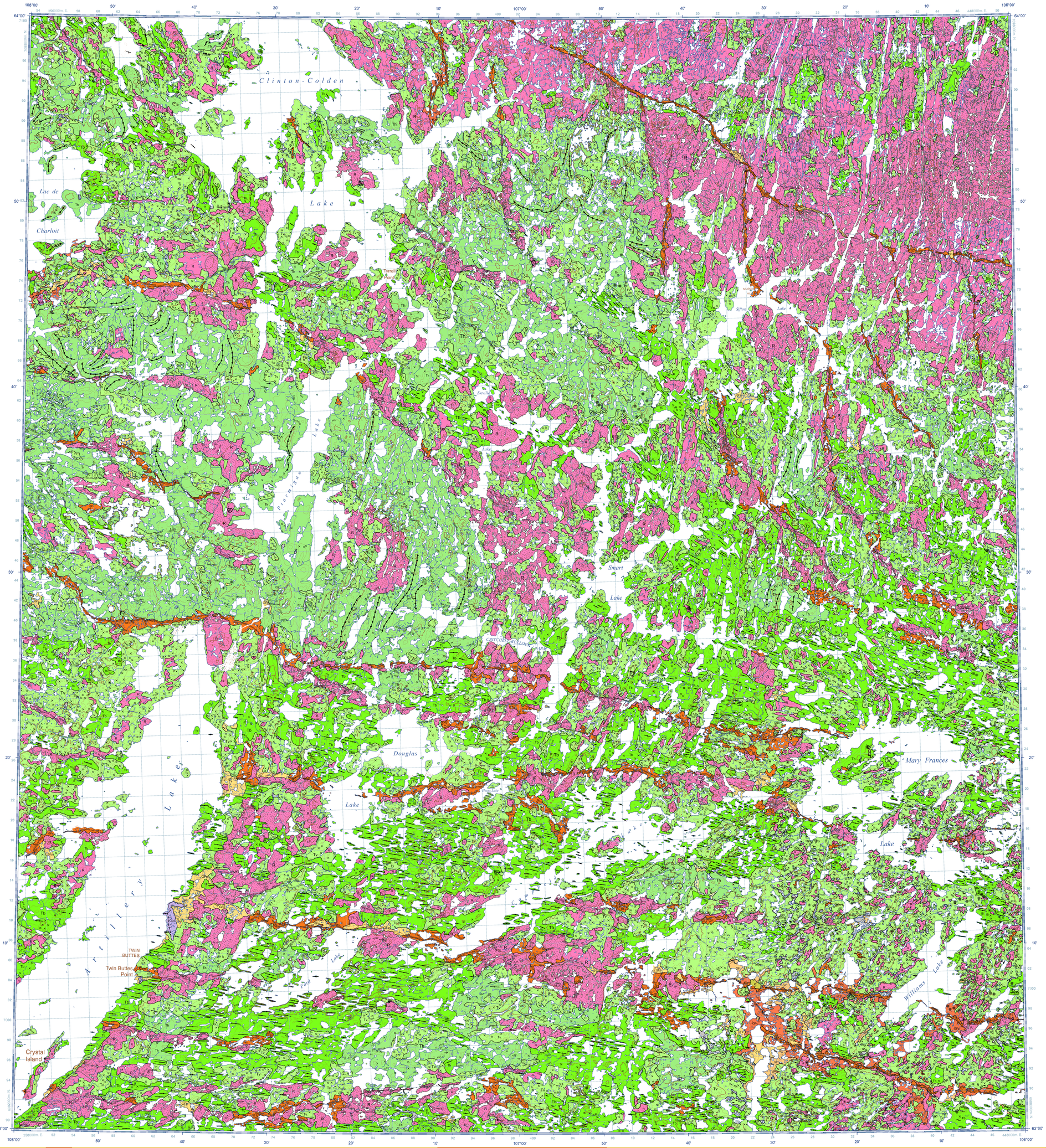
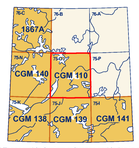


Abstract

The Artillery Lake map area is characterized by three broad zones based on distribution and nature of surficial sediments. In the northwest, hummocky till with a few north-south trending moraine ridges, and smaller areas of till veneer and bedrock dominate the landscape. The northeast is defined by extensive regions of exposed, scoured bedrock and till veneer. The southern regions consist of a combination of bedrock, till veneer and fluted till blanket. Till is dissected by glaciofluvial corridors consisting of eskers, ice-contact sediments and scoured bedrock. These features record a westward meltwater paleoflow in the south, a northwestward flow in the central regions, and a northwestward to northward flow in the northern regions of the map area. The earliest ice flow, defined by rare striae and subtle sculpted bedrock in the north, was southwestward. The last, dominant ice flow forms a radiating pattern defined by striae, fluted bedrock crag-and-tails and drumlins. Ice flow was westward in the south, to northwestward in the central regions, but locally southwestward, in the northeasternmost region.

Résumé

La carte Artillery Lake est caractérisée par trois grandes régions basées sur la distribution et nature des dépôts meubles. Dans le nord-ouest, ont retrouve du till bosselé avec quelques crêtes morainiques, ainsi que du till mince et de la roche en place. La roche en place délavée et du till mince domine le nord-est. Une combinaison de roche en place, du till mince et till épais et fusselé se trouve au sud. Le till est souvent érodé par des corridors de dépôts fluvioglaciaires et de roche délavée. Les eaux de fontes indiquent un écoulement vers l'ouest, le nord-out et le nord. Dans les régions du nord, on retrouve quelques stries glaciaires et affleurements fusselés associés à un écoulement glaciaire ancien qui était vers the sud-ouest. De nombreuses formes fusselées et stries indiquent que le dernier écoulement glaciaire était vers l'ouest dans la région sud de la carte, vers le nord-ouest au centre, mais plus variable vers le nord-nord-est, vers le nord et vers le sud-ouest dans les régions du nord.



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

Cover illustration
Till veneer over carbonate bedrock, Crystal Island, Artillery Lake. Photograph by R.D. Knight. 2013-001

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CANADIAN GEOSCIENCE MAP 110

SURFICIAL GEOLOGY

ARTILLERY LAKE

Northwest Territories
NTS 75-O
1:125 000

QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

- O — **Organic deposits, undifferentiated:** peat and muck up to 2 m thick; formed predominantly by the accumulation of vegetative material in bogs; occurs in depressions, poorly drained areas and along valley bottoms; may contain ice-wedge polygons; small unmapped organic deposits occur in most terrain units.
- E — **Eolian sediments, undifferentiated:** fine to medium sand; poorly to well-sorted; 1 to at least 4 m thick; may contain active and stabilized dunes and blow-outs; derived from glaciofluvial sediments.
- Ap — **Alluvial floodplain sediments:** silt to gravel; massive to stratified; 1 m to at least 3 m thick; occurs as floodplains deposited by modern streams and rivers.
- A — **Alluvial sediments, undifferentiated:** silt to gravel; massive to stratified; 1 m to at least 3 m thick; deposited by modern streams and rivers; may include floodplains and alluvial fans in braided and meandering rivers.

LAST GLACIATION (WISCONSIN)

PROGLACIAL AND GLACIAL ENVIRONMENT

- GLd — **Glaciolacustrine deltaic sediments:** sand, gravel, and cobbles, massive to cross-stratified; up to 5 m or more thick, associated with temporary glacier-dammed lakes; may exhibit kettle lakes, braided paleochannels, ice-wedge polygons, and beach ridges; may contain massive ground ice.

  Glaciofluvial sediments: sand, gravel, cobbles and small boulders; 2 m to at least 30 m thick; deposited by water flowing from, or in contact with, glacier ice; may exhibit kettle lakes and ice wedge polygons; may contain massive ground ice.
- GFp — **Outwash plain sediments:** sand and gravel, massive to cross-stratified; 3 m to at least 20 m thick; generally flat-topped; occur as plains and terraces; may include subaqueous fans.
- GFr — **Esker sediments:** sand, gravel, cobbles and small boulders; in planar, cross-stratified, and massive beds; 1 to at least 30 m thick; forms ridges with both sharp-crested and flat-topped segments up to 20 km long, and 10 to 250 m wide with mounds and flanking aprons; deposited at or behind the ice margin; formed subglacially or in subaerially exposed ice-walled channels; may be associated with zones of scoured rock and till veneer, boulder lags, isolated kame deposits, and small transverse gravel ridges.
- GFc — **Ice-contact glaciofluvial sediments:** sand and gravel; massive to cross-stratified; 3 m to at least 10 m thick; flat-topped to irregular hummocky topography with kettle lakes; may include small eskers.
- GF — **Glaciofluvial sediments, undifferentiated:** sand, gravel, cobbles and small boulders; variable thickness; deposited by water flowing from, or in contact with, glacier ice; may include plains, terraces, fans, eskers; may contain massive ground ice.

  Glacial sediments (till): diamicton, unsorted, consisting of a silty sand matrix containing pebbles, cobbles, and boulders; angular to rounded clasts; low to high compaction; from less than 1 m to at least 5 m or more thick; deposited beneath, or along the margin of, glaciers as lodgment till and ablation till.
- Tv — **Till veneer:** low compaction; less than 1–2 m thick; occurs as a discontinuous layer where rock structure is generally visible, and as a lag on washed bedrock; may include outcrops shown by symbols, and small isolated units of glaciofluvial sediments and till blanket.
- Th — **Hummocky till:** compact; from 3 m to at least 5 m thick; forms irregular to rolling terrain, may contain low morainal ridges up to 10 km long, local relief up to 5 m; some areas have abundant small esker segments and transverse ridges.
- Tb — **Till blanket:** moderately compact; from 2 to 5 m thick; occurs as till plains mimicking bedrock topography and as extensive drumlinoid fields with various streamlined landforms shown by symbols; may contain small areas of till veneer.

PRE-QUATERNARY

- R — **Bedrock, undifferentiated:** sedimentary, volcanic, plutonic and metamorphic rocks; rock types exhibit a range of weathering, from well-preserved ice flow features to surfaces which have undergone grusification and chemical dissolution of 2 cm or more; may include patches of till veneer and glaciofluvial sediments; areas of shattered frost heaved rock and meltwater scour are shown by symbols.

- Washed scoured lag
- Felsenmeer
- Geological contact, defined
- Minor meltwater channel, sense known
- Minor meltwater channel, sense unknown
- Terrace scarp, glaciolacustrine
- Terrace scarp, glaciofluvial
- Major moraine ridge
- Minor moraine ridge, may include crevasse fill ridges
- Esker (sense known)
- Esker (sense unknown)
- Beach crest
- Drumlin
- Drumlinoid ridge (1=oldest, 2=youngest)
- Crag-and-tail
- Fluted bedrock (roche moutonnée), sense known
- Fluted bedrock or drift, sense unknown
- Striation (sense known; 1=oldest, 2=youngest)
- Striation, poorly defined
- Striation (sense unknown; 1=oldest, 2=youngest)
- Paleocurrent measurement, bedrock erosional form (S-form)
- Patterned ground (ice-wedge polygons)
- Kame
- Small outcrop

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Additional striation and selected paleoflow data from:

Craig, B.G., 1964. Surficial geology of East-Central District of Mackenzie; Geological Survey of Canada, Bulletin 99.

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Recommended citation
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Authors: D.E. Kerr, R.D. Knight, D.R. Sharpe and D.I. Cummings

Geology based on aerial photograph interpretation by D.E. Kerr, 2008, 2009, 2012, with field work by D.E. Kerr, R.D. Knight, D.R. Sharpe, D.I. Cummings and B.A. Kjarsgaard, 2008; D.E. Kerr and R.D. Knight, 2009. Related geological data can be found in Wright et al., (ed.), 2013.

Geomatics by L. Robertson and S. Eagles

Cartography by M. O'Neill and S. Eagles

CANADIAN GEOSCIENCE MAP 110
SURFICIAL GEOLOGY
ARTILLERY LAKE
Northwest Territories
NTS 75-O
1:125 000

2 0 2 4 6 8 10km

Initiative of the Geological Survey of Canada, conducted under the auspices of the Mineral and Energy Resources Assessment (MERA) for the Proposed East Arm National Park, and the TRI Territorial Surficial Database 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 2013, 12°01'E, increasing 24' annually. Readings vary from 10°57'E in the SE corner to 13°03'E in the NW 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.

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Preliminary publications in this series have not been scientifically edited.

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