Development of a database for geoscience field observations, west-central British Columbia

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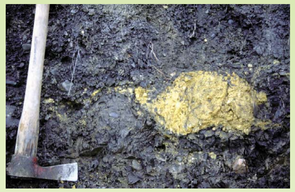
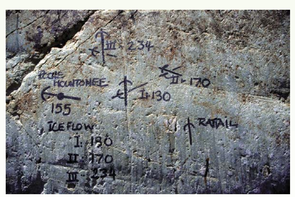


Clayey glacial till, Bell Mine

Glacially-fluted bedrock, Dome Mountain

Glacial sediments in river cut, southwest of Smithers



Glacier flow indicators on bedrock, Bell Mine

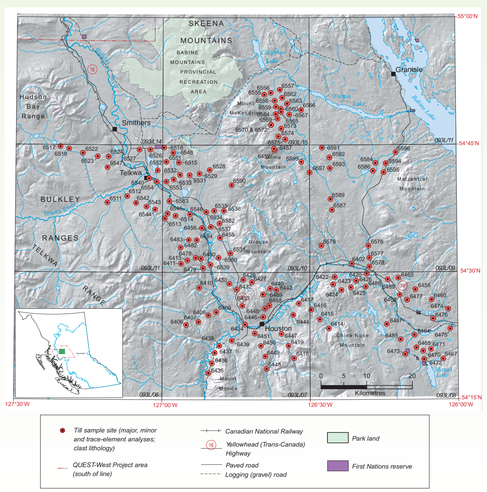
INTRODUCTION

The recording, analysis and publication of field observations, measurements and interpretations are an integral part of developing geoscience investigations. Historically, these field-acquired data and associated research materials were recorded, compiled and maintained in hard copy by individual scientists using various schemas.

To this end, a database was developed to store observations made in the field for the Geoscience BC–supported project, Surficial Geochemistry and Lithology of the Bulkley River Valley, Central British Columbia, which is currently only available from the author in hard copy.

PROJECT

This project is centred along the Bulkley River valley and adjacent areas approximately 340 km east of Prince Rupert and 400 km west of Prince George. The project is in part of NTS map area 093L within Geoscience BC's QUEST-West Project area and Mountain Pine Beetle–Impacted Zone.



Till sample site (major, minor and trace-element analyses; clast lithology)
QUEST-West Project area (south of line)
Canadian National Railway
Yellowhead (Trans-Canada) Highway
Paved road
Logging (gravel) road
Park land
First Nations reserve

THE DATABASE

A database was developed using Microsoft® Access® 2010 to input field data recorded at a total of 146 sampling sites for a study of the till geochemistry and clast lithology. At each sample site, a series of observations were made describing the site location and conditions, landscape position and vegetation, and properties of the geological materials. This information was inputted into the database via either a write-access form or three database tables. The database structure allow for easy querying and ability to append to and edit the data housed in the database. Because the database was constructed using an industry-standard database system, data can easily be exported to other systems (e.g., Oracle®, MySQL®) or linked with GIS software.

TABLE_FIELD	TYPE	LENGTH	FORM EXPLANATION
SYS_ID	NUM	12	sequential, system-generated identifier
ID	CHAR	4	sample number in survey
YEAR	CHAR	4	year sample was collected
DAY_MONTH	CHAR	4	day and month sample was collected
MASTER_NUM	CHAR	15	unique samples identification – combines type of regional sample, NTS map sheet number, collection year, and original sample site number (e.g., TILL93L09966402)
TYPE	CHAR	7	type of regional survey
STATUS	CHAR	2	sample quality control identifier

TABLE_FIELD	TYPE	LENGTH	FORM EXPLANATION
SYS_ID	NUM	12	sequential, system-generated identifier
COLLECTOR	CHAR	15	initials of field scientist(s) collecting the sample
MAP50	CHAR	5	NTS 1:50,000 scale map
UTME83	NUM	14	site location UTM easting (6 decimal places)
UTMN83	NUM	14	site location UTM northing (6 decimal places)
UTMZ	NUM	2	site location UTM zone
LAT	NUM	10	latitude in decimal degrees (6 decimal places)
LONG	NUM	10	longitude in decimal degrees (6 decimal places)
ELEV	NUM	5	elevation of site location (in feet)
DEPTH	NUM	3	depth of sample (1 decimal place) (in metres)

TABLE_FIELD	TYPE	LENGTH	FORM EXPLANATION
SYS_ID	NUM	12	sequential, system-generated identifier
UNIT	CHAR	5	deposit type and thickness/depositional process
MATERIAL	CHAR	5	sampled material type and texture
EXPOSURE	NUM	1	condition that material is exposed
TERRAIN	NUM	1	position of site location on slope
TERRAIN_COM	CHAR	100	topographic position (verbose description)
ASPECT	NUM	3	azimuth of slope (degrees)
SLOPE	NUM	2	inclination of land surface (degrees)
DRAINAGE	NUM	2	drainage class
VEGETATION	CHAR	10	predominant tree species
SOIL	NUM	3	thickness of soil horizon (m)
FISSILITY	NUM	1	degree of fissility developed
DENSITY	NUM	1	field measure of density, consistency, or compaction
OXIDATION	NUM	1	degree of oxidation
JOINTING	NUM	1	density of joints and fractures
MATRIX	NUM	2	proportion of matrix material (percent)
MATRIX_COLOUR	CHAR	3	primary color of matrix material
MATRIX_TEXTURE	CHAR	15	in field estimate of matrix texture
CLAST_MODE	NUM	2	average size of pebbles
MAX_CLAST_SIZE	NUM	3	maximum size of clasts (cm)
CLAST_SHAPE	NUM	1	dominant shape of clasts
CLAST_STRIATED	NUM	3	proportion of striated clasts in bulk sample (percent)
BEDROCK_LITH	CHAR	8	bedrock lithology at site location (if exposed)
COMMENTS	CHAR	100	descriptive details relating to sedimentology, geology, site location, etc.

DATE: 18-AUG-1996 **ID:** 6458
COLLECTOR: DM, AS **NTS MAP:** 093L/08
STATUS: X Routine __ First duplicate __ Second duplicate
Easting: 685250 **Northing:** 6039200 **ELEV (ft.):** 2523
MAP UNIT: Mb^R **MATERIAL:** czDmm
DEPTH: 1.2 m
EXPOSURE: X Roadcut __ Str./Lake cut __ Bor. pit __ Dug hole
TOPO POSITION: __ Flat X L.slope __ M.slope __ U.slope __ Crest
ASPECT: NW **SLOPE (deg.):** 2
DRAINAGE: X Poor X Moderate __ Well
VEGETATION: X Lodgepole Pine X Spruce __ Other
SOIL (cm): X Dist. __ LFH __ Ah __ Ae __ Bm __ Bf __ Bt
FISSILITY: __ None __ Weak __ Moderate X Strong
DENSITY: __ Loose __ Stiff X Hard
OXIDATION: __ None X Mild X Moderate __ High
JOINTING: __ None __ Weakly X Moderate __ Well
MATRIX %: __ 60 __ 70 X 80 X 90 __ Other
COLOUR: gb - grey brown
TEXTURE: __ S __ Z __ ZS __ SZ X Other
CLASTS %: Mode: __ S __ M X L __ Pbl Max (cm): ___
SHAPE: __ A __ SA X SR __ R X WR
STRIATED: __ none __ <1 % __ 1–10 % X >10 %
BEDROCK: green- and maroon-coloured siltstone and sandstone
COMMENTS: Site location at bottom of SE-trending (100°) fluted ridge; 50 m to east of site is exposed basalt (vesicular) with green amygdules and malachite staining; sampled bedrock

YEAR	Year sample collected
DAY_MONTH	Day and month sample collected
TYPE	Type of regional survey: TS - till, LITH - clast lithology
ID	Sample site number
COLLECTOR	Scientist(s) that collected the sample: AS - Andrew Stumpf, EB - Erin O'Brien, LV - Victor Levson, DM - Dan Meldrum, DH - David Huntley, CC - Craig Churchill
MAP50	National Topographic System (NTS) 1:50,000 scale map (in 093L)
STATUS	Identifies the collection of multiple samples from a single site. Quality control identifier: 00 – routine sample, 10 – first field duplicate, and 20 – second field duplicate
UTMZ	Site location UTM zone
UTME83	Site location UTM easting (metres) referenced to NAD 1983 datum
UTMN83	Site location UTM northing (metres) referenced to NAD 1983 datum
LAT	Latitude (decimal degrees) calculated from NAD83 UTM coordinates
LONG	Longitude (decimal degrees) calculated from NAD83 UTM coordinates
ELEV	Elevation of land surface (in feet above mean sea level) taken from BC TRIM map
DEPTH	Depth of sample from land surface (in metres)
UNIT	Surficial deposit type and thickness/depositional process: M - morainal, FG - glaciofluvial sediments LG - glaciolacustrine sediments, C - colluvial, and R - bedrock; map symbol: b - blanket, v - veneer, r - redeposited; * - overlying (e.g., FG*Mb – glaciofluvial sediments over morainal blanket)
MATERIAL	Sample material type: Dmm - diamicton (massive, matrix-supported), G - gravel, S - sand, Z - silt, C - clay; prefix: s - sandy, z - silty, c - clayey, g - gravelly (e.g., sDmm – sandy to silty diamicton)
EXPOSURE	Sample material exposed in: 1 - roadcut, 2 - shore of river or lake, 3 - borrow pit, 4 - hand-dug hole
TERRAIN	Position of site location on slope: 1 - flat, 2 - lower slope, 3 - midslope, 4 - upper slope, 5- ridgecrest
TERRAIN_COM	Topographic position (verbose description)
ASPECT	Azimuth (direction) that the land surface is sloping
SLOPE	Inclination of the land surface at the site location
DRAINAGE	Drainage class: 1 - poor, 2 - moderate, 3 - well Note: 0.5 is intermediate between any two classes.

VEGETATION	Dominant tree species at site location: al - alder, as - aspen, b - birch, bf - balsam fir, cc - clearcut, d - deciduous, f - fir, j - juniper, p - lodgepole pine, pop - poplar, s - spruce, saf - subalpine fir, sw - swamp, ws - white spruce
SOIL	Thickness (m) of soil horizon(s); X - disturbed ground
FISSILITY	0 - none, 1 - weak, 2 - moderate, 3 - strong
DENSITY	1 - loose, 2 - stiff, 3 - hard
OXIDATION	0 - none, 1 - mild, 2 - moderate, 3 - high Note: 0.5 is intermediate between any two classes.
JOINTING	0 - none, 1 - few, 2 - some, 3 - many
MATRIX	Proportion of matrix material in bulk sample: 60, 70, 80, 90
MATRIX_COLOUR	Matrix colour: b - brown, bl - blue, bt - blue tinge, cb - chocolate brown, db - dark brown, dg - dark grey, dgr - dark green, dgb - dark greyish brown, dr - dark red, g - grey, gb - grey brown, gr - green, lb - light brown, lg - light grey, o - orange, ob - orange brown, ol - olive, p - purple, r - red, rb - reddish brown, y - yellow, t - tan, tb – tan brown
MATRIX_TEXTURE	Matrix texture: 1 - sandy, 2 - silty, 3 - silty sand, 4 - sandy silt, 5 - other (see comments)
CLAST_MODE	Size of pebbles: 1 - small pebble, 2 - medium pebble, 3 - large pebble. Note: 0.5 is intermediate between any two mode classifications.
MAX_CLAST_SIZE	Maximum clast size observed (b-axis dimension in cm)
CLAST_SHAPE	Shape of clasts: 1 - angular, 2 - sub-angular, 3 - sub-rounded, 4 - rounded, 5 - well rounded. Note: 0.5 is an intermediate value between any two shape classifications.
CLAST_STRIATED	Proportion of striated clasts: 0 - none, 1 - rare (<1 %), 2 - common (1-10 %), 3 - abundant (>10 %)
BEDROCK_LITH	Bedrock lithology: n/v - not exposed, AND - andesite, B - basalt, CH - chert, CONG - conglomerate , DIO - diorite, FP - feldspar porphyry, GR - granitic, GRD - granodiorite, GW - greywacke, LAPT - lapilli tuff, LST - limestone, METSEDS - metasediments, MS - mudstone, RHY - rhyolite, SS - sandstone, SH - shale, SY - syenite, T - tuff, VC - volcaniclastics, ZS - siltstone, GRN - greenstone, COAL - coal
COMMENTS	Relevant information about the sedimentology, geology, location, or site characteristics

Scan for more information

CONCLUSION

This database will provide access to ancillary information collected as part of a geochemical survey that can be incorporated into a wide range of exploration and research activities and assist in the planning of detailed surveys and targeted studies. In addition, the database has a digital framework that is compatible with other data repositories maintained by Geoscience BC and the BC Geological Survey.

ACKNOWLEDGMENTS

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