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CANADIAN GEOSCIENCE MAP 206

RECONNAISSANCE SURFICIAL GEOLOGY

MACKAY LAKE

Northwest Territories

NTS 75-M

Map Information Document

Preliminary

Canadian Geoscience Maps

2014

Canada

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Scale

1:125 000

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Cover Illustration

Fluted landforms, MacKay Lake, Northwest Territories. Photograph by P. Morse. 2014-216

ABSTRACT

Reconnaissance mapping, through aerial photograph interpretation and limited legacy field data in the MacKay Lake map area, provides a basic understanding of surficial sediments and glacial history. The region appears to have experienced more than one ice flow, but fluted till and crag-and-tails record a dominant last, southwestward flow. Bedrock is well exposed in some areas of the northeastern and extreme southeastern regions of the map area. Elsewhere, extensive till deposits occur, with variable surface expressions. Till blanket and till veneer are common throughout the map areas, whereas morainal deposits appear in the central regions and increase in importance towards the south and west. Glaciofluvial complexes and corridors consisting of eskers, ice-contact sediments and scoured bedrock, record a generally west-southwestward meltwater flow across the map area during deglaciation. A few raised beaches and trim lines along the shores of MacKay Lake range from 410 to 440 m elevation. Their limited extent may suggest confined ice marginal glacial lakes during deglaciation.

RÉSUME

La cartographie de reconnaissance établie grâce à l'interprétation de photographies aériennes et d'un nombre limité d'anciennes données de terrain dans la région de la carte du lac MacKay nous donne une compréhension des sédiments superficiels et de l'histoire glaciaire. Pendant le Wisconsinien tardif, la région était enfouie sous la glace qui s'écoulait vers le sud ouest. La roche mère est exposée, dans certaines zones au nord est et à l'extrême sud est de la carte. Ailleurs, on trouve de grands dépôts de till dont l'expression en surface est variable. Du till épais, des placages de till, du till cannelé et des têtards (crag-and-tails) sont répandus sur tout le territoire de la carte, alors que les dépôts morainiques apparaissent dans les régions centrales et accroissent en importance vers le sud et l'ouest. Des complexes et des corridors fluvioglaciaires formés d'eskers, de sédiments juxtaglaciaires et de roche mère décapée signalent l'écoulement de l'eau de fonte lors de la déglaciation dans une direction générale ouest sud ouest dans la région cartographiée. On trouve quelques plages soulevées et des lignes de démarcation le long du rivage du lac MacKay entre 410 et 440 m d'altitude. Leur étendue limitée semble suggérer l'existence pendant la déglaciation de lacs glaciaires confinés, en marge de la glace.

ABOUT THE MAP

General Information

Author: D.E. Kerr

Geology based on aerial photograph interpretation by D.E. Kerr, 2014. Striation data from J.F. Henderson, 1944.

Geology conforms to Surficial Data Model v. 2.0

Geomatics by L. Robertson

Cartography by R. Chan

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

Map projection Universal Transverse Mercator, zone 12.
North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications. Elevations above mean sea level are expressed in metres (NTS 75-M/03, 75-M/04, 75-M/05, 75-M/06, 75-M/07, 75-M/08, 75-M/09, 75-M/10, 75-M/11, 75-M/12, 75-M/13, 75-M/14, 75-M/15, and 75-M/16) and feet (NTS 75-M/01 and 75-M/02)

Mean magnetic declination 2014, 15º21'E, decreasing 27' annually.
Readings vary from 14º27'E in the SE corner to 16º13'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.

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

Preliminary publications in this series have not been scientifically edited.

Map Viewing Files

The published map is distributed as a Portable Document File (PDF), and may contain a subset of the overall geological data for legibility reasons at the publication scale.

ABOUT THE GEOLOGY

Descriptive Notes

An old southwestward ice flow is recorded by crag-and-tails across the map area, but they are more prominent in the south. These landforms, up to 4 km long, exhibit variable states of preservation, from little modification to heavily meltwater-dissected slopes. In the south central region north of Lac du Mort, they are locally overlain by major moraine ridges. Small isolated crag-and-tails in the southwest (Rolfe Lake area) appear to record localized and limited ice flow to the northeast, with one rare occurrence recording a southeastward flow in the northeastern map quadrant. These small isolated crag-and-tails may relate to another older flow originating from very localized cold-based ice or old ice-accumulation zones associated with till veneer, undifferentiated till or moraine complexes. Alternatively these isolated crag-and-tails may actually represent pre-crag landforms, with till ramping up to outcrops, and formed by the regional southwestward flow. The entire map area was glaciated by late Wisconsin ice which flowed westward in the north, to southwestward in the south. In the southern regions, this resulted in older moraines and crag-and-tails being overprinted by flutings of the last ice flow. Where the old southwestward flow was parallel to the youngest flow, in the extreme southeast bedrock-dominated corner, the respective fluted landforms are not easily discernable. Preservation of the crag-and-tails and of the old moraines, some well-preserved and others heavily pitted and dissected, would suggest the possible existence of localized cold-based ice at some point. The association of undifferentiated till and moraines in the adjoining NTS map sheet to the east may also reflect similar localized cold-based ice. The last deglaciation also resulted in a series of major moraine ridges, as well as minor moraines in the central and southern parts of the map sheet, though a clear pattern of ice retreat is not readily identified based on the absence of significant, continuous end moraines.

References

Henderson, J.F., 1944. MacKay Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 738A, scale 1:253 440. doi:10.4095/107499

Author Contact

Questions, suggestions, and comments regarding the geological information contained in the data sets should be addressed to:

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Coordinate System

Projection: Universal Transverse Mercator
Units: metres
Zone: 12
Horizontal Datum: NAD83
Vertical Datum: mean sea level

Bounding Coordinates

Western longitude: 112°00’00” W
Eastern longitude: 110°00’00” W
Northern latitude: 64°00’00” N
Southern latitude: 63°00’00” N

Data Model Information

The Geological Survey of Canada (GSC) through the Geomapping for Energy and Minerals Program (GEM) has undertaken the Geological Map Flow to develop protocols for the collection, management (compilation, interpretation), and dissemination of surficial and bedrock geology data and map information. To this end, a data model has been created.

The Surficial Data Model (SDM) was designed using ESRI geodatabase architecture. The XML workspace document provided can be imported into a geodatabase, and the geodatabase will then be populated with the feature datasets, feature classes, tables, relationship classes, subtypes and domains.

Shapefile and table (.dbf) versions of the data are included within the data. Column names have been simplified and the text values have been maintained within the shapefile attributes. The direction columns are numerical, to display rotation for points, and the symbol fields will hold the correct values to be matched to the appropriate style file.

For a more in depth description of the data model please refer to the official publication:

Deblonde, C., Plouffe, A., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Kerr, D.E., Moore, A., Parent, M., Robertson, L., Smith, I R., St-Onge, D.A., and Weatherston, A., 2014. Science language for an integrated Geological Survey of Canada data model for surficial geology maps, version 2.0; Geological Survey of Canada, Open File 7631, 464 p. doi:10.4095/294225

LICENCE AGREEMENT

ACCORD DE LICENCE