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CANADIAN GEOSCIENCE MAP 276

BEDROCK GEOLOGY

(GLACIO-) VOLCANO WITHIN THE TUYA FORMATION, AT KAWDY MOUNTAIN

British Columbia



Map Information
Document

Preliminary

Geological Survey of Canada
Canadian Geoscience Maps

2016

Canada 



MAP NUMBER

Natural Resources Canada, Geological Survey of Canada
Canadian Geoscience Map 276 (Preliminary)

TITLE

Bedrock geology, (Glacio-) Volcano within the Tuya Formation, at Kawdy Mountain,
British Columbia

SCALE

1:10 000

CATALOGUE INFORMATION

Catalogue No. M183-1/276-2016E-PDF
ISBN 978-0-660-04531-3
doi:10.4095/299109

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RECOMMENDED CITATION

Turnbull, M., Russell, J.K., Edwards, B.R., and Porritt, L., 2016. Bedrock geology, (Glacio-) Volcano within the Tuya Formation, at Kawdy Mountain, British Columbia; Geological Survey of Canada, Canadian Geoscience Map 276 (preliminary), scale 1:10 000. doi:10.4095/299109

ABSTRACT

This volcano, informally named Kima'Kho, is one of more than 30 Pleistocene volcanoes on the Tuya-Kawdy plateau of northern British Columbia that record interactions with the Cordilleran ice sheet. This basaltic glaciovolcano features deposits resulting from explosive and effusive eruptions at 1.9 Ma and hosts multiple passage zones (transition surfaces between subaqueous and subaerial deposits (Russell et al., 2013)). Lithofacies include explosive lapilli tuff cone-forming deposits dominating the southern flanks of the edifice, which are partially overlain to the north by lava-fed deltas comprising lavas and tuff-breccia. Late-stage intrusions are identified by geological field relationships and $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology. Explosive and effusive deposits show textural and stratigraphical indicators that delineate 'passage zones'. Six prominent passage zones record depth fluctuations of ~160 m in the englacial lake. Based on estimates of maximum lake depths, the reconstructed minimum ice thickness is ~440 m.

RÉSUMÉ

Ce volcan, connu sous l'appellation non officielle de Kima'Kho, compte parmi plus de 30 volcans du Pléistocène situés sur le plateau Tuya-Kawdy, dans le nord de la Colombie-Britannique, qui conservent les traces d'interactions avec l'Inlandsis de la Cordillère. Ce volcan basaltique sous-glaciaire exhibe des dépôts résultant d'éruptions explosives et effusives s'étant produites il y a 1,9 millions d'années et renferme plusieurs zones de passage (des surfaces de transition entre des dépôts subaquatiques et des dépôts subaériens (Russell et al., 2013)). Les lithofaciès comprennent des dépôts coniques de tufs à lapillis formés par des éruptions explosives qui dominent sur les flancs sud de l'édifice volcanique et qui sont en partie recouverts au nord par des deltas de lave constitués de coulées et de tuf bréchique. Des intrusions tardives ont été reconnues grâce aux relations géologiques sur le terrain et à la géochronologie $^{40}\text{Ar}/^{39}\text{Ar}$. Des indicateurs texturaux et stratigraphiques à l'intérieur des dépôts d'éruptions explosives et effusives délimitent des « zones de passage ». Six grandes zones de passage rendent compte de variations de la profondeur d'environ 160 m dans le lac intraglaciaire. Selon les estimations de la profondeur maximale du lac, l'épaisseur minimale de la glace reconstituée serait d'environ 440 m..

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SHEET 1 OF 1, BEDROCK GEOLOGY

GENERAL INFORMATION

Authors: M. Turnbull, J.K. Russell, B.R. Edwards, and L. Porritt

Geology by M. Turnbull, with contributions from J.K. Russell, B.R. Edwards and L. Porrit, 2015

Geological compilation by M. Turnbull and B.R. Edwards, 2015

Geology conforms to Bedrock Data Model v. 4.0.0

Geomatics and cartography by R. Cocking

Joint initiative of the Geological Survey of Canada and the University of British Columbia, conducted under the auspices of the Cordillera Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program

Map projection Universal Transverse Mercator, zone 9. North American Datum 1983

Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications. Elevations in metres above mean sea level

Magnetic declination 2016, 20°06'E, decreasing 18.5' annually.
This map is not to be used for navigational purposes.

Title photograph: Kima'Kho volcano, northwestern British Columbia. Photograph by B.R. Edwards. 2016-002

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional observations not portrayed on this map.

See map info document accompanying the downloaded data for more information about this publication.

This publication is available for free download through GEOSCAN (<http://geoscan.nrcan.gc.ca/>).

Preliminary publications in this series have not been scientifically edited.

MAP VIEWING FILES

The published map is distributed as a Portable Document File (PDF), and may contain a subset of the overall geological data for legibility reasons at the publication scale.

ACKNOWLEDGMENTS

This project has been funded by an NSERC Discovery and Discovery Accelerator Supplement held by J.K. Russell. National Science Foundation (Research Grant EAR-0910712 and EAR-1220403) held by B. Edwards. Geological Society of America Research Grants held by M. Turnbull.

Special thanks to D. Gainer, W. Kochtitzky and Jim and Sharon Reed of Pacific Western Helicopters for logistical and field support.

REFERENCES

Edwards, B.R. and Russell, J.K., 2000. The distribution, nature and origin of Neogene-Quaternary magmatism in the Northern Cordilleran Volcanic Province, northern Canadian Cordillera; Geological Society of America Bulletin, v. 112, no. 8, p. 1280–1295.

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Russell, J.K., Edwards, B.R., and Porritt, L.A., 2013. Pyroclastic Passage Zones in Glaciovolcanic Sequences; Nature Communications 4. doi:10.1038/ncomms2829

Russell, J.K., Edwards, B.R., Porritt, L.A., and Ryane, C., 2014. Tuya: A descriptive genetic classification. Quaternary Science Reviews 87, 70–81.

ADDITIONAL INFORMATION

The Additional Information folder of this product's digital download contains figures and tables that appear in the map surround as well as additional geological information not depicted on the map, nor this document, nor the geodatabase.

- PDF of each figure/table that appears in the CGM surround.
- Excel file of the Master Legend Table (legend symbols, descriptions, headings, etc.).
- Excel file of age locations.
- PDF(s) of cross-section(s).

AUTHOR CONTACT

Questions, suggestions, and comments regarding the geological information contained in the data sets should be addressed to:

R.B. Cocking
Geological Survey of Canada
1500-605 Robson Street
Vancouver, BC
V6B 5J3
Robert.Cocking@Canada.ca

COORDINATE SYSTEM

Projection: Universal Transverse Mercator
Units: metres
Zone: 9
Horizontal Datum: NAD83
Vertical Datum: mean sea level

BOUNDING COORDINATES

Western longitude: 131°13'00"W
Eastern longitude: 131°07'00"W
Northern latitude: 59°00'20"N
Southern latitude: 58°57'20"N

SOFTWARE VERSION

Data has been originally compiled and formatted for use with ArcGIS™ desktop version 10.2.2 developed by ESRI®.

DATA MODEL INFORMATION

Bedrock (Calgary)

Surface bedrock data are organized into feature classes and themes consistent with logical groupings of geological features. All field observation point data are related through the Station_ID property of the Station theme. These feature attribute names and definitions are identical in the shapefiles and the XML files.

Consult PDFs in Data folder for complete description of the feature classes, feature attributes, and attribute domains.

The Bedrock Data Model and the Bedrock Domains documents are intended to describe all bedrock features which may be compiled at the 1:50 000 scale. Therefore, some of the feature classes and feature attributes described in these documents may not be present.