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Map no.	Station	Latitude	Longitude	Elevation (m)	Corrected Age
1	15PTA-149	55.8384	-64.3245	486	7.93 ± 0.72 ka
2	15PTA-074	55.8387	-64.9888	314	7.65 ± 0.99 ka

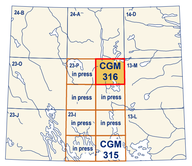
Table 1. Corrected ages by Optical Stimulated Luminescence (OSL) from fine-grained glaciolacustrine littoral sediments of glacial Lake Naskaupi.

Abstract

The Lac Mistinibi area is of moderate relief characterized by extensive till blankets and at higher elevations, till veneers and bedrock outcrops. The region was glaciated by the Laurentide Ice Sheet throughout Wisconsin time, east of the Quebec-Labrador ice centre. Two general phases of glacial landform development have occurred in the map-area, with northeast-trending large crag-and-tail landforms and streamlined eastward-trending landforms. These two orientations represent two phases of radial ice flow that have affected the region. Large eskers and related glaciofluvial deposits also transect the map sheet along west to east direction, indicative of the westward deglaciation of the region. Abundant, small meltwater channels in the upland areas of the region are evidence of late-phase ice ablation during final deglaciation. Below 488 m elevation, the region was inundated by glacial Lake Naskaupi, which occupied the George River basin and its tributaries and winnowed till surfaces.

Résumé

La région cartographique de Lac Mistinibi est une région au relief modéré, caractérisée par des nappes de till étendues et, aux altitudes plus élevées, par des placages de till et des affleurements du substratum rocheux. La région a été couverte par les glaces de l'Inlandsis laurentidien au cours du Wisconsinien, à l'est du centre glaciaire Québec-Labrador. Deux phases générales de formation de reliefs glaciaires ont eu lieu dans la région cartographique, produisant de vastes structures en crag-and-tail de direction nord est et des reliefs profilés de direction est. Ces deux directions rendent compte de deux phases d'écoulement glaciaire radial ayant touché la région. De grands eskers et des dépôts fluvioglaciaires connexes s'étirent aussi de l'ouest vers l'est dans la région cartographique, ce qui témoigne d'une progression vers l'ouest de la déglaciation de la région. De petits chenaux d'eau de fonte en abondance dans les secteurs élevés de la région sont des preuves d'une ablation glaciaire de phase tardive lors de la déglaciation finale. En deçà d'une altitude de 488 m, la région a été inondée par le Lac glaciaire Naskaupi, qui occupait le bassin de la rivière George et ses affluents et qui a vanné les surfaces de till.



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

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CANADIAN GEOSCIENCE MAP 316

SURFICIAL GEOLOGY

LAC MISTINIBI

Quebec

NTS 23-P northeast

1:100 000

QUATERNARY

POST LAST GLACIATION

NON-GLACIAL ENVIRONMENT

ORGANIC DEPOSITS: peat and muck, 1 to 2 m thick on average; formed by the accumulation of plant material in various stage of decomposition; generally occurs as low relief, wet terrain (swamps, bogs and fens).

Owf — **Organic deposits, fen:** derived from sedges and partially decayed shrubs in a eutrophic environment; commonly forms a ribbed pattern of low shrubs transverse to drainage with ponds of open water.

O — **Organic deposits, undifferentiated:** undifferentiated bog and fen deposits, area may be locally mixed or underlain with alluvial sediments; often associated with minor alluvial channels established for surface drainage.

ALLUVIAL SEDIMENTS: undifferentiated deposits of sorted gravel, sand, silt, and organic detritus; commonly stratified, variable thickness; deposited by streams and rivers.

Ap — **Floodplain sediments:** sorted gravel, sand, and silt, possibly containing varying amount of organics, variable thickness. Deposited within the floodplain of active rivers and streams, including meander channels and scroll bars.

At — **Alluvial terrace sediments:** sorted sands and fine gravels; elongated, inactive terraces above floodplain of active rivers and streams.

A — **Alluvial sediments, undifferentiated:** gravel to silt and organic detritus, variable thickness.

LACUSTRINE SEDIMENTS: cobble to pebble gravel, sand, silt, and minor organic detritus; >1 m thick, consisting of beach and storm deposits, ice rafted debris or formed during recent fluctuations in lake levels, deposited along the shorelines of larger lakes.

L — **Lacustrine sediments, undifferentiated:** gravel, sand, silt, and organic detritus; variable thickness.

POSTGLACIAL OR LATE WISCONSIN

GLACIAL ENVIRONMENTS

GLACIOLACUSTRINE SEDIMENTS: coarse gravel, sand, silt, and minor clay; commonly massive to portly stratified; >1 m; derived from winnowing of till in relatively shallow water; formed in proglacial Lake Naskaupi.

GLr — **Ridged beach sediments:** pebbly to coarse granular sand; moderate to well sorted, with stratification and open framework of clasts. Deposited during glacial lake inundation limited to elevations approximately at 485 m for glacial Lake Naskaupi.

GLn — **Littoral and nearshore sediments:** sand and gravel, moderately sorted, not more than 1 m thick, commonly produced by glaciolacustrine winnowing of till deposits.

GL — **Glaciolacustrine sediments, undifferentiated:** sand silt, and minor clay; commonly overlain by organic deposits; low relief terrain.

GLACIOFLUVIAL SEDIMENTS: sand, gravel with minor silt and diamicton; well to poorly sorted, massive to stratified; deposited by glacial meltwater streams from, or in contact with, glacial ice in a subglacial, subaqueous or proglacial subaerial environment.

GFp — **Outwash plain sediments:** sand and rounded gravel, minor silt; moderately to well sorted; planar and cross-stratified; from low relief plains commonly with kettle lakes, channel scars, and minor kettle lakes; ice-contact stratified drift deposited in a proglacial, subaerial environment within meltwater corridors.

GFt — **Glaciofluvial terrace:** well sorted, subrounded to rounded cobbly-pebbly gravel to fine-sand; terraced sediments that were formed along former floodplain of glaciofluvial channels.

GFf — **Outwash fan sediments:** fine sand to well rounded gravel, minor silt, moderately sorted; cross-stratified, with foreset bedding; sediments fine toward distal edge of fan; deposited at the terminous of subglacial and subaerial meltwater corridors.

GFh — **Hummocky sediments:** gravel to fine-sand, with minor silt, and isolated boulders; massive to crudely stratified, moderate to poor sorting; commonly formed in ice-contact meltwater environments, local relief is 2 to 4 m.

GFc — **Ice-contact sediments:** moderately to poorly sorted, massive to crudely stratified often occurring as small hummocks and ridges (1 to 4 m high); deposits usually are restricted in morphology due to overlying ice, often associated with subglacial meltwater corridors and esker networks.

GFr — **Esker:** sinuous ridges of moderate to well sorted sand and gravel, cross-stratified to massive; characterized by pronounced ridges with crested peaks, or flat topped and winnowed by proglacial lakes; associated deposits often flank each side, deposited as ice-contact glaciofluvial sediments in larger subglacial meltwater corridors; can be associated with kame deposits, other ice-contact sediments and outwash fan deposits with kettle depressions and lakes.

GFv — **Glaciofluvial veneer:** glacial meltwater sediments, gravels to fine-sand with minor silt; cross-stratified to massive; <1 m thick, often draping the underlying till or bedrock morphology.

GF — **Glaciofluvial sediments, undifferentiated:** sand, gravel with minor silt; well to poorly sorted massive to stratified; deposited by glacial meltwater streams from or in contact with glacial ice in a subglacial, subaqueous or proglacial subaerial environment.

GLACIAL SEDIMENTS (TILL): silty-sand to sandy diamicton; with striated and faceted clasts of various lithologies; clast content ranges from 15 to 25%; thickness ranges from 1 to >5 m thick; till sheets and ridges have been exposed to varying degrees of washing and winnowing from meltwater channel systems and proglacial Lake Naskaupi; generally thicker in the lowland regions and also as lee-side tails of streamlined glacial landforms; deposited directly by the Laurentide Ice Sheet.

Tr — **Ridged till:** bouldery, silty-sand diamicton of varying thickness, characterized generally by subparallel low-relief ridges, often tranverse to regional ice flow indicators as ribbed moraine.

Ts — **Streamlined till:** silty-sand diamicton, deposited by active flowing ice, associated with larger landforms and former ice stream corridors; geomorphology includes mega scale glacial lineations (fluted forms with high length:width ratios), drumlinoid features, and larger crag-and-tail forms.

Tv — **Till veneer:** bouldery, sandy diamicton; generally less than 1 m but up to 2 m thick locally; forms a discontinuous cover over bedrock and interspersed with many small outcrops of bedrock; geomorphology commonly mimics the underlying bedrock structure; local regions of frost heaved bedrock and boulders are frequent at higher elevations.

Tb — **Till blanket:** silty-sand diamicton; >2 m thick; forms continuous cover that generally masks underlying bedrock topography and structure; frost boils and solifluction stripes are common.

PRE-QUATERNARY

R — **Bedrock:** Core Zone bedrock, a composite Precambrian lithotectonic terrane of undifferentiated Archean rocks, Paleoproterozoic supracrustal rocks and variable age plutons extensively reworked during ca. 1.8–1.9 Ga collision of the Superior and North Atlantic (or Nain) cratons.

Winnowed sediments and localized thin (<1 m) sorted sediments of sand, gravel and cobble lag deposits; surface may exhibit meltwater channels or minor littoral features.

Kettle

Geological boundary, defined

Terrace scarp

Beach crest

Meltwater channel:
- *Minor, sense unknown*
- *Minor, sense known*
- *Major scarp*

Other moraine ridge, minor

Esker ridge:
- *Direction unknown or unspecified*
- *Direction known or inferred*

Drumlinoid ridge

Crag-and-tail ridge

Kame

Striations:
- *Direction known*
- *Crossed, relative ages given (1 = oldest)*

Small outcrop

Station location (ground observation or stratigraphic section)

Dated sample location, corrected age by Optical Stimulated Luminescence (OSL) (*see* Table 1)

Till sample location

Recommended citation

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Geology based on air photo interpretation and fieldwork by J.M. Rice, R.C. Paulen, and M. Ross, 2014–2016

Geological compilation by J.M. Rice and R.C. Paulen, 2014–2016

Geology conforms to Surficial Data Model v. 2.2

Geomatics by L. Robertson

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Map projection Universal Transverse Mercator, zone 20. North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.
Elevations in metres above mean sea level

CANADIAN GEOSCIENCE MAP 316

SURFICIAL GEOLOGY

LAC MISTINIBI

Quebec

NTS 23-P northeast

1:100 000

2 0 2 4 6 8 km

Mean magnetic declination 2017, 22°08'W, decreasing 14.4' annually. Readings vary from 21°54'W in the SW corner to 22°21'W in the NE corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Photo of perched erratics that sit atop glacially scoured bedrock, looking to the southwest, a distant esker emerges out of Lac aux Goélands, NTS 23-P/09 (55°57'28"N / 65°28'09"W), Quebec. Photograph by J.M. Rice. 2017-039

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

Data may include additional observations not portrayed on this map. *See* map info document accompanying the downloaded data for more information about this publication.

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Preliminary publications in this series have not been scientifically edited.

CANADIAN GEOSCIENCE MAP 316

SURFICIAL GEOLOGY

LAC MISTINIBI

Quebec

NTS 23-P northeast