



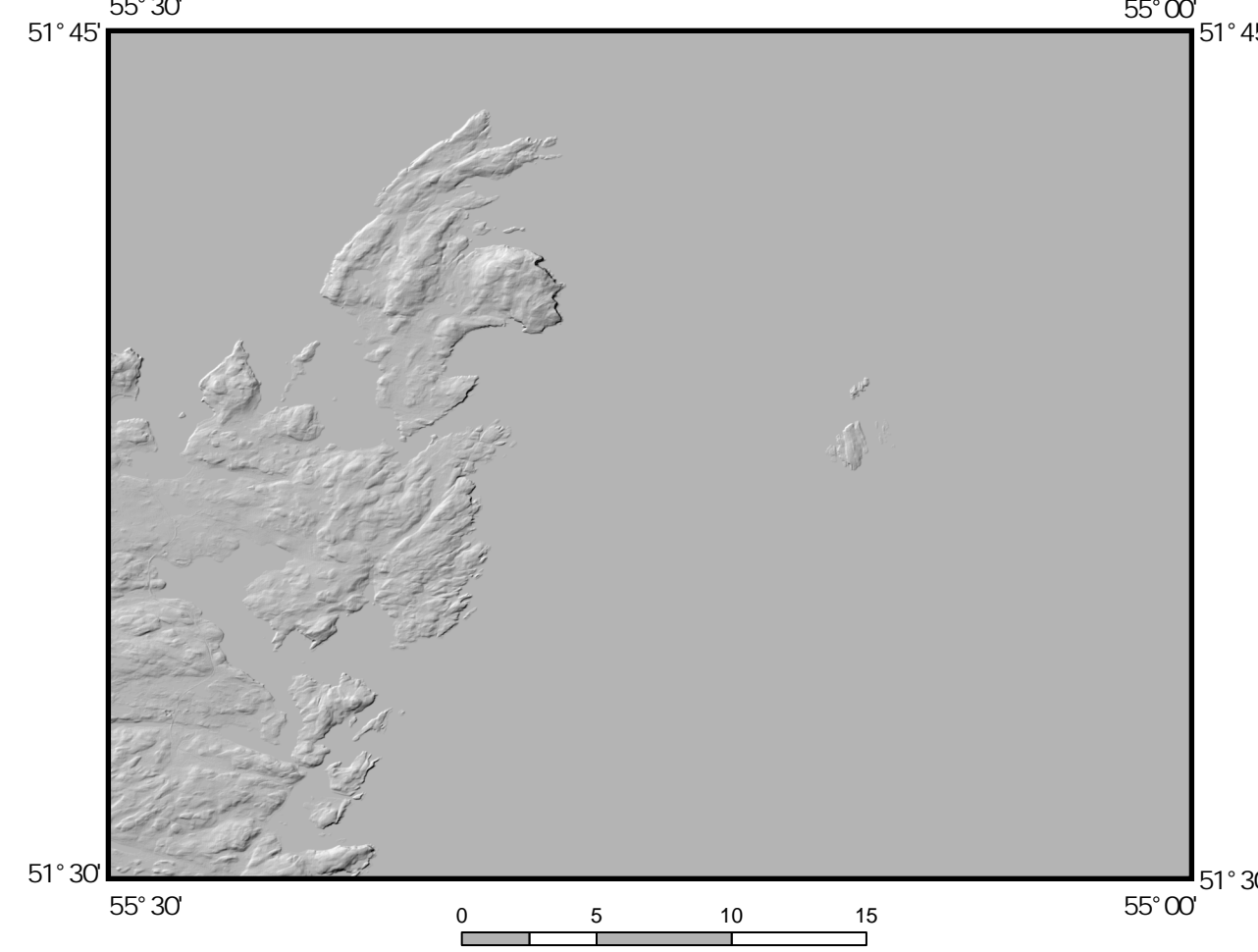
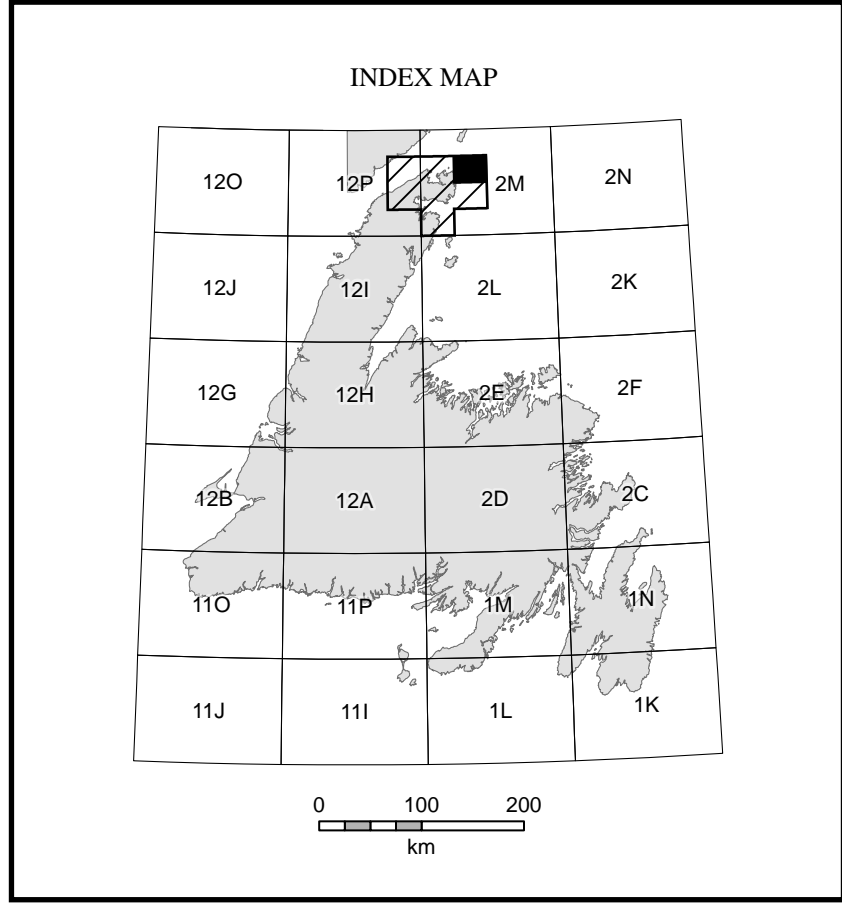
QUIRPON MAP AREA

Methods and Map Projection
Field mapping was undertaken and completed during the 2018 and 2019 field seasons. The survey used track, all-terrain vehicles (ATVs), boat and foot traverses. Field information was collected using a Trimble unit with GPS. Field observation data are marked by an "r" on the map. The surficial map was created using ortho imagery (data from the Department of Forestry, Newfoundland and Labrador) and bathymetry is derived from Newfoundland and Labrador Sea Digital Elevation Model (Department of Fisheries, Forestry and Agriculture Geomatics) in ArcGIS pro™.

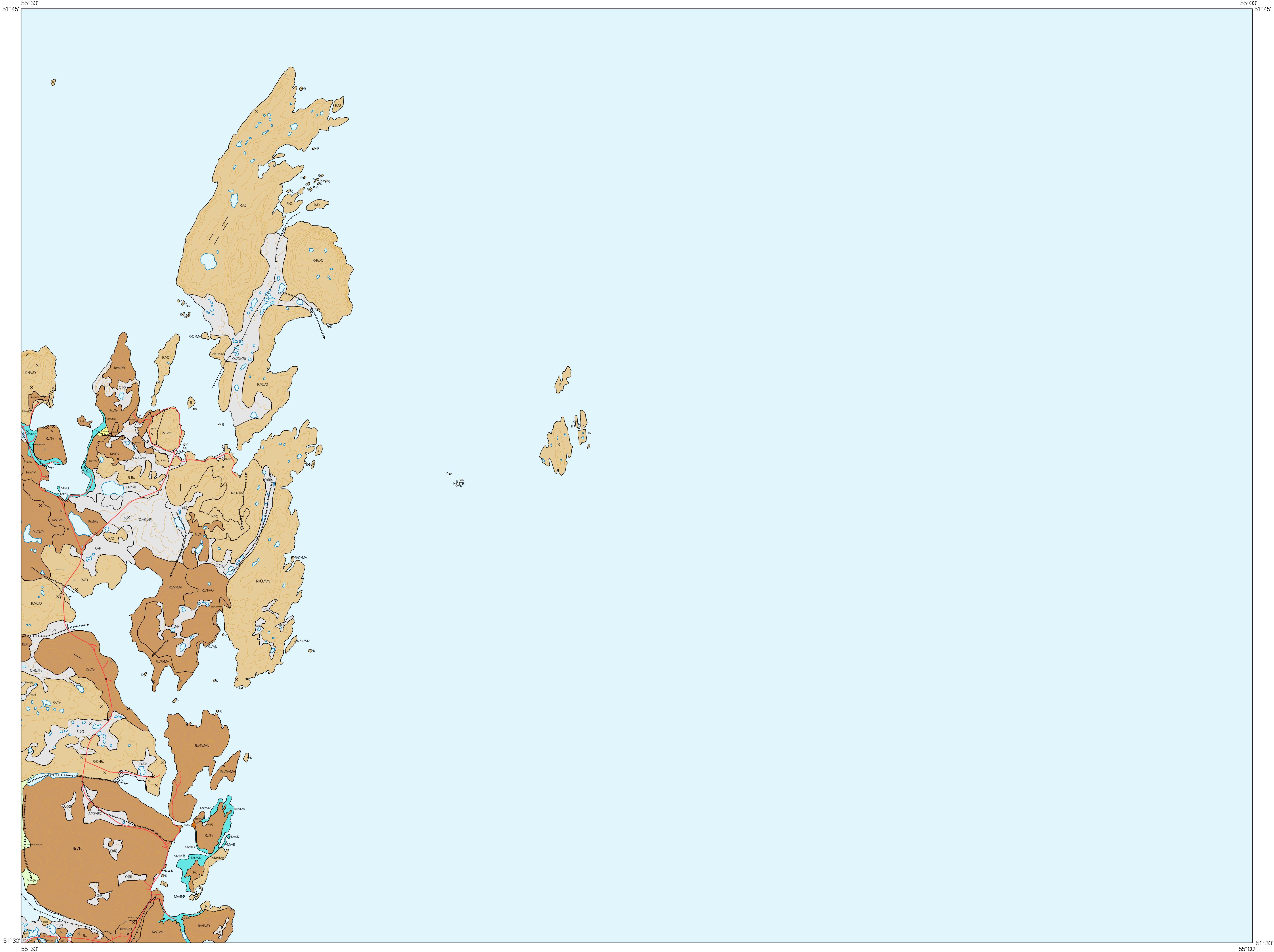
Location and Physiography
This map sheet is located on the northeastern tip of the GNP between the latitudes 51°30'N and 51°45'N and longitudes 55°00'W and 55°15'W. The study area is nearly accessible from Highway 420 that connects to the Trans-Canada Highway and to routes 432, 433, 435, 436 and 437. The highest elevation in the map area is approximately 150 m above sea level (asl) and the lowest elevation is sea level. Relief is low, with areas of higher elevation dominated by residual bedrock and stony outcrops, most covered and those of lower elevation dominated by organic (bog). The climate is near Arctic (type 16C) and the region is classified as "boreal-temperate", a transitional zone characterized by moss, shrub, scattered spruce and birchland (Grant, 1992). Moss, scattered pine, and fir trees in the map area dominate vegetation.

Glacial History
The study area was affected by the 35–10 ka BP Late Wisconsin Glaciation. During glacial advance, glacial outwash in the Long Range Mountains flowed northeast into the area. The rate flow is well documented by abundant large-scale glacial features such as ridges, mounds and ice bedforms. During the glacial maximum between 15.5 and 10 ka BP the Laurentide Ice Sheet (LIS) covered over the Strait of Belle Isle and flowed over the northern tip of the GNP. The coalescence of glaciers from the Long Range Mountains and the LIS resulted in a flow that was highly asynchronous and later finally southward. Deglaciation may have commenced between 10–7 ka BP (Grant, 1982). During deglaciation, ice sheets disintegrated primarily via meltback and re-advance. As the ice sheets shrank, they became topographically controlled and retreated back towards the primary ice centres the Long Range Mountains. Glacial melting resulted in the discharge of meltwater that carved meltwater channels into weakened bedrock as well as the deposition of glacioluvial sediments. Deglaciation was mainly complete by 10 ka BP (Grant, 1982). Deglaciation resulted in the immediate rebound of the study area. 1°C dates of meltwater suggest that almost part of the study area was still submerged at 5.5 ka BP (Liverman, 1994).

Surficial Sediments and Landform Features
Bare (n) and covered (n) are covered by vegetation (n) or trees, moss and shrubs are the most prevalent surficial units in the study area. A few bi-directional, flutings are mapped in the northern part of the map area. These are oriented northeast-southeast, southeast-northeast, east-west and north-south. Of these, the northeast-southwest flow is consistent to glacial advance and the southeast-northeastward flow is consistent with glacial meltback. The east-west and north-south flows likely represent localized movement that was topographically controlled. This is the oldest sediment unit documented in the study area. It is mapped as a veneer (Tv, <1 m) in bedrock low. Glacioluvial sand and gravel associated with deglaciation in the region is mapped as a veneer (Gv) and as a complex (Gc) in central map area. The glacioluvial materials is primarily associated with large, well-defined meltwater channels mapped all over the map area. Along the coast, the bedrock is covered by a veneer of organic or proglacial meltwater deposits (M). These are characterized by coarsely to well-sorted, medium to coarse sand, and pebbly to bouldery gravel that are primarily mapped as a veneer (Mv). The organic deposits in the region are organic deposits (O), consisting of muskeg, bog, and fen. These are prevalent in the coastal lowlands and bedrock depressions inter-d and can be observed overlying bedrock.



Digital Bathymetric Surface Model (DSM) of the Quirpon map area from Newfoundland and Labrador Sea Digital Elevation Model (Department of Fisheries, Forestry and Agriculture Geomatics) in ArcGIS pro™. The image provides terrain information not readily illustrated on the surficial map. Terrain variability is related with areas of bedrock highlighted as rugged, bedrock (consistent with surficial map), and most of thicker till shown as smooth textured.

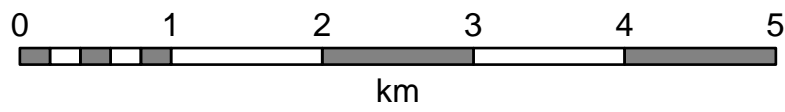


MAP 2025-03

SURFICIAL GEOLOGY OF THE QUIRPON MAP AREA (NTS 2M/11)

OPEN FILE 002M/11/0129

Scale 1:50 000



Elevations are in metres above sea level. Contour interval is 10 m.

GENETIC CLASSIFICATION		
Category	Depositional Environment	Origin and Material Characteristics
	Bog	Poorly drained accumulations of peat, peat moss and other organic matter; developed in areas of poor drainage
	Fluvial	Alluvium consisting of silt and clay to boulders; gravel, forms terraces and plains associated with modern stream channels, their floodplains and deltas, usually less than 1 m thick; deposited by fluvial action at, or below, maximum flood levels
	Colluvial	Coarse-grained bedrock-derived materials; may include sand, silt or clay; accumulates on the lower parts, or at the base of steep rock faces; transported by gravity
	Aeolian	Medium- to fine-grained sand and silt; well sorted, poorly compacted; commonly forms dunes up to 10 m high; transported and deposited by wind
	Glacioluvial	Fine-grained sand- to coarse-grained (clayey) gravel; forms plains, ridges (bedrock), hummocks, terraces and deltas; generally greater than 1 m thick; deposited as outwash in an ice-contact or proglacial position
	Lacustrine	Silt, clay, gravel and sand; forms as plains and blankets; silt and clay is deposited in freshwater lakes from suspension, sand and silt by lake-floor currents; gravel and sand by shoreline wave action
	Marine	Clay, silt, gravel and sandstone; sand is present in some places, generally moderately to well sorted and commonly calcareous; but may be massive; forms beach ridges, dunes, terraces and low-lying areas in marine environment; gravel and sand are formed by shoreline wave action; may include shells, silt and silt deposited from suspension and turbidity currents; gravel is generally a well-sorted, fine
	Glacial	Includes all types of till composed of clast-rich; transported and subsequently deposited by till from glacier ice with no significant sorting by water. These include relatively fine (Tv) or thicker (Tb, Tc, Td, Te, Tf) till with little or no surface expression; features protected by features having ice (Tb, Tc, Td) or meltwater deposited through ice disintegration (Tb, Te)
	Rock	Bedrock, either exposed (R) or concealed by vegetation (Rc)

MORPHOLOGY		
Modifier	Morphology	Description
a	apron	A relatively gentle slope at the foot of a steeper slope, commonly used to describe colluvium at the base of a rock outcrop; consists of material derived from the usually steeper upper slope
b	banket	Any deposit greater than 1.5 m thick; minor irregularities of the underlying unit are masked but the major topographic form is still evident
c	concealed by vegetation	Vegetation that developed on either colluvial surface or a thin layer of angular frost-heaved and frost-heaved rock fragments overlying bedrock; includes areas of shallow (less than 1 m), discontinuous overburden
d	drumfield	Elongate (ridges) between 1.5 and 20 m high, 20 and 300 m wide, and 200 to 500 m long; ridges have a rounded end pointing in the ice-flow direction and gently curving sides that taper in the down-ice direction; within a convex longitudinal profile, commonly with a steeper slope in the up-ice direction; consist of subglacially formed deposits draped in a downstream form parallel to the direction of glacial flow; commonly consist of silt, although some may contain stratified drift; may have a rock core
e	eroded and dissected	A series of closely spaced gullies or deeply incised channels; can have a dendritic pattern or may be a single straight or acute channel; gullies and channels may contain underdrain streams
f	fan	A gently sloping accumulation of debris deposited by a stream issuing from a valley onto a lowland; has its apex at the mouth of the valley from which the stream issues; the fan shape results from the deposition of material on the stream terraces back and forth across the lowland; fluvial fans are usually derived from eroded glacial and glacioluvial deposits; glacioluvial fans (deltas) are deposited in standing water rather than in a perennial environment; outflow fans are derived from bedrock and are usually steeper (i.e., cone shaped)
h	hummock	An apparently random assemblage of knobs, mounds, ridges and depressions without any pronounced parallelism, significant form or orientation; formed by glacial melting during ice stagnation and disintegration; includes subglacial, englacial, supraglacial and stratified materials
k	kettle	A basin or bowl-shaped closed depression or hollow in glacial drift; results from the melting of a buried or partly buried detached block or lens of glacial ice; commonly occurs in association with hummocks
i	linear	Elongate spindle-shaped (ridges) between 5 and 80 m high, 75 and 300 m wide and up to 4000 m long; ridges are commonly straight sided, lower at one or both ends, and have a flat longitudinal profile; consist of subglacially formed deposits shaped in a streamlined form parallel to the direction of ice flow; commonly consist of silt, although some may contain stratified drift; may have a rock core; includes slope-freased bogs (O)
p	plain	A comparatively flat, level, or slightly undulating tract of land; materials are either R; glacioluvial, alluvial, marine, lacustrine or organic sediments; bedrock features are commonly masked by the overlying sediments
r	ridge	Narrow, elongated and commonly steep-sided feature that rises above the surrounding terrain; materials are either rock, R; glacioluvial, fluvial, marine, lacustrine, sandstone, or organic sediments; includes string bogs (O)
t	terrace	Long, narrow, level or gently inclined step-like surface, bounded along one edge by a steeper descending slope or scarp and along the other by a steeper ascending slope or scarp; materials are either R; glacioluvial, fluvial or lacustrine sediments; generally formed by fluvial and glacioluvial erosion or marine wave action
v	veneer	Any deposit less than 1.5 m thick; morphology of the underlying unit is evident
w	weathered	A thin layer, generally less than 1 m thick, of frost-heaved and frost-shattered bedrock fragments
x	complex	Commonly used to indicate numerous older ridges that are closely spaced; can be used where any genetic category exhibits numerous surface expressions in a small area, and in which no single element can be defined on the map scale

Each outlined area is assigned a classification consisting of up to two generic categories and modifiers that designate the types of deposits within each area. Each category within a classification is listed in order of dominance and is separated from the other categories by a dash (e.g., Tv-R). Generally, the areas are divided up so that up to three landforms or deposit types are identified within a given area. The classification system is also used to denote the approximate percentage of landforms occurring within an outlined area, but those that form less than 5 percent of the area are not included in the classification. Three variations of the landform system are as follows:

- Where two landforms are included in a single map unit, a double slash (//) or single slash (/) is used to separate them, and their relative percentages are (50–95) / (5–15) for double slash, or (60–85) / (15–40) for a single slash.
- A hyphen between two landform types indicates that they are approximately equal in area. For example, Tv-R indicates that till veneer and rock concealed by vegetation or a thin till veneer are equal in area.
- A composite symbol is used to show combinations of the above cases. For example, $\frac{R}{50}$ indicates that about 60–85 percent of the area is covered by fluvial sediment, 15–40 percent by glacioluvial sediments, and is underlain by R.

LEGEND

SYMBOLS	
Geological boundary	Drumlin (direction known, unknown)
Terrace scarp	Crag-and-fall hill
Clippe	T/S ramp
Esker flow direction known or assumed, unknown)	Fluting
Meltwater channel (small, direction known; small, direction unknown; large)	Roché moutonnée
Crevasse of major marine ridge	Stratopit (direction known, unknown) (numbers indicate relative age)
Trend of ribbed moraine or minor moraine	Kettle hole (small, large)
Beach ridges	Skidway (small, large)
Sand dunes	Observation site
Archeologic track	Delta
Small landslide (scar, slope movement)	
Large landslide (scar, slope movement)	

Note: All symbols and classifications may not occur on this map.

Surficial geology by S. Hashmi
GIS/Digital cartography by R. Hecox

The digital topographic database map NTS 2M/11 used here is available from the Surveyor General Branch, Natural Resources, Canada.

Copies of this map may be obtained from the Department of Industry, Energy and Technology, Government of Newfoundland and Labrador, P.O. Box 8702, St. John's, NL, Canada A1B 4X6.
This map is subject to revision and modification. Symbols for site location may not be printed directly at exposure site due to overlap of symbols.

Magetic distortion at the centre of the map is 18.25° West calculated using World magnetic Model (WMM2025) <https://www.ngs.noaa.gov/magneticdata/magnetic.shtml> (October 2023).
North American Datum (NAD) 1987, Zone 21.

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Note
The surficial geology of the Quirpon map area (NTS 2M/11) describes the distribution of its surficial sediments and landforms, as well as a summary of its glacial history. Map 2025-03 is one of seven in the series documenting the surficial geology of the Great Northern Peninsula GNP. Hashmi, 2019. The other map sheets in this series are Balaigh (NTS 2M/12), St. Anthony (NTS 2M/05 and 2M/06), St. John's area (NTS 2M/04), Big Brook (NTS 2M/01) and Sable Cove (NTS 1M/08).

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