BC Ministry of Energy Mines and Petroleum Resources

1895 - 1995 100 YEARS OF GEOLOGICAL SURVEYING

Geological Survey Branch

GEOSCIENCE MAP 1995-3

(Sheet 1 of 4)

PURCELL SUPERGROUP
SOUTHEASTERN BRITISH COLUMBIA

STREAM SEDIMENT GEOCHEMISTRY
NTS 82G; 82F/E; 82J; 82K/E

Compiled by: W. Jackaman, S.J. Sibbick and P.F. Matysek

0 10 20 30 40 Kilometers

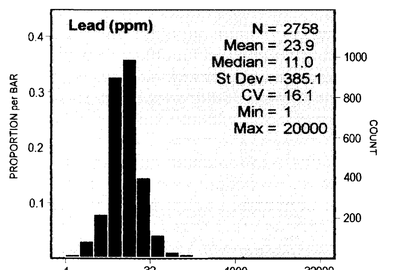
1:250 000

North American Datum 1983 - Universal Transverse Mercator Projection

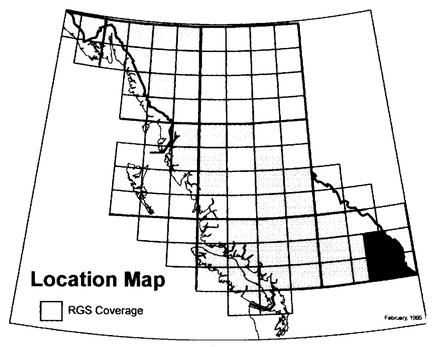
Lead by AAS

Percentile (Frequency)	Concentration
> 95 (n=283)	24 ppm
81 to 95 (n=1084)	11 ppm
51 to 80 (n=1081)	5 ppm
<= 50 (n=310)	

CONCENTRATION RANGES ARE CALCULATED FROM THE PROVINCIAL RGS DATA SET (N = 33,135).



DISTRIBUTION OF LEAD IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)



Sources of Data

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Nelson (NTS 82F); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 30.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Fernie (NTS 82G); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 27.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Kananaskis Lakes (NTS 82J); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 28.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Lardeau (NTS 82K); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 31.

Kootenay Lake

51° 50° 49° 117° 116° 115° 114°

B.C. Regional Geochemical Survey Program

Regional geochemical surveys provide a representative measurement of the concentration of metals in the environment. Resultant data depict the natural variability of metals of the Earth and highlight areas of elevated or depleted concentrations. In British Columbia, regional geochemical surveys commonly evaluate areas covering in excess of 100,000 square kilometres. Stream sediment and water samples are collected from first or second order drainage basins which have an average area of 10 to 13 square kilometres. Fine-grained stream-sediment is the preferred sample medium due to its ability to provide representative geochemical data for the drainage basin upstream from the sample site.

Since 1976, data from joint federal-provincial surveys have been systematically collected, compiled and published. Currently, the Regional Geochemical Survey (RGS) database contains determinations for up to 40 elements, field observations and sample location information for approximately 36,000 sample site locations covering over 65% of the province.

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Catchment Basins

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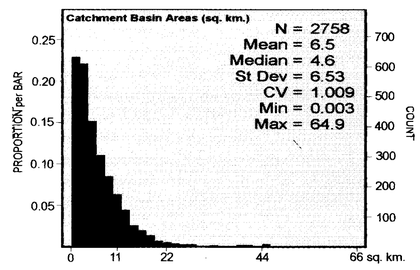


DISTRIBUTION OF CATCHMENT BASIN AREAS
IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)

BC Ministry of Energy Mines and Petroleum Resources

1895 - 1995 100 YEARS OF GEOLOGICAL SURVEYING

Geological Survey Branch

GEOSCIENCE MAP 1995-3

(Sheet 2 of 4)

PURCELL SUPERGROUP

SOUTHEASTERN BRITISH COLUMBIA

STREAM SEDIMENT GEOCHEMISTRY

NTS 82G; 82F/E; 82J; 82K/E

Compiled by: W. Jackaman, S.J. Sibbick and P.F. Matysek

0 10 20 30 40 Kilometers

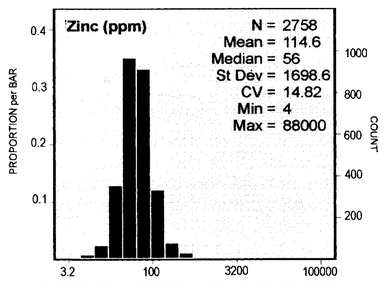
1:250 000

North American Datum 1983 - Universal Transverse Mercator Projection

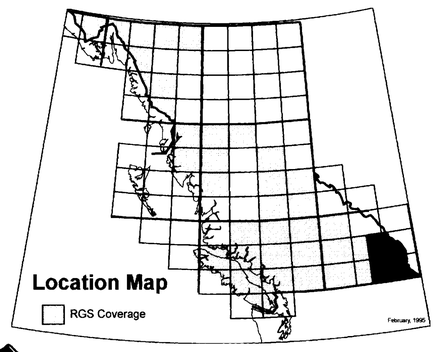
Zinc by AAS

Percentile (Frequency)	Concentration
> 95 (n=124)	162 ppm
81 to 95 (n=391)	94 ppm
51 to 80 (n=748)	59 ppm
<= 50 (n=1495)	

CONCENTRATION RANGES ARE CALCULATED FROM THE PROVINCIAL RGS DATA SET (N = 33,135).



DISTRIBUTION OF ZINC IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)



Sources of Data

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Nelson (NTS 82F); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 30.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Fernie (NTS 82G); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 27.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Kananaskis Lakes (NTS 82J); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 28.

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Lardeau (NTS 82K); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 31.

Kootenay Lake

51°
50°
49°
117°
116°
115°
114°

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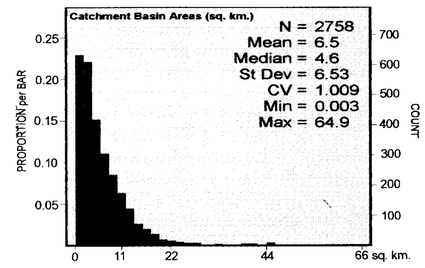


DISTRIBUTION OF CATCHMENT BASIN AREAS
IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)

BC
Ministry of Energy Mines and Petroleum Resources

1895 - 1995
100 YEARS OF GEOLOGICAL SURVEYING

Geological Survey Branch

GEOSCIENCE MAP 1995-3

(Sheet 3 of 4)

PURCELL SUPERGROUP
SOUTHEASTERN BRITISH COLUMBIA

STREAM SEDIMENT GEOCHEMISTRY
NTS 82G; 82F/E; 82J; 82K/E

Compiled by: W. Jackaman, S.J. Sibbick and P.F. Matysek

0 10 20 30 40 Kilometers

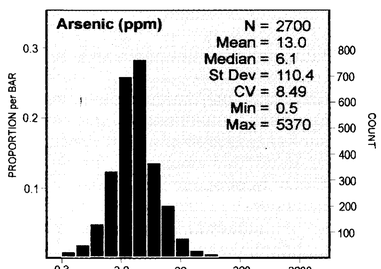
1:250 000

North American Datum 1983 - Universal Transverse Mercator Projection

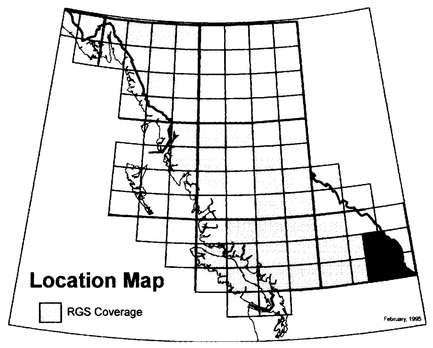
Arsenic by INAA

Percentile (Frequency)	Concentration
> 95 (n=165)	26.0 ppm
81 to 95 (n=531)	10.0 ppm
51 to 80 (n=1388)	3.4 ppm
<= 50 (n=616)	

1 CONCENTRATION RANGES ARE CALCULATED FROM THE PROVINCIAL RGS DATA SET (N = 10,490).



DISTRIBUTION OF ARSENIC IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)



Sources of Data

Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Nelson (NTS 82F); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 30.

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Matysek, P.F., Jackaman, W., Gravel, J.L., Sibbick, S.J. and Feulgen, S. (1991): British Columbia Regional Geochemical Survey - Lardeau (NTS 82K); *B.C. Ministry of Energy, Mines and Petroleum Resources*, BC RGS 31.

Kootenay Lake

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115°
114°

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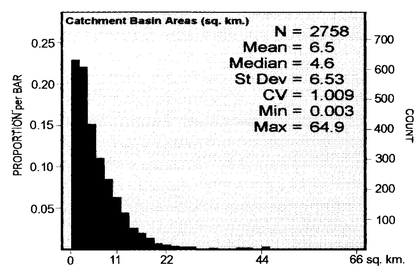


DISTRIBUTION OF CATCHMENT BASIN AREAS
IN SOUTHEASTERN B.C.
(NTS 82F/E, 82G, 82J, 82K/E)

BC Ministry of Energy Mines and Petroleum Resources

1895 - 1995 100 YEARS OF GEOLOGICAL SURVEYING

Geological Survey Branch

GEOSCIENCE MAP 1995-3

(Sheet 4 of 4)

PURCELL SUPERGROUP

SOUTHEASTERN BRITISH COLUMBIA

STREAM SEDIMENT GEOCHEMISTRY

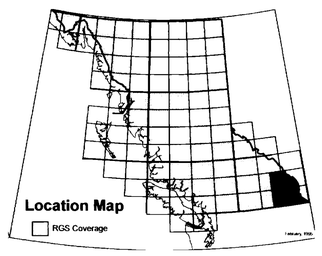
NTS 82G; 82F/E; 82J; 82K/E

Compiled by: W. Jackaman, S.J. Sibbick and P.F. Matysek

0 10 20 30 40 Kilometers

1:250 000

North American Datum 1983 - Universal Transverse Mercator Projection



Lead - Zinc
Anomaly Rating

Rating

HIGH — N = 43

N = 63

N = 421

LOW — N = 461

INTRODUCTION

Meaningful techniques for presenting geochemical data from regional stream sediment surveys have long been a difficulty for explorationists. Contouring and image analysis methods can create artifacts which misrepresent the data whereas its' display as point values may not portray the spatial variation inherent to the dataset. Further, the geochemistry of a stream sediment sample is often most influenced by the geology of the sediment source area. Coding the sample site by its' underlying geology may not accurately represent the site and may result in the misidentification of anomalies (Sibbick, 1994).

An effective solution to this problem is to utilize the catchment basin of each sample site to define its' zone of influence (Bonham-Carter and Goodfellow, 1986). This method can be used to:

Reclassify the geological influence on each sample based on its' source area.
Redefine the thresholds which separate anomalous from background populations.

Catchment basin analysis of RGS data can be used to remove the influence of differences in natural background between rock types. In this example, RGS data from potential host rocks to lead-zinc mineralization have been evaluated to determine anomalous catchments within specific lithologies.

METHODOLOGY

The geology of each RGS catchment in the Purcell Supergroup was determined using the southeastern British Columbia geological compilation map (Hoy, et al., 1995).

Catchments underlain by more than 90% of a single rock type were identified.

These catchments were classified into four major lithological groups (Intrusives, Upper Purcell, Creston and Aldridge).

For each lithological group, normalized multielement (Pb+Zn) anomaly ratings were calculated based on thresholds derived from probability plots. These normalized values were combined, ranked and plotted.

Geology Legend

I Intrusive Rocks

P Upper Purcell

C Creston

A Aldridge

Modified from Höy *et al.*, 1995

References

Bonham-Carter, G.F. and Goodfellow, W.D. (1986): Background Correction to Stream Geochemical Data Using Digitized Drainage and Geological Maps: Application to Selwyn Basin, Yukon and Northwest Territories; *Journal of Geochemical Exploration*, Volume 25, pages 139-155.

Höy, T., Price, R.A., Legun, A., Grant, B., and Brown, D. (1995): Purcel Supergroup, Southeastern British Columbia Geological Compilation Map (NTS 82G; 82F/E; 82J/SW; 82K/SE); *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geoscience Map 1995-1.

Sibbick, S.J. (1994) Preliminary Report on the Application of Catchment Basin Analysis to Regional Geochemical Survey Data, northern Vancouver Island; *in* Geological Fieldwork 1993, Grant, B. and Newell, J.M., Editors, *British Columbia Ministry of Energy, Mines and Petroleum Resources*, Paper 1994-1, pages 111-118.

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