

## QUATERNARY

## POST LAST GLACIATION

- NONGLACIAL ENVIRONMENT**
- H** Anthropogenic deposits: Rubble, diamicton, sand, and gravel, and mine tailings; massive, greater than 5 m thick, occurring as flat or steep surfaces embayed by human activity near active mine sites.
  - O** Organic deposits, **undifferentiated**: dominantly fen peat with rare bog peat; 1 to 3 m thick on average; peat derived from decayed plant material in an eutrophic environment; the plant material is in various stages of decomposition; generally occurs as flat, wet terrain (swamps) over poorly drained substrates; forms relatively open peatlands.
  - COLLUVIAL AND MASS WASTING DEPOSITS**: diamicton and rubble; poorly sorted, massive to stratified, silts deposited by direct, gravity-induced movement; composition dependant on source material.
  - Ca** **Apron and talus scree deposits**: diamicton and minor amount of poorly sorted sand, and gravel, generally 1 to 10 m thick, but may exceed 10 m at the base of large steep slopes.
  - Cz** **Landslide deposits**: diamicton, generally 1 to 10 m thick, but may exceed 10 m near the toe of large landslides; hummocky topography; includes inactive and potentially active landslides.
  - Cv** **Colluvial veneer**: thin and discontinuous cover of slumped material; 1 to 2 m thick on average; dominantly overlies bedrock or till; occurs on moderate to steep slopes.
  - Cb** **Colluvial blanket**: continuous cover of slumped material; more than 2 m thick on average; dominantly overlies bedrock or till; occurs on moderate to steep slopes.
  - ALLUVIAL SEDIMENTS**: sorted gravel, sand, minor silt, and organic detritus deposited by modern streams; commonly stratified.
  - Ap** **Alluvial floodplain sediments**: sorted sand, and silt with lesser amount of pebbly gravel, and organic detritus; more than 1 m thick, forming active floodplains close to river level with meander channels and scold marks; prone to flooding.
  - Al** **Alluvial fan sediments**: poorly sorted gravel, sand, and diamicton; more than 2 m thick; occur where a stream issues from a narrow valley onto a plain or valley floor.
  - At** **Alluvial terraced sediments**: sorted gravel, sand, and minor silt; more than 2 m thick; forming inactive terraces above modern floodplain; represents a potential aggregate source.
  - A** **Undifferentiated alluvial sediments**: undivided floodplain, alluvial terrace, and alluvial fan sediments.
  - L** **LACUSTRINE SEDIMENTS, undifferentiated**: sand, silt, and minor clay intermixed with variable amount of organic material, deposited in a lake; more than 1 m thick; exposed following lowering of lake levels; includes organic deposits too small to be mapped separately.

## GLACIAL AND LATE-GLACIAL

- PROGLACIAL AND GLACIAL ENVIRONMENTS**
- GLACIOLACUSTRINE SEDIMENTS**: fine sand, silt, and clay, with minor debris-flow diamicton and gravel; laminated, bedded and massive; deposited in glacier-dammed lakes in valleys and along the margin of retreating glaciers.
  - GLV** **Glaciolacustrine veneer**: fine sand, silt, and clay; dominantly laminated and bedded; 1 to 2 m thick on average; thin and discontinuous.
  - GLB** **Glaciolacustrine blanket**: fine sand, silt, and clay; dominantly laminated and bedded; more than 2 m thick on average; forms a continuous cover.
  - GL** **Undifferentiated glaciolacustrine sediments**: undivided glaciolacustrine sediments; more than 1 m thick.
  - GLACIOFLUVIAL SEDIMENTS**: sand and gravel with minor diamicton, well to poorly stratified; deposited behind, at, or in front of the ice margin by glacial meltwater; represent a potential aggregate source.
  - Gp** **Outwash plain sediments**: poorly-sorted sand and gravel; bedded; 1 to more than 10 m thick; deposited by meltwater at various positions in front of the retreating glaciers; generally forms flat surfaces sloping away from the retreating glacier.
  - GFI** **Glacioluvial terraced sediments**: sand and gravel; 1 to 10 m thick; forming gently sloping flat surfaces perched above modern streams, meltwater channels or alluvial deposits.
  - Gf** **Hummocky glacioluvial sediments**: poorly-sorted sand and gravel with minor diamicton; bedded to massive; individual beds can be deformed; 1 to more than 20 m thick; deposited in contact with a retreating glacier; forms hummocky topography that is related to melting of ice.
  - GFC** **Ice-contact glacioluvial sediments**: poorly sorted coarse sand and gravel deposited with pockets of diamicton and fine sand, and silt lenses; greater than 1 m and up to 10 m thick; landforms include kame terraces, kettles and kame topography; small ovoids, deltas, and debris fans forming an irregular topography.
  - GFK** **Kame terraced sediments**: poorly-sorted sand and gravel with minor diamicton; bedded to massive; individual beds can be deformed; 1 to more than 20 m thick; deposited in contact with a retreating glacier; forms terraces, generally uncapped, on valley walls, perched above modern valley floor.
  - GLV** **Glacioluvial veneer**: sand and gravel; 1 to 2 m thick on average; occurs near the margins and at the mouth of meltwater channels; follows underlying topography.
  - Gfb** **Glacioluvial blanket**: sand and gravel; more than 2 m thick; occurs near the margins and at the mouth of meltwater channels; forms gently undulating to flat surfaces.
  - TLL**: diamicton consisting of clasts of all size in a sandy to silty-sand matrix; deposited directly by glaciers; clasts are of various lithologies and numerous ones are stratified.
  - Th** **Hummocky till**: more than 2 m thick on average; hummocky to rolling surface including pockets of diamicton and fine sand, and silt lenses; greater than 1 m and up to 10 m thick; landforms include kame terraces, kettles and kame topography; small ovoids, deltas, and debris fans forming an irregular topography.
  - Ts** **Streamlined and fluted till**: more than 2 m thick on average; till surface marked by streamlined landforms including flutings, drumlins, and crag-and-tails; rare bedrock outcrops can be present at the head or up-ice end of crag-and-tails.
  - Tv** **Till veneer**: 1 to 2 m thick on average; discontinuous till cover; underlying bedrock morphology is discernible; bedrock outcrops are abundant.
  - Tb** **Till blanket**: more than 2 m thick on average; continuous till cover forming undulating topography that locally obscures underlying units; rare bedrock outcrops.

## PRE-QUATERNARY

- R** **BEDROCK, undifferentiated**: Volcanic, intrusive, sedimentary, and lesser amount of metamorphic bedrock of Paleozoic to Cenozoic age; can include pockets of till or colluvium rarely exceeding 1 m thickness.
- Stratigraphic relationship**: A stratigraphic relationship is shown with two map-unit designators separated by slash (e.g. GLV/R) indicates a veneer of glaciolacustrine sediments overlying streamlined till.

- Mine tailing
- Quarry
- Geological contact, defined
- Limit of mapping
- Landslide escarpment
- Minor meltwater channel (paleocurrent direction unknown)
- Minor meltwater channel (paleocurrent direction known)
- Large meltwater channel
- Esker (paleocurrent direction unknown)
- Esker (paleocurrent direction known)
- Drumlinoid ridge
- Drumlin
- Crag-and-tail
- Fluted bedrock or drift (paleo ice-flow direction unknown)
- Fluted bedrock or drift (paleo ice-flow direction known)
- Small landslide scar
- Slope movement
- Ice-contact delta
- Glacial strations (paleo ice-flow direction unknown)
- Glacial strations (paleo ice-flow direction known)
- Cross strations (numbers indicate relative age; 1 = oldest)
- Outcrop
- Gravel pit
- Field station without sample
- Field station with sample

## Recommended citation

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Preliminary publications in this series have not been scientifically edited.

GEOLOGICAL SURVEY OF CANADA  
CANADIAN GEOSCIENCE MAP 209  
BRITISH COLUMBIA GEOLOGICAL SURVEY  
GEOSCIENCE MAP 2015-02

## SURFICIAL GEOLOGY

## BOOTJACK MOUNTAIN AREA

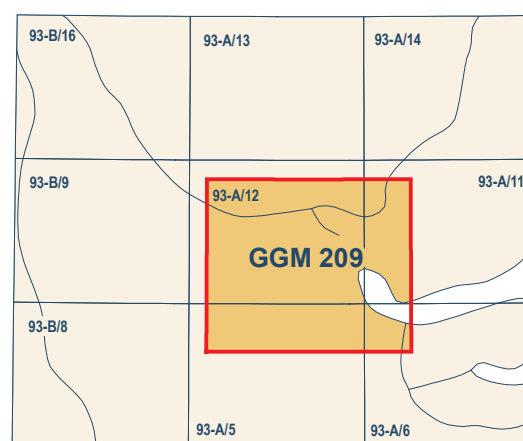
British Columbia  
Parts of NTS 93-A/5, NTS 93-A/6, NTS 93-A/11, and NTS 93-A/12

## Abstract

The Bootjack Mountain region is bounded by the Quesnel and Cariboo river valleys to the north, Beaver Valley to the west and Quesnel Lake to the east. Till, of the Late Wisconsinan Fraser Glaciation, is the dominant surficial material, mapped primarily as blankets but also as streamlined, hummocky and ridged topography. Glacioluvial sediments, marking glacial retreat, are mapped predominantly as outwash terraces, as well as kame terrace and ice-contact deposits interpreted to reflect ice-deglaciation. Glaciolacustrine sediment veneers and blankets are mapped along Beaver Valley. Holocene alluvial and alluvial sediments are mapped in Beaver Valley and the Quesnel and Cariboo river valleys. Colluvium is mapped as blankets, veneers, aprons, landslide and hummocky deposits whereas alluvial deposits include terraces, plains, and fans. Meltwater channels are generally oriented parallel to ice flow (northwest-southeast). Two distinct ice-flow movements have been recorded in this region. An earlier west-southwestward flow (255°–275°) followed by a later, northwestward flow (253°–330°).

## Résumé

La région de la montagne Bootjack est limitée au nord par les rivières Quesnel et Cariboo, à l'est par la vallée Beaver et à l'est par le lac Quesnel. Le till mis en place durant la glaciation de Fraser du Wisconsinien tardif est la formation superficielle dominante et a été cartographié en couverture continue, ainsi qu'avec une topographie fuselée, bosselée et côtelée. Les sédiments fluvioglaciers sont associés au retrait glaciaire et sont cartographiés sous forme de terrasses, terrasses de kame et sédiments bosselés juxtaposés, ces derniers étant interprétés comme sédiments mis en place pendant une stagnation glaciaire. Des sédiments glaciolacustres en couverture mince et continue ont été cartographiés dans la vallée Beaver. Des dépôts de versants et des alluvions d'âge Holocène ont été cartographiés dans la vallée Beaver et dans la vallée des rivières Quesnel et Cariboo. Les dépôts de versants sont cartographiés en couverture mince et continue, sous forme de dépôts d'éboulis et de dépôts de terrain avec une topographie bosselée. Les alluvions sont présentées sous forme de terrasses, de plaines et de cônes alluviaux. Les chenaux d'eau de fonte sont généralement orientés parallèles à l'écoulement glaciaire (nord-ouest – sud-est). Deux mouvements glaciaires distincts ont été identifiés dans cette région. Un premier mouvement vers l'ouest sud-ouest (255°–275°) a été suivi par un mouvement vers le nord-ouest (253°–330°).



National Topographic System reference

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GEOLOGICAL SURVEY OF CANADA  
CANADIAN GEOSCIENCE MAP 209  
BRITISH COLUMBIA GEOLOGICAL SURVEY  
GEOSCIENCE MAP 2015-02

## SURFICIAL GEOLOGY

## BOOTJACK MOUNTAIN AREA

British Columbia  
Parts of NTS 93-A/5, NTS 93-A/6, NTS 93-A/11, and NTS 93-A/12

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GSC CANADIAN GEOSCIENCE MAP 209 • BCGS GEOSCIENCE MAP 2015-02

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Preliminary

Geological Survey of Canada  
Canadian Geoscience Maps

Authors: S. Hashmi, A. Plouffe, and B.C. Ward  
Geology by S. Hashmi, A. Plouffe, and B.C. Ward, 2012, 2013, 2014  
Geology conforms to Surficial Data Model v. 2.0.2  
Geomatics by L. Robertson  
Cartography by G.S. Hanna  
Initiative of the Geological Survey of Canada, as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM-2) program.

Map projection Universal Transverse Mercator, zone 10,  
North American Datum 1983  
Base map at the scale of 1:50 000 from Natural Resources Canada, with modifications.  
Elevations in feet above mean sea level  
Shaded relief image derived from the digital elevation model supplied by Natural Resources Canada.  
Illumination: azimuth 315°, altitude 45°, vertical factor 1x

SURFICIAL GEOLOGY  
BOOTJACK MOUNTAIN AREA

British Columbia  
Parts of NTS 93-A/5, NTS 93-A/6, NTS 93-A/11, and NTS 93-A/12

1:50 000

0 1 2 3 4 km

Magnetic declination 2015, 17°18'E, decreasing 13.8° annually.  
This map is not to be used for navigational purposes.  
Title photograph: Looking to the northwest at a striated outcrop located 10 km northwest of Mount Polley Mine. Strations are oriented 140–320. For scale, the Britton compass is 22 cm and water bottle 36 cm long.  
Photograph by A. Plouffe, 2014-244

The Geological Survey of Canada welcomes corrections or additional information from users.  
Data may include additional observations not portrayed on this map. See documentation accompanying the data.  
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