

Landslides in the Central Mackenzie River Region and Adjacent Mountainous Areas, 64°N to 68°N

1:1 000 000 scale
A. Duk-Rodkin

| Landslide Legend | |
|------------------|---|
| ● | Retrospective-thaw flow slide, >10 slides; <10 slides |
| ○ | Active layer detachment slide |
| ○ | Debris flow |
| □ | Rotational slide |
| ■ | Translational slide |
| □ | Rock flow |
| □ | Rock slide |
| ■ | Rock topple |

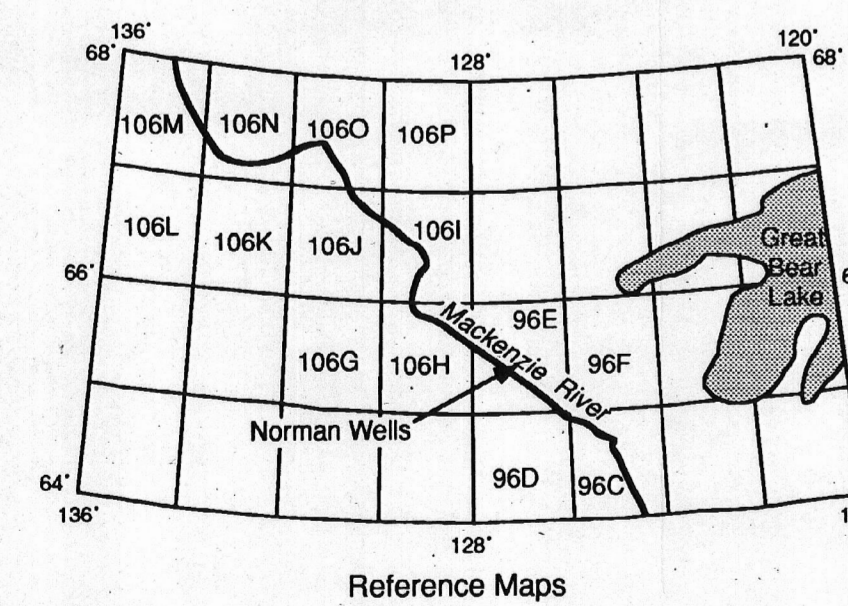
Notes:

1) **Source of Landslide Information:** Mapping of slope failures is primarily based on the interpretation of 1948 to 1972 airphotos. Slope failures that occurred since 1972 have not been included unless they were reported or inventoried in the field. Landslide type is based on the classification established by Varnes (1978). Retrospective-thaw flow slides and active layer detachment slides are landslide types restricted to areas of permafrost and are described in Hughes et al. (1973).

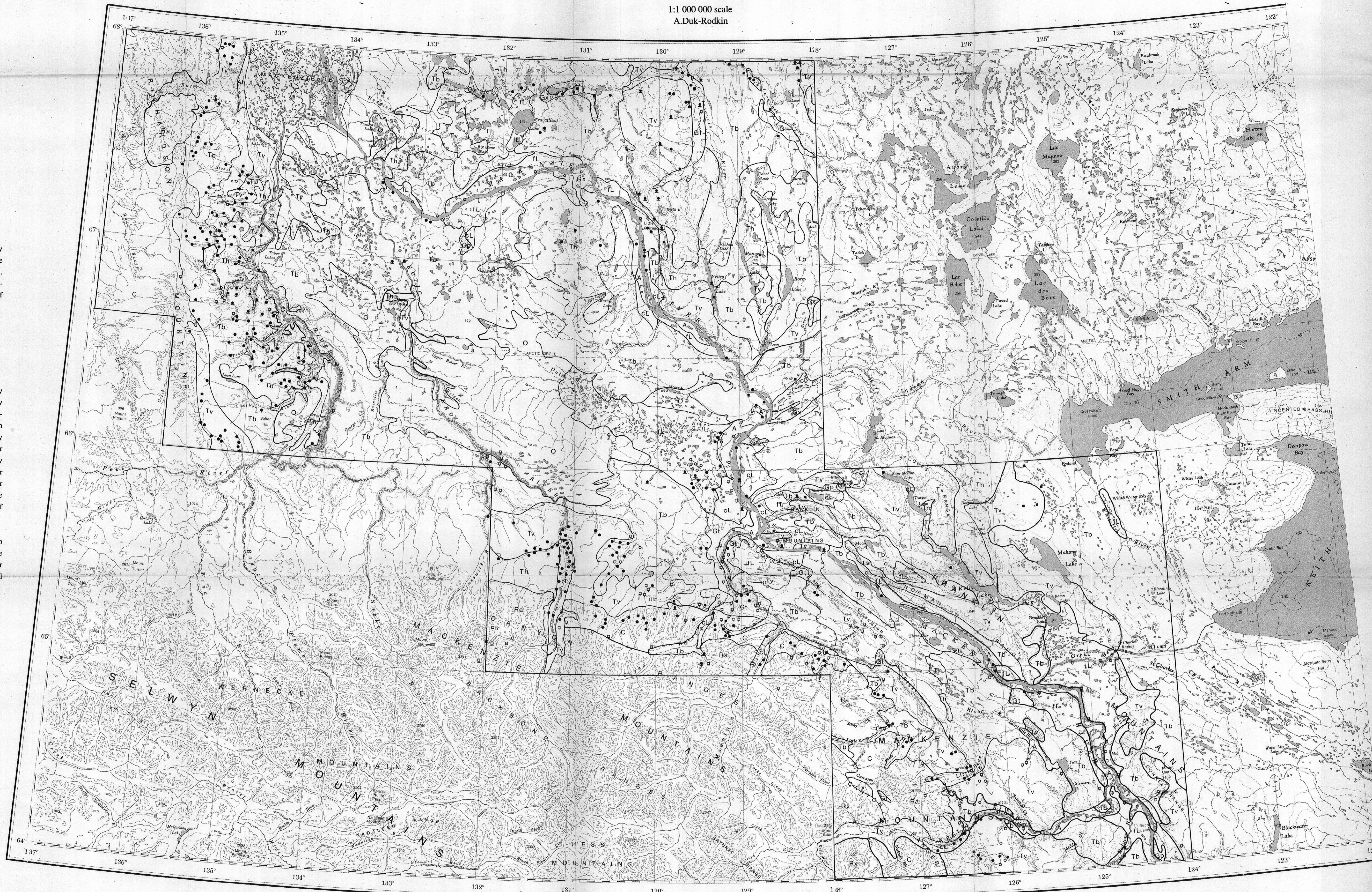
References:
Varnes, D. J., 1978: Slope Movement and Types and Processes; in Landslides: Analysis and Control, Transportation Research Board, National Academy of Sciences, Washington, D.C., Special Report 176, Ch. 2.
Hughes, O.L., Veillette, J.J., Pilon, J., Hanley, P.T. and van Everdingen, R.O., 1973: Terrain evaluation with respect to pipeline construction, Mackenzie Transportation Corridor, central part, lat. 64° to 68°N; Environmental Social Committee, Northern Pipelines, Task Force on Northern Oil Development, Report No. 73-37, Information Canada, Cat. No. 872-11873, 74p.

2) **Discussion:** Slope failures in the Central Mackenzie region are generally controlled by the nature of surficial deposits and/or bedrock. Retrospective-thaw flow slides are developed mainly on ice-rich glaciolacustrine sediments, less commonly on ice-rich till. Active layer detachment slides occur on colluvial slumps developed on glaciolacustrine sediments or on siltstone and shale. They are commonly triggered by forest fires and evolve into debris flows. Rotational and translational slides typically occur where glaciolacustrine sediments are overlain by sand and/or gravel or where relatively weak bedrock (shale, siltstone) is overlain by competent bedrock such as limestone or quartzite. Rock flows and slumping are also common in shale. Rock slides mostly occur in carbonates, with failure occurring along bedding planes. Rock topples are an active process on steep faces developed on carbonates or quartzite, for example along the walls of karst features.

3) **Further Information:** This Open File map is a preliminary release. The final map will cover the entire length of the Mackenzie River and adjacent areas and will be available in a GSC Paper by J.M. Aylsworth, A. Duk-Rodkin and P.A. Eggington. The GSC paper will be accompanied by a database of landslide location, type, characteristics and material association.



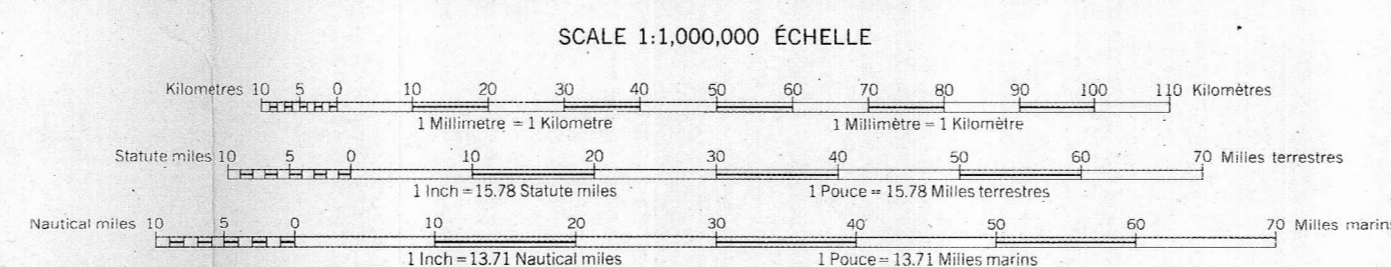
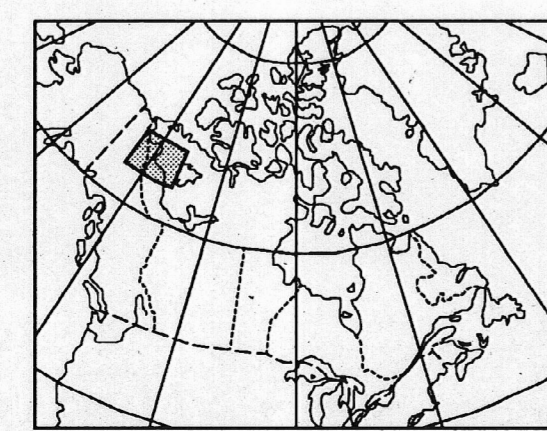
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| Surficial Geology Legend | |
|---|--|
| Note: The surficial geology base is modified from unpublished 1:1 000 000 manuscript maps, compiled by R.J. Fulton and L. Maurice as a stage in production of the Surficial Geology Map of Canada, 1:5 000 000. These manuscript maps were compiled from 1:250 000 scale maps. (see Reference Maps, below) | |
| O | Organic Deposits: peat, muck and minor inorganic sediments; includes bogs and fens. |
| C | Colluvial Deposits: sandy, silty and clay diamictic; generally thin over bedrock and largely reflects nature of underlying rock. |
| A | Alluvial Deposits: silt, sand, clay and gravel; includes floodplains, low terraces and deltas; Af: area of alluvial fans. |
| Lacustrine and Glaciolacustrine Deposits: | |
| fl | Glaciolacustrine and Lacustrine Silt and Clay; includes flat to gently rolling plains. |
| cl | Glaciolacustrine and Lacustrine Sand; includes spits, bars, beaches, deltas and sheet sands. |
| Glaciofluvial Deposits: | |
| Gp | Glaciofluvial Outwash; sand and gravel; includes valley trains, and channel bottom sediments, fans and deltas of spillways and meltwater channels. |
| Gx | Ice-contact Stratified Drift; sand and gravel; includes kame complexes, compound eskers, end moraines and interlobate moraines. |
| Tv | Till: silty, sandy and clayey diamictic; includes thick till and continuous till blanket (Tb) and discontinuous or thin till veneer (Tv). |
| Bedrock: | |
| Rx | Bedrock; rock or rock with a discontinuous cover of surficial deposits. |
| Ra | Alpine Complex; rock, colluvium, and till with minor other sediments; used for mountainous areas characterized by typical alpine landforms such as cirques and arêtes. |

REFERENCE MAPS

- NTS 106P Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Canot Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1748A, 1:250 000, in press.
- 166O Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Travallant Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1747A, 1:250 000, in press.
- 106N Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Arctic Red River, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1746A, 1:250 000, in press.
- 106M Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Fort McPherson, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1745A, 1:250 000, in press.
- 106L Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Trail River, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1744A, 1:250 000, in press.
- 106K Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Martin House, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1743A, 1:250 000, in press.
- 106J Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Ontaratae River, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1742A, 1:250 000, in press.
- 106I Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Fort Good Hope, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1741A, 1:250 000, in press.
- 106H Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Sans Sault Rapids, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1784A, 1:250 000, in press.
- 106G Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Upper Ramparts River, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 1783A, 1:250 000, in press.
- 96F Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Mabony Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, 1:250 000, manuscript map in prep.
- 96E Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Norman Wells, District of Mackenzie, Northwest Territories; Geological Survey of Canada, 1:250 000, in press.
- 96D Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Carajou Canyon, District of Mackenzie, Northwest Territories; Geological Survey of Canada, 1:250 000, in press.
- 96C Duk-Rodkin, A. and Hughes, O.L. Surficial geology, Fort Norman, District of Mackenzie, Northwest Territories; Geological Survey of Canada, 1:250 000, manuscript map in prep.



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