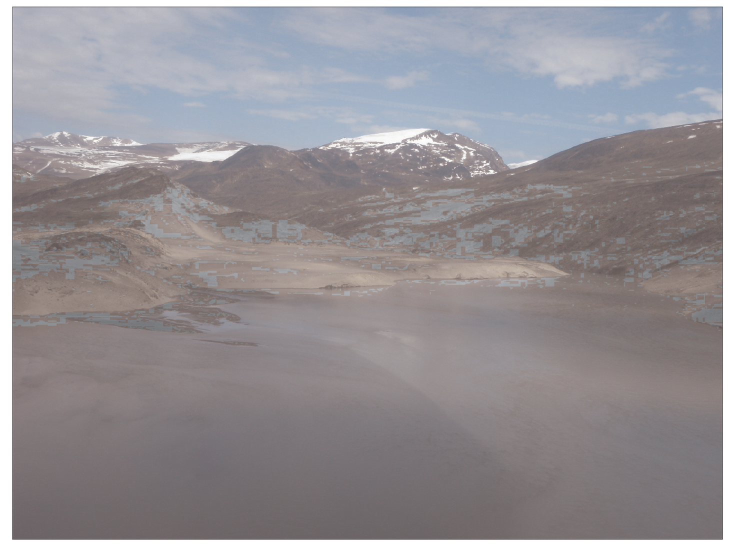


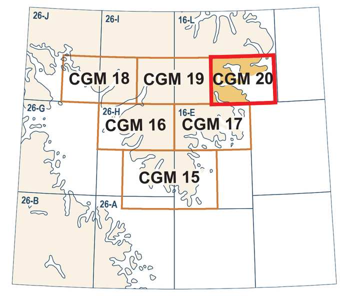
Figure 1. Head of Mermaid Fiord. The sandy terrace is a wind eroded, raised glaciomarine delta (sample sites 09-SRB-E071-073) at 36m elevation (66.3°N, 62.9°W), one of a few raised marine deposits along this coast. 2011-54

Abstract

In 2009, as part of the GEM Program of the Geological Survey of Canada, Cumberland Peninsula east and southeast of the National Park was mapped. Mapping included several aspects of the regional Precambrian geology, as well as the Quaternary geology. Regional till was sampled for sedimentological and geochemical purposes, and moraines and other deposits were sampled for cosmogenic exposure dating.
The eastern part of the peninsula is today an area of intensive alpine glaciation and evidently has experienced this style of glaciation throughout the Quaternary. During the last glacial maximum (28–12ka), alpine glaciers thickened to form regional ice divides over the mountains. Ice flow from these divides covered most, possibly all, of the region and supplied ice streams along several fiords. This local ice coalesced with the Laurentide Ice Sheet in Cumberland Sound. Despite possibly repeated glaciation, substantial areas show little or no sign of glacial erosion and retain Tertiary surfaces mantled with block fields and tors.

Résumé

En 2009, dans le cadre du programme GEM, la Commission géologique du Canada a cartographié les régions de la péninsule de Cumberland à l'est et au sud-est du parc national. La cartographie incluait plusieurs aspects de la géologie régionale précambrienne de même que la géologie du Quaternaire. Des échantillons de till régional ont été effectués à des fins d'analyses sédimentologiques et géochimiques ainsi que des moraines et d'autres dépôts à des fins de détermination des âges d'exposition aux rayonnements cosmogéniques.
La partie est de la péninsule est aujourd'hui une région de glaciation alpine intense et de toute évidence, ce type de glaciation existait durant le Quaternaire. Durant le dernier maximum glaciaire (28–12ka), les glaciers alpins se sont épaissis pour former des lignes de partage glaciaire au-dessus des montagnes. L'écoulement glaciaire provenant de ces lignes de partage glaciaire couvrait une grande partie sinon toute la région et formait des courants glaciaires en bordure de plusieurs fjords. Cette glace locale entrait en coalescence avec l'Indlandsis laurentidien dans la baie Cumberland. Malgré plusieurs glaciations, des régions importantes ne montraient que très peu ou même aucun signe d'érosion glaciaire et retenaient les surfaces du Tertiaire recouvertes de champs de blocs et de tors.



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

Cover illustration
Usualuk Glacier, Cumberland Peninsula. Photograph by Art Dyke. 2002-255

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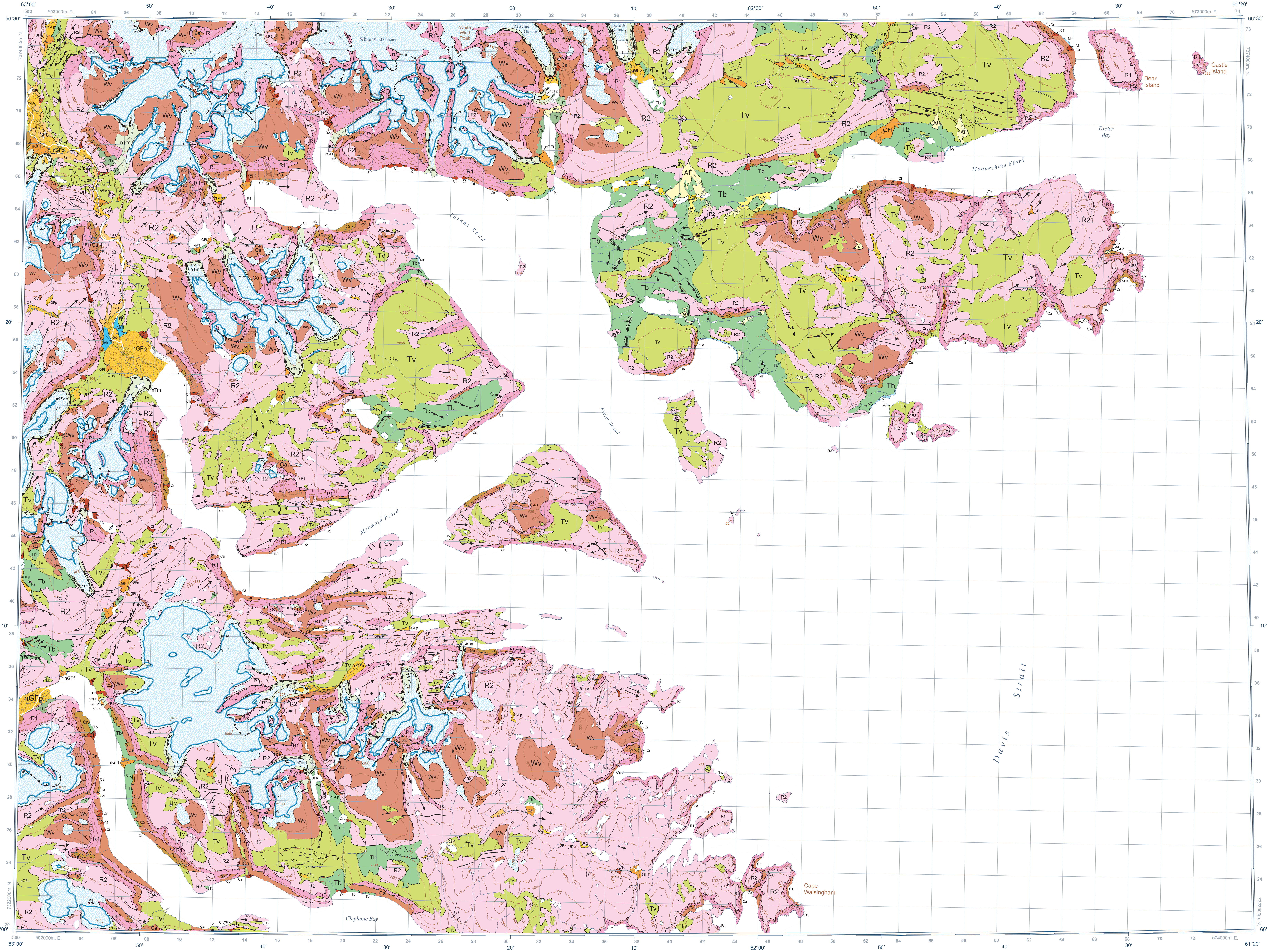
CANADIAN GEOSCIENCE MAP 20
(preliminary version)
SURFICIAL GEOLOGY
CAPE DYER SOUTH
Baffin Island, Nunavut
1:100 000



SURFICIAL DEPOSITS

QUATERNARY

HOLOCENE

NEOGLACIAL

Ice: glacier ice, 1–600 m thick forming cold-based and polythermal plateau ice caps and cirque and valley glaciers; extent as of AD 1958 with AD 2008 extent superimposed.

GLACIOFLUVIAL SEDIMENTS: gravel and sand, 1–10 m thick, deposited beyond the ice margin

nGFf — **Proglacial outwash:** gravel and sand, 1–10 m thick, forming fans.

nGFp — **Proglacial outwash:** gravel and sand 1–10 m thick, forming active braidplains.

Till: nonsorted glacial debris commonly very bouldery with a silty sand matrix

nTm — **Latero-frontal moraines:** 5–100 m high moraine ridges with over-steepened, failing slopes on shallowly buried glacier ice cores and associated ground moraine with minor glaciofluvial sediments; distinguished from older moraines by lack of mature lichen and plant covers.

POSTGLACIAL (including Neoglacial)

FLUVIAL SEDIMENTS: alluvium; gravel and sand deposited beyond primary influence of Holocene glaciers

Af — **Alluvial fans:** gravel and sand commonly bouldery, with detrital organic layers and buried soils, 1–20 m thick, formed by steep-gradient streams and debris flows forming channels and levees.

Ap — **Alluvial plains:** gravel and sand, 1–10 m thick.

At — **Alluvial terraces:** gravel and sand, 1–10 m thick, above limit of modern flooding.

COLLUVIUM: block and rubble accumulations, 1–50 m thick

Cf — **Colluvial fan deposits:** blocky to gravelly debris-flow accumulations mixed with scree, 1–50 m thick, traversed by narrow channels and debris levees; typically interrupt scree slopes (Ca) at the exits of prominent debris hopper in cliff; surface slopes less than angle of repose but steeper than those of alluvial fans

Ca — **Talus:** generally active accumulations of blocks and rubble, as much as 50 m thick forming talus (scree) aprons at angle of repose below cliffs derived from rock falls.

Cr — **Rock glacier debris:** talus, generally 10–50 m thick, deformed by interstitial flow of buried ice to form talus glaciers; irregular terraces on talus slopes with transverse ridges on treads above steep frontal risers; some risers stable and well vegetated; most risers instable, unvegetated, and at angle of repose.

MARINE SEDIMENTS: gravel, sand, silt, and minor clay, 1–20 m thick, deposited in beach, deltaic, and offshore environments during regression of postglacial sea.

Mr — **Beach sediments:** gravel and sand, commonly bouldery, 1–5 m thick, forming raised beach ridges and swales and the modern, transgressive beach, a barrier beach in places.

Md — **Deltaic sediments:** sand and gravel, typically overlying fine sand and silt bottomset beds, 5–20 m thick, forming raised terraces; terraces at marine limit formed at or near the ice margin.

GLACIOFLUVIAL SEDIMENTS: gravel and sand, 1–10m thick, deposited behind, at, and in front of the ice margin

GFf — **Proglacial outwash:** gravel and sand, 1–10 m thick, forming fan-shaped deposits.

GFp — **Proglacial outwash:** gravel and sand, 1–10 m thick, forming inactive braided plains.

GFt — **Proglacial outwash:** gravel and sand, 1–10 m thick, forming terraced deposits.

TILL: nonsorted bouldery diamictons, 1–40 m thick, deposited in subglacial and ice marginal environments, lithic composition generally reflecting underlying bedrock

Tm — **Latero-frontal moraines:** 5–40 m high ridges and hummocks comprised mainly of till probably overlying debris-rich glacier ice cores, forming lateral and end moraine ridges and less organized, hummocky accumulations formed during ice-marginal recession; moraine crests muted due to colluviation during partial degradation of ice cores; matrix somewhat more sandy and less silty than till forming ground moraine; locally contains ice-contact stratified drift and outwash.

Tr — **Rock-glacierized moraines:** ice-cored end or lateral moraines, 5–40 m high, displaced from original site of glacial deposition by down-slope flow of ice-debris mixture; till mixed in places with scree; commonly act as local base level for scree accumulation, hence difficult to distinguish from Cr in places; mainly stable risers.

Tv — **Till veneer:** variously bouldery (10–60% cover; typically 20–40%) diamicton with silty sand matrix, 0.5–2 m thick and discontinuous; insufficiently thick to obscure relief of underlying bedrock.

Tb — **Till blanket:** variously bouldery (10–60% cover; typically 20–40%) diamicton with silty sand matrix, 2–10 m thick, sufficiently thick to obscure relief of underlying bedrock.

PRE-WISCONSINAN

Wv — **Residuum:** felsenmeer, rock rubble, and gruss, 1–2 m thick, mantling bedrock; formed by disintegration of Precambrian bedrock prior to Last Glacial Maximum but including sparse erratics and possibly morphologically degraded old till; tonalite felsenmeer comprised of metre-scale blocks in diamict matrix, with typically 60–90% block cover; finer rubble and gruss on coarse monzogranite of Cumberland Batholith, interrupted by tors 1–6 m high; bedrock surface shows little or no sign of glacial scouring, hence retains its pre-Quaternary form; mainly on flat or gently graded, cliff-bounded, upland plateaus, but on moderately steep slopes in places; most surfaces probably covered by cold-based ice during one or more glaciations.

BEDROCK

PRE-QUATERNARY

ROCK: rock of various compositions and Precambrian ages; Cumberland Batholith comprised largely of monzogranite dominant west of Kingnait Fiord, tonalite and metasediments farther east

R1 — **Cliffs:** major escarpments, typically hundreds of metres high, forming serrated faces with multiple debris hoppers; glacially scoured surfaces removed by postglacial scarp retreat producing basal (or submarine) talus accumulations.

R2 — **Scoured rock:** hilly and hummocky surfaces with lake basins and ice moulded eminences resulting from glacial scouring and with patchy veneers of till, commonly depleted of matrix material; probably covered by warm-based ice during stadial intervals of Wisconsin Glaciation, including Last Glacial Maximum.

Glacier ice margin for 2009 from SPOT5 satellite imagery
Geological boundary (defined)
Geological boundary (gradational)
Fluted bedrock (direction known)
Fluted bedrock (direction unknown)
Drumlin
Latero-frontal moraine
Lateral meltwater channel; barb on upslope side
Proglacial meltwater channel
Lacustrine limit
Cirque
Arête
Cliff
Dyke
Wv Field observation (point colour relative to geological units)
Striae (ice flow direction known)
20 Station, marine shoreline elevation in metres

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Cartes géoscientifiques du Canada

Canada

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Geological compilation by A.S. Dyke, 2009
Cartography by L. Robertson

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SURFICIAL GEOLOGY
CAPE DYER SOUTH
Baffin Island, Nunavut
1:100 000

2 0 2 4 6 8 km

Map projection Universal Transverse Mercator, zone 20.
North American Datum 1980

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

Mean magnetic declination 2011, 33°54'W, decreasing 29.0' annually. Readings vary from 33°32'W in the SE corner to 34°16'W in the NW corner of the map.

The Geological Survey of Canada welcomes corrections or additional information from users.
This map conforms to the ISO 9001:2008 standard used by the Scientific and Technical Publishing Services Quality Management System.

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CANADIAN GEOSCIENCE MAP 20
(preliminary version)
SURFICIAL GEOLOGY
CAPE DYER SOUTH
Baffin Island, Nunavut

Four trim marks around perimeter of map sheet. Trim map sheet first, then fold at folding marks.

Cover and additional panels are 17cm wide when folded.