



Bedrock geology of the Dease Lake area: Supporting GIS, structural, magnetic susceptibility, and other digital data

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Front cover: Gossanous volcanic rocks (MINFILE 104I 153) of the Horn Mountain Formation (upper Hazelton Group) exposed on slopes above Glacial Lake; view towards the south-southwest. **Photo by Bram van Straaten.**

Back cover: The McBride gossan (MINFILE 104I 171) hosted in mafic to intermediate volcanic rocks of the Sister Mary unit (Horn Mountain Formation, upper Hazelton Group). Approximately 48 km southeast of Dease Lake; view towards the southwest. **Photo by Bram van Straaten.**



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Abstract

This release provides Geographical Information System (GIS) files, structural measurements, magnetic susceptibility measurements, and other digital data from the Dease Lake area of northwestern British Columbia to support the bedrock geology map by van Straaten et al. (2022).

Keywords: Dease Lake, Stikinia, bedrock geology, digital data, GIS, structural measurements, magnetic susceptibility measurements

1. Introduction

Herein we present digital data to support the bedrock geology map by van Straaten et al. (2022) for the Dease Lake area in northwestern British Columbia. The digital release ([BCGS_GF2023-08.zip](#)) includes bedrock geology GIS files for reproduction at 1:50,000 and 1:100,000 scale, detailed unit descriptions, structural measurements, magnetic susceptibility measurements, geochronology point data, paleontology point data, and other digital files. GIS files use the BC Albers equal-area conic NAD83 projection ([EPSG 3005](#)), unless noted otherwise. Microsoft Excel files use the UTM NAD83 zone 9 north projection ([EPSG 26909](#)).

2. Bedrock geology GIS files

We provide two sets of bedrock geology GIS files, a 1:50,000-scale version and a 1:100,000-scale version. Each set contains geological linework, centroid and polygon files; all files are provided in both MapInfo tab and ArcGIS shape

format. Features in all files are attributed using an updated version of the BC Digital Geology geospatial frame data model (Cui et al., 2017; Cui, 2021).

GIS files for reproduction at 1:50,000 scale cover an approximately 8,500 km² area. Bedrock geology unit codes are in the *strat unit* field of the centroid and polygon files. Once incorporated into the British Columbia Digital Geology, this dataset will be available from the [BC Geological Survey Digital Geology website](#).

GIS files to re-create the 1:100,000-scale BCGS Geoscience Map 2022-01 (van Straaten et al., 2022) cover an approximately 5,000 km² area. Bedrock geology unit codes displayed on the Geoscience Map are in the *unit_local* field of the centroid and polygon files.

The 100,000-scale version is simplified from the 1:50,000-scale version by excluding features outside the Geoscience Map footprint (*Show_GM* = outside), hiding some detailed features (*Show_GM* = hide), and adding a limited

number of additional features to ensure correct topology and (or) properly attributed bedrock geology polygons (*Show_GM* = extra). Identical features used in both sets are marked using *Show_GM* = show.

Due to the character limitations of tab and shape files, the *original_d* and *Orig_d_GM* fields in the centroid and polygon files are truncated at 254 characters; complete descriptions are included in the Microsoft Excel unit description file (see Section 3 below).

Features are attributed by source (*src_id*, *source_ref*), which includes mapping by Read (1983; 1984), Gabrielse (1998), Logan et al. (2012), van Straaten et al. (2012; 2017), van Straaten and Bichlmaier (2018), van Straaten and Wearmouth (2019) and van Straaten et al. (2022).

GF2023-08_GeoLines GIS files contain all bedrock geology polygon forming linework. Line types are attributed by line type (*f_type*: e.g., contact, unconformity, fault) and confidence level (*f_conf*: e.g., defined, approximate, inferred). For thrust faults and normal faults, line direction follows the right-hand rule, that is, the line is digitized in the direction whereby the ornaments (teeth, tick mark) are displayed on the right-hand side.

GF2023-08_GeoCentroids GIS files contain all centroids to create bedrock geology polygons.

GF2023-08_GeoPolys GIS files contain all bedrock geology polygons.

3. Unit descriptions

Detailed unit descriptions and other relevant metadata for each unique geological unit are in **GF2023-08_GeoUnits_all**, a Microsoft Excel file (xlsx format) which follows the updated version of the BC Digital Geology geospatial frame data model (Cui et al., 2017; Cui, 2021). These data can be linked with centroid and polygon files through the *strat_u_UNIQUE* field.

The shortened unit description (*unit_desc*, limited to 254 characters), detailed unit description (*original_d*, unlimited characters) and detailed unit description used on Geoscience Map 2022-01 (*orig_d_GM*, unlimited characters) adopt a consistent, easily parsed, machine-readable format. Descriptive segments are separated by the pipe symbol, '|', as follows: composition | colour; texture | mineralogy | structure | other distinguishing features | interpreted environment, correlation, age (isotopic, fossil).

4. Additional GIS files

This folder contains additional linework and polygons, including fold traces, metamorphic isograds, outcrop outlines, alteration outlines, and the footprint for this data release.

GF2023-08_GeoLines_NoBedrockPoly contains all non-bedrock geology polygon forming linework, including: 1) axial traces of folds (where F1 is Middle Permian to Early Triassic, F2 is latest Triassic to Early Jurassic, F3 is Middle to early Late Jurassic, F4 is Cretaceous); 2) contact metamorphic facies contacts (isograds) surrounding the Snow Peak pluton; 3) outlines of altered or gossanous rocks; and 4) outcrop outlines (only complete for footprints of maps by Logan et al., 2012,

van Straaten et al., 2017, van Straaten and Bichlmaier, 2018, and van Straaten and Wearmouth, 2019).

GF2023-03_Footprint contains the footprint for this data release. The file projection is in UTM NAD83 zone 9 north.

5. Point data

This folder contains additional point data in digital format (field stations, structural measurements, magnetic susceptibility measurements, new and compiled geochronology data, and new and compiled paleontology data).

GF2023-08_Stations, a Microsoft Excel table (xlsx format) containing 3614 field stations within the Dease Lake area that were visited between 2011 and 2018. Each station is attributed with a unique station number (*statnum*).

GF2023-08_Structure, a Microsoft Excel table (xlsx format) containing 1374 structural field measurements recorded between 2011-2018, and 1059 structural measurements digitized from Read (1983; 1984), Read and Psutka (1990) and Gabrielse (1998, Figure 14). Structural measurements are recorded using the right-hand rule.

GF2023-08_MagneticSusceptibility, a Microsoft Excel file (xlsx format) containing 1615 magnetic susceptibility measurements collected between 2011 and 2018 (MagSus tab). Each magnetic susceptibility value (*mag_sus_mean* in 10^{-3} SI units) represents the average of ten measurements at one field station. Depending on the model of magnetic susceptibility meter employed, either a standard deviation (*magsus_SD* in 10^{-3} SI units, measured with Terraplus KT-10) or minimum and maximum value (*magsus_min* in 10^{-3} SI units and *magsus_max* in 10^{-3} SI units, measured with Terraplus KT-9) are also recorded. Within the Excel table, bedrock geological units are assigned – in order of decreasing confidence – using: 1) field database, unit assigned in field and separately captured in field database; 2) field notes, unit assigned based on field notes; or 3) Geoscience Map, unit assigned based on enclosing bedrock geology polygon on BCGS Geoscience Map 2022-01. Statistical data (median, mean, mean of logged values – calculated using iOGAS™) are presented for all units in the Stats tab of the Microsoft Excel file. Box and whisker plots for all units with five or more magnetic susceptibility data points are shown in Figure 1.

GF2023-08_Geochronology, a Microsoft Excel table (xlsx format) containing 141 new and compiled geochronology data points.

GF2023-08_Paleontology, a Microsoft Excel table (xlsx format) containing 136 new and compiled paleontology data points.

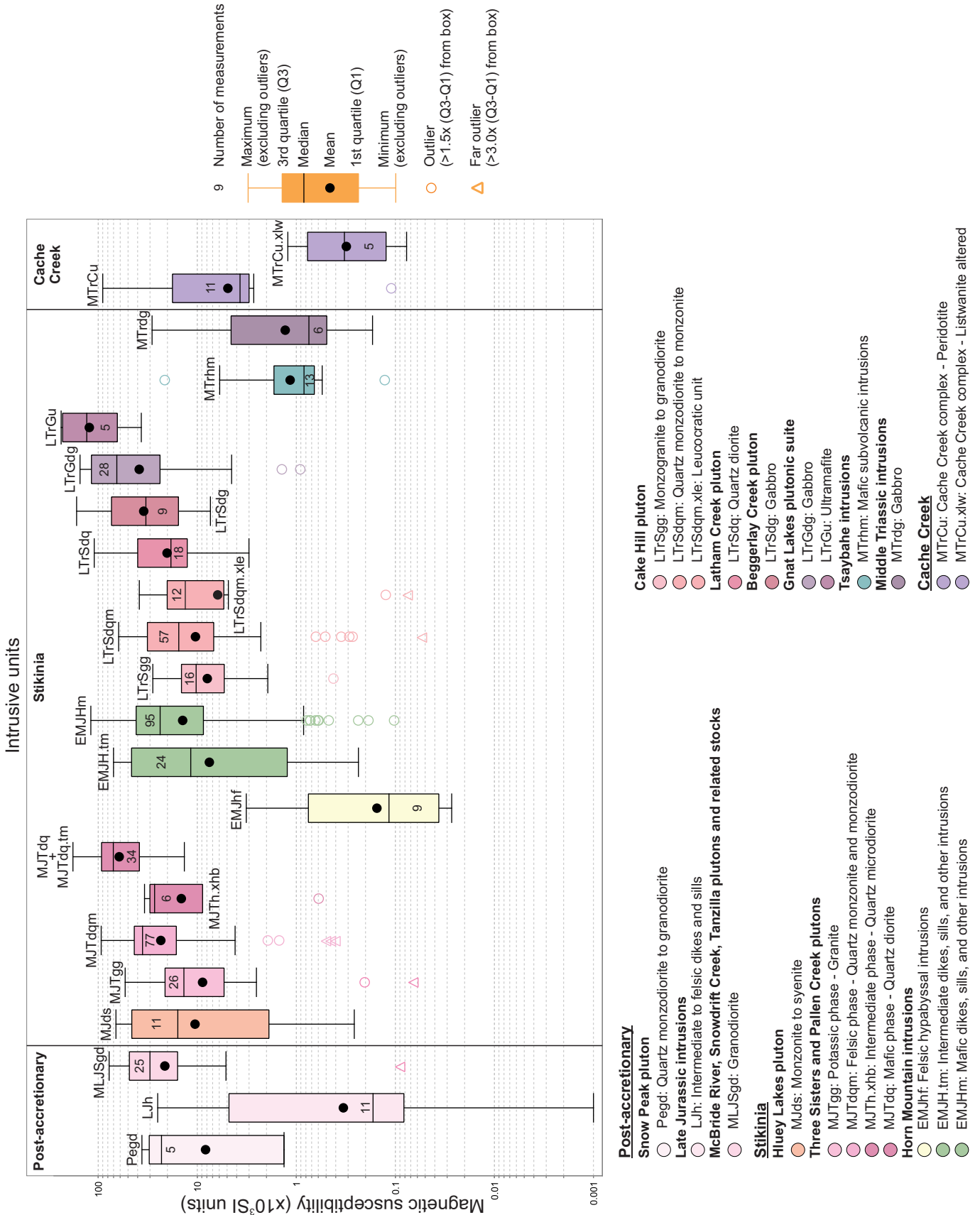


Fig. 1b. Box and whisker plots showing magnetic susceptibility values for intrusive units, ordered from young (left) to old (right).

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