References and additional ice flow data from:

Aylsworth, J.M., Boydell, A.N., and Shilts, W.W., 1981. Surficial geology, Marble Island, District of Keewatin; Geological Survey of Canada, Map 10-1980, scale 1:125 000. https://doi.org/10.4095/109704

Cocking, R.B., Deblonde, C., Kerr, D.E., Campbell, J.E., Eagles, S., Everett, D., Huntley, D.H., Inglis, E., Laviolette, A., Parent, M., Plouffe, A., Robertson, L., Smith, I.R., and Weatherston, A., 2016. Surficial Data Model, version 2.2.0: Revisions to the science language of the integrated Geological Survey of Canada data model for surficial geology maps; Geological Survey of Canada, Open File 8041, 45 p. https://doi.org/10.4095/298767

McMartin, I. and Henderson, P. J., 2004. Ice flow history and glacial stratigraphy, Kivalliq Region, Nunavut (NTS 55-J, K, L, M, N, O; 65-I and P); complete datasets, maps and photographs from the Western Churchill NATMAP Project; Geological Survey of Canada, Open File 4595, 1 .zip file. https://doi.org/10.4095/215057

Wright, G.M., 1967. Surficial geology, southeastern Barren Grounds, District of Keewatin and District of Mackenzie; Geological Survey of Canada, Map 1217A, scale 1:1 000 000. https://doi.org/10.4095/108855

Abstract

This new surficial geology map product represents the conversion of Map 10-1980 and its legend only, using the Geological Survey of Canada's Surficial Data Model (SDM version 2.2) which can be found in Open File 8041. All geoscience knowledge and information from Map 10-1980 that conformed to the current SDM were maintained during the conversion process. Additional material such as marginal notes or figures which may exist on the original map, are not included here. Supplementary, legacy information was added to complement the converted geoscience data. This consists of ice flow features and striations from McMartin and Henderson, 2004 and Wright, 1967. It is identified in the accompanying geodatabase. The purpose of converting legacy map data to a common science language and common legend is to enable and facilitate the efficient digital compilation, interpretation, management and dissemination of geologic map information in a structured and consistent manner. This provides an effective knowledge management tool designed around a geo-database which can expand following the type of information to appear on new surficial geology maps.

Résumé

Ce nouveau produit dérivé de la carte des formations superficielles 10-1980 a été produit avec le Modèle de données des formations superficielles (MDFS version 2.2) de la Commission géologique du Canada qui a été publié sous forme de dossier public 8041. La connaissance et toutes les données de la carte 10-1980 se retrouvent dans le MDFS ont été maintenues pendant le processus de conversion. Des éléments supplémentaires tels que les notes marginales ou les figures qui peuvent exister sur la carte originale, ne sont pas incluses ici. Des données complémentaires ont été ajoutées pour compléter les données géoscientifiques converties. Ce sont des formes glaciaires et stries de McMartin et Henderson, 2004 et de Wright, 1967. Elles sont identifiées dans la base de données géospatiales. Le but de convertir les cartes publiées antérieurement en langage scientifique commun et en légende commune est de permettre et faciliter la compilation, l'interprétation, la gestion et la diffusion numériques efficace d'information de cartes géologiques de façon structurée et cohérente. Cette base de données géospatiales est un outil de gestion qui pourra évoluer suivant le type d'information à paraître sur les nouvelles cartes des formations superficielles.

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

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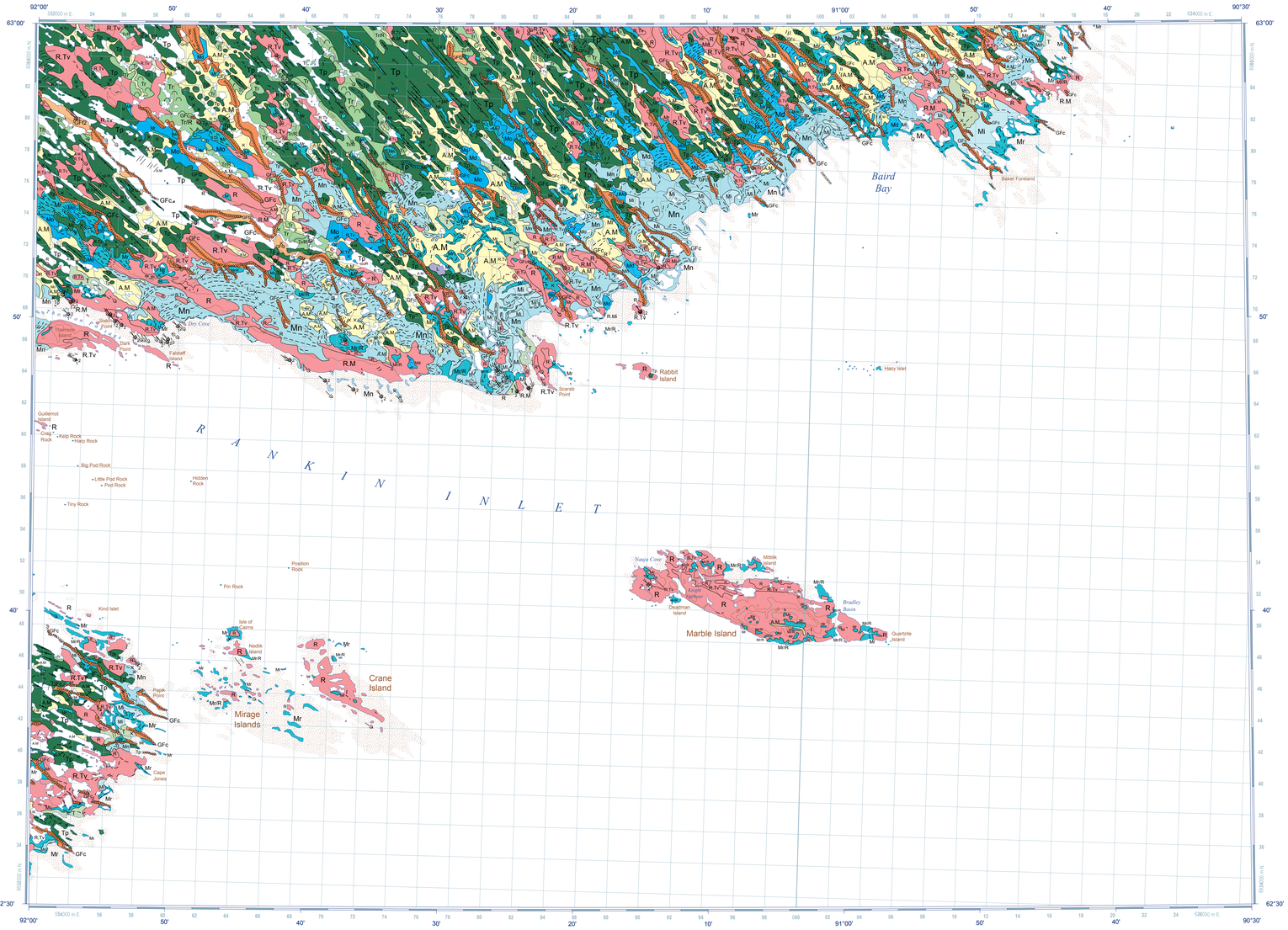
Natural Resources Canada / Ressources naturelles Canada

CANADIAN GEOSCIENCE MAP 242
RECONNAISSANCE SURFICIAL GEOLOGY
MARBLE ISLAND
Nunavut
part of NTS 55-J
1:125 000



QUATERNARY

NONGLACIAL ENVIRONMENT

ALLUVIAL SEDIMENTS: stream deposited material within modern active drainage systems; "modern" is defined as the period since retreat of the sea, proglacial lakes, or glacial ice.

Ap — **Alluvial floodplain sediments:** silt, sand, and gravel; variable thickness; deposited in channels and on floodplains; may include alluvial sediments in terraces which formed as streams cut to present level in glacial and marine sedimentary fill.

A — **Alluvial sediments, undifferentiated:** silt, sand and gravel; variable thickness; stream-deposited material within modern active drainage systems; "modern" is defined as the period since retreat of the sea, proglacial lakes, or glacial ice; when associated with marine sediments they occur as flat areas consisting of modern alluvium mixed with silt and sand that were washed from slopes by wave action or deposited in the sea by meltwater streams; surface generally covered by 40 cm to more than 1 m of fibrous peat on which mosses, sedges, and grasses grow; maximum active layer is 15 to 50 cm deep; surface characterized by frost polygons and thaw ponds related to vertical ice wedges extending to a depth of 2 to 3 m.

L — **Lacustrine sediments, undifferentiated:** silt and sand; variable thickness; associated with permanently drained postglacial lake basins; may include deposit of silty sediment with up to 15% organic carbon.

NONGLACIAL AND GLACIAL ENVIRONMENT

MARINE SEDIMENTS: materials deposited in the Tyrrell Sea and during marine regression, and glacial deposits modified by marine processes.

Mr — **Beach sediments:** sand, gravel, cobbles, or boulders; variable thickness; generally well sorted; deposited as beaches, bars, spits, and ice-pushed ridges in littoral and nearshore environments; surface characterized by sparse vegetation and orthogonal frost cracks.

Md — **Deltaic sediments:** sand, gravel, and boulders; variable thickness; deposited in the Tyrrell Sea by glacial streams, and during regression by nonglacial streams; includes modern streams entering Hudson Bay; surface may be characterized by sparse vegetation and polygonal frost cracks.

Mi — **Intertidal sediments:** stony silt and sand; variable thickness; poorly sorted; coastal plain complex includes wind-blown sand and marine clayey silt associated with tidal flats along Hudson Bay, with pockets of sorted nearshore sand and gravel; probably a till plain levelled by filling of depressions and planation by wave action during emergence; forms a flat plain extending as far as 20 km inland; a generally complete organic cover and high density of shallow lakes make determining the nature of underlying sediments difficult; periglacial features include mudboils on muddy substrate to frost cracks or polygons on organic, gravelly or sandy deposits.

Mn — **Nearshore sediments:** sand; variable thickness; thin sheet deposited by a migrating shoreline; thought to be a lag developed by wave reworking of marine clayey sand or silty sand, generally associated with Mi; characterized on some aerial photos by a mottled pattern resulting from periglacial processes or gullying by streams or tidal currents.

Mo — **Offshore sediments:** clay, silt and silty sand; variable thickness; deposited in a deep water environment; may occur anywhere below marine limit but distribution is patchy above 60 m a.s.l.; thickest deposits generally are found in major river valleys or valleys with major eskers; may include prominent striped or mottled pattern on aerial photos; difficult to differentiate on airphotos from till; surface vegetation is dominantly shrubs in turf circles around mudboils; striped pattern consists of dark and light stripes, 10 to 20 m wide, running downslope and reflects vegetation differences; mottled pattern due to shrub- and mudboil-covered mounds, 5 to 10 m in diameter and less than 0.5 m high, surrounded by light coloured grass-sedge vegetation; thought to have high ground ice content.

M — **Marine sediments, undifferentiated:** clay, silt and sand; variable thickness; deposited in various marine environments; appears as a secondary unit in complex polygons.

GLACIAL ENVIRONMENT

GLACIOFLUVIAL SEDIMENTS: water-sorted sediments deposited in, or around, or near a glacier; largely as a result of meltwater stream flow.

GFt2 — **Subaqueous outwash fan sediments:** silt, sand, fine gravel; variable thickness; terraced, hummocky, and kettled surfaces; distal fine sediment debouching from the subaqueous mouth of an ice tunnel into the sea; vegetation is commonly sedge, grass, and moss growing on thin, fibrous peat; surface characterized by thaw ponds and tundra polygons; difficult to differentiate on aerial photos from unit A.

GFc — **Ice-contact sediments:** sand and gravel; variable thickness; stratified, deposited near ice margins in, over, or around ice or in ice tunnels, commonly as eskers but includes isolated hummocky deposits of uncertain origin; many eskers are beaded or interrupted at irregular intervals by major bulges marking positions where deltaic or subaqueous fan deposition occurred during periods of slowed ice retreat.

GLACIAL SEDIMENTS (TILL): poorly sorted diamicton with distinctive forms deposited directly by glacial ice.

Th — **Hummocky till:** diamicton; variable thickness; without significant boulder cover occurring as low, rounded hummocks; includes ridges of till that are minor end moraines or erosion remnants between subparallel meltwater channels; extensive areas are present in the region of the Keewatin Ice Divide and in some places adjacent to areas of ribbed moraines (Tr); exact origin unknown; may have formed in association with stagnant ice and in some places from erosion of till surfaces by streams in anastomosing meltwater channels; vegetation and periglacial features similar to those on till plain (Tp).

Tr — **Ridged moraine:** generally bouldery till, in places sand and gravel; variable thickness; ribbed (Rogen) moraine, forming hummocks and straight to sinuous ridges, generally less than 1 km long and 2 to 10 m high; ridges generally oriented at right angles and form trains parallel to direction of ice flow; individual ribs may be asymmetric in cross-section with steep side facing down-ice; trains of ribs pass laterally into drumlin fields and may be drumlinized in the transition zone; surfaces have sparse vegetation and generally a heavy cover of large boulders and mudboils where composed of till, and are marked by frost cracks where composed of gravel.

Tp — **Till plain:** generally sandy, silty diamicton with less than 25% clay sized particles; noncalcareous; grey; variable thickness; forms till plains; includes areas of clay-rich red till; vegetation (shrubs, mosses, grasses) grows in elevated peaty rings around bare or lichen-covered mudboils 1–2 m diameter; may exhibit striped pattern on clay-rich red till as observed on aerial photos.

Tv — **Till veneer:** generally sandy, silty diamicton; less than 1 m thick; appears as a secondary unit in complex polygons.

T — **Till, undifferentiated:** diamicton; variable thickness; associated with complex map units of till-cored landforms blanketed by marine sediments; based solely on aerial photo interpretation.

PRE-QUATERNARY

R — **Bedrock, undifferentiated:** Precambrian intrusive igneous and metamorphic rocks, red volcanic rocks, and unmetamorphosed sediments; surface comprises more than 80% outcrop; vegetation sparse; surface may be glacially rounded or covered by felsenmeer; bedrock (20 to 80% outcrop) is mantled with less than 1 m of the surficial deposit indicated in complex polygons.

Complex units: two map-unit designators are used in cases where the surficial cover forms a complex area and the map units are too small to be mapped individually, yet constitute a significant areal extent of the total polygon (e.g. R.Tv designates an area of bedrock with numerous small deposits of till veneer). In such instances a dot (.) is used to separate the map-unit designator.

Stratigraphic relationship: a stratigraphic relationship is shown with two map-unit designators separated by a slash (/) (e.g. Mr/R designates beach sediments overlying bedrock).

Geological contact, defined

Beach crest, bar, or ice-shoved ridge

Moraine ridge, minor, unspecified, De Geer

Esker ridge:

Paleoflow direction unknown

Paleoflow direction known

Drumlinoid, fluting, length mapped to scale

Fluted bedrock, roche moutonnée

Hummock, hummocky moraine

Paleocurrent measurement, bedrock erosional form, 1 = older, 3 = younger

Striations:

Poorly defined, direction unknown

Poorly defined, direction known

Well defined, direction unknown

Well defined, direction known

Crossed, 1 = older, 3 = younger

Small bedrock outcrop

Recommended citation
Geological Survey of Canada, 2017. Reconnaissance surficial geology, Marble Island, Nunavut, part of NTS 55-J; Geological Survey of Canada, Canadian Geoscience Map 242 (preliminary, Surficial Data Model v. 2.2 conversion of Map 10-1980), scale 1:125 000. https://doi.org/10.4095/300228

Celebrating 175 yrs

Geological Survey of Canada
Canadian Geoscience Maps

Canada

Author: Geological Survey of Canada

Geology based mainly on airphoto interpretation and ground observations by J.M. Aylsworth, A.N. Boydell, and W.W. Shilts, 1973.

Geology conforms to Surficial Data Model v. 2.2

Data conversion by D.E. Kerr, 2014, 2015

Geomatics by S. Eagles

Cartography by R. Buenviaje

Initiative of the Geological Survey of Canada, conducted under the auspices of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) Program.

Map projection Universal Transverse Mercator, zone 15. North American Datum 1983

CANADIAN GEOSCIENCE MAP 242
RECONNAISSANCE SURFICIAL GEOLOGY
MARBLE ISLAND
Nunavut
part of NTS 55-J
1:125 000

2 0 2 4 6 8 10 km

Basemap at the scale of 1:250 000 from Natural Resources Canada, with modifications.
Elevations in metres above mean sea level.

Mean magnetic declination 2017, 8°18'W, decreasing 5.7' annually. Readings vary from 6°36'W in the SW corner to 10°02'W in the NE corner of the map.

This map is not to be used for navigational purposes.

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/).

Preliminary publications in this series have not been scientifically edited.

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