

BEDROCK GEOLOGY, TREK PROJECT AREA, NORTHERN INTERIOR PLATEAU, CENTRAL BRITISH COLUMBIA



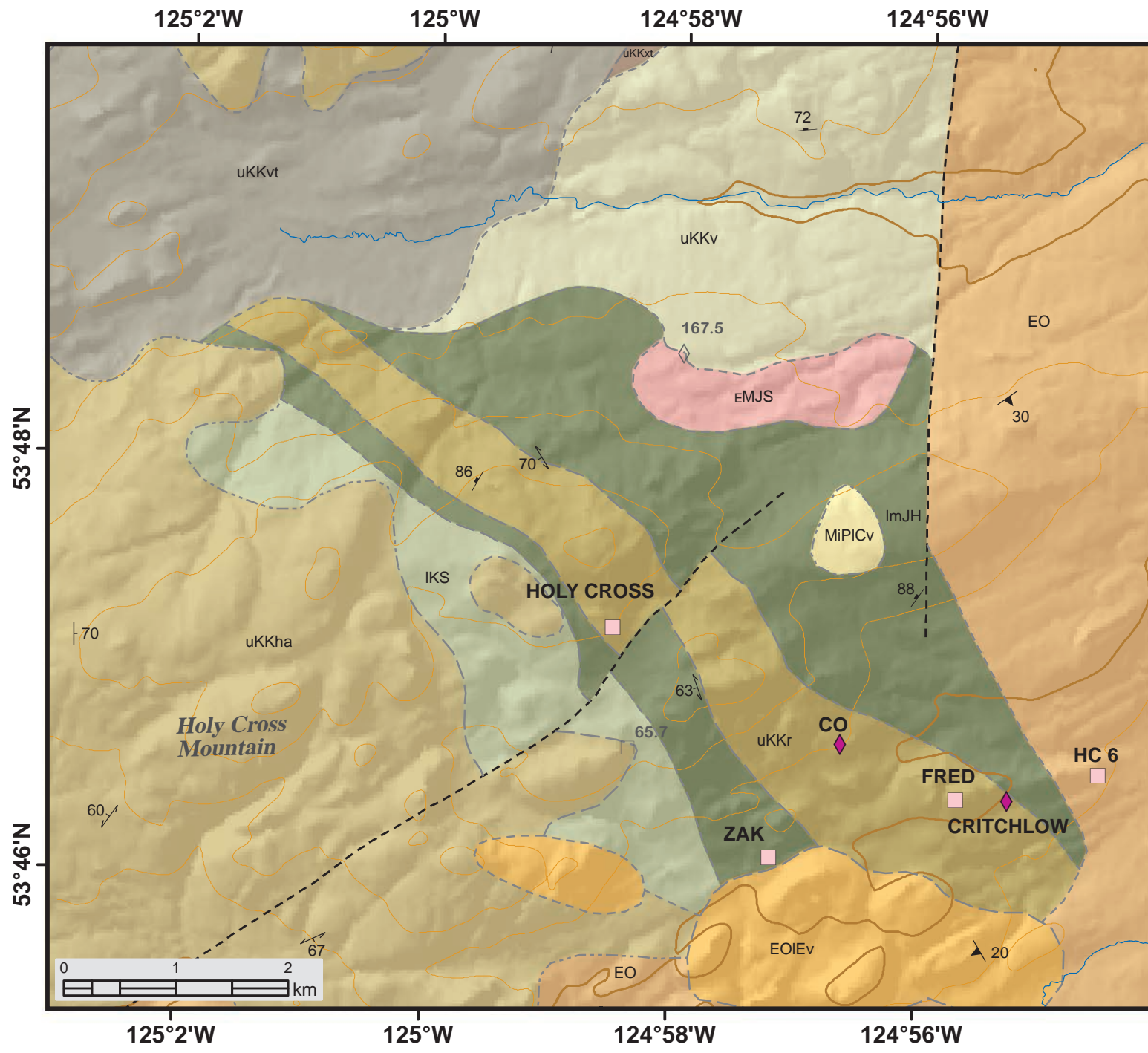
VOLCANIC AND SEDIMENTARY ROCKS

- Post Accretionary**
- Miocene to Holocene**
- Anahim volcanics**
- MIHvAr** Basalt, trachybasalt, basanite, trachyte and rhyolite. Occurs as flows and related tuff and breccia.
- Miocene to Pliocene**
- Chilcotin Group**
- MPICV** Olivine basalt flows. Dark grey to black, often vesicular and/or columnar jointed; minor pillow basalts, intercalated siliceous tephra layers, and associated high level intrusions. Flows are aphanitic or olivine microphyric. Locally contains xenoliths of spinel peridotite and less common crustal xenoliths as well as megacrysts of olivine, clinopyroxene, plagioclase, and magnetite. Rare, poorly consolidated polyolithic conglomerate and sandstone with red-brown matrix.
- Eocene to Oligocene**
- Endako Group**
- EOIEV** Basaltic andesite and andesitic flows. Dark green-grey to black, columnar jointed to massive, fine-grained to sparsely porphyritic flows with plagioclase phenocrysts. Vesicular, brecciated flow tops.
- Eocene**
- Ootsa Lake Group**
- EO** Undifferentiated rhyolite to andesite flows and associated volcanoclastic rocks. Predominantly white to beige to pale pink rhyolite, often flow banded and spherulitic with minor quartz, plagioclase, K-feldspar, and magnetite phenocrysts. Perlitic black dacite with sparse pyroxene and plagioclase phenocrysts. Tan to pink dacite with minor hornblende and K-feldspar phenocrysts. Aphanitic to sparsely plagioclase and pyroxene phryc andesite flows. Associated tuff and breccia, locally welded. Minor volcanic sandstone and conglomerate containing plutonic clasts.
- Upper Cretaceous**
- Kasaska Group**
- uKKhA** Dark purple to grey andesite to trachyandesite flows. Contains abundant hornblende and plagioclase and sparse biotite phenocrysts. Minor associated monomict lapilli tuff.
- uKKhT** Pale peach crystal-lithic tuff. Contains abundant embayed quartz crystals and K-feldspar crystals in siliceous groundmass. Includes rare accretionary lapilli tuff.
- uKKhV** Brick red to pale green vitric tuff. Black obsidian fragments often devitrified to chalky white or pale green. Sparse quartz, biotite and andalusite phenocrysts.
- uKKhR** White, pale pink and pale purple flow-laminated rhyolite. Flow bands are highly contorted and brecciated.
- uKKhV** Undifferentiated rhyolite to trachyandesite flows and associated volcanoclastic rocks. Includes minor red polymict conglomerate.
- Lower to Upper Cretaceous**
- Nazko Belt**
- luKNS** Predominantly chert and quartz grain sandstone with chert-rich polymict conglomerate, minor maroon mudstone and dark grey siltstone. Conglomerate contains chert clasts with quartz veins and clasts of conglomerate. Rare maroon dacitic and tan rhyolitic tuff.
- Skeena Group**
- IKS** Argillite, siltstone, sandstone and chert-rich polymict conglomerate.
- Middle Jurassic to Lower Cretaceous**
- Bowser Lake Group**
- IKBMV** **Moose Lake volcanics**
Red dacite flows. Contains abundant plagioclase and rare biotite phenocrysts in glassy red groundmass.
- uJBnv** **Nechako volcanics**
Dark green basalt flows and associated mafic and felsic volcanoclastic rocks. Flows are moderately plagioclase, pyroxene and rarely hornblende-phyric. Mafic volcanoclastic rocks include block breccia and pyroxene rich epidecic sandstone. Rhyolitic lapilli tuff contains white flow-laminated and aphanitic fragments in beige to pale green ash matrix with sparse quartz and K-feldspar crystal fragments.
- muJBs** **Bowser Lake Group sediments**
Interbedded chert pebble conglomerate, sandstone, siltstone, and mudstone. Conglomerate is clast-supported and dominated by moderately to well-rounded clasts of beige to pale green and dark grey chert and lesser black argillite in a sandy matrix of the same composition. Mudstone contains calcareous lenses.
- Stikine Terrane**
- Lower and Middle Jurassic**
- Hazelton Group**
- Quack Formation**
Thin bedded dark grey siliceous mudstone and tan to pale pink tuff with locally abundant feldspar crystal fragments. Weathers rusty due to finely disseminated pyrite.
- Tagai Succession**
Interbedded greywacke, polymict conglomerate, red siltstone, rhyolitic tuff, and andesitic tuff. Rhyolitic tuff is beige and weathers rusty brown. Andesitic tuff is predominantly maroon with very fine grained plagioclase and pyroxene crystal fragments.
- Naglico Formation**
Dark green and lesser maroon basaltic and andesitic lava flows, volcanic breccia and conglomerate, undivided volcanoclastic rocks, rare hyaloclastite, argillite and greywacke. Volcanic rocks contain variably abundant clinopyroxene and plagioclase phenocrysts.
- Entiako Formation**
Dark grey basalt flows with interflow pumiceous lapilli tuff and block breccia. Flows are 2.5 to 5m thick and aphyric to phenocrystic with plagioclase and chlorite-replaced mafic minerals. Flattened amygdulose and hercynitic Liesegang rings are abundant.
- muJHE** Red, maroon and white flow-laminated dacite. Flow bands are highly contorted and brecciated. Vugs filled with euhedral quartz crystals occur parallel to flow bands.
- muJHE** Brick red lithic lapilli tuff and ash tuff. Contains lapilli up to 10 cm of purple plagioclase-phyric andesite, red dacite and beige rhyolite.
- muJHE** White to pale purple crystal lithic tuff. Lapilli include red tuff and flow banded rhyolite. Contains abundant crystal fragments including plagioclase, K-feldspar, and embayed quartz. Moderately sericite and epidote-altered.
- muJHE** Undifferentiated Entiako Formation volcanic and sedimentary rocks. Arkosic sandstone and epidecic sandstone and conglomerate.
- Tolkwa Formation**
- luJHT** Green and maroon interlayered pyroclastic and epidecic rocks and minor flows. Contains lithic lapilli breccia and tuff dominated by andesitic fragments containing plagioclase and hornblende phenocrysts in an ash groundmass of the same composition. Maroon tuffaceous siltstone and epidecic sandstone are common. Minor dark green and maroon plagioclase-phyric andesite and well rounded, volcanic cobble conglomerate. Patchy chlorite and epidote alteration common.
- Undifferentiated Hazelton Group**
- luJH** Undifferentiated basaltic to rhyolitic flows, associated volcanoclastic and sedimentary rocks. Includes dark green to black and purple amygdaloidal andesite to basalt flows with abundant plagioclase and pyroxene phenocrysts and beige to maroon rhyolite to dacite flows with sparse plagioclase phenocrysts.
- Permian to Triassic**
- PTTs** Light grey limestone. Thin-bedded black shale and dark grey siltstone.
- Cache Creek Terrane**
- Permian to Triassic**
- PTCCBv** Black to dark grey chert, black argillite, black to green basalt and light grey limestone. Variably deformed.
- PTCCBm** Dun brown, variably serpenitized peridotite.
- Faults / Contacts**
- Thrust fault, approximate / inferred / interpreted from geophysics / concealed
- Normal fault, approximate / inferred / interpreted from geophysics / concealed
- Dextral fault, approximate / inferred / interpreted from geophysics / concealed
- Sinistral fault, approximate / inferred / interpreted from geophysics / concealed
- Unknown fault, approximate / inferred / interpreted from geophysics / concealed
- Contact, defined / approximate / inferred / interpreted from geophysics
- Fold axial trace, inferred / interpreted from geophysics

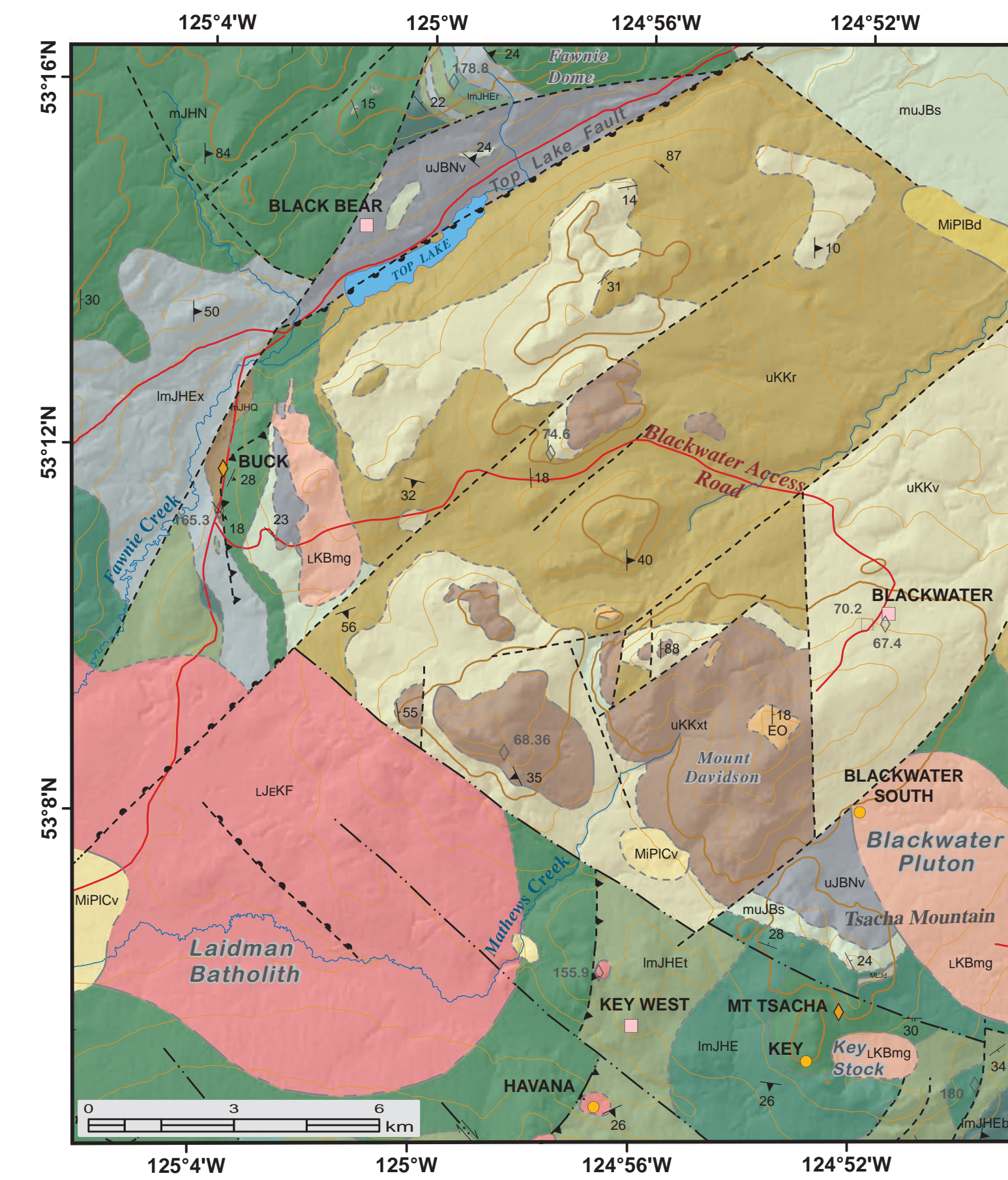
INTRUSIVE ROCKS

- Miocene to Pliocene**
- MIPIBd** Dark grey basalt dykes. Aphanitic to sparsely olivine-phyric.
- Eocene**
- EQ** **Quanchus Plutonic Suite**
White and black, equigranular, medium to coarse grained, biotite-hornblende granodiorite to tonalite. Minor grey to dark green, brown weathering, pyroxene and plagioclase porphyritic gabbro.
- Late Cretaceous**
- UKBmg** **Blackwater Plutonic Suite**
Light pink, equigranular, medium to coarse grained, biotite-hornblende quartz monzonite to monzogranite.
- LKBD** Light grey-green, medium grained, equigranular to fine-grained, plagioclase porphyritic diorite.
- Jurassic to Paleogene**
- Coast Plutonic Complex**
- JTq** Variably foliated diorite, quartz diorite, granodiorite, tonalite, andesite, basalt and related volcanoclastic rocks.
- Late Jurassic to Early Cretaceous**
- Francois Lake Plutonic Suite**
- UKBF** Pale pink, fine to coarse grained, biotite + hornblende monzogranite to hornblende-biotite granodiorite. Minor quartz diorite. Equigranular to rarely K-feldspar porphyritic.
- Middle to Late Jurassic**
- MLJd** Dark grey-green, medium to coarse grained, equigranular diorite and quartz diorite. Locally pyroxene-rich.
- Early and Middle Jurassic**
- Stag Lake Plutonic Suite**
- EMLS** Grey and pink, medium to coarse grained quartz monzodiorite, quartz monzonite, monzogranite, granodiorite and tonalite.
- Triassic to Jurassic**
- Brooks Diorite Complex**
- TrJBd** Variably foliated, fine to coarse grained hornblende ± biotite diorite, monzodiorite, monzonite and minor gabbro.
- METAMORPHIC ROCKS**
- Jurassic to Cretaceous**
- Tatla Lake Metamorphic Complex**
- JKT** Mylonite and migmatitic gneiss derived from dacite, tonalite, granodiorite, mafic tuff and epidecic rocks.
- Permian to Jurassic**
- Strongly foliated Metamorphic Complex**
- PJV** Strongly foliated and compositionally banded orthogneiss, schist, quartzite, amphibolite, marble and calc-silicate.

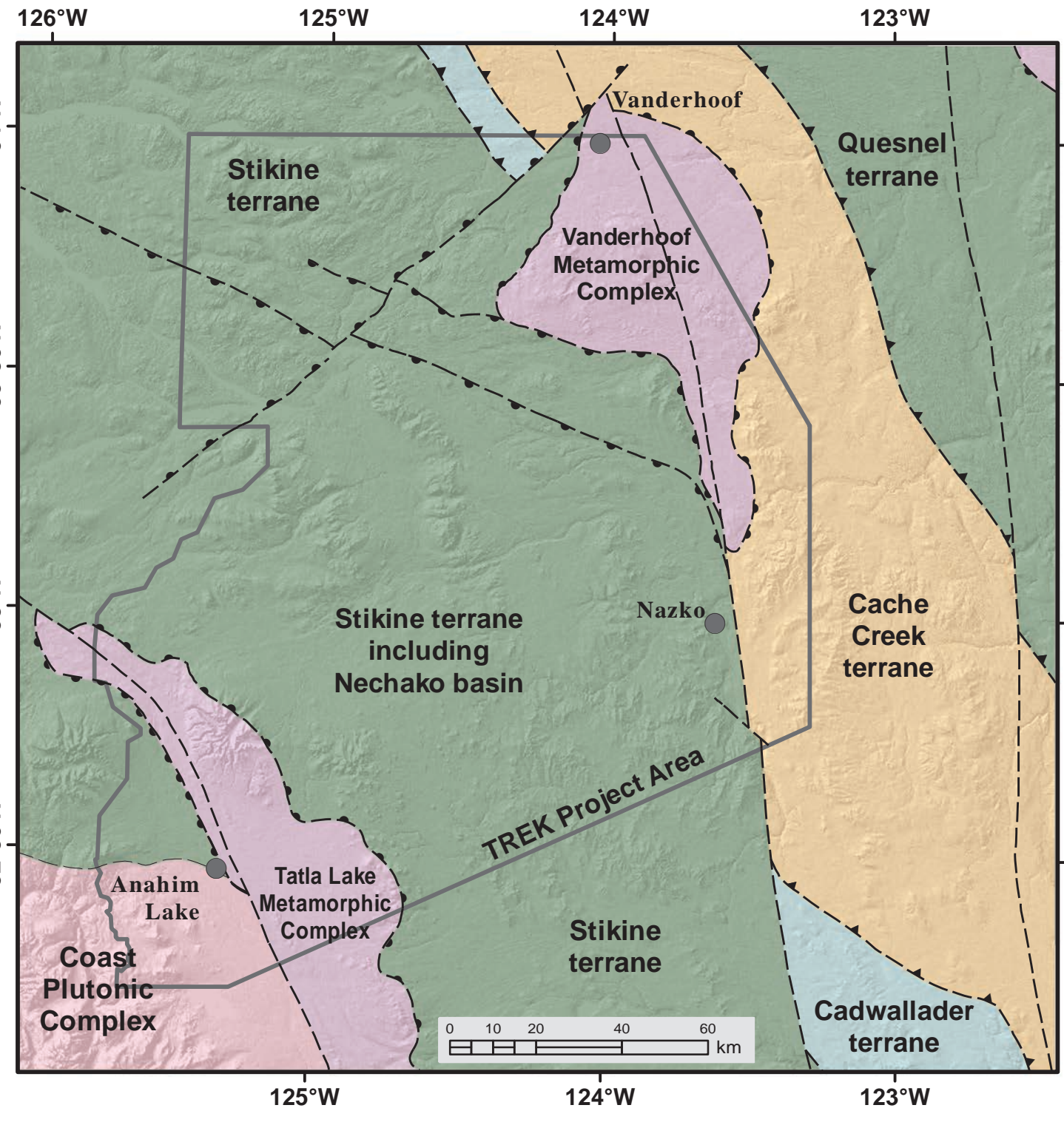
Detailed Geology of the Holy Cross Area



Detailed Geology of the Tsacha Mountain Area



Tectonic Domains



BC MINFILE Occurrences

- Volcanic Redbed Cu
- Iron oxide breccias and veins P-Cu-Au-Ag-U
- Epithermal Au-Ag: low sulphidation
- Polymetallic veins Ag-Pb-Zn+Au
- Cu-Ag quartz veins
- Cu-silver
- Porphyry Cu ± Mo ± Au
- Porphyry Mo (Low F-type)
- Ultramafic-hosted asbestos
- Volcanic ash - pumice

Geochronology (ages in Ma)

- Ar-Ar biotite
- Ar-Ar hornblende
- Ar-Ar whole-rock
- U-Pb zircon
- U-Pb titanite
- K-Ar feldspar
- K-Ar whole-rock
- K-Ar biotite
- K-Ar hornblende

Structures

- Bedding, Upright
- Joint
- Fold hinge line
- Foliation
- Minor fault
- Igneous layering, flow banding
- Stretching lineation

General

- City
- Road
- Contour line, 500m
- Contour line, 100m
- River
- Lake
- Protected area

Geoscience BC
MAP 2017-06-01
MDRU MAP 12-2017

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PART OF 1:250 000 NTS SHEETS 093 B, C, F & G

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1:250 000
North American Datum 1983, UTM Projection, Zone 10

July 2017

0 2 10 20 km
0 2 10 20 mi

Magnetic declination
Year 2017
Latitude 53.25° N
Longitude 124.5° W
Model used IGRF12
17.678° E changing by 0.20° W per year

Product of the Mineral Deposit Research Unit of The University of British Columbia as part of Geoscience BC's Targeting Resources through Exploration and Knowledge (TREK) Project. This map comprises new mapping carried out during the summer of 2014 and 2015 as well as interpretation of aeromagnetic data (Aerogeomatics Airborne Ltd., 2014) and compilation of previous mapping (Tupper, 1959; 1961; 1963; 1969; Diakov and Levson, 1997; Shukit et al., 2007; Mihalynuk et al., 2008; Bonard, 2014; Christie et al., 2014). Geoscience BC is an independent, non-profit organization that generates earth science in collaboration with First Nations, local communities, government, academia and the resource sector. Our independent earth science enables informed resource management decisions and attracts investment and jobs. Geoscience BC gratefully acknowledges the financial support of the Province of British Columbia. The Mineral Deposit Research Unit is a collaborative venture between the Ministry and The University of British Columbia. The unit, which operates on the support and financial assistance provided by the mining industry and the Natural Sciences and Engineering Research Council of Canada, is an internationally recognized research group devoted to solving mineral exploration-related problems.

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