Geological Survey of Canada
Open File 8926

LANDSLIDE INVENTORY MAP OF THE VALEMOUNT AREA, BRITISH COLUMBIA

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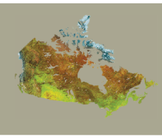
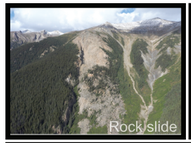



Rock slide/ Debris flow


Debris flow


Rock slide


Rockfall & Talus


Moose Lake

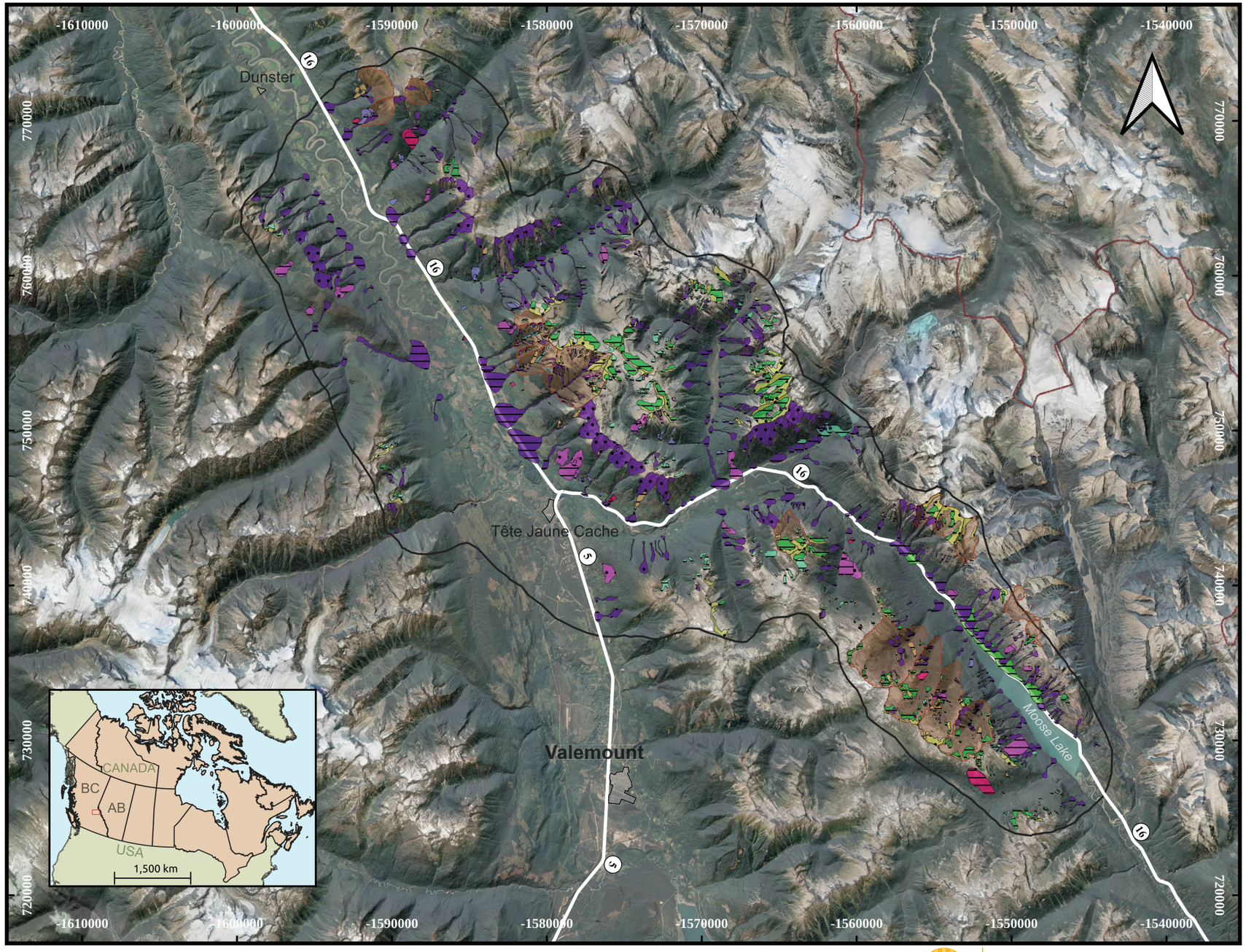
Legend

Highway

Landslide zone
- deposition
- transportation
- source
- potential source area

Landslide type
- debris slide
- debris flow
- earth flow
- rock avalanche
- coalescent debris deposits
- rock slide
- rotational slide
- rockfall

Deposit type
- coalescent debris
- colluvium
- talus



SUMMARY

Natural Resources Canada's Public Safety Geoscience Program (PSG) at the Geological Survey of Canada undertakes research of geohazards such as landslides, earthquakes, tsunamis, volcanoes, and space weather. PSG knowledge products provide baseline geoscience information to stakeholders and decision-makers to reduce the risk to population and critical infrastructure.

This map provides a landslide inventory along a transportation corridor located north of Valemount to Dunster and east to Moose Lake, in east-central British Columbia (BC) where Highways 16 and 5 intersect. The corridor covers roughly 1200 km², encompassing 40 km of the Robson River valley from Moose Lake to its confluence with the Rocky Mountain Trench and a 20 km reach of the Fraser River valley, up to the height of land. The elevation within the study area ranges between 720 and 2800 m a.s.l., and the slope gradient varies from <2° on alluvial plains, to >80° in the high mountains. The average slope is 22.5°. The area is underlain by Upper Proterozoic metamorphic and sedimentary rocks (Mountjoy, 1980) that were strongly eroded by glacial and periglacial processes, most recently during the last glacial period and post-glaciation. The daily average temperature ranges between -10 and 15.5 °C and the annual precipitation is 594 mm (372.3 mm as rain and 221.7 mm as snow-water equivalent) (Environment Canada, 2022).

The landslide types were labeled based on the classification by Hungr et al. (2014), with reference to examples in Hungr and Locat (2015). The identification and delineation of the landslides were carried out by interpretation of: i) a Digital Terrain Model (DTM; 5 x 5 m resolution) generated from 2019 to 2021 LiDAR data; ii) 10 m elevation contour map; and iii) two BC colour orthophotos (NTS 083E and 083D; 1 x 1 m resolution; 2006).

A total of 1285 landslides were compiled and subsequently grouped into 11 separate categories (see map legend). The mapped landslide polygons were subdivided into the source area, the transportation zone, and deposition zone. Furthermore, the level of certainty in our interpretation was assigned a rank from 1 to 3, with 1 reflecting the highest level of certainty in interpretation. This information is presented in the source "Valemount_landslide_inventory_2022.shp" file. About 87% of the mapped landslides have a certainty level of 1, 8.3% have a certainty level of 2, and 4.7% have a certainty level of 3. For landslide type, debris flows are the most abundant (40%), followed by debris slides (14%), and rockfalls (11%). Colluvium and talus deposits are also very common slope deposits (14% and 11%, respectively). We define colluvium as non-vegetated debris accumulated at the base of slopes with no obvious source area and talus deposits, the result of rockfall.

This preliminary landslide inventory map was derived largely from the interpretation of high-resolution LiDAR data, orthophotos, and satellite imagery. Further field validation would help increase the level of certainty in our interpretation.

Acknowledgments

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