

GEOPROCESS FILE - SUMMARY REPORT

QUIET LAKE MAP AREA - NTS 105F

INTRODUCTION

The GEOPROCESS File is a compilation of information and knowledge on geological processes and terrain hazards, including mass movement processes, permafrost, flooding risks, faults, seismic activity and recent volcanism, etc. Please refer to the GEOPROCESS File User Guide for more in-depth information on how the maps were developed, which other GEOPROCESS File maps are available, how to utilize this inventory and how to interpret the legend. Special interest should be taken in the detailed description of the terrain hazard map units. Appendices in the User Guide include a summary of the geological framework, permafrost distribution, and Quaternary geology in Yukon and a list of comprehensive GEOPROCESS File references.

Geological Processes and Terrain Hazard Compilation Maps

The GEOPROCESS File map units were drafted on the 1:250 000 topographic base maps through interpretation from bedrock geology maps, surficial geology maps and in some cases terrain hazard maps at various scales. The compilation maps have a confidence level reflecting the original source material. All materials used to produce the maps are listed in the references on each map. A file containing the data for these maps is available at the Indian and Northern Affairs Library in Whitehorse, Yukon. Areas for which no surficial geology or terrain hazard information is published were left blank. Summary reports on surficial geology and terrain hazards for these map sheets were written by extrapolating the data from adjacent map sheets or smaller scale maps. Information from small scale (e.g. 1:1 000 000) maps was used for the summary reports, but not redrafted onto the 1:250 000 GEOPROCESS File maps.

The GEOPROCESS File compilation maps are intended as a first cut planning tool; the legend on the maps describes the general aspects of terrain hazards (also see below) and associated geological processes. These maps should never replace individual site investigations for planning of site specific features, such as buildings, roads, pits, etc.

Bedrock Geology Summaries

Each 1:250 000 NTS map area is described according to morphogeological belts and terranes defined by Gabrielse et al. (1991) and Wheeler et al. (1991). Bedrock geology (including structure) and mineral occurrences are briefly described and taken largely from the referenced, most recent 1:250 000 geological map with additional contributions from Wheeler and McFadyen (1991) and Yukon MINFILE (1993). A summary paper (A Geological Framework for Yukon) in Appendix A of the User Guide provides a framework and context for each of the bedrock summaries.

The level of knowledge and understanding of Yukon geology is constantly evolving with more detailed mapping and development of geological models.

Names, ages and terrane affiliations of rock units on the most recent 1:250 000 geological maps may, in some cases, now be considered incorrect. Thus information contained within some of the bedrock geology summaries may be out of date. Although much of the information reflects the knowledge at the time that the source map was published, additional information has been inserted wherever possible to assist the user in merging the information with current geological maps, concepts and understanding. The age ranges for similar packages of rocks may also vary between map areas since the actual rocks, or at least the constraints on their age, may vary between map areas.

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BEDROCK GEOLOGY

The Quiet Lake map area is in the western Omineca Belt. The northwest-trending structural grain that is seen in most of Yukon is particularly evident in this region, illustrated by the long, linear ridges of the Polly Mountains.

The bedrock geology in this area is very complex (Templeman-Kluit, 1977). Much of the western and southwestern portion of the map area is composed of pre-270 million year old metamorphosed sedimentary and igneous rocks that make up of Cassiar Terrane (ancient North American continental margin rocks). These rocks include muscovite-biotite granodiorite gneiss, migmatite, muscovite-biotite schist, garnet-biotite schist, micaceous schist, marble and amphibolite. Younger (600-300 million year old) sedimentary and volcanic rocks of the Neudun, Cassiar and Slide Mountain Terranes occur in the southwestern corner, where they are strongly metamorphosed within the region attributed to the Teslin Suture Zone. Locally, ultramafic rocks associated with the Slide Mountain Terrane are altered to serpentinite and talc.

The northeastern part of the map area is dominated by sedimentary rocks of the Cassiar Terrane, including silicified rocks from the 380-220 million year old Earm Group and 530 million year old platform carbonates. North-east of the Teslin Fault, in the northeast corner of the map area are 290-250 million year old muscovite-quartz schist and gneiss (Kondor Schist) structurally overlain by 360-230 million year old basalt, pyroxene gabbro, serpentinized peridotite and pyroxenite of the Slide Mountain Terrane.

Large northwest-trending 100 million year old granitic plutons underlie a large portion of the southwestern half of the area and include the Quiet Lake, Neudun and Big Salmon Batholiths. These intrusions have resulted in large fault zones in the surrounding sedimentary rocks.

Much of the valley that formed in response to erosion along the Teslin Fault is filled with 50 million year old sandstone, conglomerate and shale, and mylonite, basalt, basalt breccia, and olivine basalt.

Mineral Deposits and Occurrences

The Quiet Lake map area has an abundance of mineral occurrences clustered in the Keza River and Grosche Creek areas. The Keza River gold deposit hosted in 530 million year old carbonate was mined from 1988 to 1990, producing over 3 million grams gold from high grade oxide mercuric ore. The deposit also contains a sulphide reserve of 190 000 tonnes of 11 grams per tonne gold. The Grosche deposit contains 273 000 tonnes of 5.0% zinc, 2.5% lead, 500 grams per tonne cadmium, 137 grams per tonne silver and 1.3 grams per tonne gold. The Risby tungsten skarn contains 2.7 million tonnes of 0.8% tungsten oxide. The Crew Creek gold deposit had drill indicated reserves of 270 000 tonnes grading 11.1 grams per tonne gold.

SURFICIAL GEOLOGY

The main sources of information for the Quiet Lake area are a terrain inventory (Jackson, 1987), surficial geology maps (Jackson, 1993a, b, c and d) and a report by Jackson (1994) which discusses the terrain hazards and surficial geology of NTS map sheets 105K, J, F and G.

QUIET LAKE YUKON TERRITORY

Scale 1:50 000

CONTOUR INTERVAL 500 FEET Elevations in Feet above Mean Sea Level

North American Datum 1983 Transverse Mercator Projection

Universal Transverse Mercator Grid Zone 8

Scale 10 0 10 20 30 km

Scale 10 0 5 15 miles

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QUIET LAKE MAP AREA - NTS 105F

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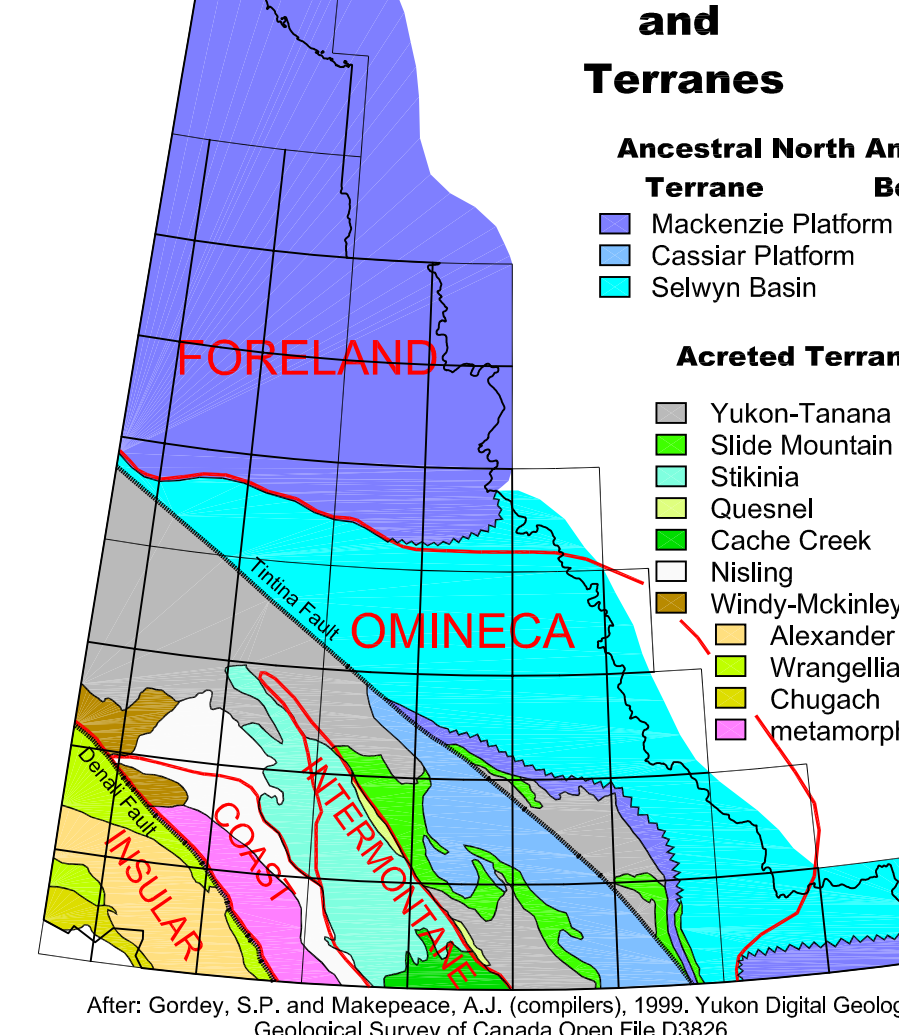
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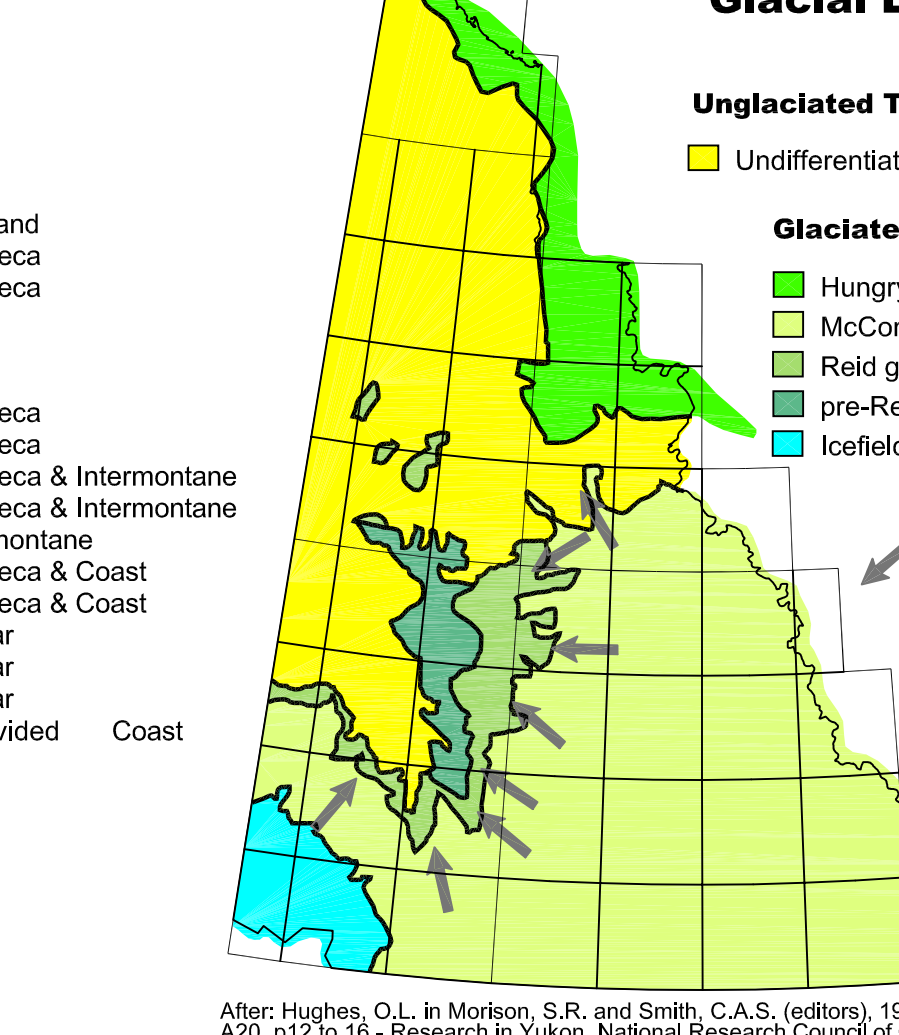
Map Symbols

Tectonic Belts and Terranes



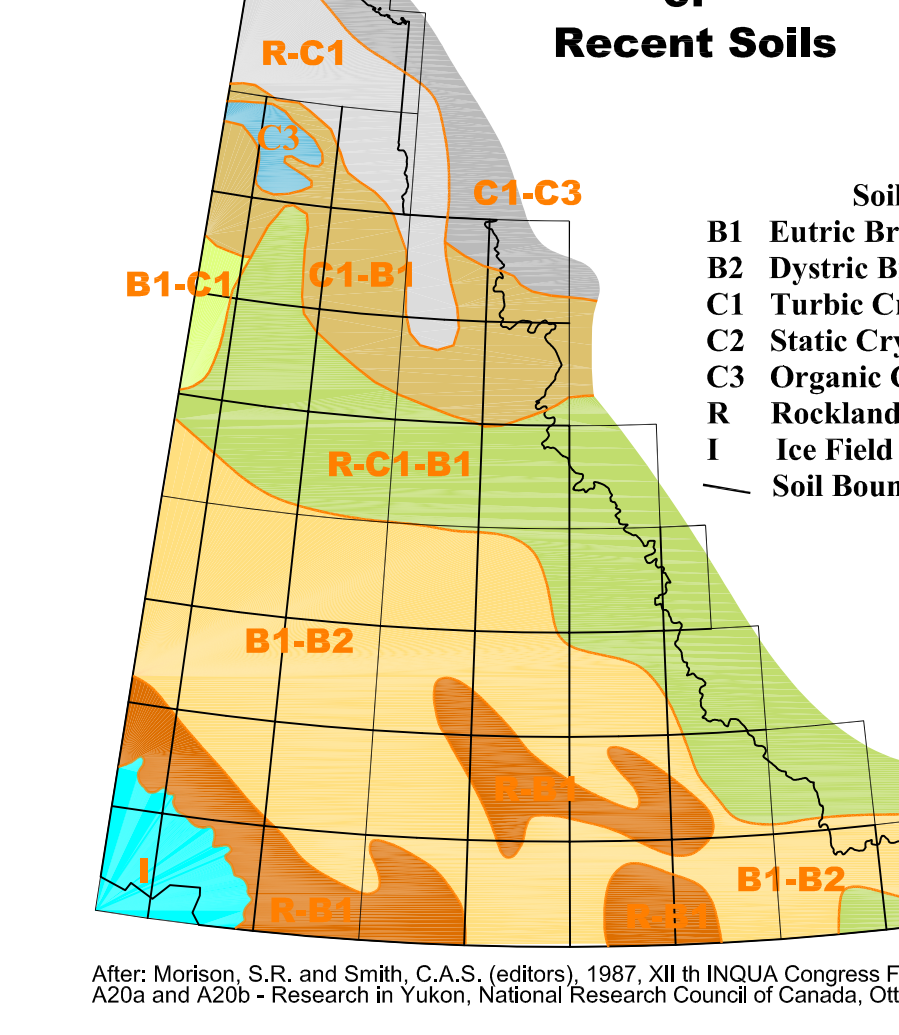
After: Gordon, S.P. and Mackenzie, A.J. (compilers), 1995. Yukon Digital Geology. Geological Survey of Canada Open File 23826. Exploration and Geological Services Division, Yukon Region and Northern Affairs, Open File 1999-1(D).

Glacial Limits



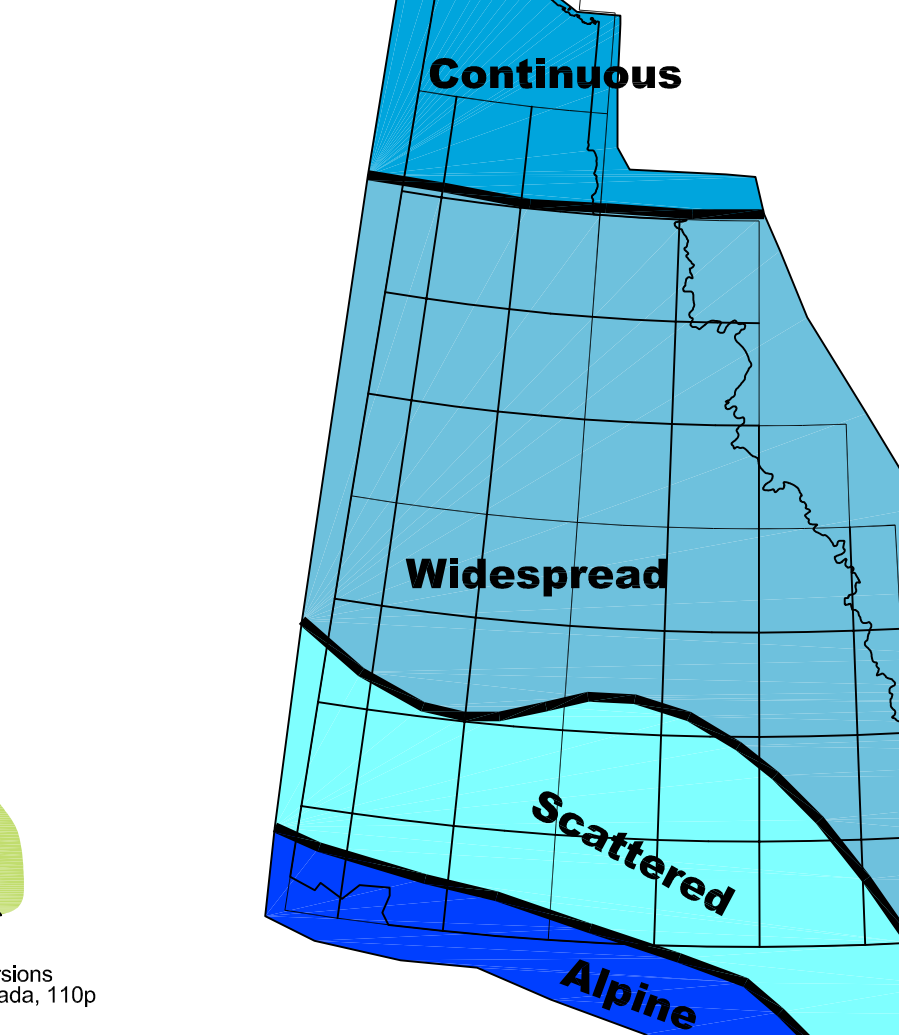
After: Hughes, D.L. in Manton, S.R. and Smith, C.A.S. (eds), 1987. XII in INQUA Congress Field Excursions 225, p12 to 16. Research in Yukon. National Research Council of Canada, Ottawa, Canada, 115p.

Distribution of Recent Soils



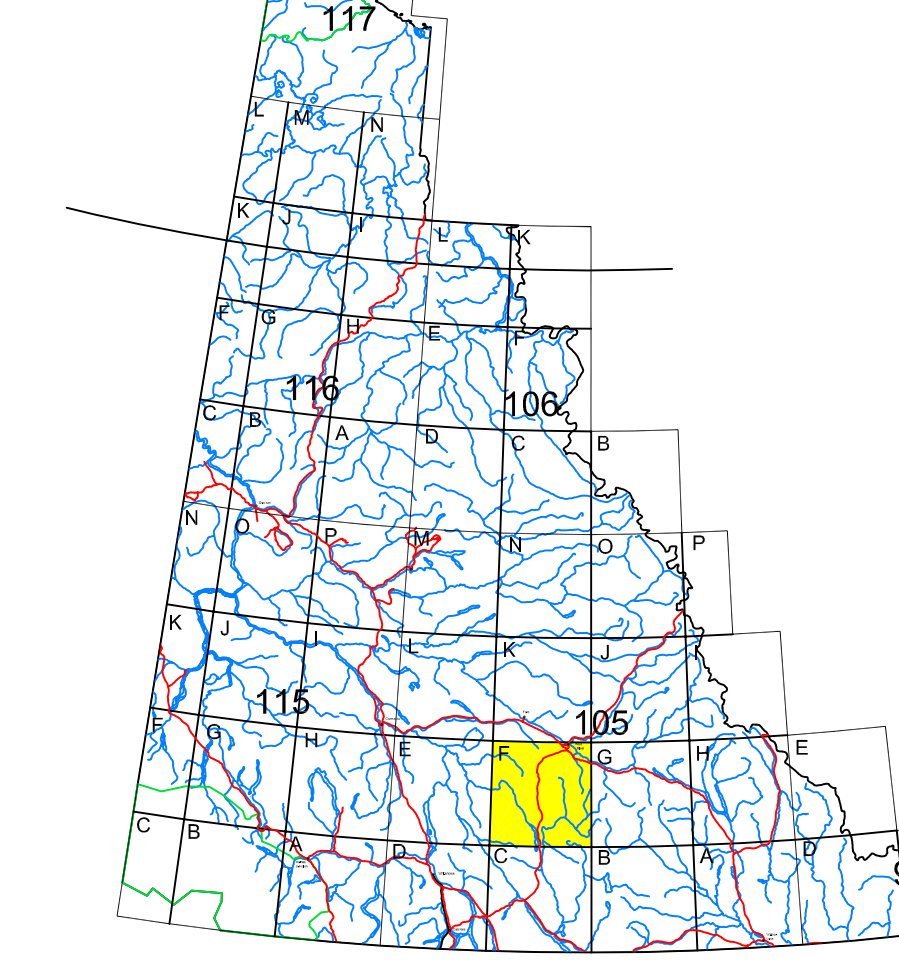
After: Manton, S.R. and Smith, C.A.S. (eds), 1987. XII in INQUA Congress Field Excursions 225 and 226. Research in Yukon. National Research Council of Canada, Ottawa, Canada, 115p.

Permafrost



After: Brown, R.J.E., 1978. Permafrost: Plate 32. Hydrological Atlas of Canada, Fisheries and Environment, Canada, 34 pages.

Location Map



After: Brown, R.J.E., 1978. Permafrost: Plate 32. Hydrological Atlas of Canada, Fisheries and Environment, Canada, 34 pages.

Exploration and Geological Services Division

Yukon Region

Indian and Northern Affairs Canada

Yukon GEOPROCESS File

Geological Processes and Terrain Hazards

of Quiet Lake

105F

by

Mougout, C.M. and Walton, L.A.

Copies of this map

may be obtained from Geoscience and Information Sales

c/o Whitehorse Mining Recorder, Indian and Northern Affairs Canada,

Room 102, 300 Main Street, Whitehorse, Yukon Y1A 2B5

(867) 667-3286; FAX: (867) 667-3287

Recommended citation: Mougout, C.M. and Walton, L.A., 1996. Yukon GEOPROCESS File (2002), Geological Processes and Terrain Hazards of Quiet Lake, 105F. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, 1:250 000 scale.

References used in compiling this map

References
Jackson, L.E., Jr., 1990. Rock avalanches in the Polly Mountains, Yukon Territory. In: Current Research, Part E, Paper 90-1E, Geological Survey of Canada, p. 263-269. (NTS 105F, 105G).

References
Jackson, L.E., 1993a. Surficial geology, Bruce Lake, Yukon Territory. Geological Survey of Canada, Map 1793A, scale 1:100 000.

References
Jackson, L.E., 1993b. Surficial geology, Gray Creek, Yukon Territory. Geological Survey of Canada, Map 1793B, scale 1:100 000.

References
Jackson, L.E., 1993c. Surficial geology, Lajale Lakes, Yukon Territory. Geological Survey of Canada, Map 1793C, scale 1:100 000.

References

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Note: To be thorough, check the references for adjacent NTS map sheets and the General Reference List (See User Guide).

Most of the following references should be available for viewing in the DIAND library on the third floor of the Elijah Smith building in Whitehorse.

Abbott, J.G., 1981. A new geological map of Mt. Hundere and the area north. In: Yukon Geology and Exploration 1979-80. Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 34-44.

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