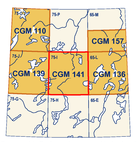
Abstract

Reconnaissance mapping, through aerial photograph interpretation and limited field and legacy data in the Beaverhill Lake map area, provides an understanding of surficial sediments and glacial history. The last major ice flow was westward, indicated by glacially fluted landforms, although local minor southwestward and northwestward flows are recorded. An earlier west-southwest flow is inferred from streamlined features and erosional troughs observed locally. Major glaciofluvial corridors indicate a westward meltwater flow, debauching locally into glacial lakes in the central and northeast regions, representing various phases of glacial Lake Thelon. Glaciolacustrine regression beaches occur around Beaverhill Lake and elsewhere, at and below 340 m a.s.l. The extensive muskeg deposits in the north central regions are remnants of this glacial lake, and occur at elevations up to 365 m or possibly higher. The lake sediments are mapped as organics, presumably underlain by glaciolacustrine sediments, and glaciolacustrine veneer over till, reflecting the uncertainty of glaciolacustrine sediment thickness and extent.

Résumé

Pour améliorer les connaissances de la distribution et nature des sédiments de surface et de l'histoire glaciaire de la région de la carte Beaverhill Lake, on a entrepris des études préliminaires de géologie de surface en analysant des photos aériennes et un ensemble limité de données héritées. Des formes profilées indiquent que la glace dans la région se déplaçait vers l'ouest au cours de la dernière glaciation. On trouve aussi des preuves d'un écoulement vers l'ouest-sud-ouest plus ancien. Des couloirs fluvioglaciaires majeurs indiquent des eaux de fonte s'écoulant vers l'ouest, et en certains cas, dans le lac glaciaire Thelon. Des plages glaciolacustres ont été observées autour du lac Beaverhill jusqu'à un niveau de 340 m. Dans les régions du nord et centrales, les sédiments lacustres cartographiés jusqu'à un niveau de 365 m ou plus comme dépots organiques, sont associées à ce lac glaciaire. Ces sédiments représentent un placage glaciolacustre recouvrant du till, et sont d'une épaisseur et étendue incertaine.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Cover illustration
Dunes and deflation surfaces developed on glaciofluvial esker sediments. Photograph by D.E. Kerr. 2013-023

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CANADIAN GEOSCIENCE MAP 141
RECONNAISSANCE SURFICIAL GEOLOGY
BEAVERHILL LAKE
Northwest Territories
NTS 75-I
1:125 000

QUATERNARY

HOLOCENE

- O — **Organic deposits, undifferentiated:** peat, muskeg, bogs, variable thickness; may overlie glaciolacustrine sediments.
- Cv — **Colluvial veneer:** sand and diamicton, <2 m thick, may form aprons, occurs in areas adjacent to strandlines on slopes, may form distinct lineation trending downslope; interpreted as debris or sand flows and rotational slumps.
- Cb — **Colluvial blanket:** diamicton, >2 m thick, derived from various sediments, may include some outcrops.
- Af — **Alluvial fan sediments:** sand and gravel, variable thickness, fan surface expression.
- Ap — **Alluvial floodplain sediments:** sand and gravel, variable thickness, associated with small meandering streams and channels.
- At — **Alluvial terraced sediments:** sand and gravel, variable thickness, occur as terraces.
- A — **Alluvial sediments, undifferentiated:** sand and gravel, variable thickness, may include various fluvial environments.
- Lr — **Lacustrine beach sediments:** sand and gravel, variable thickness, associated with modern shorelines and raised beaches relating to previous lake elevations.
- Ld — **Lacustrine beach sediments:** sand and gravel, variable thickness, delta active in present-day lakes.
- Lv — **Lacustrine veneer:** sand and silt, <2 m thick, associated with present-day lakes and depressions.
- Lb — **Lacustrine blanket:** sand and silt, >2 m thick, associated with present-day lakes and depressions.
- L — **Lacustrine sediments, undifferentiated:** sand and silt, variable thickness, may include various lacustrine environments.

PROGLACIAL AND GLACIAL ENVIRONMENT

- GLr — **Glaciolacustrine beach sediments:** sand and gravel, variable thickness, associated with glacial lake shorelines and raised beaches relating to previous lake elevations.
- GLv — **Glaciolacustrine sediments veneer:** siltclay to sand, <2 m thick, may form a veneer over till, may be associated with low lying areas often adjacent to organic deposits.
- GLb — **Glaciolacustrine sediments: blanket:** sand and gravel, >2 m thick, associated with strandlines on moist ridges (enhanced white reflectivity on air photos) and terraces along upland slopes.
- GLm — **Glaciolacustrine subaqueous moraine complex:** diamicton, variable thickness, valley-floor sediments that occur within the limit of glacial lakes; locally pitted and may represent thermokarst depressions.
- GL — **Glaciolacustrine sediments, undifferentiated:** sand and silt, variable thickness, may include various glaciolacustrine environments.
- GFp — **Glaciofluvial outwash plain sediments:** sand and gravel, 8–30 m thick, associated with river valleys such as the Thelon River; may be terraced; may exhibit rotational slumps; stratigraphic sections abundant due to river erosion exposing Quaternary sediment sequences.
- GFt — **Glaciofluvial terraced sediments:** sand and gravel, variable thickness, occur as terraces.
- GFv — **Glaciofluvial veneer:** sand and gravel, <2 m thick, continuous to discontinuous cover.
- GFb — **Glaciofluvial blanket:** sand and gravel, >2 m thick, may include a variety of surface expressions.
- GFf — **Glaciofluvial outwash fan sediments:** sand and gravel, variable thickness, fan surface expression.
- GFc — **Kame terrace sediments:** sand and gravel, 8–30 m thick, in the form of mounds, hummocks, sinuous ridges (eskers) and circular ponds (kettles) surrounded by gravel ridges berms; the unit forms distinct westward-trending corridors parallel to regional ice flow up to 100 km or more across the map area; these corridors have sharp boundaries (ice walled?) with adjacent till areas, and are also associated with areas of exposed bedrock.
- GFh — **Glaciofluvial hummocky sediments:** sand and gravel, variable thickness, irregular (non-linear) surface expression; hummocks have rounded-tops.
- GFr — **Esker sediments:** sand and gravel, variable thickness, forms ridges with both sharp-crested and flat-topped segments.
- GF — **Glaciofluvial sediments, undifferentiated:** sand and gravel, variable thickness, may include various glaciofluvial environments.
- Tv — **Till veneer:** diamicton, <2 m thick, continuous to discontinuous cover with variable bedrock exposure, may include fluted landforms and linear erosional troughs (megagrooves); may include smaller areas of till blanket interspersed with bogs too small to map; transitional to rock.
- Tb — **Till blanket:** diamicton, 3–15 m thick, continuous blanket forming a rolling, random ground moraine topography, generally without streamlined landforms; areas of occasional knobs of till interspersed with organics and peat.
- Tr — **Ridged till:** diamicton, 4–25 m thick, in the form of arcuate ridges, 5–10 m high, 100 m to 1 km long.
- Th — **Hummocky till:** diamicton, variable thickness, forms irregular hummocks, may exhibit moraine ridges.
- Tm — **Moraine complex:** diamicton, variable thickness, occurs where many small ridges are superimposed on till; symbols identify small ridges.
- Ts — **Streamlined till:** diamicton, 4–25 m thick, continuous and gently rolling topography, smooth streamlined hills (drumlinoids and drumlins) moulded in the direction of ice flow, rarely with a blunt steep, up-glacier facing slope and a tapered down glacier form; may exhibit evidence of shifting ice flow with lobate forms; may exhibit ice-wedge polygons. Northern drumlinoids often have a wispy linear ridge of sand and gravel (white reflective material observed on air photos) on their crests, that may be an effect of reworking during lake regression.
- T — **Till, undifferentiated:** diamicton, variable thickness, may include various glacial sediments.

PRE-QUATERNARY

- R — **Bedrock, undifferentiated:** continuous to discontinuous bedrock, may contain 20-40% till veneer, bedrock structure often apparent in uplands or hills; often exhibits glacially moulded bedrock features (fluted bedrock, roches moutonnées, crag-and-tails, rock drumlins).

Compound units: a multiple map-unit designator is used to record either a geological complex or a stratigraphic relationship. The first or overlying designator is the dominant material and determines the map unit colour.

Complex units: Where the surficial cover forms a complex pattern and the map units are too small to be mapped individually, yet constitutes a significant aerial extent of the total polygon, a dot (.) separates the first dominant map unit designator from the less abundant secondary unit (e.g., Tb.Tb designates an area of streamlined till with some areas of till blanket).

Stratigraphic relationship: A stratigraphic relationship is shown with a maximum of two map unit designators separated by a slash (/) (e.g., GLv/Tb designates glaciolacustrine veneer overlying till blanket).

- Geological contact, defined
- Geological contact, approximate
- Debris-flow track
- Beach crest
- Fluvial terrace scarp
- Glaciolacustrine terrace scarp
- Glaciofluvial terrace scarp
- Minor moraine ridge
- Major moraine ridge
- Ice-contact terrace scarp
- Buried esker ridge, sense known
- Esker, sense known
- Esker, sense unknown
- Buried drumlinoid ridge
- Buried drumlin ridge
- Drumlinoid (not always to scale)
- Drumlin (not always to scale)
- Crag-and-tail
- Large groove or trough, glacial lineation, sense unknown
- Fluted bedrock or drift, sense unknown
- Fluted bedrock (roche moutonnée), sense known
- Minor meltwater channel, sense unknown
- Minor meltwater channel, sense known
- Lateral meltwater channel
- Major meltwater channel
- Retrogressive thaw flow
- Patterned ground (ice wedge polygons)
- Bedrock erosional form (S-form)
- Kettle
- Kame
- Striation, sense unknown
- Striation, sense known
- Small outcrop
- Station location - remote observation (stratigraphic section)

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Canadian Geoscience Maps

Canada

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Geology based on aerial photograph interpretation by R. Stea in 2012, with minor additions and compilation in the northern and western regions by D.E. Kerr in 2012–2013

Geomatics by QSP Geographics Inc., M. O'Neill, and S. Eagles

Cartography by M. O'Neill, S. Eagles, and L. Landon-Roy

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1:125 000

2 0 2 4 6 8 10km

Initiative of the Geological Survey of Canada, conducted under the auspices of the Geo-mapping Frontiers Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) Program.

Map projection Universal Transverse Mercator, zone 13. North American Datum 1983

Base map at the scale of 1:250 000 from Natural Resources Canada, with modifications. Elevations in metres above mean sea level

Mean magnetic declination 2014, 9°32'E, decreasing 21' annually. Readings vary from 8°20'E in the NE corner to 10°39'E in the SW corner of the map.

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional observations not portrayed on this map. *See* documentation accompanying the data.

This publication is available for free dowload through GEOSCAN (http://geoscan.ess.nrcan.gc.ca/).

Preliminary publications in this series have not been scientifically edited.

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