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GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

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Canada's National Geoscience Mapping Program
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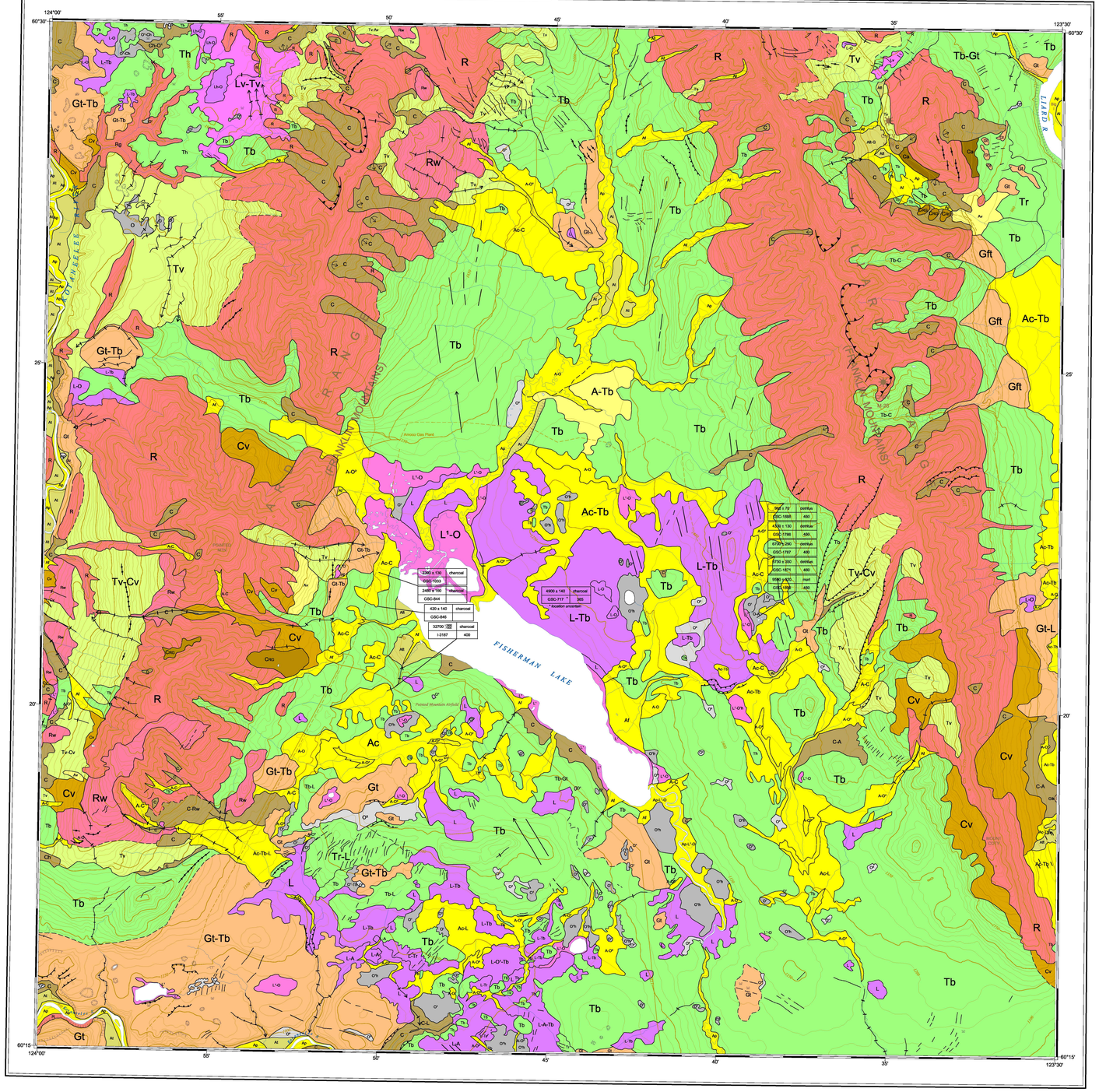

LEGEND

Coloured legend blocks indicate map units that appear on this map

QUATERNARY

SURFICIAL DEPOSITS

POST LAST GLACIATION

NONGLACIAL ENVIRONMENTS

ORGANIC DEPOSITS: *peat, 1 to 2 m thick; formed by the accumulation of vegetation in poorly drained depressions (swamps and bogs); produces flat, wet terrain*

O¹ — ***Bog peat:*** *Sphagnum or forest peat formed in an ombrotrophic environment; may be treed or treeless with a cover of ericaceous shrubs; hummocky, wet terrain, in places underlain by ground ice,* **O'h**; *undifferentiated bog and fen deposits,* **O**

O² — ***Fen peat:*** *peat derived from sedges and partially decayed shrubs in a eutrophic environment; forms relatively open peatlands with a mineral rich water table that persists seasonally near the surface; often covered with low shrubs and sometimes a sparse layer of trees*

COLLUVIAL DEPOSITS: *mass wasting debris <1-100 m thick; nonsorted to poorly sorted, massive to stratified debris deposited by direct, gravity-induced movement*

C — ***Landslide debris****: active and inactive landslides, undivided,* **C**; *hummocky topography,* **Ch**

Ca — ***Talus (scree):*** *accumulation of angular boulders below cliffs; usually forming fans or aprons*

Crg — ***Rock glaciers:*** *inactive rock glaciers; rock debris deformed by the flow of buried or interstitial ice, forming ridges and furrows*

Cv — ***Colluvial veneer:*** *thin cover of rock debris <1 m; usually the product of solifluction acting on lower slopes*

ALLUVIAL DEPOSITS: *sorted gravel, sand, and organic detritus deposited by flowing water*

A — ***Fluvial deposits:*** *sorted gravel and sand >1 m thick; forming active flood plains with meander channels and scroll marks,* **Ap**; *alluvial fan deposits, poorly sorted gravel and sand >1 m thick,* **Af**; *numerous subparallel alluvial channels covering gentle to moderate slopes,* **Ac**; *low terraces with meander scars with active and inactive channels, primarily along the Liard River,* **Al**; *undifferentiated,* **A**

Av — ***Alluvial veneer:*** *deposits too thin to mask the underlying surface, <1 m thick*

At — ***Fluvial terraces:*** *inactive; alluvial fan terraces,* **Aft**

L¹ — ***LACUSTRINE DEPOSITS:*** *sand, silt and minor clay deposited in a former lake; generally overlain by organic deposits; exposed by recent fluctuations in lake levels*

POSTGLACIAL OR LATE WISCONSINAN

PROGLACIAL AND GLACIAL ENVIRONMENTS

GLACIOLACUSTRINE DEPOSITS: *fine sand, silt, and clay, deposited in glacier-dammed lakes in valleys or along the margin of the retreating Laurentide Ice Sheet*

L — ***Glaciolacustrine deposits:*** *sediment >1 m thick; usually overlain by organic deposits in lowlands with level topography; hummocky topography,* **Lh**

Lv — ***Glaciolacustrine veneer:*** *discontinuous cover of lacustrine sediment, usually <1m thick*

Gt — ***GLACIOFLUVIAL DEPOSITS*** *: proglacial outwash, gravel and sand with minor diamictons deposited in front of the ice margin, usually 1-10 m thick; forming distal outwash terraces* **Gt**; *proximal kettled outwash terraces,* **Gtk**; *glaciofluvial fan terraces,* **Gft**

TILL: *nonsorted debris deposited directly by glaciers; matrix is sandy to clayey and contains striated clasts of various lithologies, including many Canadian Shield erratics in the lowlands*

Tb — ***Till blanket:*** *> 1 m thick; forming undulating topography that may be fluted and drumlinized in places; contains Canadian Shield erratics; moraines or crevasse fillings forming a ridged topography,* **Tr**; *hummocky moraine,* **Th**

Tv — ***Till veneer:*** *< 1 m thick and discontinuous; underlying bedrock topography is discernible*

PRE-QUATERNARY

BEDROCK

R — *Sedimentary bedrock,* ***R****; two prominent ridges of the Liard Range expose Paleozoic to Mesozoic rocks forming northward trending cliffs; extensively gullied outcrops exposed along river banks,* **Rg**

Rw — *Rubble covered bedrock surfaces*

NOTE: *In areas where the surficial cover forms a complex pattern, the area is coloured according to the dominant unit and labelled in descending order of cover*

Geological boundary (defined, gradational)

Small swamp or bog

Landslide (arrow indicates the direction of movement)

Abandoned meltwater channel or channel occupied by an underfit stream (large, small and direction of flow inferred; small and direction of flow not inferred)

Lateral meltwater channel, barb on the uphill side

Escarpment

Kettle

End moraine

Minor moraine or crevasse filling

Ice moulded form in bedrock and/or till (direction of flow inferred, not inferred)

Striae

Cirque; cirques; peaks and sharp ridges formed by glacial erosion

Radiocarbon date (uncorrected)

Date	Material
Lab. no.	Elev. [m]

NOTES ON GLACIAL HISTORY:

Fisherman Lake map area was glaciated during the Late Wisconsinan glaciation (ca. 25 000-10 000 years ago). Wood fragments between reworked till and glaciolacustrine sediment radiocarbon dated 32.7 ka BP (I-3187, Millar 1968), which provide a maximum age for the advance. Although the area was probably first glaciated by montane ice from the west, the last major ice sheet to cover the area was the continental Laurentide Ice Sheet. The Laurentide Ice Sheet flowed into the region from the northeast, carrying with it distinctive erratics from the Canadian Shield, which are now found in till mantling the valley floors and on several mountain summits in the area. Just to the east of the map area, the flow of this ice sheet was diverted southward along the eastern flank of the Liard Range, but South of Mount Coty, the ice flowed to the west and then northwest into the map area. This northward deflection in flow was caused by the Laurentide Ice Sheet coming in contact with montane ice west of here. North of Fisherman Lake, the flow continued northward, up the mountain slopes. Well-preserved glacial striae on a ridge crest at 1200 m above sea level, show a northwestward ice flow into the Kotaneelee River valley.

During deglaciation, the Liard River system was blocked by the retreating Laurentide Ice Sheet and glacial lakes were created in many of the mountain valleys, including the valley occupied by Fisherman Lake. As the ice margin retreated further eastward these lakes enlarged onto the plains forming glacial Lake Liard. Pond sediments a few kilometres east of Fisherman Lake record continuous sedimentation since at least 9590 BP, with permafrost invading the site during the last 300-500 years (GSC-1890, and other dates; Matthews 1980). Several other radiocarbon dates in the area record episodic forest fires (e.g. GSC-717; McNeely, 1989; exact location unknown), as well as human occupation dating back several thousand years (Millar, 1968).

Landslides are common in the area. Interbedded recessive shales and thick sandstones exposed along cliffs in the Liard Range are prone to failures causing landslides ranging in size from a few 10's m² to several km². Active and relic landslides suggest that mass wasting has been occurring throughout the postglacial time and is on going. For example, an active landslide/debris flow occurred 5 km northeast of Fisherman Lake, on a west-facing mountain flank. Initial failure occurred near the ridge crest prior to August 1991, and it now extends about 3.5 km downvalley but is mostly <200 m wide. A second debris flow occurred in ca. 1995, on the same ridge, 5 km north of the former landslide.

REFERENCES

Matthews, J.V., Jr.
1980: Paleoecology of John Klondike Bog, Fisherman Lake region, southwest District of Mackenzie; Geological Survey of Canada, Paper 80-22.

Millar, J.F.V.
1968: Archeology of Fisherman Lake, western District of Mackenzie, N.W.T.; unpublished Ph.D. dissertation, University of Calgary, 496 p.

McNeely, R.
1989: Geological Survey of Canada Radiocarbon dates XXVII; Geological Survey of Canada, Paper 89-7, p. 97.

INDEX MAP

CONTOUR INTERVAL 50 FEET
Elevations in Feet above Mean Sea Level

Digital Topographic Data provided by Geomatics Canada, Natural Resources Canada

OPEN FILE 4360

SURFICIAL GEOLOGY

FISHERMAN LAKE

NORTHWEST TERRITORIES - YUKON TERRITORY - BRITISH COLUMBIA

Scale 1:50 000 Échelle

kilometres 1 0 1 2 3 4 5 kilometres

Universal Transverse Mercator Projection
North American Datum 1983
© Her Majesty the Queen in Right of Canada, 2000

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983
© Sa Majesté la Reine du chef du Canada, 2000

Geology by J. Bednarski, 2000, 2001
Geological compilation and digital cartography by J. Bednarski, 2002

This is a product of the Central Foreland NATMAP Project

Any revisions or additional geological information form the user would be welcomed by the Geological Survey of Canada

95 C/9 Chinkeh Creek	95 B/12 Mount Flett	95 B/13 Sawmill Mountain
95 C/8 Babiche Mountain	95 B/5 Fisherman Lake	95 B/6 Fisherman Lake
95 C/1 Mount Martin	95 B/4 Betalamea Lake	95 B/3 Fort Liard

NATIONAL TOPOGRAPHIC SYSTEM REFERENCE

OPEN FILE DOSSIER PUBLIC
4360
GEOLOGICAL SURVEY OF CANADA
COMMISSION GÉOLOGIQUE DU CANADA
2002

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