QUEST-Northwest Mapping: BC Geological Survey Dease Lake Geoscience Project, Northern British Columbia (NTS 104I, J)

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Introduction

The British Columbia Geological Survey Dease Lake Geoscience Project is part of the Geoscience BC's QUEST-Northwest initiative, a program launched in 2011 to stimulate exploration in the northwestern part of the province along Highway 37 (Figure 1). Geoscience BC has committed $3.25 million in funding to provide two high-resolution (with a line spacing of 250 m) airborne magnetic surveys, a collection and analysis of new regional stream sediment samples, a reanalysis of stream sediment samples and the new bedrock mapping described in this paper. The 2011 program of bedrock mapping and mineral deposit studies undertaken by the BC Geological Survey, with involvement from the University of Wisconsin–Eau Claire, is complementary to the geophysical and geochemical programs directly administered through Geoscience BC (see Jackaman, 2012 and Simpson, 2012). Collectively, these programs will provide detailed, high-quality geoscience data that is intended to enhance metallic mineral exploration in an area of prospective geology adjacent to Highway 37, near Dease Lake, in northern British Columbia.

The Dease Lake study area is situated within the Stikine terrane, an extensive subduction-generated island arc magmatic system responsible for recurring calcalkaline and/or alkaline plutonic events and associated Cu-Au mineralization, mainly during Late Triassic and Early Jurassic. Prospective Mesozoic volcanic rocks exposed around the margins of the Bowser Basin form an arcuate belt containing porphyry deposits that include KSM (MINFILE 104B 103; BC Geological Survey, 2011), Galore (MINFILE 104G 090) and Schaft Creek (MINFILE 104G 015) deposits to the west and the Kemess deposits (MINFILE 094E 094) to the east. The Dease Lake study area is located at the apex of this arcuate belt, immediately north of the Red Chris Cu-Au porphyry deposit (MINFILE 104H 005) and also adjacent to the Hotailuh batholith, a large composite intrusive complex similar in age to the intrusions hosting porphyry mineralization at the Galore and Schaft Creek deposits.

Numerous small plutons project through mainly Late Triassic arc stratigraphy in the Dease Lake area. Neither the plutons nor the volcanosedimentary rocks have undergone a thorough regional geological re-evaluation for mineral potential since being mapped by the Geological Survey of Canada in the late 1970s and early 1980s (Gabrielse, 1980; Anderson, 1983, 1984). Modern detailed bedrock mapping is essential to characterize and refine time-space relationships of this arc segment around Dease Lake to assess significance for mineralization, comparison with mineralized arc segments elsewhere and integration with the airborne magnetic program. In addition, the project will provide supplementary databases including rock geochemical classification, magnetic susceptibility and geochronology. These data will integrate with Regional Geochemical Survey (RGS) data and airborne geophysics to ensure cost-effective exploration targeting porphyry-style mineralization.

In 2011, the BC Geological Survey completed four field-based geology studies located within a 70 km radius of the Dease Lake community (Figure 1b). These standalone components collectively make up the Dease Lake Geoscience Project, and they consist of

- Dease Lake regional bedrock mapping;
- Hotailuh batholith: intrusive phases, ages and related mineralization;

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- Snow Peak pluton: age, emplacement and molybdenum mineralization; and
- Tsaybahe group: lithological and geochemical characterization of Middle Triassic volcanism.

Regional Geology and Previous Work

Kerr (1925; 1948) carried out the earliest geological bedrock mapping surveys in the area around Dease Lake. Systematic regional mapping by the Geological Survey of Canada began in 1956 with Operation Stikine, a reconnaissance mapping program covering four adjoining 1:250 000 map areas in northwestern BC (Geological Survey of Canada, 1957). Mapping and thematic studies conducted between 1956 and 1991 in the NTS 104I and 104J map areas are summarized by Gabrielse (1998). Most relevant to the current study is Anderson's work on the Hotailuh and Stikine batholiths (1983; 1984) and, more recently, 1:250 000 scale geological mapping of the Iskut River area (Anderson, 1993). P. Read of Geotex Consultants Ltd. (Vancouver, British Columbia) has conducted detailed mapping for the Geological Survey of Canada in the Stikine Canyon area (Read, 1983, 1984; Read and Psutka, 1990). Regional mapping projects by the BC Geological Survey include work to the south by Ash et al. (1997) around Tatogga Lake and farther west by Brown et al. (1996) in the Stikine River area.

The Dease Lake map area straddles the early Middle Jurassic thrust-imbricated boundary between the Cache Creek and Stikine terranes (Figure 2). At this latitude, the Stikine terrane comprises three overlapping island arc successions, which span 200 m.y. from Devonian to Middle Jurassic and include Stikine, Stuhini and Hazelton volcanic and sedimentary rocks. Their genetically related plutonic suites include the Devono-Carboniferous Forrest Kerr, the Late Triassic Stikine and Copper Mountain, the Early Jurassic Texas Creek and the Middle Jurassic Three Sisters (Anderson, 1983, 1993; Brown et al., 1996; Logan et al., 2000). These plutonic suites are the roots of cospatial arc rocks exposed along the Stikine arch, an east-trending area of uplifted Jurassic and older rocks that bound the northern margin of the Bowser Basin. Long-lived arc magmatism in the Stikine arch has produced diverse styles of magmatism (calcalkaline and alkaline) and large Cu–Au–Ag±Mo mineral deposits associated with some intrusive centres (i.e., KSM, Snip [MINFILE 104B 004], Galore Creek, Schaft Creek and Kemess).

The Cache Creek terrane, lying north of the King Salmon fault (KSF), consists of oceanic basalt, siliciclastic rocks and limestone of Carboniferous to Early Jurassic age. The terrane for the most part is overlain by Jurassic clastic sediments of the Inklin Formation comprising the southeastern extent of the Whitehorse Trough.

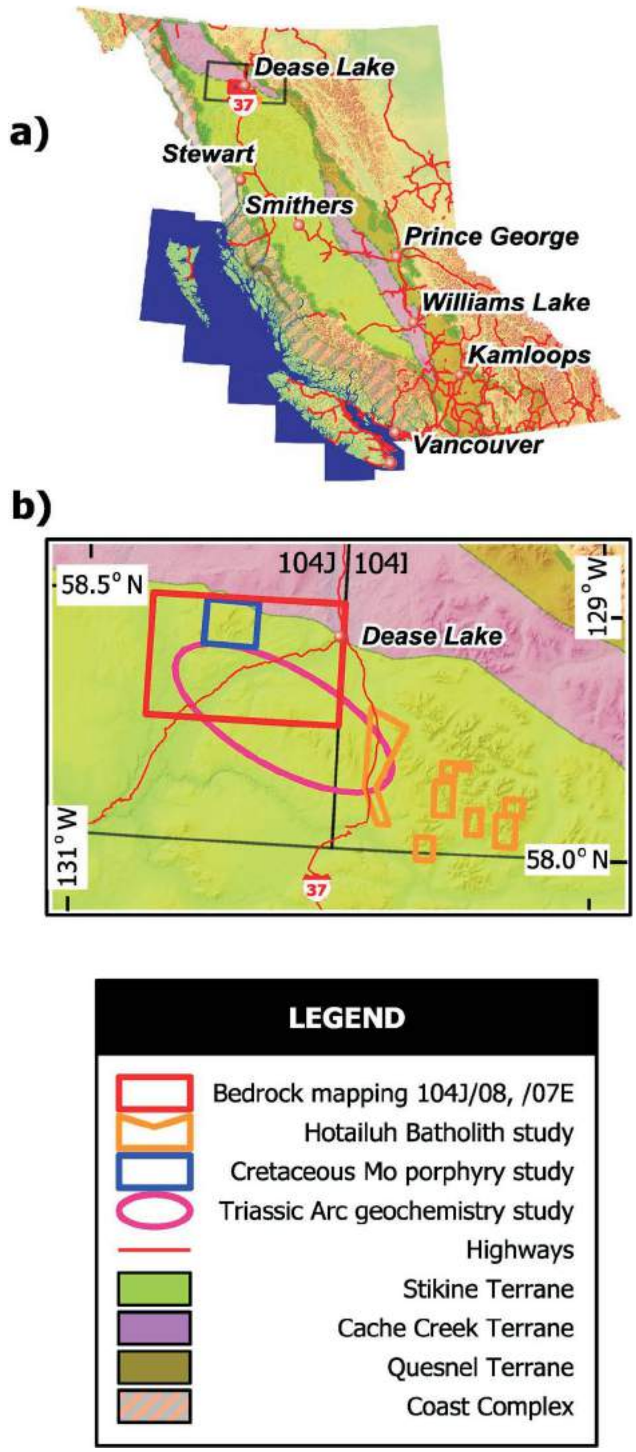


Figure 1. Location of the QUEST-Northwest mapping: British Columbia Geological Survey Dease Lake Geoscience Project on the a) BC terrane map (after Massey et al., 2005); b) detailed view straddles NTS 104J and 104I 1:250 000 map areas at Dease Lake, showing the locations of the bedrock mapping study (NTS 104J/08, /07E), the Hotailuh batholith study, the Snow Peak pluton study and the Triassic arc geochemistry study.

Project Objectives and Results to Date

The Dease Lake Geoscience Project consists of a systematic bedrock mapping study and three integrated topical studies. Together they cover regional aspects of stratigraphy, magmatic evolution and metallogeny along part of the Stikine arch and also within the broader footprint of the QUEST-Northwest airborne geophysical survey (Simpson, 2012).

Dease Lake Regional Bedrock Mapping

The main component, systematic regional bedrock mapping of the NTS 104J/08 and the east half NTS 104J/07 map areas was delivered with the following objectives:

- publishing 1:50 000 scale geological maps for 104J/08 and the east half of NTS 104J/07, a cumulative area of 1275 km^2, located immediately west of Dease Lake;
- determining U-Pb and Ar-Ar ages for layered and intrusive rock units as well as mineralized rocks in order to constrain magmatic and mineralizing events;
- establishing the geological controls for mineralized rocks, then comparing these regionally to metallogenic epochs between 220 and 190 Ma (i.e., Late Triassic [Cu–Mo±Au], Late Triassic to Early Jurassic [Cu-Au-Ag] and Cretaceous to Tertiary [Cu-Mo-W]), related to alkaline and calcalkaline plutonism known elsewhere in the Stikine terrane;
- determining the history of magmatism, tectonism and mineralization along the Dease Lake transect for comparison to other parts of the Stikine magmatic arc system.

Results

Regional-scale geological mapping was completed over a 1275 km^2 area extending southwest from the community of Dease Lake to the Tuya River during the 2011 summer field season. The map area includes NTS 104J/08 and the east half of NTS 104J/07 (Figure 3). Traverses were helicopter supported.

The map is underlain mainly by Paleozoic to Late Triassic sedimentary, volcanic and plutonic arc rocks of the Stikine terrane. In the northeastern part of the map, these are thrust imbricated with similarly aged volcanic and sedimentary oceanic rocks of the Cache Creek terrane along the north-dipping King Salmon fault. Early–Middle Jurassic sedimentary rocks of the Takwahoni and Inklin formations of the Whitehorse Trough overlie the Stikine and Cache Creek terrane rocks, respectively. An equidimensional Late Cretaceous granite intrudes the Early Jurassic Takwahoni sedimentary rocks, and columnar basalts of the Miocene–Pliocene Tuya Formation unconformably cap some of the highest peaks in the area. Preserved beneath these young basalts in the southwestern corner of the map are lower Ter-

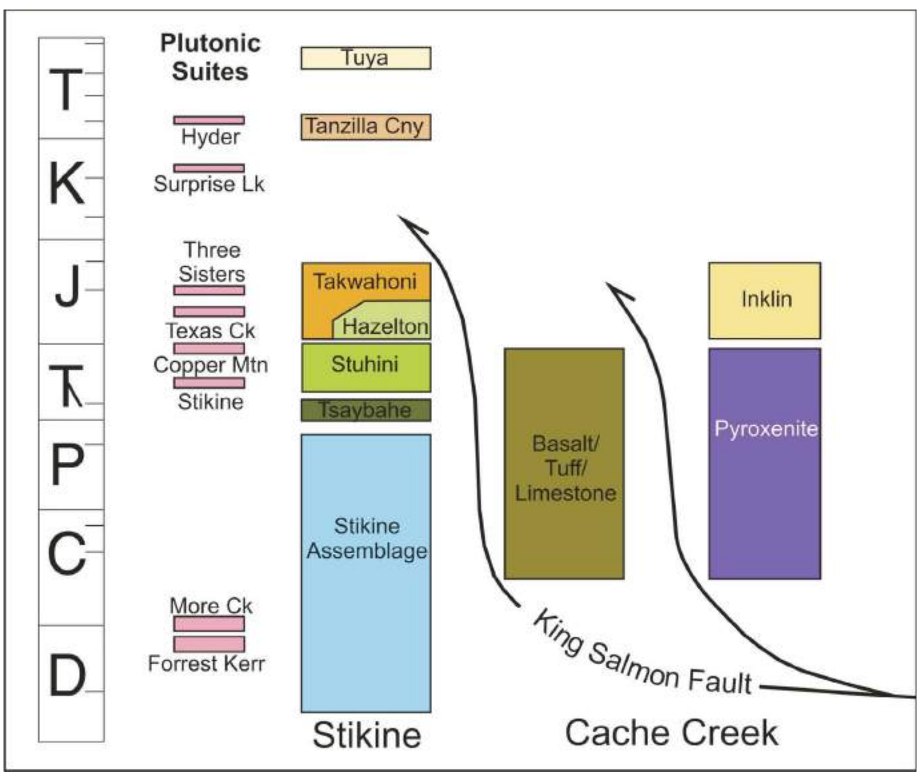


Figure 2. Schematic stratigraphic, plutonic and structural relationships for Stikine and Cache Creek terrane rocks within the map area (Abbreviations: Ck, creek; Cny, canyon; Mtn, mountain).

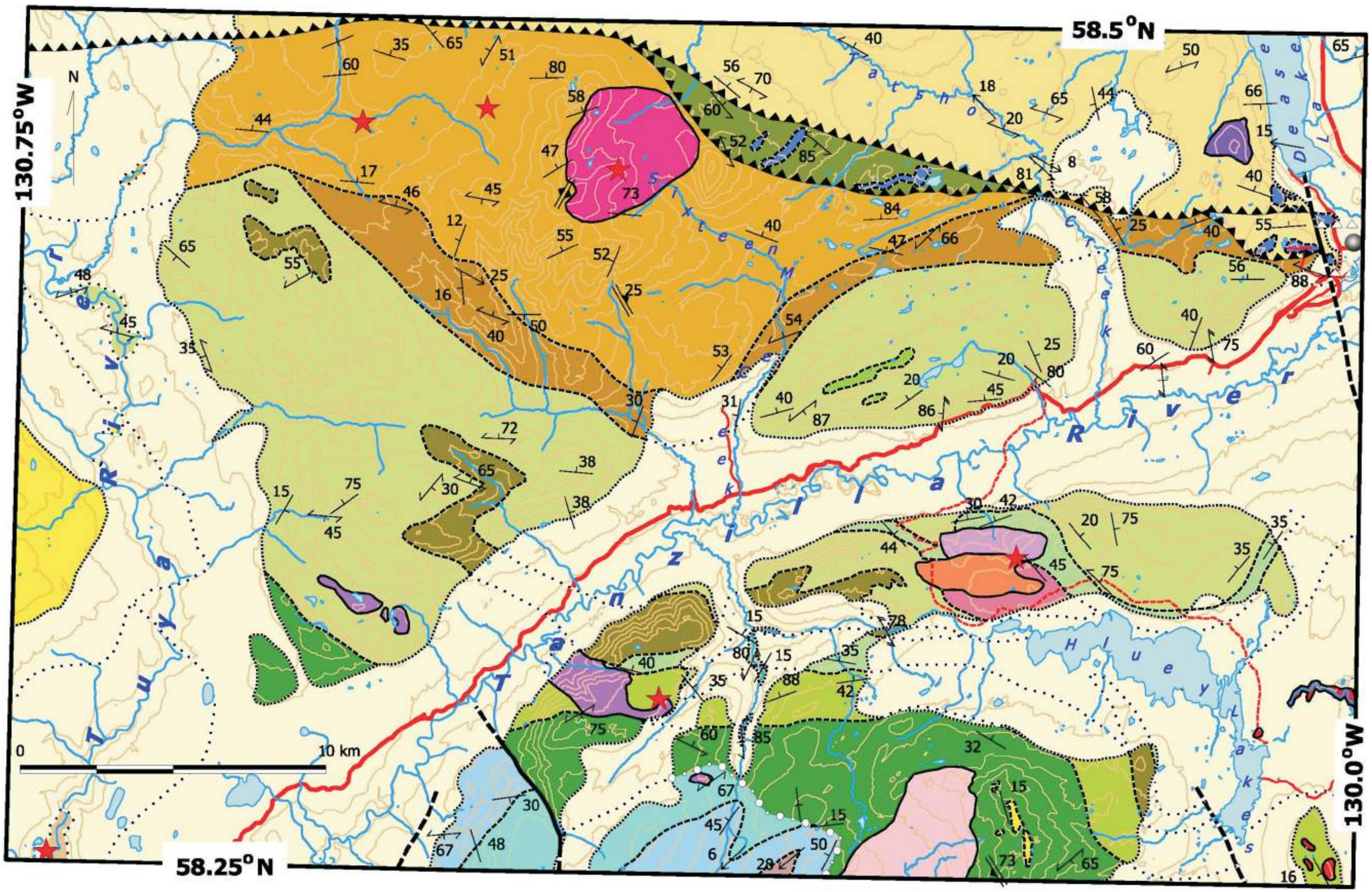


Figure 3. Generalized geology of the NTS 104J/08 and the east half of NTS 104J/07E map areas, including work by Ryan (1991) and Gabrielse (1998). Abbreviations: bio, biotite; brcc, breccia; congl, conglomerate; crse, coarse; hnbl, hornblende; monzn, monzonite; mudstn, mudstone; plag, plagioclase; px, pyroxene; qtz, quartz; sndst, sandstone; slstn, siltstone; xstl, crystal.

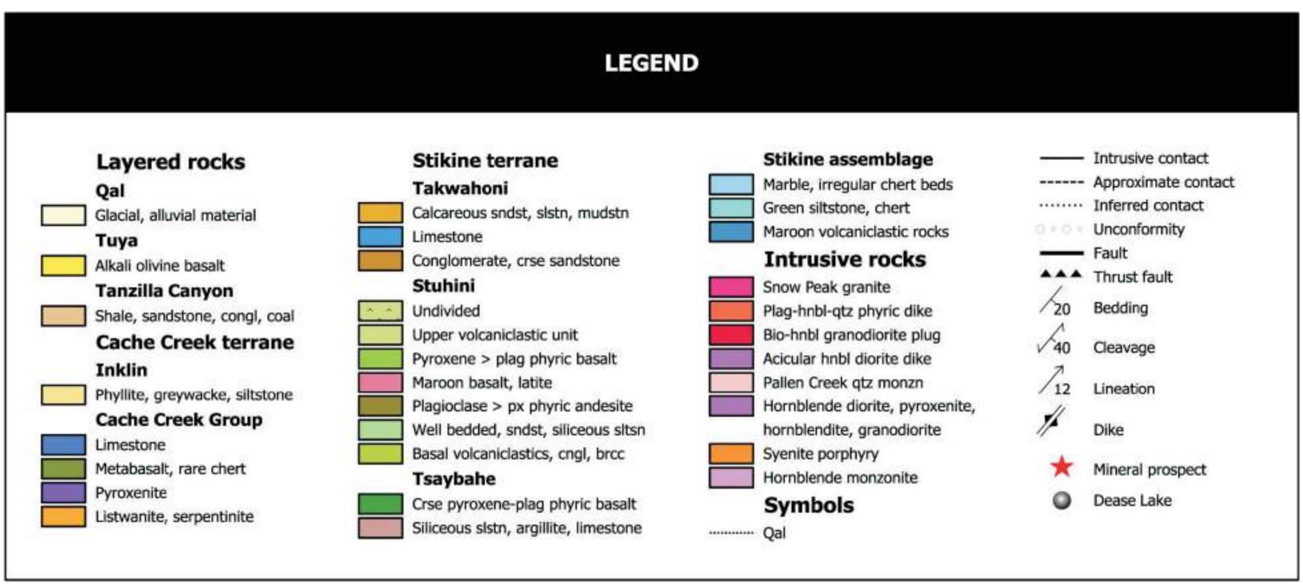
tiary coal-bearing sediments of the Tanzilla Canyon Formation.

South of the King Salmon fault, the oldest rocks in the map area are Permian limestone, phyllite, chert and metavolcanic rocks exposed in north- to northeasterly trending structural culminations (Figure 3). Despite generally poor exposures throughout the map area, a general stratigraphy can be recognized for the Triassic Stuhini Group, which in one locale (the headwaters of Itsillitu Creek) appears to unconformably overlie foliated limestone, chert and metavolcanic rocks of presumed late Paleozoic age. Here, the stratigraphic base comprises volcaniclastic beds and coarse pyroxene breccias. Early work on adjoining map areas to the south (Read, 1983, 1984) reported Early and Middle Triassic paleontological ages from cherty sedimentary rocks and coarse pyroxene breccias of the Tsaybahe group. However, no direct age constraints are known for the overlying pyroxene breccias in the current study area, which are characterized by thick accumulations of crowded augite-phyric basalt breccias and clastic volcanic rocks exposed at the tops of the ridges in the southern part of the map. These correlative Tsaybahe group basalt breccias dip north below a thick pile of mixed, bedded and reworked volcaniclastic rocks and rare basalt flows that generally fined upward into a well-bedded siliceous section of siltstone with Upper Triassic (?) bivalves. These are overlain by a thick package of coarse plagioclase-phyric andesitic basalt flows, in turn overlain by more massive plagioclase- and pyroxene-dominated volcaniclastic units (Stuhini?) identical to the thick-bedded volcaniclastic units that overlie the Tsaybahe group basalts. The uppermost Triassic volcaniclastic and flow unit is unconformably (?) overlain by quartz-bearing conglomerate and sandstone rocks of the Early Jurassic Takwahoni Formation.

North of the King Salmon fault are structurally imbricated north-dipping panels of Cache Creek rocks that comprise the King Salmon allochthon (Figures 2, 3). The structurally lowest panel consists of massive metabasite, tuff and limestone of presumed Carboniferous–Permian age and is marked along its structural hangingwall contact by serpentinized ultramafic rocks and zones of listwanite alteration. The latter is characterized by dun- to orange-weathering foliated zones containing various amounts of chrome-rich mica, quartz veining and often pyrite. Structurally overlying this panel and comprising the northeastern portion of the map area are fine-grained, well-bedded and variably foliated clastic rocks of the Inklin Formation. Within this panel and west of the south end of Dease Lake are a large pyroxenite body and three west-trending large outcrops of recrystallized massive limestone correlated with the Upper Triassic Sinwa limestone (Gabrielse, 1998).

Two stages of deformation affect rocks within the map: the earlier is characterized by northwest-trending, southwest-verging folds and faults associated with the King Salmon fault. This deformation is related to the early Middle Jurassic obduction of the Cache Creek terrane onto the Stikine terrane. The later deformational event is characterized by north-trending structures that gently warp the earlier northwest-trending structures and fold rocks as young as Tertiary (Ryan, 1991).

Metallic mineral occurrences within the map area include two alkalic porphyry Cu-Au prospects located south of the Tanzilla River in massive volcaniclastic rocks of the Stuhini Group, a porphyry Mo-Cu-W prospect (Mack; MINFILE 104J 014) within the Cretaceous Snow Peak pluton that intruded Takwahoni sediments near the headwaters of Sixteen Mile Creek, and a Ag–Pb–Zn±Au quartz vein showing (Mac; MINFILE 104J 064) associated with



dikes cutting Takwahoni sedimentary rocks west of the Mack prospect. The Hu alkalic porphyry Cu-Au prospect (MINFILE 104J 013) is associated with an east-trending multiphase syenite-monzonite intrusion adjacent to the Hleuy Lake Hydroelectric Power Station and the Tan showing (MINFILE 104J 036) is related to a southeast-trending composite pyroxenite-amphibolite-monzonite body. Geochemical and assay samples (n = 15) characterizing base- and precious-metal mineralization have been collected and submitted for analyses at Acme Labs in Vancouver, British Columbia and will be reported in the BC Geological Survey's Geological Fieldwork 2011 volume (Logan et al., 2012).

Along Tuya Creek, at the southwestern margin of the map (Figure 3), between 5 to 30 m of high volatile B bituminous coal occurs within the Lower Tertiary, Paleocene sediments of the Tuya River coal basin (Ryan, 1991). This area was not visited during the current mapping program.

In addition to collecting lithological descriptions, structure data and geochemical and assay rock samples, magnetic susceptibilities were routinely collected for stratified and plutonic rocks from the map areas. This data provides rock-type–specific characterization and ground-truthing capabilities to interpret the airborne magnetic survey results.

Isotopic age dating is currently underway to provide constraints on volcanic, plutonic and mineralizing events. Eleven samples have been submitted for U-Pb, zircon crystallization age determinations by laser ablation inductively coupled plasma–mass spectrometry (ICP-MS) and eight samples for Ar-Ar step heating on hornblende and biotite separates. These data will be reported on as results are received. In addition, two detrital zircon samples will be analyzed to complement other samples of the Tsaybahe group collected in the Tsaybahe study (Iverson and Mahoney, 2012).

Detrital zircon samples were collected from medium-grained sandstone in a Stuhini volcaniclastic member, and from the basal section of the Takwahoni Formation. They will be used to evaluate the uplift and evolution of sediment source regions and complement the stratigraphy determined from field mapping. These results compared to detrital zircons recovered from the Tsaybahe study (Iverson and Mahoney, 2012) will test if the Stuhini Group is significantly younger than rocks assigned to the Tsaybahe group.

Hotailuh Batholith: Intrusive Phases, Ages and Related Mineralization

The Hotailuh batholith study, led by B. van Straaten, focuses on the magmatic evolution and mineral potential of the Triassic–Jurassic Hotailuh batholith and its surrounding volcanosedimentary rocks. The Hotailuh batholith is well exposed in a 2275 km^2 area southeast of Dease Lake and mainly east of Highway 37. The batholith coincides with approximately one third of the QUEST-Northwest Block 1 airborne geophysical survey (Simpson, 2012) and contains a wide variety of intrusion-related mineral occurrences including the Gnat Pass porphyry Cu developed prospect (Figure 1). The objectives of this project include

- further developing the temporal magmatic and geochemical evolution of the Hotailuh batholith and refining the geochronology (U-Pb) of magmatic events and the geochemistry of plutons;
- establishing the formation and preservation potential for magmatic-hydrothermal mineral deposits within the batholith;
- reconstructing the pressure, temperature, time and deformation (P-T-t-D) history of plutonic suites using geothermobarometry, geochronology and thermochronology; and
- building a metallogenic framework that relates mineralizing and magmatic events.

Results

Nine weeks of fieldwork by two people covered an area of 30 × 40 km, focused on mapping within the mineralized Gnat Pass corridor and seven smaller areas (Figure 1) chosen for their association with mineral occurrences and suitability for understanding the internal geology of the batholith. The Hotailuh batholith comprises three distinct plutonic suites (Anderson, 1983; Anderson and Bevier, 1990): the Late Triassic Stikine (Cake Hill, Beggerlay Creek and Gnat Lake plutons), the Early Jurassic Texas Creek (McBride River pluton) and the Middle Jurassic Three Sisters (Three Sisters pluton; Figure 2, Table 1). Each plutonic suite generally consists of several individual plutons and/or plutonic phases. The crosscutting relationships between plutonic suites established by Anderson

Table 1. Ages of plutonic suites and composition of plutons comprising the Hotailuh batholith.

Age	Pluton	Lithology
Middle Jurassic	Three Sisters, potassic phase	Biotite quartz syenite, granite
	Three Sisters, central phase	Biotite quartz monzonite, quartz monzodiorite
	Three Sisters, mafic phase	Acicular hornblende diorite
	Three Sisters, fine-grained phase	Hornblende diorite
Early Jurassic	McBride River	Hornblende granodiorite
Late Triassic	Beggerlay Creek	Hornblende-rich diorite/gabbro
	Cake Hill	Hornblende quartz monzodiorite, quartz monzonite
	Gnat Lake	Plagioclase-bearing ultramafic

(1983) were mostly confirmed in this study; however, a notable exception is the Gnat Lake ultramafite, which is crosscut by Cake Hill dikes at one location (van Straaten, 2012). Contact relationships between the Late Triassic (?) Beggerlay Creek and Cake Hill plutons was not observed, nor was the relationship between the apparently oldest fine-grained mafic phase of the Three Sisters pluton with any younger phases, due to the lack of exposed contacts. However, several external contact relationships were (re)defined. For example, the plutonic rocks that contact metamorphosed Toarcian sediments were previously assigned to the Late Triassic Cake Hill, but they are more likely related to the McBride River pluton. Also, the predominantly mafic Beggerlay Creek pluton was shown to comprise several ultramafic domains that resemble the Gnat Lake ultramafite. Lithogeochemistry and geochronology is underway to test this suggestive genetic link between the Beggerlay Creek and Gnat Lake bodies.

Results of the field program include 331 field stations and 134 samples collected for follow-up study and analysis. Five mineral showings were visited (Gnat Pass [MINFILE 104I 001], BCR [MINFILE 104I 068], Pat [MINFILE 104I 043], Mat [MINFILE 104I 034] and Dalvenie [MINFILE 104I 003]). Fieldwork also resulted in the discovery of seven new mineralized and altered zones within the Hotailuh batholith. Mineralized samples were collected and submitted for base- and precious-metal analyses; results are pending. Four of the new zones are hosted in Late Triassic rocks and include 1) a 10 cm wide vein of massive pyrite with trace copper in the Cake Hill pluton close to Highway 37; 2) metre-scale zones of disseminated pyrite and bornite in the Cake Hill pluton 3 km northeast of the Mat showing; 3) several percent disseminated pyrite in narrow zones within the Gnat Lakes ultramafite; and 4) pyritic fault zones cutting a large Stuhini inclusion within the Cake Hill pluton, approximately 9 km north-northwest of the McBride–Stikine river confluence. The remaining three zones are hosted in Middle Jurassic intrusive rocks and include quartz+pyrite±copper sulphide veins located 1) approximately 5 km southwest of the Pat showing, 2) on the northern edge of the Three Sisters fine-grained body, and 3) approximately 3 km north of the Three Sisters fine-grained body (van Straaten, 2012).

The presence of mineralization in both the Late Triassic (Cake Hill) and Middle Jurassic (Three Sisters) rocks is suggestive of at least two mineralizing events within the Hotailuh batholith. Based on current observation within the batholith, the ca. 171 Ma Three Sisters intrusions apparently host more mineral showings than the ca. 221 Ma Cake Hill intrusions.

The Cake Hill pluton is overlain nonconformably by Upper Triassic and younger rocks (Anderson, 1983; Gabrielse, 1998), suggesting uplift and erosion following its emplacement but prior to the end of Late Triassic arc magmatism and later intrusion by Middle Jurassic Three Sisters plutonism. The determination of relative pluton emplacement depths and subsequent exhumation levels have important implications for the formation and preservation potential of porphyry and epithermal deposits. Hornblende geothermobarometry and zircon thermochronology on a select suite of plutonic rocks associated with mineral prospects will be used to assess depth of emplacement and levels of erosion.

Snow Peak Pluton: Age, Emplacement and Mineralization

Late Cretaceous Mo and Cu-Mo mineralization is a well-established Cordilleran-wide metallogenic event. At Snow Peak, sedimentary rocks of the Jurassic Takwahoni Formation are intruded by pre-, syn- and postkinematic porphyry dikes and a circular Cretaceous granitoid. Porphyry Cu-Mo mineralization is present in the Cretaceous Snow Peak pluton and evaluating the magma evolution, emplacement depth and controls on mineralization was the focus of D. Moynihan's fieldwork (Moynihan, 2012). The objectives of his research include

- establishing the age relationships between the Cretaceous Snow Peak pluton and spatially associated minor intrusions; and
- characterizing the molybdenite mineralization associated with Cretaceous magmatism at the Snow Peak (i.e., Mack) prospect.

Results

The Snow Peak pluton is a steep-sided 15 km^2 equidimensional body that was intruded into Early Jurassic rocks of the Takwahoni Formation in the Late Cretaceous. The intrusion is a biotite-hornblende monzogranite to quartz monzonite with equigranular and locally K-feldspar–phyric textures. Molybdenite mineralization is developed along west-northwest-trending brittle fracture planes in the central part of the pluton.

The Takwahoni Formation adjacent to the Snow Peak pluton hosts a swarm of dikes and sills, many of which are hornblende-bearing plagioclase porphyry with distinctive round quartz phenocrysts. Field relations indicate that the dike swarm is crosscut by the pluton, suggesting dikes may have a separate origin unrelated to the pluton and its Mo-Cu mineralization. The U-Pb and Re-Os geochronology is currently being undertaken to establish absolute ages of the pluton, the dike swarm and Mo mineralization.

Intrusion of the Snow Peak pluton led to the formation of a contact metamorphic aureole in surrounding rocks of the Takwahoni Formation. The aureole is manifested in a rusty zone of hornfelsed rock, often with a purple tint. Contact metamorphic biotite is developed over a broad area, and adjacent to the contact, metasiltstone and mudstone have been converted to spotted hornfels with abundant cordierite porphyroblasts. Cordierite-bearing assemblages indicate low-pressure metamorphism, and petrological work is in progress to provide quantitative constraints on the emplacement depth.

Depositional Setting and Geochemical Evolution of Tsaybahe and Stuhini Volcanism

A final study undertaken by O. Iverson will compare lithostratigraphic features and geochemical data collected from several reference stratigraphic sections through the Middle Triassic Tsaybahe group and the Late Triassic Stuhini Group. This research aims to test the consanguinity of these superposed stratigraphic successions, potentially providing insight on earliest deposition and evolution of the Triassic arc magmatism in the Stikine arch.

In the vicinity of the Stikine Canyon, the Tsaybahe group (Read, 1984; Read and Psutka, 1990) was named informally for sedimentary and volcanic rocks characterized by abundant coarse pyroxene-phyric breccias and Early and Middle Triassic fossils. They distinguished it from the Stuhini Group, which they characterized as being primarily sedimentary and Late Triassic in age. Subsequent workers (Gabrielse, 1998; Evenchick and Thorkelson, 2005) could not distinguish the volcanic and sedimentary rocks of the Tsaybahe group from those of the Stuhini Group on a regional basis and therefore consigned all Triassic units to the Stuhini Group.

Iverson collected rock samples from both stratigraphic packages as part of a B.Sc. thesis supervised by Mahoney at the University of Wisconsin. The objectives of her research include

- comparing lithogeochemical features of Tsaybahe and Stuhini group volcanic rocks; and
- proposing a model for deposition of the Tsaybahe group and its relationship to the Stuhini Group.

Results

Lithogeochemical samples of the Tsaybahe group (n = 22, primarily clinopyroxene-phyric basalt), the Stuhini Group (mixed pyroxene-phyric, plagioclase-phyric, alkalic latite, n = 17) and the Hazelton Group (plagioclase-phyric andesite, n = 1) volcanic rocks were collected during the course of the mapping following the unit designations of Read and Psutka (1990), Gabrielse (1998) and this study.

Detrital zircon samples were collected from fine-grained sediments located structurally and stratigraphically below the coarse clinopyroxene-phyric breccias of the Tsaybahe group at two locations: 5 km east of Gnat Pass and 2 km east of Tsenaglode Lake. The former sample was collected from a quartz-bearing tuffaceous horizon recognized within a well-bedded, 800 m thick section of dark siltstone, sandstone and lesser conglomerate that underlies the volcanic rocks. East of Tsenaglode Lake, similar fine-grained siltstone and sandstone underlie a 200 m thick pile of coarse pyroxene-phyric breccias but here the contact is intruded and the sediments are contact metamorphosed by Middle Jurassic (?) monzonite.

Chemical analyses of the volcanic samples and heavy mineral separation for detrital zircon studies of interlayered sedimentary horizons are currently underway at the University of Wisconsin. The results of these studies together with a stratigraphy and environment of deposition constitute Iverson's thesis study (Iverson and Mahoney, 2012).

Conclusions

The BC Geological Survey Dease Lake Geoscience Project is part of the new QUEST-Northwest project initiated by Geoscience BC. The program consists of four field-based integrated research projects designed to investigate the stratigraphy, magmatic evolution and metallogeny along the Stikine arch in the vicinity of Dease Lake. The project was initiated in the summer of 2011 and results of the mapping project will be released as a Geoscience BC Report and a BC Geological Survey open file. Preliminary accounts of the integrated research projects will also be published in BC Geological Survey's Geological Fieldwork 2011 volume.

Acknowledgments

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