Natural Resources Canada | Ressources naturelles Canada

CANADIAN GEOSCIENCE MAP 346

SURFICIAL GEOLOGY

ASHUANIPI RIVER

Newfoundland and Labrador
NTS 23-I southwest

Map Information Document

Celebrating 175 yrs

Geological Survey of Canada
Canadian Geoscience Maps

2018

Canada

MAP NUMBER

Natural Resources Canada, Geological Survey of Canada
Canadian Geoscience Map 346 (Preliminary)

TITLE

Surficial geology, Ashuanipi River, Newfoundland and Labrador, NTS 23-I southwest

SCALE

1:100 000

CATALOGUE INFORMATION

Catalogue No. M183-1/346-2018E-PDF
ISBN 978-0-660-24434-1
https://doi.org/10.4095/306431

COPYRIGHT

© Her Majesty the Queen in Right of Canada, as represented by the Minister of Natural Resources, 2018

Information contained in this publication or product may be reproduced, in part or in whole, and by any means, for personal or public non-commercial purposes, without charge or further permission, unless otherwise specified.

You are asked to:

- exercise due diligence in ensuring the accuracy of the materials reproduced;
- indicate the complete title of the materials reproduced, and the name of the author organization; and
- indicate that the reproduction is a copy of an official work that is published by Natural Resources Canada (NRCan) and that the reproduction has not been produced in affiliation with, or with the endorsement of, NRCan.

Commercial reproduction and distribution is prohibited except with written permission from NRCan. For more information, contact NRCan at nrcan.copyrightdroitdauteur.rncan@canada.ca.

RECOMMENDED CITATION

Campbell, H.E., Paulen, R.C., and Rice, J.M., 2018. Surficial geology, Ashuanipi River, Newfoundland and Labrador, NTS 23-I southwest; Geological Survey of Canada, Canadian Geoscience Map 346 (preliminary), scale 1:100 000.
https://doi.org/10.4095/306431

ABSTRACT

The Ashuanipi map area lies south of the ancestral Labrador ice divide of the Laurentide Ice Sheet. The combined record of striations and large-scale streamlined landforms reveal three phases of ice flow (oldest to youngest): northeast, south-southeast, and east-southeast. Erosional and depositional features throughout the map area distinguish the distinct glacial domains. Till veneer with channels and bedrock eroded by glacial meltwater was observed in higher elevation terrain north of Ashuanipi River, and also in the uplands formed by the Paleoproterozoic De Pas batholith to the east. Ribbed moraines, eskers, and streamlined landforms characterize the area southeast of Wade Lake. Extensive lowland fens, glaciolacustrine strandlines, and wave-cut benches that surround isolated streamlined till units in the central portion of the map area mark the former inundation of a large, shallow glacial lake (glacial Lake Low), the basin of which is occupied by the present-day Smallwood Reservoir.

RÉSUMÉ

La région cartographique d'Ashuanipi se situe au sud de la protoligne de partage glaciaire du Labrador de l'Inlandsis laurentidien. L'analyse combinée des stries et des grandes formes de relief profilées révèle trois phases d'écoulement glaciaire (de la plus ancienne à la plus récente : nord-est, sud–sud-est et est–sud-est). Les entités d'érosion et de dépôt dans l'ensemble de la région cartographique permettent de reconnaître des domaines glaciaires distincts. Des placages de till avec des chenaux et des roches érodées par l'action de l'eau de fonte glaciaire ont été observés dans un terrain de plus haute altitude au nord de la rivière Ashuanipi, ainsi que dans les hautes terres formées par le batholite de De Pas du Paléoprotérozoïque à l'est. Des moraines côtelées, des eskers et des formes de relief profilées caractérisent la région au sud-est du lac Wade. Dans la partie centrale de la région cartographique, de vastes tourbières minérotrophes, des lignes de rivage glaciolacustres et des escarpements créés par l'action des vagues qui circonscrivent des unités isolées de till profilé marquent un terrain anciennement inondé par un grand lac glaciaire peu profond (Lac glaciaire Low), dont le bassin est occupé de nos jours par le réservoir Smallwood.

LICENCE AGREEMENT

View the license agreement at
http://open.canada.ca/en/open-government-licence-canada

ACCORD DE LICENCE

Voir l'accord de licence à
http://ouvert.canada.ca/fr/licence-du-gouvernement-ouvert-canada

SHEET 1 OF 1, SURFICIAL GEOLOGY

GENERAL INFORMATION

Authors: H.E. Campbell, R.C. Paulen, and J.M. Rice

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

Geological compilation by H.E. Campbell and R.C. Paulen, 2017

Geology conforms to Surficial Data Model v. 2.3

Geomatics by L. Robertson

Cartography by E. Everett

Initiative of the Geological Survey of Canada, conducted under the auspices of the GEM-2 Hudson-Ungava Core Zone Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program.

Logistical support provided by the Polar Continental Shelf Program as part of its mandate to promote scientific research in the Canadian north. PCSP 05915 (2015) and 06016 (2016)

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

Mean magnetic declination 2018, 21°55'W, decreasing 14.2' annually. Readings vary from 20°41'W in the SW corner to 21°08'W in the NE corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Oblique aerial view southward toward the Smallwood Reservoir at the confluence of three eskers that form part of a large trunk esker system commencing northwest of Giasson Lake and terminating just north of Churchill Falls (more than 100 km long). In the foreground, strandlines of glacial Lake Low can be seen on the glaciofluvial sediments, up to 8 metres above the present maximum level of the Smallwood Reservoir. NTS 23-I/04 (54°07'52"N/65°39'37"W). Photograph by H.E. Campbell. 2017-100

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.

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

This publication has been scientifically reviewed, but it has not undergone a formal edit.

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.

Descriptive Notes

This map encompasses three physiographic regions: the glacially bedrock uplands of the Kaniapiskau Supergroup to the west, the De Pas batholith to the east, and the lowland fen underlain by Neoarchean gneisses in the central portion of the map.

The earliest phase of glacial flow was to the northeast and is preserved on the lee of later ice movements. A dominant southeast flow is observed in large streamlined landforms and striae, with a later shift to eastward flow. Abundant meltwater channels are observed on the northern part of the map sheet. Northeast-southwest oriented moraines are located in the southwest sector of the map area, in the region of Ashuanipi River and Giasson Lake. Long southeast trending eskers and glaciofluvial outwash deposits are located approximately 10 km spaced intervals throughout the map sheet.

A large, shallow glacial lake once inundated the central low lands and current Smallwood Reservoir. Features defining this glacial lake were first noted by Paulen et al. (2017). They named this glacial Lake Low after A.P. Low of the Geological Survey of Canada, who first recognized that the final disintegration of the continental ice sheet occurred in this region (Low, 1896). Washing limits in this portion of the map are about 480–500 m above sea level (8–10 m above the current reservoir levels), and affected much of the lowland of the map sheet. Littoral beach deposits, winnowed tills, strandlines and wave-cut benches in glacial landforms are observed as markers of past glacial lake levels. Glacial lake sediments have been locally re-worked into modern nearshore lake deposits, and alluvial deposition of sediments occurs along current day waterways.

Acknowledgments

The surficial mapping survey was undertaken as part of the second phase of the Geo-mapping for Energy and Mineral Program (GEM II) in collaboration with the Geological Survey of Newfoundland and Labrador (GSNL) under the scientific leadership of D. Corrigan and surficial activity leader M.B. McClenaghan, with GSC management support from R. Couture and L. Chebab. This research benefitted from the support of the Polar Continental Shelf Program. G.W. Hagedorn (University of Waterloo) is thanked for his assistance in the field. M.D. Pyne (GSC) is thanked for his fieldwork assistance, data collection, database and GIS support through the project. M. Ross (University of Waterloo) provided useful Quaternary insights and discussions while in the field. A. Plouffe (GSC) and D. Taylor (GSNL) are thanked for their careful and thorough reviews of this map.

References

Brushett, D. and Amor, S., 2013. Kimberlite-indicator mineral analysis of esker samples, western Labrador; Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey, Open File LAB/1620, 58 p.

Clark, T. and Wares, M., 2005. Lithotectonic and metallogenic synthesis of the New Québec Orogen (Labrador Trough); Ministere des Ressources naturelles,Québec, MM 2005-01, 175 p.

Henderson, E.P., 1959. A glacial study of central Quebec-Labrador; Geological Survey of Canada, Bulletin 50, 1 .zip file. https://doi.org/10.4095/123901

Jansson, K.N., Kleman, J., and Marchant, D.R., 2002. The succession of ice-flow patterns in north-central Québec-Labrador; Quaternary Science Reviews, v. 21, Issues 4–6, p. 503–523. https://doi.org/10.1016/S0277-3791(01)00013-0

Klassen, R.A. and Paradis, S., 1990. Surficial geology of western Labrador: NTS 23A, 23B, 23G, 23J, 23I, and portions of 13L, 22P, and 23H; Geological Survey of Canada, Open File 2198, scale 1:250 000. https://doi.org/10.4095/130817

Klassen, R.A. and Thompson, F.J., 1989. Ice flow history and glacial dispersal patterns, Labrador; *In*: Drift Prospecting, (ed.) R.N.W. DiLabio and W.B. Coker; Geological Survey of Canada, Paper 89-20, p. 21–29. https://doi.org/10.4095/127361

Klassen, R.A. and Thompson, F.J., 1993. Glacial history, drift composition, and mineral exploration, central Labrador; Geological Survey of Canada, Bulletin 435, 82 p. https://doi.org/10.4095/183906

Klassen, R.A., Paradis, S., Bolduc, A.M., and Thomas, R.D., 1992. Glacial landforms and deposits, Labrador, Newfoundland and eastern Québec; Geological Survey of Canada, Map 1814A, scale 1:1 000 000, 1 .zip file. https://doi.org/10.4095/183872

Low, A.P., 1896. Report on exploration in the Labrador Peninsula along the East Main, Koksoak, Hamilton, Manicuagan and portions of other rivers in 1892-93-94-95; Geological Survey of Canada, Annual Report vol. 8, Part L, 387 p. https://doi.org/10.4095/293888

Paulen, R.C., Rice, J.M., and McClenaghan, M.B., 2017. Surficial geology, northwest Smallwood Reservoir, Newfoundland and Labrador, NTS 23-I southeast; Geological Survey of Canada, Canadian Geoscience Map 315 (preliminary), scale 1:100 000. https://doi.org/10.4095/300685

Veillette, J.J., Dyke, A.S., and Roy, M., 1999. Ice-flow evolution of the Labrador Sector of the Laurentide Ice Sheet: a review, with new evidence from northern Quebec; Quaternary Science Reviews, v. 18, Issues 8–9, p. 993–1019. https://doi.org/10.1016/S0277-3791(98)00076-6

Wardle, R.J., 1977. Geological mapping of the Snelgrove Lake–Andre Lake area, Labrador Trough; *In*: Report of Activities, (ed.) R.V. Gibbons, Government of Newfoundland and Labrador, Department of Mines and Energy, Mineral Development Division, Report 77-1, p. 71–78.

Author Contact

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

R.C. Paulen
Geological Survey of Canada
601 Booth Street
Ottawa ON
K1A 0E8
roger.paulen@canada.ca

Coordinate System

Projection: Universal Transverse Mercator
Units: metres
Zone: 20
Horizontal Datum: NAD83
Vertical Datum: mean sea level

Bounding Coordinates

Western longitude: 66°00’00”W
Eastern longitude: 65°00’00”W
Northern latitude: 54°30’00”N
Southern latitude: 54°00’00”N

Software Version

Data has been originally compiled and formatted for use with ArcGIS™ desktop version 10.2.2 developed by ESRI®.

Data Model Information

Surficial

The Geological Survey of Canada (GSC) through the Geo-mapping 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., Cocking, R.B., Kerr, D.E., Campbell, J.E., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Parent, M., Plouffe, A., Robertson, L., Smith, I.R., and Weatherston, A., 2017. Surficial Data Model, version 2.3.0: revisions to the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 8236, 1 .zip file. https://doi.org/10.4095/302717