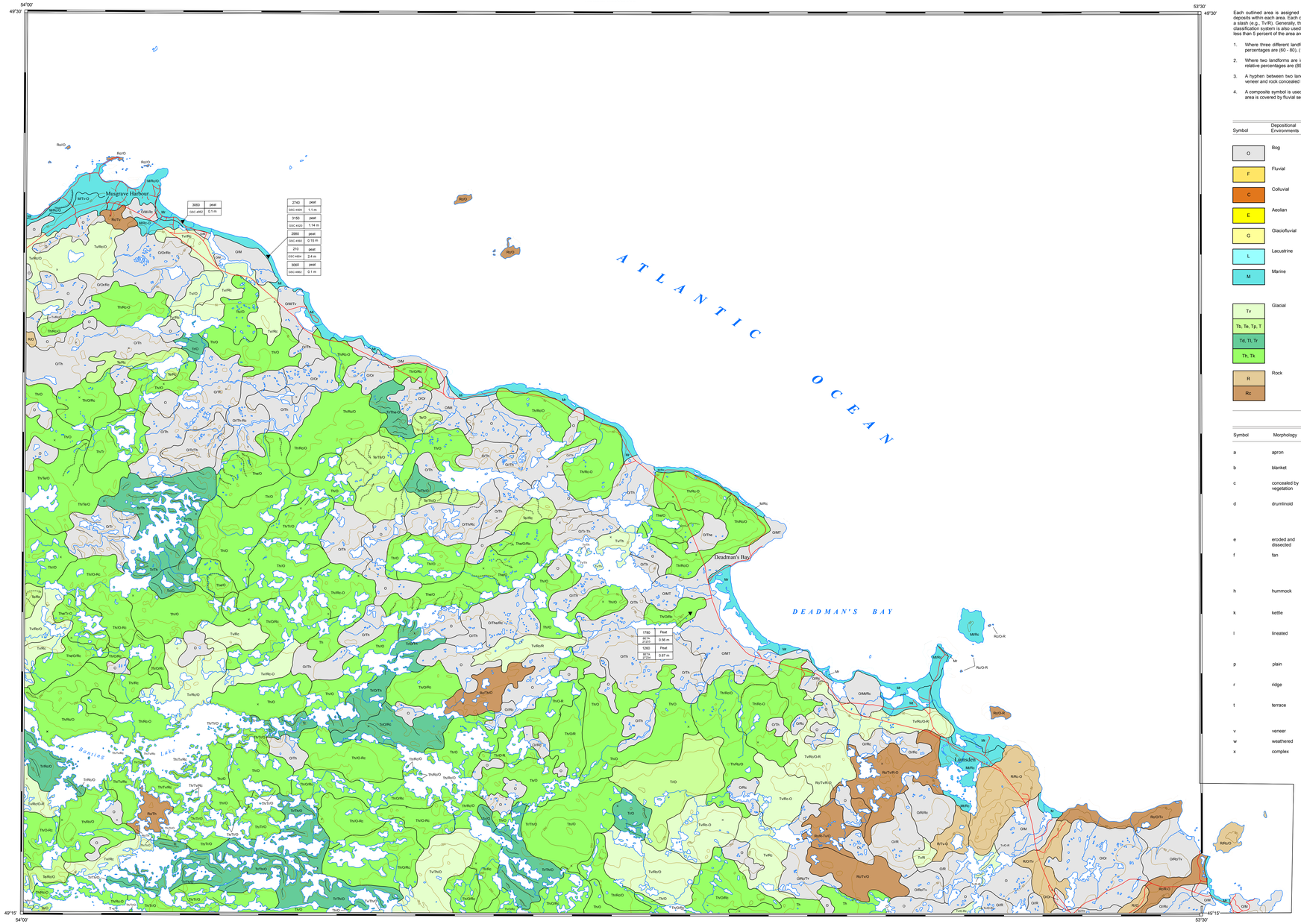
Newfoundland Labrador
Natural Resources



LEGEND

Each outlined area is assigned a classification consisting of up to three genetic 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 slash (e.g., Tv/R). Generally, the areas are divided 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. Four variations of the landform system are as follows:

1. Where three different landforms are included in a single map unit they are each separated by a single slash (/) and their relative percentages are (60 - 80), (15 - 35), and (5 - 15).
2. 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 (65 - 95) // (5 - 15) for double slash, or (60 - 85) / (15 - 40) for a single slash.
3. A hyphen between two landform types indicates that they are approximately equal in area. For example, Tv-Rc indicates that till veneer and rock concealed by vegetation or a thin regolith are equal in area.
4. A composite symbol is used to show combinations of the above cases. For example, $\frac{F,G}{T}$ indicates that about 60 - 85 percent of the area is covered by fluvial sediment, 15 - 40 percent by glaciofluvial sediments, and is underlain by till.

GENETIC CLASSIFICATION

Symbol	Depositional Environments	Origin and Characteristics of Materials
O	Bog	Poorly drained accumulations of peat, peat moss and other organic matter; developed in areas of poor drainage
F	Fluvial	Alluvium consisting of silt and clay to bouldery 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
C	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
E	Aeolian	Medium- to fine-grained sand and silt, well sorted, poorly compacted; commonly forms as dunes up to 10 m high; transported and deposited by wind
G	Glaciofluvial	Fine-grained sand to coarse-grained cobbly gravel; forms plains, ridges (eskers), hummocks, terraces and deltas; generally greater than 1 m thick; deposited as outwash in an ice-contact or proglacial position
L	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
M	Marine	Clay, silt, gravel and diamicton; sand is present in some places, generally moderately to well sorted and commonly stratified, but may be massive; forms beach ridges, deltas, terraces and bars deposited in a marine environment; gravel and sand are formed by shoreline wave action; may include shells, clay and silt deposited from suspension and turbidity currents; gravel is generally a wavewashed lag
Tv Tb, Te, Tp, T Td, Tl, Tr Th, Tk	Glacial	Includes all types of till; composed of diamicton; transported and subsequently deposited by/or from glacier ice with no significant sorting by water. These include relatively thin (Tv) or thicker (Tb, Te, Tp, T) till with little or no surface expression; features produced by actively flowing ice (Td, Tl, Tr) or sediment deposited through ice disintegration (Th, Tk)
R Rc	Rock	Bedrock, either exposed (R) or concealed by vegetation (Rc)

MORPHOLOGY

Symbol	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 escarpment; consists of materials derived from the usually steeper upper slope
b	blanket	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 mat developed on either colluvial surfaces or a thin layer of angular frost-shattered and frost-heaved rock fragments overlying bedrock; includes areas of shallow (less than 1 m), discontinuous overburden
d	drumlinoid	Elongate ridge(s) between 1.5 and 20 m high, 20 and 300 m wide, and 200 to 5000 m long; ridges have a rounded end pointing in the up-ice direction and gently curving sides that taper in the down-ice direction; exhibit a convex longitudinal profile, commonly with a steeper slope in the up-ice direction; consist of subglacially formed deposits shaped in a streamlined form parallel to the direction of glacial flow; commonly consist of till, 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 arcuate channel; gullies and channels may contain underfit 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 as the stream swings back and forth across the lowland; fluvial fans are usually derived from eroded glacial and glaciofluvial deposits; glaciofluvial fans (deltas) are deposited in standing water rather than in a terrestrial environment; colluvial 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 glacier ice; commonly occurs in association with hummocks
l	lineated	Elongate spindle-shaped ridge(s) between 6 and 60 m high, 75 and 300 m wide and up to 4000 m long; ridges are commonly straight sided, taper at one or both ends, and have a flat longitudinal profile; consists of subglacially formed deposits shaped in a streamlined form parallel to the direction of ice flow; commonly consist of till, although some may contain stratified drift; may have a rock core; includes slope lineated bogs (Ol)
p	plain	A comparatively flat, level, or slightly undulating tract of land; materials are either till, glaciofluvial, 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, till, glaciofluvial, fluvial, marine, lacustrine, aeolian, or organic sediments; includes string bogs (Or)
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 till, glaciofluvial, fluvial or lacustrine sediments; generally formed by fluvial and glaciofluvial 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 esker 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 at this scale

Index Map

MAP 2015-01

MUSGRAVE HARBOUR
(NTS 2F/05,06)

NEWFOUNDLAND AND LABRADOR

1 0.5 0 1 2 3 4
kilometres

GEOLOGICAL SURVEY
NEWFOUNDLAND AND LABRADOR
Celebrating 150 years

SURFICIAL GEOLOGY
MUSGRAVE HARBOUR MAP AREA
(NTS 2F/05,06)

MAP 2015-01

SYMBOLS

Geological boundary
Scarp face at edge of terrace
Cirque
Esker (flow direction known or assumed, unknown)
Meltwater channel (small, large)
Crestline of major moraine ridge
Trend of ribbed or minor moraine ridges
Beach ridges
Sand dunes
Avalanche track

Drumlin (direction known, unknown)
Crag-and-tail hill
Till ramp
Fluting
Röche moutonnée
Striation (direction known, unknown) (numbers indicate relative age)
Kettle hole (small, large)
Sinkhole (small, large)
Observation site
Delta
Radiocarbon age (type (users): Material; Lab. No.; Elevation)

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

Geology by D.M. Brushett.

GIS / digital cartography by T.J. Sears.

Digital elevation data supplied by the Shuttle Radar Topography Mission (SRTM), a partnership between NASA and the National Geospatial-Intelligence Agency (NGA). Flown aboard the NASA Space Shuttle Endeavour (11 - 22 February, 2000). Additional information available from, http://edc.usgs.gov/products/elevation/srtmbil.html.

The age dates and glacial striations, where included, on this map have been obtained from Taylor (2001a, b).

Elevation in feet above mean sea level. Contour interval 50 feet.

Copies of this map may be obtained from the Geoscience Publications and Information Section, Geological Survey, Department of Natural Resources, Government of Newfoundland and Labrador, P.O. Box 8700, St. John's, NL, Canada, A1B 4J6.

This map is subject to review and revision. Comments to the author concerning errors or omissions are invited.

Base from maps published by Surveys and Mapping Branch, Department of Natural Resources, Ottawa, Canada.

Open File 002F/0044
This map supersedes Map 88-168, open file NFLD 1693.

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Department: http://www.nr.gov.nl.ca/nr/
Geological Survey: http://www.nr.gov.nl.ca/nr/mines/geoscience/
E-mail: pub@gov.nl.ca

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Taylor, D.M. (Compiler)

2001a: Carbon-14 date list for Newfoundland and Labrador. Government of Newfoundland and Labrador, Department of Mines and Energy, Geological Survey. [http://gis.geosurv.gov.nl.ca].

2001b: Newfoundland and Labrador Striation Database. Government of Newfoundland and Labrador, Department of Mines and Energy, Geological Survey. [http://gis.geosurv.gov.nl.ca].

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Note

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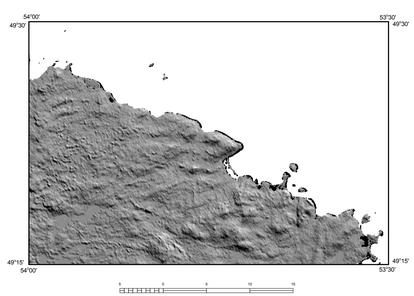

Digital Elevation Model (DEM) from Shuttle Radar Topography Mission (SRTM) data of the Musgrave Harbour map area (shaded from the northeast). The image provides surface information not readily illustrated on the surficial map. Terrain variability is evident, with areas of bedrock highlighted as rough textured areas (consistent with surficial map), and areas of thicker till shown as smooth textured areas.