Newfoundland Labrador

Industry, Energy and Technology

Mines

REMOTE MAPPING OF MARINE SEDIMENTS AND LANDFORMS IN EAST-CENTRAL LABRADOR: PARTS OF 1:250 000-SCALE NTS MAP AREAS 13F, G, I, J, K, N AND O

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Open File LAB/1773

St. John's, Newfoundland
October, 2022

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Recommended citation:

Hagedorn, G.W.

2022: Remote mapping of marine sediments and landforms in east-central Labrador: Parts of 1:250 000-scale NTS map areas 13F, G, I, J, K, N and O. Government of Newfoundland and Labrador, Department of Industry, Energy and Technology, Geological Survey, Open File LAB/1773, 8 pages.

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TABLES

SUMMARY

Limited surficial mapping in east-central Labrador has hindered a thorough characterization of the complex glacial history and postglacial marine incursion ("marine limit"). This report presents the results of a remote mapping project that was undertaken (at a scale of 1:10 000) to identify and interpret surficial sediments and related landforms, deposited by glaciomarine or postglacial marine processes in east-central Labrador between Hopedale and Happy Valley–Goose Bay. The survey includes portions of NTS map areas 13F, G, I, J, K, N and O (Figure 1). The extent and elevation of marine limits may be important to a variety of stakeholders, including the mineral exploration industry (*e.g.*, evaluating geochemical sampling campaigns), local communities and municipalities, scientists and academic researchers, and infrastructure agencies, among others.

METHODS

Landforms and marine sediments preserved inland and above the present coastline were mapped by visual analysis of a variety of remotely sensed datasets (ArcGIS "World Imagery" satellite imagery mosaic (ESRI, 2022), digital elevation models, and airphotos). Map units were delineated using the methodology and nomenclature from the Geological Survey of Canada's surficial data model (Deblonde *et al.*, 2019); the model infers depositional environment and sediment source. Boundaries of the map units were defined by changes in visual properties, distinguishable at the mapping scale (*e.g.*, surface tone/colour, surface texture and morphology, degree of postdepositional modification or incision), elevation relative to inferred regional marine limit, and association with other landforms and map units.

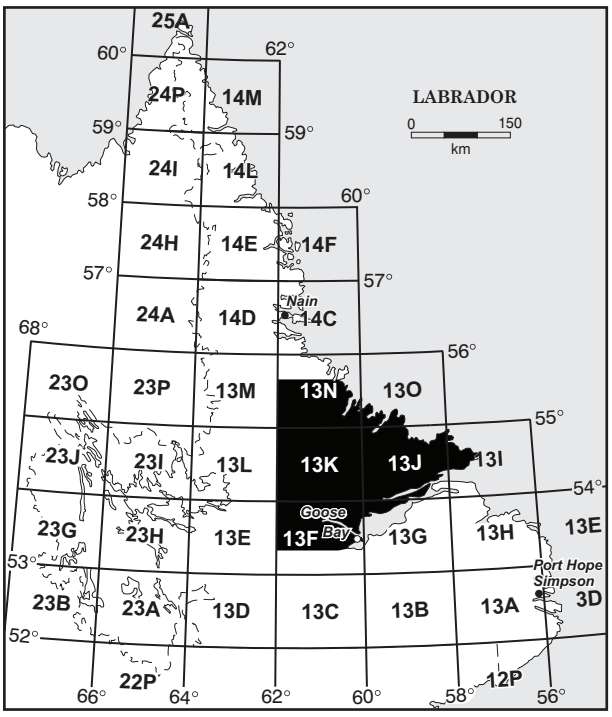

Figure 1. *Location of the map area depicted in black.*

The Japanese Space Exploration Agency ALOS World 3D-30m DEM (AW3D30) version 3.2/3.1 was used to estimate the lateral extent of marine inundation to aid with marine sediment location prediction. A flooding surface was applied to the DEM based on previous publications and the elevation of preserved marine landforms (*e.g.*, beach ridges). The elevation of the flooding surface was raised or lowered across the mapping window in GIS to align with sediment and landform observations. No glacioisostatic adjustment was applied during mapping. The reader should refer to Hagedorn (2022) for a more thorough discussion of the mapping methodology, as well as the geological setting and glacial history of the map area.

Previously published maps (Batterson, 2000a–j; Liverman and Sheppard, 2000a–c;

McCuaig, 2007) and geoscience colleagues with experience in the area were consulted regularly to support the correct delineation of polygons.

DATA RELEASE

Geospatial data products (*see* Appendices A and B) included with this report represent a remotely sensed interpretation of the marine sediments and landforms preserved at surface in the study area, including:

1) **marine sediments:** extent and type of postglacial marine or glaciomarine sediments at surface (n=4104 polygon features) in both shapefile (.shp) and Keyhole Markup Language (.kml) formats; and,

2) **marine landforms:** linear marine features (beach ridges or wave-cut notches; n=3385) in both shapefile (.shp) and Keyhole Markup Language (.kml) formats.

The attribute tables of the shapefiles describe, where applicable, visual features and genetic interpretation for each sediment unit (Table 1) or landform (Table 2).

Table 1. List of attributes for the marine sediment inventory GIS shapefiles, including descriptive features observed or inferred from satellite imagery and other remote sensing sources, and map unit interpretation

Attribute	Description
Genesis	inferred depositional environment of the map unit
Category	subcategory of sediment types within the depositional environment, often related to energy within the depositional environment or system
Label	map unit label derived from the Genesis and Category, *e.g.*, code "Mv" indicates a map unit comprising a veneer of sediment (Category) deposited in a marine environment (Genesis)
Morphology	surface characteristics of the map unit, where applicable
Modified	description of postdepositional modification or erosion of the map unit (*e.g.*, fluvial incision or gullying)
Marine_Lim	vertical position of the map unit relative to the local marine limit
Associatn	geographic position of the map unit relative to other marine units, useful for understanding relationships between marine units and the extent of marine complexes
Location	geographic position of the map unit relative to other geological features in the map area
Vegetation	extent of vegetation development on the surface of the map unit, interpreted from satellite imagery
Colour	colour tone or hue of the map unit in satellite imagery
Reference	citation for map units that have appeared in previously published works

Note: Attribute fields are not all populated for each map unit.

Table 2. Attributes for the marine landforms inventory. Landform mapping focused on indicators of marine limits, such as beach ridges and pre-existing coastlines or strandlines

Attribute	Description
Feature	geomorphological feature type; only marine limit indicators are included in in this inventory

All features in these datasets were interpreted from remote observation or compiled from previously published maps. Users of these data are cautioned that mapping has not been validated with fieldwork and may be subject to reinterpretation in future map products.

ACKNOWLEDGMENTS

This work was aided by a variety of members within and external to the Geological Survey of Newfoundland and Labrador, especially Heather Campbell and Sara Jenkins. Dave Taylor is thanked for a helpful review of this Open File and associated datasets. Discussions with Robert Way and Yifeng Wang (Queen's University) helped develop the project goals. This work benefitted from previous mapping by other Geological Survey of Newfoundland and Labrador geologists.

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APPENDICES

Appendices A and B are available (as zipped files) through this link.

APPENDIX A: Marine Sediments and Landforms in Shapefile Format.

Files in the archive include:

1) **GSNL_OF_LAB_1773_MarineSediments.zip** – Polygon file (n=4104) depicting remote interpretation of surficial marine sediments in central Labrador in shapefile format (zipped). File coordinate system is geographic, NAD83 datum. ISO 19139-compliant metadata is embedded and included in stand-alone XML format. Zip archive includes a layer file containing colour scheme and labelling convention for depiction of the marine sediment polygon file in a GIS.

2) **GSNL_OF_LAB_1773_MarineLandforms.zip** – Polyline file (n=3385) depicting remote interpretation of surficial marine landforms and geomorphic features in central Labrador in shapefile format (zipped). File coordinate system is geographic, NAD83 datum. ISO 19139-compliant metadata is embedded and included in stand-alone XML format. Zip archive includes a layer file ascribing color scheme and labelling convention for depiction of the marine landform polyline file in a GIS.

APPENDIX B: Marine Sediments and Landforms in KML Format.

Files in the archive include:

1) **GSNL_OF_LAB_1773_MarineSediments.kml** – Polygon file (n=4104) depicting remote interpretation of surficial marine sediments in central Labrador using Keyhole Markup Language (kml). This file is appropriate to view in Google Earth or similar applications for users without access to standard GIS software, and renders features with symbology only (no labels). File coordinate system is geographic, WGS84 datum. A 25% transparency was applied during file creation.

2) **GSNL_OF_LAB_1773_MarineLandforms.kml** – Polyline file (n=3385) depicting remote interpretation of surficial marine landforms and geomorphic features in central Labrador using Keyhole Markup Language (kml). This file is appropriate to view in Google Earth or similar applications for users without access to standard GIS software, and renders features with their symbology. File coordinate system is geographic, WGS84 datum. Beach ridges are rendered in yellow in this version, to improve visibility against satellite imagery.