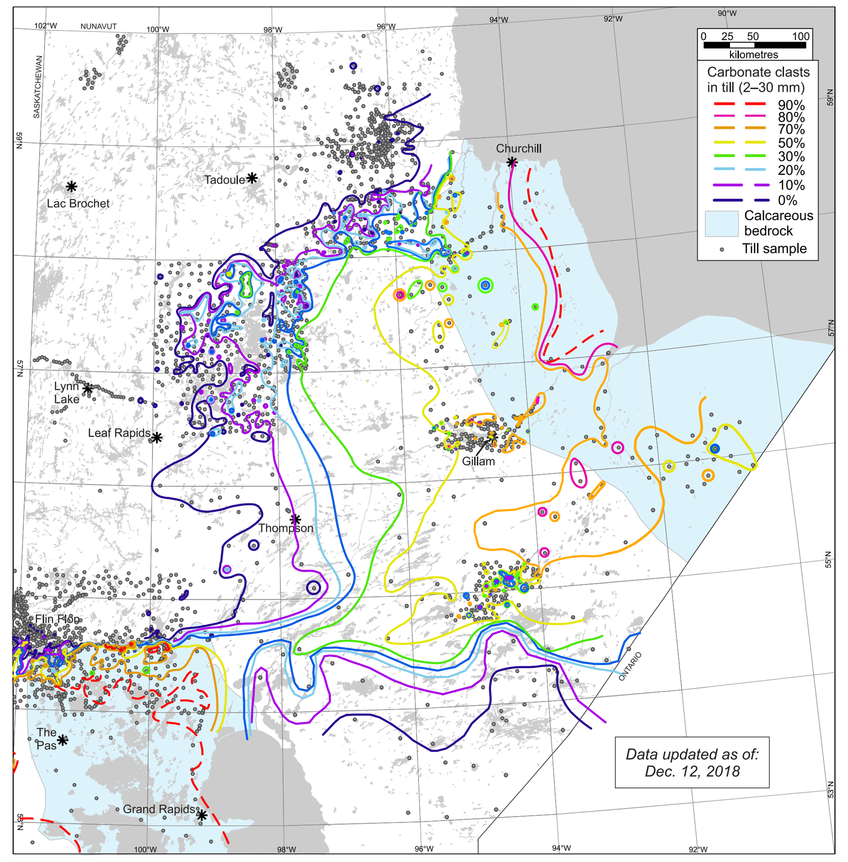


https://www.gov.mb.ca/iem/geo/surficial/tillgeochem.html

Interactive map that allows an user to click on a 1:250 000-scale NTS sheet, and obtain a list of available till-geochemistry studies for that region.

Links to either the MGS download link, or the NrCAN geochemical survey database, where more information can be found on federal surveys.

Carbonate concentration in till



https://www.manitoba.ca/iem/geo/surficial/carbonate.html

In northern Manitoba, calcareous detritus was glacially dispersed to the west and/or northwest and/or southwest for distances up to 260 km beyond the limit of carbonate bedrock.

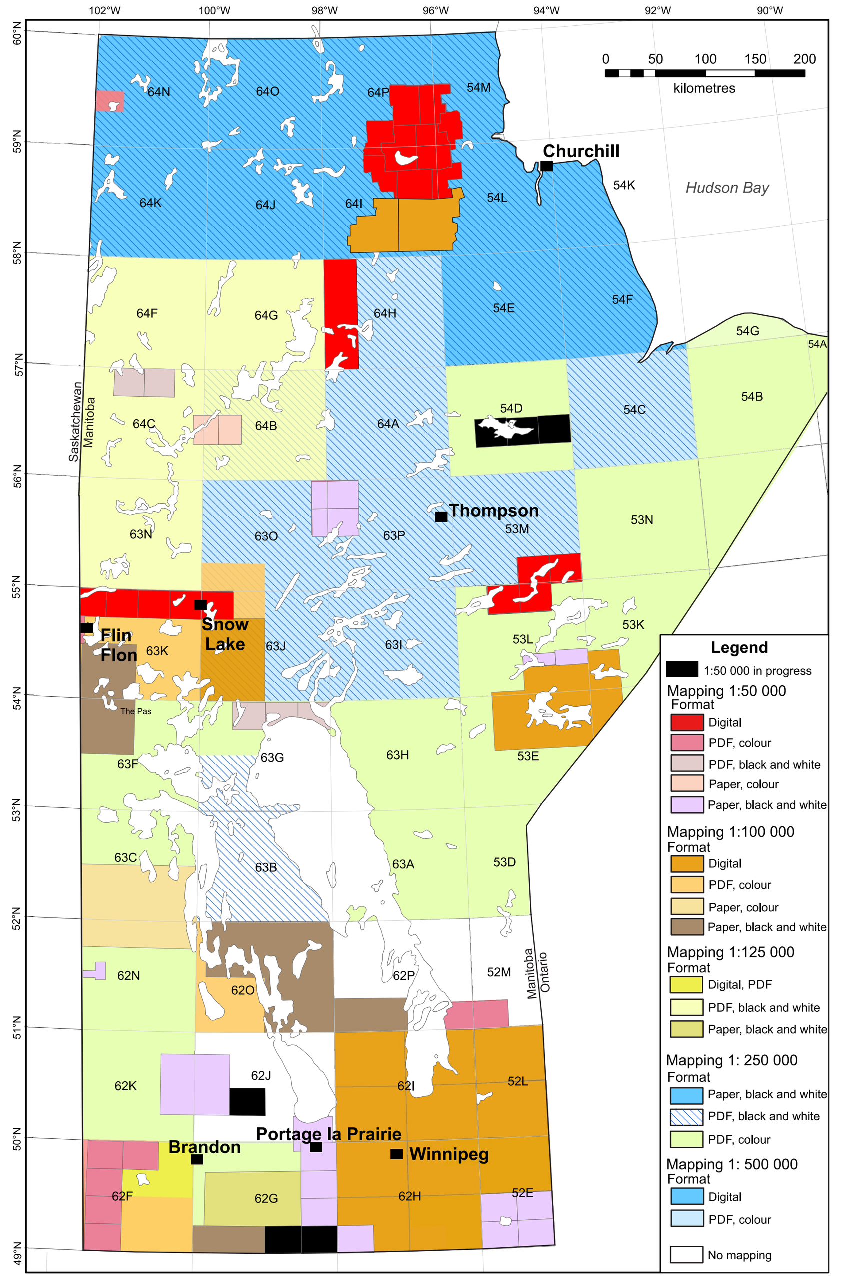
The resulting pattern of dispersal is available as hand-contoured PDF maps for the distribution of both carbonate clasts (pebbles) and carbonate in the till matrix.

Carbonate-bearing till is not uniform in thickness or carbonate concentration. Instead, it is a patchy palimpsest result of multiple glacial events deposited, preserved and modified under different subglacial conditions.

On the Precambrian Shield, increased carbonate-concentration in the till indicates far-travelled material that can mask potential mineralization of the underlying bedrock.

Contours are most detailed in areas of intensive till sampling, and inaccurate where only a few data points exist.

Surficial geology map index

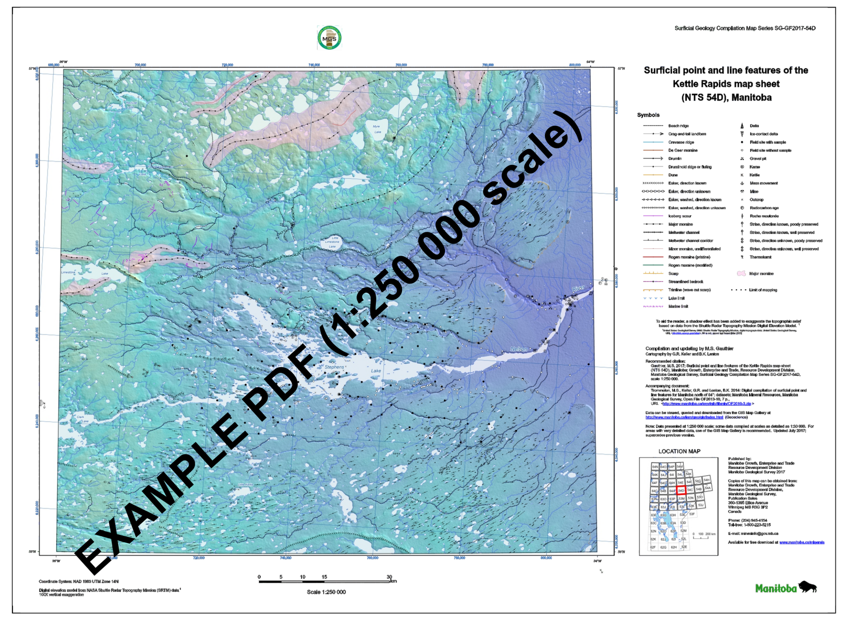


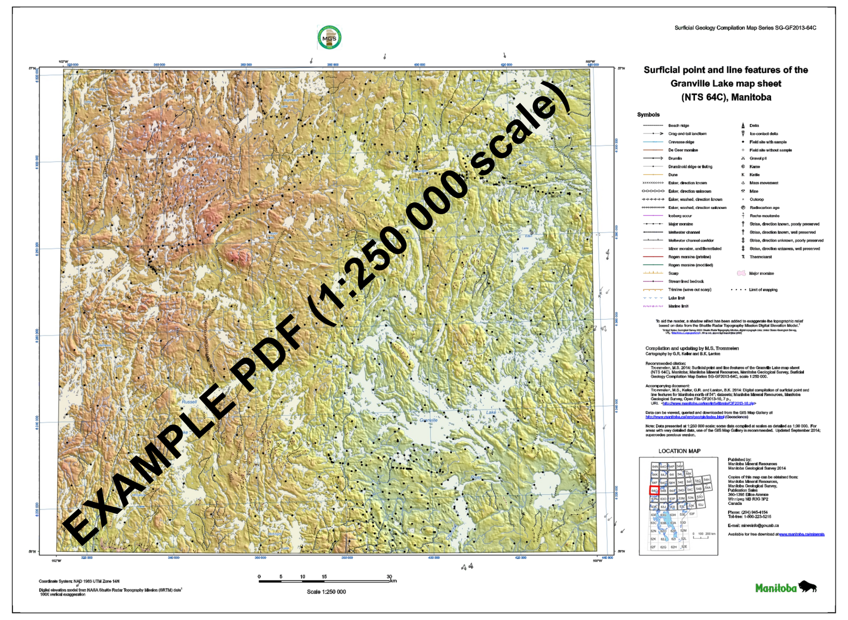
https://www.gov.mb.ca/iem/geo/surficial/sg_gf.html

Interactive map that allows an user to click on a 1:250 000-scale NTS sheet, and obtain a list of available surficial geology maps for that region.

MGS maps made after 2012 are available as PDF, or as **DIGITAL SHAPEFILES.** Some older maps are also digital.

Point and line data





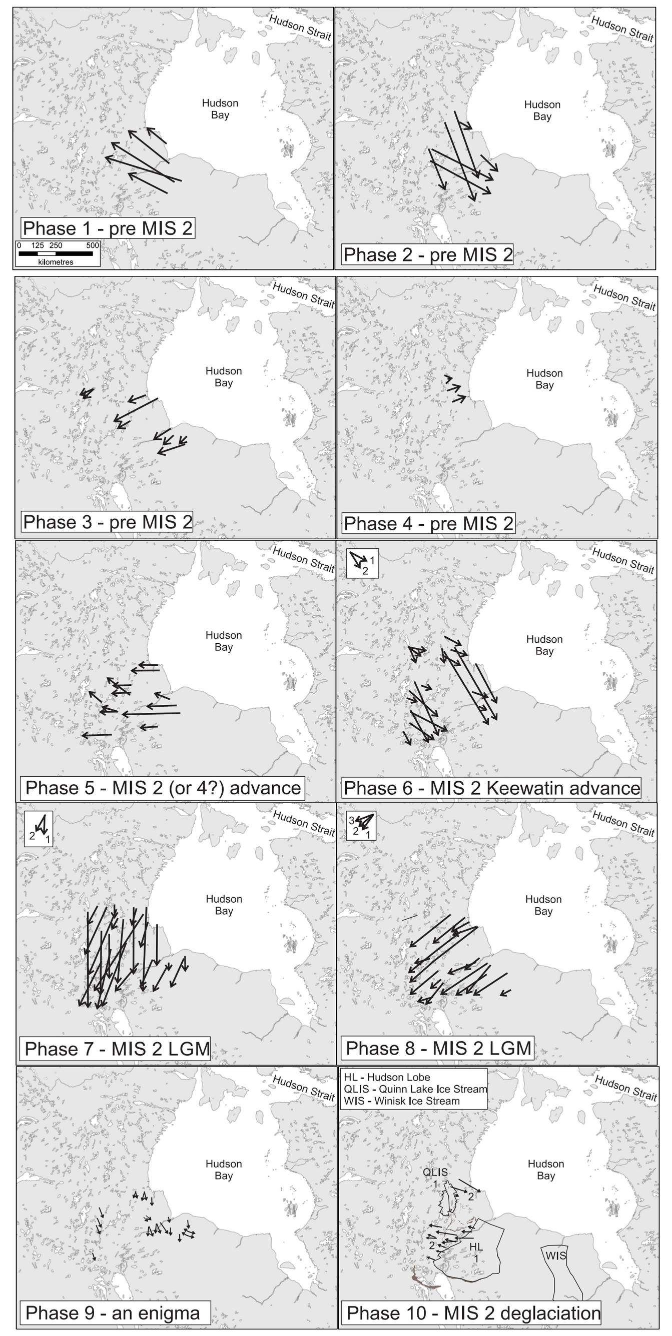
https://www.gov.mb.ca/iem/geo/surficial/digitalcompilation.html

This data is compiled from pre-existing reports and maps to provide a one-stop-shop to access point and line feature data for all of your GIS needs. It is based on different types of remotely-sensed imagery, incorporating data at various scales. **Updated as new fieldwork is completed in an area.**

Available as PDF but also as **DIGITAL SHAPEFILES**

Includes ice-flow information (striations, streamlined-landforms) as well as MGS field-site locations and known bedrock outcrops.

Northern Manitoba ice-flow reconstruction



Ongoing compilation of the ice-flow history in northern Manitoba. MIS refers to marine isotope stages, which are alternating warm and cool periods in the Earths paleoclimate. MIS 2 refers to the Late Wisconsinan, which is 24 000 to 60 000 years ago.

Till sampling - the most important part of drift exploration

Till is composed of crushed bedrock debris blended with reworked older sediments.

It may be glacially transported a few metres to many kilometres from its bedrock source, forming a significantly larger exploration target than bedrock mineralization.

It is very important to understand the local geology and sample the correct sediment - Get help if you need it

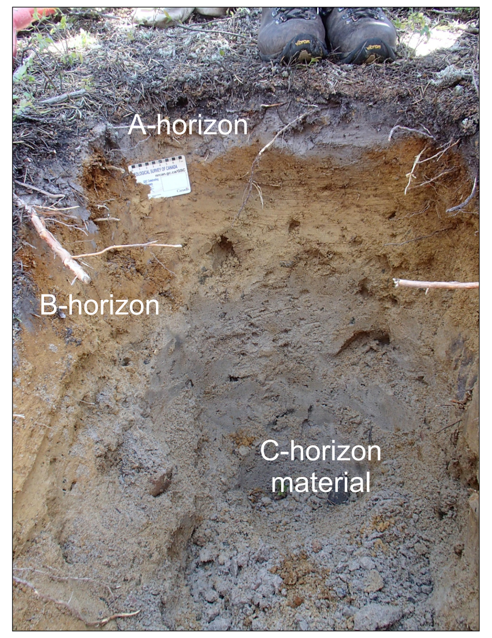
Good sandy till

Good silty sand till

Sand and gravel, derived from till but not suitable for sampling

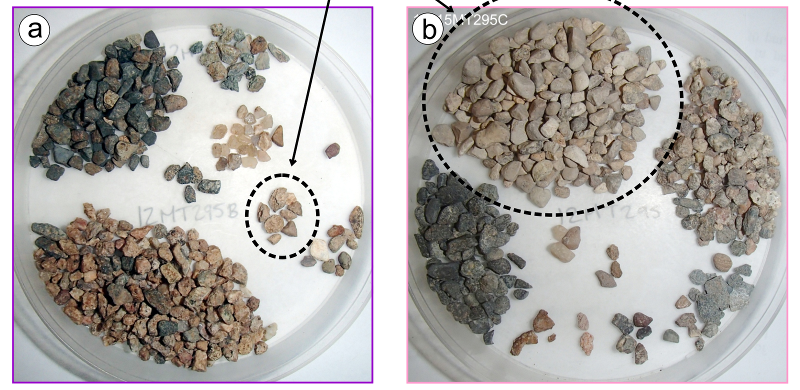
Sand can overlie till, and should NOT be mixed with the underlying till during sampling

Large till samples are needed for indicator mineral analysis, while smaller till samples (2-3 kg) are needed for geochemical analyses of the till matrix.



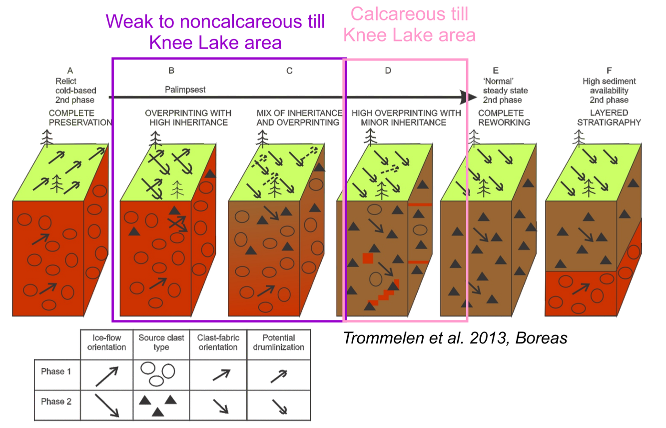
Till sampled for geochemistry should be taken from the soil C-horizon. This ensures that the sample has not been altered by modern soil processes.

Calcareous clasts



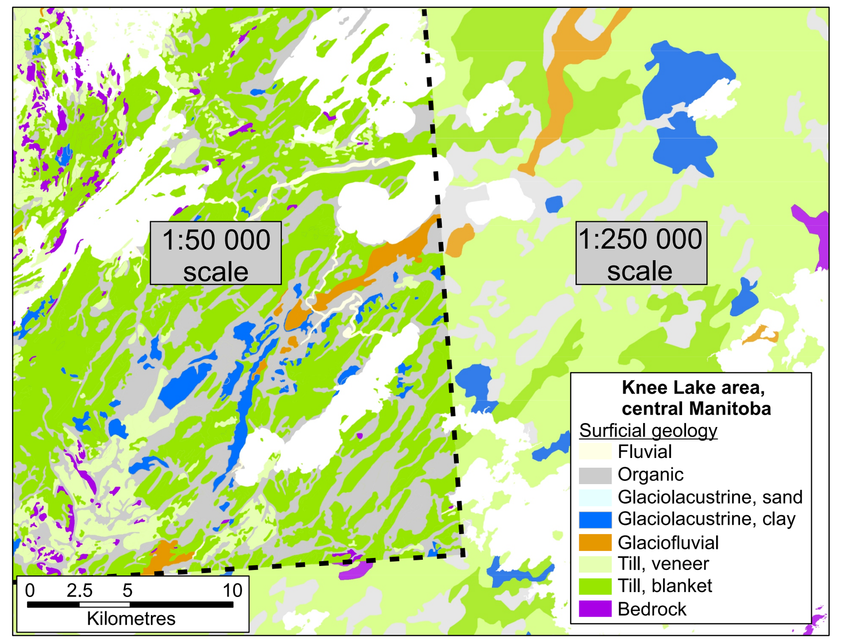
At one site in the Knee Lake area, 0.25 m of weakly-calcareous till overlies 0.15 m of calcareous till, over greenstone bedrock. As seen above, though both tills are thin, the weakly-calcareous till (a) has a very different clast-lithology than the calcareous till (b).

This is very important information for drift prospecting, as it means that you can't treat the entire area as one dataset. In order to properly interpret the till-geochemistry results, you need to understand whether your till is locally-derived (a), farther-travelled (b) or a mix of both.



Trommelen et al. 2013, Boreas

Scale of mapping



When planning a till-sampling program, you need to know:

1) Where the till is? (how widespread, thickness, type?)
The SCALE of the map that you use to plan target sites is very important. You need to use the most detailed map that you can find. Even the MGS 1:50 000 scale mapping will probably be inaccurate for property-scale work.

2) What the target till (basal, lodgement, undisturbed) looks like in the field.
- Depth of surface weathering?
- Is there possible wave-washing from lakes/meltwater channels/eskers/ocean that could remove the water-soluable elements from the fines?
- Is there a thin veneer of overlying sediment that needs to be avoided during sampling?
- Are there multiple overlying till units that need to be sampled?

Reconstructing the ice-flow history

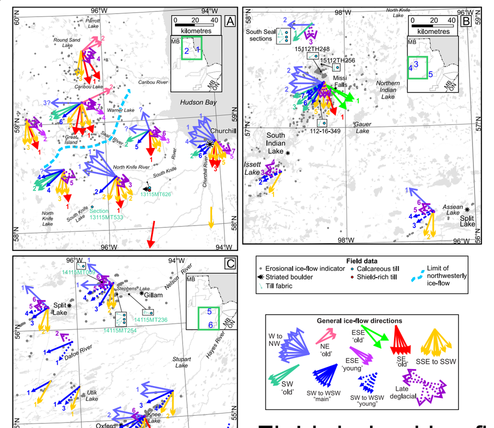
The MGS has produced a regional ice-flow history for northeastern Manitoba.

This was done by carefully combining data from 8 different regional studies.

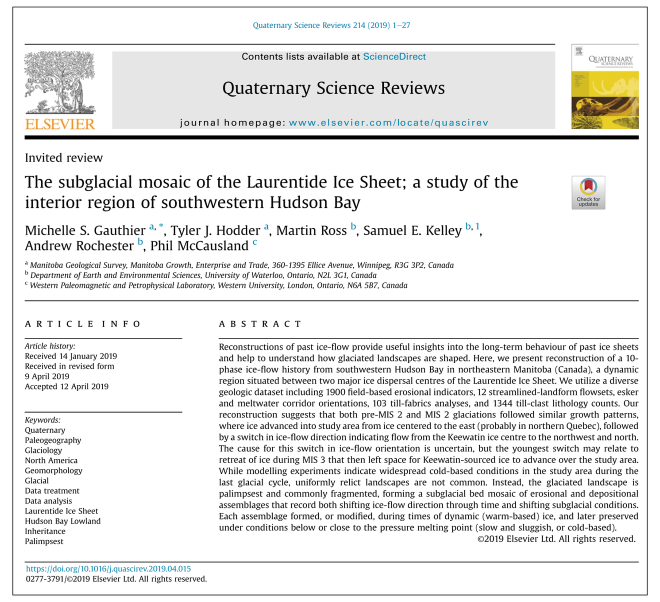
Data includes field-mapped striations, till fabrics, stratigraphy and till composition, as well as remotely-sensed streamlined-landform and esker orientation.

The record is incomplete at any one site, and careful analysis of the fragmented record was necessary to reduce all observations to 10 regional ice-flow phases.

This study shows that there is a high degree of landscape preservation (inheritance) in some area, and strong reworking (overprint) by younger ice-flow phases in other areas.



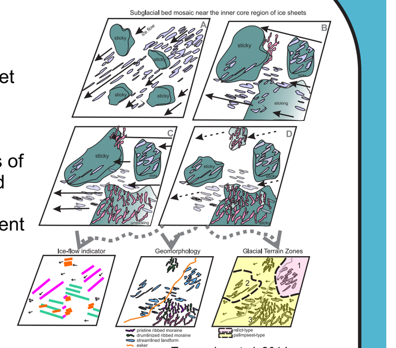
Field-derived ice-flow data; thin-till area



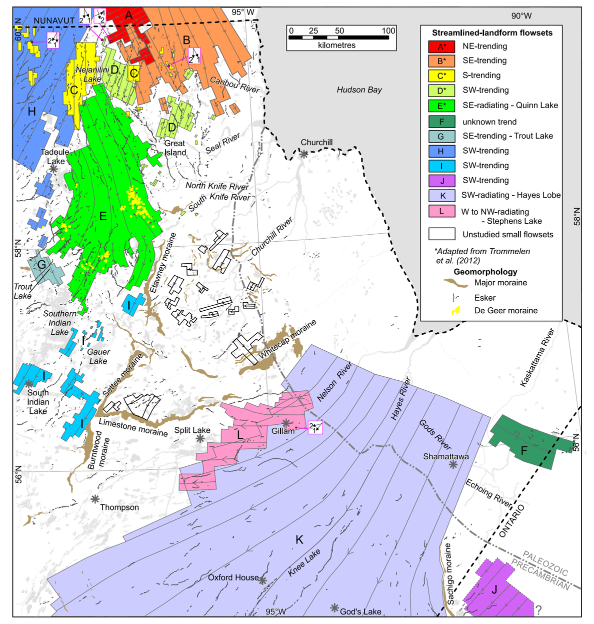
Subglacial bed mosaic

Erosion, transportation and deposition beneath an ice sheet likely occur within a mosaic of deforming and stable spots.

This means that different parts of the subglacial landscape could have been formed at different times, and perhaps from different source areas.



Streamlined-landform flowsets



Field-derived ice-flow data; thick-till area