

References

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Suggested Readings

Campbell, J.E., McMartin, I., Normandeau, P.X., and Gorbout, P.-M., 2019. Report of 2018 activities for the GEM-2/Rae project glacial history activity in the eastern Northwest Territories and the Kikmiut and Kivalliq Regions, Nunavut; Geological Survey of Canada, Open File 8586, 16 p. <https://doi.org/10.4095/314741>

Craig, B.G., 1964. Surficial geology of east-central district of Mackenzie; Geological Survey of Canada, Bulletin 99, 52 p. <https://doi.org/10.4095/100018>

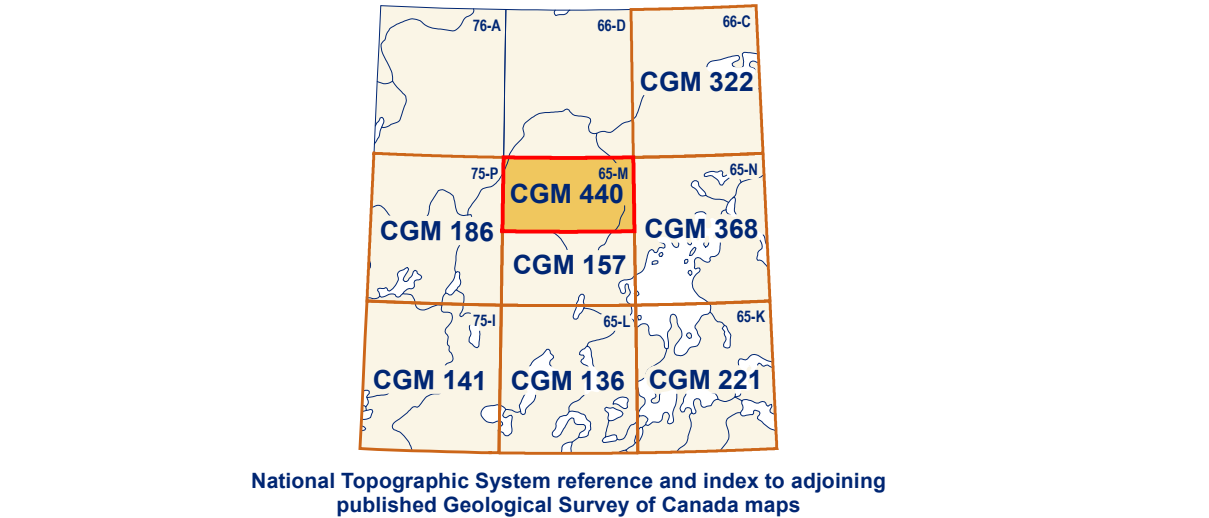
Stokes, C.R. and Clarke, C.D., 2003. The Dubawnt Lake palaeo-ice stream: evidence for dynamic ice sheet behavior on the Canadian Shield and insights regarding the controls on ice-stream location and vigour. *Boreas*, v. 32, p. 253-270. <https://doi.org/10.1111/j.1502-3885.2003.tb01442.x>

Abstract

The Clarke River map area (north half) comprises isolated areas of glacially and meltwater scoured bedrock, till veneers and blankets, locally fluted, and strongly fluted (mega-scale glacial lineations) streamlined till in the northeast. Ridged till may overlie fluted till blanket and streamlined till. Glaciofluvial esker complexes and associated meltwater outwash sediments trend westward (some may parallel pre-glacial valleys), southwestward, and northwestward. Glaciofluvial sediments are a minor component. An early regional warm-based diverging southwestern and southern ice flow is well preserved in the central regions across the map area. The youngest late deglacial ice flows, in the extreme southwest and broader northeast region, are both northwesterly. The latter represents the Dubawnt Lake ice stream. During ice retreat, ridged till was deposited with minor moraines and larger recessional moraines locally. Ponding meltwater formed pro-glacial lakes with deltas, beaches, and trim lines from 355 m elevation, in the southwest, to 155 m, in the northeast.

Résumé

La région cartographique de Clarke River (demie nord) renferme des secteurs isolés de substratum rocheux affouilli par les glaciers et les eaux de fonte, des placages et des nappes de till, localement cannelé, et du till profilé fortement cannelé (lineations glaciaires à grande échelle) dans le nord-est. Du till à crêtes peut surmonter les nappes de till cannelé et le till profilé. Des complexes d'eskers fluvio-glaciaires et des sédiments d'épandage par les eaux de fonte associés s'étendent vers l'ouest (certains peuvent être parallèles à des vallées pré-glaciaires), le sud-ouest et le nord-ouest. Des sédiments glaciofluviaux sont un composant mineur. Les traces d'un écoulement régional précoce d'un glacier à base chaude, qui diverge vers le sud-ouest et le sud, sont bien conservées dans les régions centrales de la région cartographique. Dans l'extrême sud-ouest et la région plus large au nord-est, les écoulements glaciaires les plus récents survenus à la fin de la déglaciation se dirigent dans les deux cas vers le nord-ouest. L'écoulement dans la région nord-est correspond au courant glaciaire de Dubawnt Lake. Pendant le retrait glaciaire, du till à crêtes a été déposé avec des moraines mineures et, localement, des moraines de retrait de plus grande taille. La retenue des eaux de fonte a formé des lacs proglaciaires avec des deltas, des plages et des épaulements depuis une altitude de 355 m au sud-ouest, jusqu'à 155 m au nord-est.



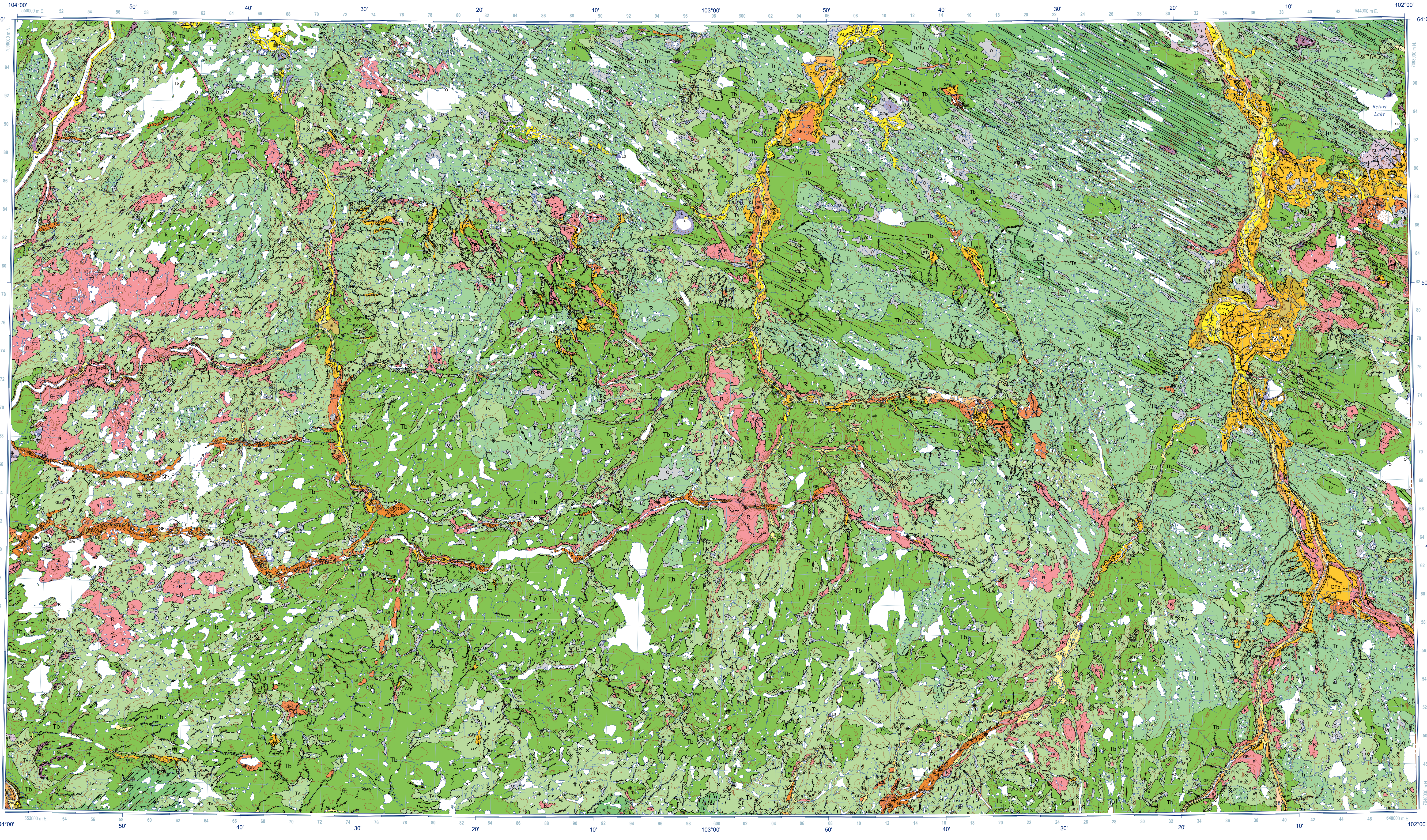
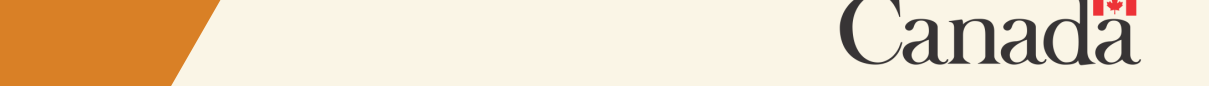
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CANADIAN GEOSCIENCE MAP 440
RECONNAISSANCE SURFICIAL GEOLOGY
CLARKE RIVER
Northwest Territories
NTS 65-M north
1:125 000



Geological Survey of Canada
Canadian Geoscience Maps



QUATERNARY		HOLOCENE		Geological contact, defined
		POSTGLACIAL ENVIRONMENT		
O	Organic deposits, undifferentiated:	peat, muskeg, bogs; varied thickness; occur in topographic lows, often along streams and around lake margins.		Landslide scar, oriented
Er	Eolian dune sediments:	well sorted sand; varied thickness; wind-blown sediments forming dunes, derived from alluvial and glaciofluvial sediments; active and stabilized.		Thermokarst depression
E	Eolian sediments, undifferentiated:	well sorted sand; varied thickness; wind-blown sediments derived from alluvial and glaciofluvial sediments; active and stabilized.		Patterned ground, ice wedge
Ap	Aluvial plain sediments:	silt, sand, and gravel; varied thickness; active floodplain; mainly occur within narrow valleys along small stream channels and along the bottom of larger river valleys.		Softlution lake, oriented
Af	Aluvial fan sediments:	silt, sand, and gravel; varied thickness; fan surface expression.		Dune crest
At	Aluvial terraced sediments:	silt, sand, and gravel; varied thickness; inactive sediments occurring as benches elevated above modern floodplains.		Terrace scarp
A	Aluvial sediments, undifferentiated:	silt, sand, and gravel; varied thickness; may include meandering streams, terraces and floodplains.		Beach crest, erosional and depositional
Ld	Lacustrine deltaic sediments:	minor clay, sand, and silt; varied thickness; formed where active alluvial sediments enter a lake, forming a gently sloping delta surface that may exhibit braided channels.		Kettle
L	Lacustrine sediments, undifferentiated:	minor clay, sand, and silt; varied thickness; associated with margins of present-day lakes and depressions of drained lakes.		Glacioacustrine limit of submergence, defined; from 210 m to 245 m a.s.l.
				Meltwater channel: Minor, paleocurrent unknown or unspecified
				Minor, paleocurrent known
				Major, channel scarp, proglacial, subglacial, unspecified; may include preglacial drainage valleys in the west-central regions
				Meltwater erosional depression
				Moraine ridge: Minor, unspecified, may include small mounds
				Major, recessional, interlobate, unspecified
LATE PLEISTOCENE (WISCONSIN GLACIATION)		PROGLACIAL AND GLACIAL ENVIRONMENT		
GLr	Glaciofluvial beach sediments:	sand and gravel; varied thickness; derived mainly from reworked glaciofluvial sediments, and locally sandy till; forming raised beach ridges between 155 m a.s.l. and 355 m elevation; may contain organics between swale ridges.		Ice-contact scarp
GLd	Glaciofluvial deltaic sediments:	silt to gravel; varied thickness; may be associated with ancestral glacial Lake Thelon in the northern map area, forming gently sloping delta deposited as proglacial outwash, ice-contact, and more distal outwash sediments by meltwater; surface between 200 and 220 m elevation; may exhibit paleochannels.		Kame
GLv	Glaciofluvial veneer:	silt to gravel; less than 2 m thick; deposited in glacial lakes (may include glacial Lake Thelon) during deglaciation; occurs in low areas overlying till in the northern map area.		Esker: Direction unknown
GFp	Outwash plain sediments:	sand and gravel; varied thickness; generally flat-topped; occur as a plain fed by meltwater; may include minor terraces along active meandering rivers and ice-contact sediments; surfaces exhibit meltwater paleochannels.		Direction known
GFt	Terraced sediments:	sand and gravel; varied thickness; forming raised terraces of glacial meltwater origin, situated above active and inactive braided streams and meandering rivers; surfaces may exhibit meltwater paleochannels.		Drumlinoid ridge, buried; generally overlain by ridged till; 1 = oldest
GFc	Ice-contact sediments:	sand and gravel to cobbles; varied thickness; deposited by glacial meltwater in contact with ice, flat to irregular surface; may contain kettles and eskers.		Drumlinoid ridge, longer forms (mega-scale glacial lineations) associated with ice streams
GFv	Esker sediments:	sand and gravel to cobbles; varied thickness; deposited by glacial meltwater in contact with ice, flat to irregular surface; may contain kettles and eskers.		Drumlin ridge, buried; generally overlain by ridged till
GFy	Fluting, poorly defined, direction unknown;	1 = oldest, 2 = youngest		Drumlin ridge
GFb	Fluted bedrock, direction known			Crag-and-tail ridge, buried; generally overlain by ridged till; 2 = youngest
	Small outcrop			
GFb	Glaciofluvial blanket:	sand and gravel to cobbles; greater than 2 m thick; deposited by glacial meltwater; masks underlying topography.		
GF	Glaciofluvial sediments, undifferentiated:	sand and gravel to cobbles; varied thickness; deposited by glacial meltwater; may form pitted or flat-topped ice-contact deposits of different depositional environments.		
GLACIAL SEDIMENTS				
Tm	Moraine complex:	diamictic; varied thickness; end moraine ridges, up to 3 km long, deposited by retreating ice in uplands of the eastern map area.		
Tr	Ridged till:	diamictic; varied thickness; deposited by glaciers; extensive areas of minor, irregular to sinuous moraine ridges with varied orientations (from transverse to parallel to ice flow); may include scoured till, meltwater corridors, small eskers, and kettle lakes; ridged moraine may overlie till blanket in central uplands and throughout the map area.		
Tb	Streamlined till:	diamictic; varied thickness; deposited by glaciers; strongly fluted till defined by a close grouping of drumlinoids and drumlins of various dimensions, highly elongated; up to 10 km or more long; associated with the Dubawnt Lake ice stream; locally dissected by meltwater channels; overlain by unit Tr in the northeastern map area.		
Tv	Till veneer:	diamictic; less than 2 m thick; deposited by glaciers; generally occurs as featureless to fluted, generally overlies bedrock with numerous outcrops; locally scoured by meltwater.		
Tb	Till blanket:	diamictic; greater than 2 m thick; deposited by glaciers; generally occurs as featureless to fluted, with low-relief circular mounds locally.		
T	Till, undifferentiated:	diamictic; varied thickness but generally greater than 2 m thick; deposited by glaciers; locally contains flutings, minor ridges, and meltwater channels.		
PRE-QUATERNARY				
R	Bedrock, undifferentiated:	predominantly Thelon Sandstone Formation, with varied surficial cover (generally till veneer); bedrock structure and topography readily apparent.		
Lithostratigraphic relationship: two map-unit designators separated by a slash (/) are used where lithostratigraphic relationship is observed or confidently inferred (e.g. GLv/Tr indicates glaciofluvial veneer overlying till blanket). The map-unit polygon is coloured according to the primary unit.				

Stratigraphic relationship: two map-unit designators separated by a slash (/) are used where a stratigraphic relationship is observed or confidently inferred (e.g., GLr/Tb indicates glaciofluvial veneer overlying till blanket). The map-unit polygon is coloured according to the overlying unit.

Recommended citation
Kerr, D.E., 2022. Reconnaissance surficial geology, Clarke River, Northwest Territories, NTS 65-M north. Geological Survey of Canada, Canadian Geoscience Map 440, scale 1:125 000. <https://doi.org/10.4095/329416>

CANADIAN GEOSCIENCE MAP 440

RECONNAISSANCE SURFICIAL GEOLOGY
CLARKE RIVER
Northwest Territories
NTS 65-M north
1:125 000



Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications
Elevations in metres above mean sea level
Mean magnetic declination 2022, 7°01'E, decreasing 0.4° annually
Readings vary from 5°50'E in the NE corner to 8°07'E in the SW corner of the map.
This map is not to be used for navigational purposes.
Title photograph: Northwest-trending drumlinoid ridges (mega-scale glacial lineations), west of the Fovine River. Photo from the National Air Photo Library, NAPL photo A15066-64

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