



Natural Resources

Mines

**GEOCHEMICAL DATA FROM GRANITIC ROCKS
IN SOUTH-CENTRAL NEWFOUNDLAND
(NTS MAP AREAS 12A/07, 08, 09 and 10)**

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Open File 012A/1802

**St. John's, Newfoundland
September, 2019**

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SUMMARY

This Open File Release contains whole-rock geochemical analyses of 84 samples collected in NTS map areas 12A/07, 08, 09 and 10 in south-central Newfoundland. Sampling during the summer of 2018 included grab samples of mostly granitic rocks. The purpose of the sampling was to follow up on till samples that returned anomalously high fluoride values (*see* Organ, 2014; Campbell, 2018, 2019; Campbell *et al.*, 2017; Smith *et al.*, 2009). A current research paper summarizing the results of this study will be published in 2020.

NOTES ON THE DATABASE

This report consists of geochemical analyses of 84 samples collected from NTS map areas 12A/07 (Snowshoe Pond), 12A/08 (Great Burnt Lake), 12A/09 (Noel Paul's Brook) and 12A/10 (Lake Ambrose) (Figure 1). Sampling focused on granitic rocks of various ages and consists of samples of both bedrock and boulders of glacial origin. The *in-situ* nature of some of the outcrops could not be determined in some cases. The boulders were up to 10 m in length, angular and likely located near their bedrock sources (Campbell, 2019). The database includes the location of the samples in UTM coordinates in NAD27 (Zone 21), NTS map sheet areas, the name or label of the sampled formation and group, a brief description (lithology and grain size) and whole-rock geochemical analyses (Appendix B). Standards and duplicates are included in separate files (Appendices C and D). The databases are in comma-separated value (.csv) format and are available from the Natural Resources website. Table 1 comprises a list of abbreviations used in this open-file report.

All the samples were analyzed at the geochemical laboratory of the Geological Survey of Newfoundland and Labrador (GSNL) in St. John's. Table 2 includes the analytical methods used

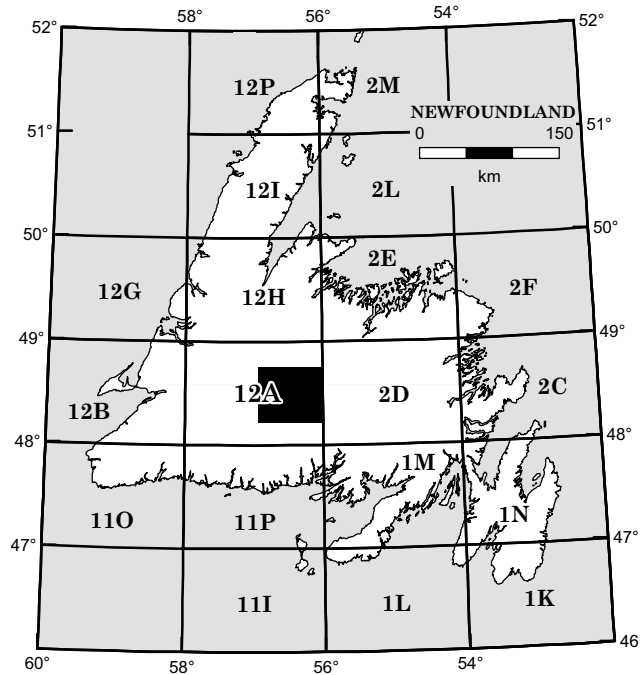


Figure 1. Location map of the study area.

for each element. Most of the major elements were analyzed with ICP-OES following borate fusion. FeO was measured by the titration method and LOI by the gravimetric method. Most of the trace elements were analyzed using ICP-MS following borate fusion and the rest using ICP-OES following four-acid digestion. Silver was analyzed using ICP-OES following nitric acid digestion. Fluoride was analyzed using ion-selective electrode (ISE). The analytical procedures are given in Finch *et al.* (2018). Major elements are reported in wt. % and trace elements are reported in ppm. Negative detection limit values represent analyses below the detection limit and -99 represents samples that were not analyzed for that element. Fe₂O₃T is the total measured iron. Quality assurance and quality control (QA/QC) procedures and informa-

Table 1. List of abbreviations

Abbreviation	Explanation
-99	Sample not analyzed for that element
Fe ₂ O ₃ T	Total measured iron
Grav.	Gravimetric
ICP-MS FUS	Inductively Coupled Plasma Mass Spectrometry following lithium metaborate/tetraborate fusion
ICP-OES-4 Acid	Inductively Coupled Plasma Optical Emission Spectrometry following HF-HCl-HNO ₃ -HClO ₄ acid digestion
ICP-OES-FUS	Inductively Coupled Plasma Optical Emission Spectrometry following lithium metaborate/tetraborate fusion
ICP-OES-HNO ₃	Inductively Coupled Plasma Optical Emission Spectrometry following nitric acid digestion
ISE	Ion-selective electrode
LOI	Loss-on-ignition
N/A	Not available
negative detection limit	below detection limit
ppm	Parts per million
wt. %	Weight percent

Table 2. Analytical methods for the elements

Element	Analytical Method
SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ T, MgO, CaO, Na ₂ O, K ₂ O, TiO ₂ , MnO, P ₂ O ₅ , Ba, Be, Cr, Cr, Sc, Zr	ICP-OES-FUS
Fe ₂ O ₃	Calculation
FeO	Titration
LOI	Gravimetric
Ga, Ge, Sr, Y, Nb, Sn, Cs, La, Ce, Pr, Nd, Sm, Eu, Tb, Gd, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Tl, Bi, Th, U	ICP-MS-FUS
As, Cd, Co, Cu, Li, Mo, Ni, Pb, Rb, S, V, Zn	ICP-OES-4 Acid
Ag	ICP-OES following nitric acid digestion
F	Alkaline fusion with ion-selective electrode

tion on the standards are included in Finch *et al.* (2018). Information on standards not included in Finch *et al.* (2018) are summarized in Appendix A.

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Appendix A
Additional Standard Information

List of abbreviations

Abbreviation	Explanation
Rec Val	“Recommended” or, if asterisked, “information” value for that element, in that certified reference material (CRM), normally derived as the arithmetic mean of multiple analyses (after the removal of outliers), at several laboratories, by the supplier of the CRM.
A. Mean	Arithmetic mean (after the removal of outliers) of a variable number of analyses (<i>see</i> “Count”, below) at the GSNL laboratory.
Std. Dev.	Standard deviation of the same analyses used to calculate the mean, above.
UCL	Upper control limit. Calculated as the mean plus two standard deviations, as calculated above.
LCL	Lower control limit. Calculated as the mean minus two standard deviations. Analyses of the CRM that fall between the UCL and the LCL, and the batch of samples into which it was inserted, are generally considered acceptable.
Count	The number of analyses used to calculate the arithmetic mean, standard deviation, UCL and LCL.

CH-2		SU-1	
Element	Ag	Element	Ag
Units	ppm	Units	ppm
Rec Val	24.2	Rec Val	4.3
A. Mean	10.1	A. Mean	2.7
Std. Dev.	2.2	Std. Dev.	0.4
UCL	14.5	UCL	3.5
LCL	5.8	LCL	1.9
Count	239	Count	235

SY-3		MA-N		USGS XR3	
Element	F	Element	F	Element	F
Units	ppm	Units	ppm	Units	ppm
Rec Val	6960	Rec Val	17000	Rec Val	86200
A. Mean	6460	A. Mean	13051	A. Mean	78136
Std. Dev.	565	Std. Dev.	1126	Std. Dev.	4722
UCL	7589	UCL	15303	UCL	87581
LCL	5331	LCL	10800	LCL	68691

APPENDICES B–D

Appendices B–D are available as digital comma-separated files (.csv) through [this link](#).

Appendix B: Sample Locations, Description and Whole-rock Major and Trace Element Geochemistry

Appendix C: Standard Analyses

Appendix D: Duplicate Analyses