Geologic Hazard Rankings
Village of Mayo, Yukon
(1:20 000 scale)

HAZARD RANKING

The potential environmental changes identified in the preceding sections of this report can be used to identify current and future landscape hazards in the Mayo region. The combined properties of surficial material type, landform shape, slope, aspect, hydrological regime, climate regime, and permafrost conditions have been used to arrive at a set of hazard 'rankings' that can be used to assess the potential stability of landscape units around the Village of Mayo.

It is important to note that hazard rankings are based on general observations of surface materials, drainage, slope angle, vegetation and the presence of permafrost landforms; limited subsurface information was provided by Direct Current resistivity profiling, shallow drilling and probing of permafrost, and textural analyses. This has resulted in a projected risk ranking that will require geotechnical and/or engineering analyses to quantify.

In classifying polygons, we have taken a precautionary approach and applied a category of higher risk where we are not confident in lower categories. However, every polygon will contain zones of lower and higher risk than the overall polygon classification. It is for this reason that this map should serve only as an initial guide for planning purposes. Any development will still require detailed site investigations.

Based on processes acting on distinct geological units, a hazard ranking of low, medium, or high has been assigned to each geological unit in the hazard map area. Rankings are qualitatively assigned to reflect the following conditions:

Low: Stable landform. Unlikely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of gravel or sand, are well drained and have shallow to moderate slopes. Low hazard landforms may contain little to no permafrost and are above the floodplain of the Stewart or Mayo rivers. Landforms with low rankings are unlikely to become unstable under predicted changes in climate.

Medium: Moderately stable landform. Unlikely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of gravel, sand, glacial diamict or colluvial materials. They are well to moderately drained and have shallow to steep slopes. Medium hazard landforms may have moderate amounts of permafrost and may occur within an area of shallow groundwater. Landforms containing permafrost may be susceptible to ground subsidence which could be accelerated by thermal erosion in areas of shallow groundwater. Permafrost thaw may also cause slope instability in some landforms. Medium hazard landforms are likely to become either more or less stable under predicted changes in climate.

High: Unstable landform. Likely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of glacial diamicts, colluvium, glaciolacustrine, lacustrine and fluvial deposits. They are generally moderately to poorly drained and have shallow to steep slopes. High hazard landforms may have a significant thickness of permafrost containing high ice contents, be prone to gravity-induced erosion, and occur within the floodplain of the Stewart or Mayo rivers. High hazard landforms are likely to become either more or less stable under predicted changes in climate.

SYMBOLS

- contours
- water courses
- roads
- 99 textural sample locations (see Appendix A)
- DC resistivity profile locations
- permafrost field sites
- *00* polygon identifiation number (see Appendix C and Table 1 below)

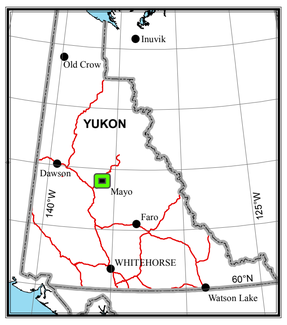
Geological boundaries

- defined boundary
- approximate boundary
- assumed boundary

** NOTE: Linework for map is based on aerial photography from 1989 and may not match basedata (contours, streams) derived from 1:50 000 scale topographic maps.*

Table 1. Hazard or combined hazards for individual polygons.

Polygon number	Landscape Hazards
1	flooding (Stewart River), permafrost
2	permafrost
3	flooding (Stewart River, Mayo River), permafrost
4	flooding (Mayo River), permafrost
5	flooding (Mayo River), permafrost
6	flooding (Stewart River, Mayo River), permafrost
7	flooding (Mayo River), permafrost
8	flooding (Mayo River), permafrost
9	mass movement (steep slope)
10	flooding (Mayo River), permafrost
11	flooding (Mayo River), permafrost
12	flooding (Mayo River), permafrost
13	flooding (Mayo River), permafrost, shallow groundwater table
14	permafrost
15	permafrost
16	permafrost
17	permafrost
18	permafrost
19	permafrost, mass movement (steep slope)
20	permafrost (thermokarst), shallow groundwater table
21	flooding (Stewart River), permafrost (thermokarst), shallow groundwater table
22	permafrost, shallow groundwater table
23	permafrost
24	permafrost, shallow groundwater table
25	permafrost
26	mass movement (steep slope)
27	flooding (Mayo River), permafrost
28	flooding (Mayo River), permafrost
29	permafrost, mass movement
30	permafrost, mass movement
31	mass movement (steep slope)
32	permafrost
33	permafrost
34	permafrost
35	flooding (Mayo River), permafrost
36	flooding (Mayo River), permafrost
37	permafrost
38	permafrost
39	flooding (Mayo River), permafrost
40	flooding (Mayo River), permafrost
41	permafrost
42	mass movement (steep slope)
43	mass movement (steep slope)
44	mass movement (steep slope)
45	permafrost
46	permafrost
47	permafrost
48	permafrost
49	permafrost, shallow groundwater table
50	permafrost
51	permafrost
52	flooding (Stewart River), permafrost
53	flooding (Stewart River), permafrost
54	flooding (Stewart River), mass movement, permafrost
55	flooding (Stewart River), permafrost
56	permafrost (thermokarst), shallow groundwater table
57	permafrost
58	permafrost
59	permafrost
60	permafrost
61	permafrost, mass movement (steep slope)
62	permafrost
63	permafrost, mass movement (steep slope)
64	permafrost
65	permafrost
66	permafrost, mass movement
67	permafrost, mass movement
68	permafrost
69	permafrost
70	permafrost
71	permafrost
72	permafrost, shallow groundwater table
73	permafrost, shallow groundwater table
74	mass movement
75	mass movement
76	permafrost, mass movement
77	permafrost, shallow groundwater table
78	permafrost, mass movement
79	permafrost
80	permafrost
81	permafrost
82	permafrost
83	permafrost
84	permafrost
85	permafrost
86	permafrost, mass movement
87	flooding (Stewart River), permafrost
88	flooding (Stewart River), permafrost
89	permafrost (thermokarst), shallow groundwater table
90	permafrost, mass movement
91	permafrost, mass movement
92	permafrost, mass movement
93	permafrost, shallow groundwater table
94	permafrost, shallow groundwater table
95	permafrost, shallow groundwater table
96	permafrost, shallow groundwater table, flooding (Mayo River)
97	permafrost (thermokarst), shallow groundwater table
98	permafrost (thermokarst), shallow groundwater table
99	permafrost (thermokarst), shallow groundwater table
100	permafrost (thermokarst), shallow groundwater table
101	permafrost (thermokarst), shallow groundwater table
102	mass movement (steep slope)
103	flooding (Mayo River), permafrost
104	mass movement, permafrost
105	permafrost
106	permafrost
107	mass movement (steep slope)
108	permafrost
109	flooding (Mayo River)
110	mass movement (steep slope)



GEOLOGIC HAZARD RANKINGS

VILLAGE OF MAYO, YUKON

parts of NTS 105M/12

SCALE 1:20 000

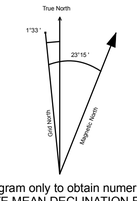
0 0.5 1 2 3 4

Kilometres

ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection
North American Datum 1983
Zone 8

CONTOUR INTERVAL 100 FEET
Elevations in feet above Mean Sea Level

115P/09 MINTO LAKE	105M/12 MAYO (MAP LOCATION)	105M/11 WILLIAMSON LAKE
115P/08 ETHEL LAKE	105M/05 FRANCIS LAKE	105M/06 NOGOLD CREEK



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION FEBRUARY 2010
FOR CENTRE OF MAP

This map accompanies the report "Mayo Landscape Hazards: Geological Mapping for Climate Change Adaptation Planning" released in 2011 by the Northern Climate Exchange, Yukon Research Centre, Yukon College. For copies of the report, or additional information, please contact Lacia Kinnear at lkinnear@yukoncollege.yk.ca.