References

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., 2018. Surficial Data Model: the science language of the integrated Geological Survey of Canada data model for surficial geology maps. Geological Survey of Canada, Open File 8236, ver. 2.3.14, 1 .zip file. https://doi.org/10.4095/308178

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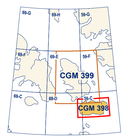
Abstract

This new surficial geology map product represents the conversion of the parts of Open File 541 covering Cornwall Island (Edlund and Hodgson, 1978) and its legend, using the Geological Survey of Canada's Surficial Data Model (SDM version 2.3.14) (Deblonde et al., 2018). All geoscience knowledge and information from Open File 541 that conformed to the current SDM were maintained during the conversion process. 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 geological map information in a structured and consistent manner. This provides an effective knowledge-management tool designed around a geodatabase which can expand following the type of information to appear on new surficial geology maps.

Résumé

Ce nouveau produit cartographique de la géologie des formations superficielles correspond à la conversion de la partie de la carte couvrant l'île Cornwall du Dossier public 541 (Edlund et Hodgson, 1978) et de sa légende, en se servant du Modèle de données pour les formations superficielles (MDFS version 2.3.14) de la Commission géologique du Canada (Deblonde et al., 2018). Toutes les connaissances et l'information de nature géoscientifique du Dossier public 541 qui sont en conformité avec le modèle de données ont été conservées pendant le processus de conversion. Le but de la conversion de cartes publiées antérieurement suivant un langage scientifique commun et une légende commune est de permettre et de faciliter la compilation, l'interprétation, la gestion et la diffusion efficaces de l'information géologique cartographique en mode numérique de façon structurée et cohérente. Cette façon de faire offre un outil efficace de gestion des connaissances élaboré à l'aide d'une géodatabase qui pourra évoluer suivant le type d'information à paraître sur les nouvelles cartes de la géologie des formations superficielles.



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

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CANADIAN GEOSCIENCE MAP 398

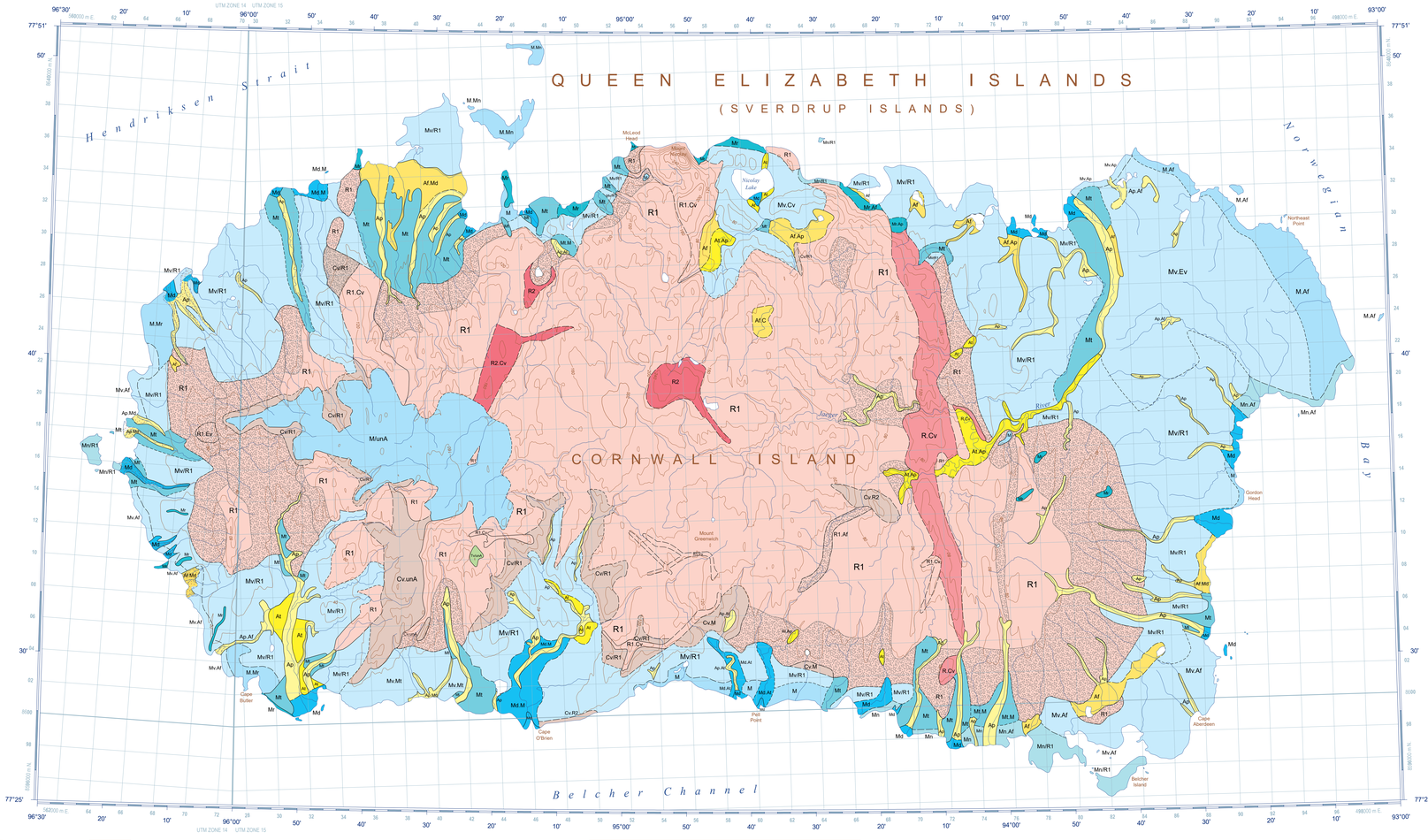
SURFICIAL GEOLOGY

CORNWALL ISLAND

Nunavut

parts of NTS 59-C and 69-D

1:125 000



QUATERNARY

HOLOCENE

NONGLACIAL ENVIRONMENT

Eolian veneer: sand or coarse silt; rarely greater than 50 cm thick; wind-blown material with a smooth or ripple-marked surface; eolian processes are most active on sandy alluvial and marine sediments, and on poorly consolidated sandstone and siltstone, particularly where marine reworked; deposits are commonly superficially indistinguishable from the source material, hence the term is used only where the eolian sediment has a different texture (usually coarser grained) than the underlying material; appears only as secondary unit in complex polygons.

COLLUVIAL DEPOSITS

Colluvial veneer: variable texture, clay to angular rock fragments; less than 2 m thick and often much thinner; overlies bedrock and residual material.

Colluvial deposits, undifferentiated: variable texture, clay to angular rock fragments; variable thickness; material displaced or altered by rills or mass-wasting processes to such a degree that it markedly differs in texture and/or structure from subjacent material; may occur on slopes of any angle; however, material on most slopes does not fall under this definition of colluvium; appears only as secondary unit in complex polygons.

ALLUVIAL SEDIMENTS

Alluvial floodplain sediments: generally clay to sand; variable thickness; only valley flats wider than 100 m mapped; most are straight or slightly sinuous with no, or rare, terraces, except for inactive delta surfaces; during peak discharge, at snowmelt, the whole channel zone is filled for 1 to 2 weeks; at lower water stages, flow is restricted to one or more narrower channels, rarely greater than 1 m deep; a minority of valleys and channel zones are irregular to meandering in form, and only here are floodplains or terraces common; channel sediments only partially reflect materials through which a river passes; material from upstream sources, particularly where coarse grained, may dominate over the whole course; even a minor outcrop of indurated rock may introduce gravel- and boulder-sized material downstream over several kilometres.

Alluvial fan sediments: generally sand; rarely greater than 2 m thick; fan-shaped deposits of stream sediments, common where a stream gradient abruptly decreases and/or flow is no longer confined by channel banks; at peak snowmelt, the entire fan surface may be under a thin (few centimetres) sheet of flowing water that forms low ripple marks; flow is soon confined to one or more shallow channels and for much of the summer the fan is dry.

Alluvial terraced sediments: generally clay to gravel; up to 10 m or more thick; inactive, fluvially worked surface at higher elevation than laterally adjacent valley flat, and usually separated from it by a bluff 1 to 10 m high; only terraces wider than 100 m mapped.

MARINE SEDIMENTS

Marine terraced sediments: variable texture, silty clay to sand; succession normally silty-clay bottomset beds overlain by transitional fine to coarse foresets, overlain by coarse (usually sand) topset beds; however, all beds may be of fine or coarse materials depending on source materials in the drainage basin; thickness up to 30 m or more; terraces derived from raised inactive deltas; may be fan-shaped; the modern stream or river channel may be incised 2 to 30 m into older deltaic sediments; terraced deltaic sediments older than Holocene are preserved locally.

Marine beach sediments: sand to gravel; variable thickness; a single beach berm or flight of ridges and swales; although a low sand beach berm is commonly developed along much of the modern shoreline (even where inland sediments are fine grained), ridges are rarely preserved inland, probably because predominantly sand-sized material is readily windblown (see unit Mv).

Marine deltaic sediments: variable texture, silty clay to sand and gravel; succession normally silty-clay bottomset beds overlain by transitional fine to coarse foresets, overlain by coarse (usually sand) topset beds; however, all beds may be of fine or coarse materials depending on source materials in the drainage basin; thickness exceeds 30 m in larger deltas; sediment deposited where a river enters the sea; active deltas are invariably fan-shaped, with an arcuate front which may thrust up to 2 km beyond the adjacent coastline, indicating little wave or current erosion, or lateral deflection of the channel; prograding due to sediment deposition, together with relative fall of sea level over the last 9000 years has advanced the delta front as much as 20 km seawards on some rivers, though 1 to 10 km is more common; as a result, the modern channel is incised 2 to 30 m into older deltaic sediments over this distance; deltaic sediments older than Holocene are preserved locally.

Marine nearshore sediments: sand; generally 1 to 2 m thick; planar sediments in a zone extending 0.1 to 5 km inland from the present shoreline; distinctive striped pattern on airphotos resembles closely spaced beach ridges; on the ground, stripes have little or no morphological expression and mark moisture differences; commonly transected at close-spaced intervals by alluvial fans and wide braided-channel zones.

Marine veneer: silty clay to medium sand; less than 2 m thick, but may be thicker in valleys and much thinner on divides; underlain by bedrock commonly exposed in stream cuts.

Marine sediments, undifferentiated: silty clay to medium sand; rarely greater than 5 m thick, and thickness commonly decreases inland to a feathered edge; a generally planar surface of marine sediments deposited in a low-energy environment (i.e. generally ice-covered sea), and uncovered by the relative fall in sea level over the last 9000 years; includes nearshore and offshore sediments, marine-reworked underlying deposits (chiefly rock), ice-rafted sediments, and minor (i.e. inseparable at mapping scale) beach deposits and alluvial and deltaic sediments of minor drainage lines; overlain by eolian sediment where adjacent to (usually to southeast of) a suitable sediment source; composition may be similar to, or quite different from, texture of underlying bedrock; the bedrock contact may be transitional or sharp, with scattered evidence of thin onlap beach gravel.

GLACIAL ENVIRONMENT

Till veneer: clayey, gravelly silt diamicton; generally 1 m thick; overlies alluvial sand and gravel (unit unA) on west central Cornwall Island.

LATE TERTIARY OR QUATERNARY (?)

Alluvial sediments, undifferentiated: sand, fines, gravel, and boulders, round to angular; variable thickness; gravel and boulders are dominantly quartzose sandstone, minor siltstone, gabbro, limestone, and granite that unconformably overlie Mesozoic sedimentary rocks, and commonly function as a capping rock; stratified sand up to 5 m thick, with rare noncarbonized wood, has also been observed, and probably underlies the gravel and boulders conjectured to be a remnant of a Quaternary, or older, sheet of alluvial sediments that formerly covered lower, less-resistant lithologies of the eastern Queen Elizabeth Islands; appears only as secondary unit in complex polygons and in stratigraphic relationships within polygons.

PRE-QUATERNARY

BEDROCK

Bedrock, sedimentary: various formations; see Edlund and Hodgson (1978) for more detailed lithologies and references; unconsolidated to poorly consolidated sand and sandstone; poorly lithified shale; poorly to well cemented sandstone; well cemented and resistant calcareous siltstone and sandstone; diapiric gypsum domes; well to poorly cemented limestone and conglomerate.

Bedrock, igneous: dykes and sills of fine to very coarse-grained, generally diabasic gabbro; little alteration of adjacent sediments; moderately to highly weathered outcrop also breaks down to angular gravel- to boulder-sized rubble, minor silt, sand, and clay; blocks commonly cover adjacent sediments as colluvial veneer.

Bedrock, undifferentiated: fine- to coarse-grained bedrock; a morphologically subdued form of the rock units described above; between present sea level and approximately 50 m, bedrock has been repeatedly washed, reworked, or planed during higher Quaternary or older sea levels; a discontinuous veneer of marine sediments (see unit Mv) is commonly present.

Complex units: two map-unit designators separated by a dot (.) are used where the surficial cover forms a complex area and the units are too small to be mapped individually (e.g. Ap.At designates an area of alluvial plain sediments with terraced sediments). The map-unit polygon is coloured according to the dominant unit and labeled in descending order of cover.

Stratigraphic relationship: two map-unit designators separated by a slash (/) are used where a stratigraphic relationship is observed or confidently inferred (e.g. Cv/R1 indicates colluvial veneer overlying bedrock). The map-unit polygon is coloured according to the overlying unit.

Area repeatedly washed, reworked, or planed during higher Quaternary or older sea levels.

Geological contact:
- *Defined*
- *Approximate*
- *Assumed or gradational*

Recommended citation
Geological Survey of Canada, 2022. Surficial geology, Cornwall Island, Nunavut, parts of NTS 59-C and 69-D; Geological Survey of Canada, Canadian Geoscience Map 398 (Surficial Data Model v. 2.3.14 conversion of Open File 541), scale 1:125 000. https://doi.org/10.4095/314740

Geological Survey of Canada
Canadian Geoscience Maps

Canada

Author: Geological Survey of Canada

Geology by D.A. Hodgson, 1978, from field work in 1977, and air photo interpretation in 1977 and 1978

Geological compilation by D.A. Hodgson, 1978

Geology conforms to Surficial Data Model v. 2.3.14 (Deblonde et al., 2018).

Geological data conversion by D.E. Kerr, 2018

Geology has been spatially adjusted to fit the updated base.

Geomatics by C.D. Stevens

Cartography by A. De Silva

Scientific editing by L. Ewert

Initiative of the Geological Survey of Canada, conducted under the auspices of the Information Management Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program

CANADIAN GEOSCIENCE MAP 398

SURFICIAL GEOLOGY

CORNWALL ISLAND

Nunavut

parts of NTS 59-C and 69-D

1:125 000

2 0 2 4 6 8 10 km

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

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

Proximity to the North Magnetic Pole causes the magnetic compass to be useless in this area.

This map is not to be used for navigational purposes.

The Geological Survey of Canada welcomes corrections or additional information from users (geopublications-cgcpublications@nrcan-rncan.gc.ca).

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 (https://geoscan.nrcan.gc.ca/).

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