GEOLOGICAL SURVEY OF CANADA

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Reconnaissance biogeochemical survey of southwestern Cape Breton Island, Nova Scotia, using balsam fir twigs (NTS 11F/14, and parts of 11F/10, 11, 15)

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Natural Resources Canada Ressources naturelles Canada

Canada

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Contribution to Canada-Nova Scotia Cooperation Agreement on Mineral Development (1992-1995), a subsidiary agreement under the Economic and Regional Development Agreement.

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Canada

Nova Scotia

Province of Nova Scotia

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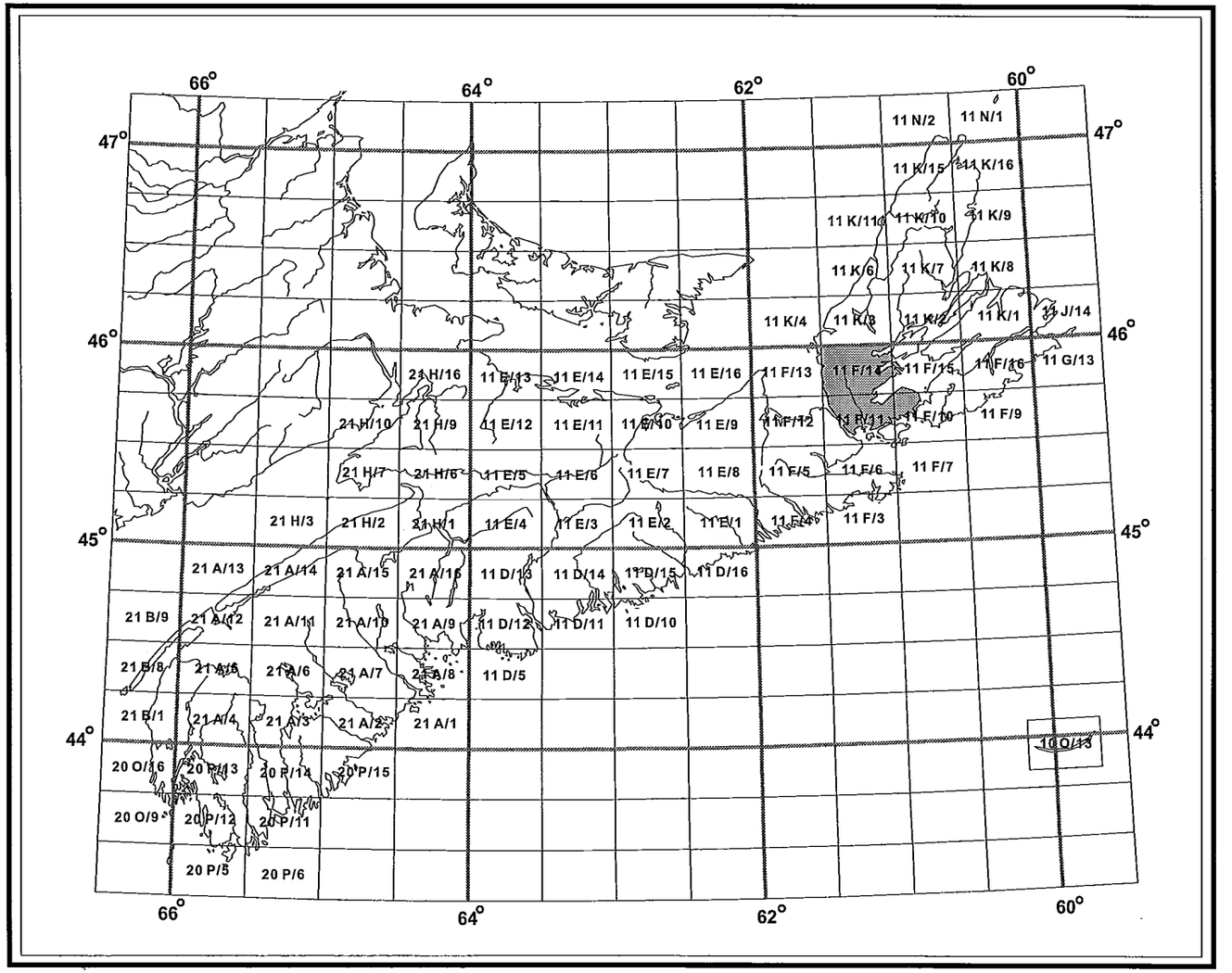


Figure 1: Survey area with respect to National Topographic System (NTS) map sheets.

RECONNAISSANCE BIOGEOCHEMICAL SURVEY OF SOUTHWESTERN CAPE BRETON ISLAND, NOVA SCOTIA, USING BALSAM FIR TWIGS

C.E.Dunn and R.G. Balma

ABSTRACT

Samples of balsam fir twigs were collected from 365 locations within a 1600 sq. km area of southwestern Cape Breton Island. Once stripped of their needles, the twigs were reduced to ash by controlled ignition and analysed by instrumental neutron activation for 36 elements. Of these, 28 elements were in sufficient concentration to be detected and quantified. A second portion of each ash sample was digested in aqua regia and the solution analysed by inductively coupled plasma emission spectrometry for approximately 30 elements. Data for 11 of these elements were sufficiently concentrated and precise to be added to the data set provided in this report.

In general, element concentrations in the balsam fir twigs are similar to those reported from surveys of similar magnitude elsewhere in Nova Scotia. Median concentrations of Au are higher than in other parts of the province, although no unusually high levels were found. Data analysis indicates a zone northward from Port Hastings where relatively high concentrations of Au occur in association with Br and K. Relatively high levels of the alkali metals Rb and Cs characterise the Craignish Hills. High concentrations of Ba, Cr, and Ni occur in a synclinal structure of clastic rocks comprising the Mabou Group, in the River Denys Lowlands. Along North Mountain, especially in the vicinity of the Lime Hill sphalerite occurrence, notable enrichment of Zn occurs with weak enrichment of Pb.

INTRODUCTION

This Open File contains data from a reconnaissance biogeochemical survey in southwestern Cape Breton Island (Fig. 1), conducted in June, 1995, by the Geological Survey of Canada under the Canada - Nova Scotia Co-operation Agreement on Mineral Development (1992 - 1995). Field observations, data listings, statistical summaries, a geological and sample location map, and element distribution maps are presented. The maps show element concentrations in the ash of twigs from balsam fir (*Abies balsamea*). Instrumental neutron activation analysis (INAA) was used for determining 36 elements, of which 28 were in sufficient concentration to be detected and quantified. In addition data are included for 11 elements determined by inductively coupled plasma emission spectrometry (ICP-ES). All data reported are concentrations in ash remaining after controlled ignition at 470°C. For balsam fir and other coniferous trees, reduction to ash is a concentration process with little or no loss of elements except for a few of high volatility (e.g. Br and Hg).

The value to exploration of reconnaissance geochemical surveys that involve the collection of lake or stream sediments and waters has been extensively tried, tested and documented. Since 1987 reconnaissance biogeochemical surveys of similar magnitude to that reported here, also using balsam fir twigs, were conducted in other parts of Nova Scotia. Results were published as Open File reports (Dunn *et al.*, 1989; Dunn *et al.*, 1994a, 1994b; and Dunn *et al.*, 1996), and interpretative accounts are given in Dunn (1988, 1990), Rogers and Dunn (1989, 1993), and Dunn *et al.* (1991).

Unlike other geochemical sample media, plants *require* certain elements for their existence. Zinc, for example, is needed for plant metabolism. Subtle differences in Zn concentrations between sample sites are more likely to reflect the health of the plant than significant differences in the chemistry of the substrate. However, major differences in Zn concentrations may reflect the presence of Zn mineralization.

The Zn example illustrates that biogeochemical data should be interpreted with caution and the text notes provided for each element should be considered when evaluating results. Biogeochemistry is a complex science involving the interaction of organic and inorganic processes that are controlled by many physicochemical parameters. However, despite these complexities, careful and systematic collection and preparation of vegetation samples can provide cost-effective new insight, not readily obtainable by other means, into the chemistry of the substrate and its groundwater.

The data listed in Appendix A are available in digital form from:

GSC Bookstore
Geological Survey of Canada
601 Booth St.
Ottawa
Ontario, K1A 0E8 Tel: (613) 995-4342; Toll-free 1-888-252-4301
Fax: (613) 943-0646
Internet: gsc_bookstore@gsc.NRCan.gc.ca

The data will be supplied on an MS-DOS (IBM-PC) 3.5" 1.44 Mb diskette which can be read by any DBASE-compatible software, and as an ASCII comma-delimited file.

CREDITS

Survey design, direction, and sampling methodology: C.E.Dunn, in collaboration with G.E.M. Hall who planned and implemented a simultaneous hydrogeochemical survey.

Field party leader: R.G. Balma.

Sub-party leaders: P. Lombard (NSDNR), P. James and K. Slough, assisted by T.L. Hearty, L. Young, P. Pelchat, K. Simpson and J. Adams.

Sample Preparation: undertaken and supervised by T. Hearty, with the assistance of L. Young.

Data Management: R.G. Balma and W.A. Spirito.

Computer Programming: S.W.Adcock developed a program for the data and statistical listings presented in Appendices A and B.

Instrumental Neutron Activation Analysis: by contract to Activation Laboratories Ltd., Ancaster, Ontario.

Inductively-Coupled Plasma Emission Spectrometry: by contract to Acme Analytical Laboratories Ltd., Vancouver, B.C.

SURVEY DESCRIPTION AND METHODOLOGY

SCOPE OF SURVEY

During a three week period in June, 1995, balsam fir twig samples were collected from 365 sites within a 1600 km^2 area of south-western Cape Breton Island (Fig. 1). Samples were collected on as even a grid as was practically possible, attaining an average sample density of approximately 1 site per 4.5 km^2. In general, samples were collected at 2 km intervals along driveable roads and tracks, with some helicopter support for access to remote areas. Three trucks were used, each with a crew of two. At each sample location, vegetation samples were selected from a site at least 50 m from a highway, or 10 m from a little-used track. Samples were located by using 1:50,000 NTS (National Topographic Survey) maps.

SAMPLE COLLECTION

The most common tree species in the survey area are balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), and black spruce (*Picea mariana*). Earlier studies involving the chemical analysis of twigs from these species and the outer bark of the spruce indicated that each was sensitive to a particular range of elements, and that outer bark from black spruce had generally the highest concentrations of many trace metals. However, within the survey area black spruce is not evenly distributed, and therefore balsam fir was selected as the sample medium. The selection of balsam fir had the added advantage that comparative data were available for this species from other reconnaissance biogeochemical surveys conducted in Nova Scotia.

At each sample location 200 - 250 g of fresh twigs and needles were snipped from balsam fir using standard anvil-type, teflon-coated, garden pruning snips. Twig samples were placed in heavy-duty brown paper hardware bags (approximately 25 x 35 cm) and secured with masking tape. There are seasonal variations in the chemistry of twigs, therefore the survey was completed as quickly as possible (less than three weeks).

Usually 5 - 7 twigs, each comprising 5 - 7 years of growth, provided the required amount of material. Within the survey area this amount of growth is commonly a 35 - 40 cm length of twig. The range of age in twigs from each site is given in the data listings (Appendix A). At a few sites where growth was more spindly (e.g. dense forest) and annual growth increments were shorter approximately 10 years of growth was collected. Although there is annual variation in the metal uptake and storage of many chemical elements (some accumulating near the twig ends), the over-riding factor for consideration in a biogeochemical sampling programme is the *diameter* of the twig. It is important to maintain a consistent ratio of twig bark to twig wood, because many of the heavy metals are located in the bark, and not in the woody tissue of the twig. If this ratio changes substantially, then variations in element content may be attributable to mixing thick with thin twigs, providing

false anomalies. For the balsam fir survey the twig diameter at most locations was approximately 5 mm where twig growth was 5 - 7 years old.

SAMPLE PREPARATION AND ANALYSIS

After the samples were air-dried for several weeks in a greenhouse, the needles were separated from the twigs. Balsam fir needles have a different chemical composition from the twigs (lower levels of most heavy and base metals in the needles). The ratio of needle to twig may vary among sample locations, so if twigs are not separated from needles some false biogeochemical anomalies may be generated which are simply a function of different twig to needle ratios. Approximately 50 g of dry twigs was weighed into aluminum trays. The trays were placed in a pottery kiln, and the temperature slowly raised (over 2 - 3 hours) to 470°C. After a further 12 hours no charcoal remained, and the twigs were reduced to approximately 1 g of ash. Half was accurately weighed and compacted into small polyethylene vials, suitable for instrumental neutron activation analysis (INAA), and submitted for the determination of 36 elements. Maps are provided for 28 of these elements. Of the remaining 8 elements, concentrations were all, or mostly, below the determination levels (in parentheses) for Ag (2 ppm), Hg (1 ppm), Ir (2 ppb), Sn (50 ppm), Ta (0.5 ppm), and Tb (0.5 ppm). Reproducibility of data for W and Ni by INAA was poor at the low levels present (mostly <2 ppm W and 50 ppm Ni), therefore maps of W and Ni determinations by INAA are not presented.

Of the remaining ash sample, 0.25 g was submitted for aqua regia digestion and multi-element analysis by ICP-ES analysis. For most elements this extraction is near `total', although for some (e.g. Al, B) it is only partial. However, the analytical precision was good for most elements, such that the element distribution patterns of relative concentrations are meaningful even if the absolute concentrations are only partial.

ANALYTICAL QUALITY CONTROL

Included within each block of 20 samples prepared for analysis there was one standard ash sample (V6c), and one duplicate ash sample. These provided controls on accuracy and precision, respectively. Data on mean values and standard deviations obtained for each element in the standard ash sample are given in Tables 1 (INAA) and 2 (ICP-ES). Tables 3 and 4 contain the raw data from which these calculations were made. Tables 5 and 6 list the analytical data obtained by the two analytical methods on the duplicate pairs. With few exceptions the reproducibility of analytical data is excellent for most elements, attesting to the skills of the analysts and the good sample homogeneity. In house repeat ICP-ES analyses by Acme Laboratories indicated extremely good and consistent precision, suggesting that samples with some variation between analytical pairs probably have some heterogeneity.

Tables 7 and 8 show the determination (detection) limits quoted for each element by the analytical laboratories. Where concentrations in the survey samples were below determination limits, a value of half the limit was used for statistical calculations.

Table 1: Mean and Standard Deviation for Standard V6c Analyzed by INA (n=19)

Element			*Mean*	*Standard Deviation*
Arsenic	As	ppm	7.2	1.1
Gold	Au	ppb	17	5.2
Barium	Ba	ppm	381	24
Bromine	Br	ppm	12	1.1
Calcium	Ca	%	15.2	1.0
Cerium	Ce	ppm	39	1.6
Cobalt	Co	ppm	8.2	0.8
Chromium	Cr	ppm	68	3.5
Cesium	Cs	ppm	0.8	0.28
Europium	Eu	ppm	0.75	0.06
Iron	Fe	%	1.67	0.09
Hafnium	Hf	ppm	4.8	0.34
Potassium	K	%	3.48	0.27
Lanthanum	La	ppm	20	0.81
Lutetium	Lu	ppm	0.26	0.03
Molybdenum	Mo	ppm	4.8	1.1
Sodium	Na	ppm	10758	485
Neodymium	Nd	ppm	20	1.7
Rubidium	Rb	ppm	43	4.3
Antimony	Sb	ppm	1.1	0.07
Scandium	Sc	ppm	4.2	0.16
Samarium	Sm	ppm	2.9	0.11
Strontium	Sr	ppm	868	154
Thorium	Th	ppm	2.8	0.28
Uranium	U	ppm	1.3	0.23
Ytterbium	Yb	ppm	1.61	0.10
Zinc	Zn	ppm	722	24

Note: Statistics for Se are omitted because >90% of samples had concentrations below the determination limit of 2 ppm.

Table 2: Mean and Standard Deviation for Standard V6c Analyzed by ICP-ES (n=19)

Element			*Mean*	*Standard Deviation*
Aluminum	Al	%	1.12	0.06
Boron	B	ppm	154	14
Cadmium	Cd	ppm	3.0	0.16
Copper	Cu	ppm	132	18
Lithium	Li	ppm	7.1	1.9
Magnesium	Mg	%	2.04	0.10
Manganese	Mn	ppm	735	62
Nickel	Ni	ppm	69	4.1
Phosphorus	P	%	0.623	0.054
Lead	Pb	ppm	180	10
Vanadium	V	ppm	25	1

Table 3: Standard V6c - Concentrations in Ash Determined by INAA

Au	As	Ba	Br	Ca	Ce	Co	Cr	Cs	Eu	Fe	Hf	K	La	Lu	Mo	Na	Nd	Rb	Sb	Sc	Se	Sm	Sr	Th	U	Yb	Zn
ppb	ppm	ppm	ppm	pct	ppm	ppm	ppm	ppm	ppm	pct	ppm	pct	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
5*	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	0.05	2	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
10	7.3	380	11	18.0	38	8	65	0.8	0.64	1.65	4.6	3.41	20.0	0.26	5	10800	18	45	1.1	4.2	<2	2.9	850	3.2	1.1	1.42	700
16	11.0	360	13	15.1	40	9	71	0.8	0.71	1.68	4.6	3.40	21.0	0.26	5	10500	21	46	1.2	4.2	<2	3.1	820	3.1	0.9	1.64	720
14	7.2	400	12	15.6	40	8	70	0.6	0.78	1.68	4.9	3.50	20.0	0.28	5	10900	20	47	1.1	4.2	<2	2.9	850	2.8	1.2	1.66	720
12	7.3	400	11	14.9	42	9	74	0.7	0.86	1.89	5.1	3.56	21.0	0.30	6	10800	23	40	1.0	4.4	<2	2.9	1100	3.1	1.3	1.76	710
16	7.1	380	11	13.7	38	8	75	0.8	0.79	1.74	4.8	3.58	18.0	0.32	7	10100	19	41	1.0	4.1	<2	2.6	900	2.3	0.8	1.70	700
18	6.5	400	12	15.9	39	7	70	0.8	0.72	1.66	4.9	3.27	21.0	0.25	5	11200	19	38	1.1	4.3	<2	3.0	560	3.2	1.4	1.64	790
16	7.6	350	12	14.7	38	7	69	0.8	0.68	1.54	4.8	3.58	20.0	0.23	3	10600	20	38	1.1	4.1	<2	2.9	750	2.6	1.5	1.61	690
14	7.0	380	12	15.6	39	8	70	<0.5	0.70	1.67	5.0	3.90	20.0	0.27	5	10800	18	43	1.1	4.1	<2	2.9	840	2.9	1.4	1.61	740
17	7.4	360	11	14.7	38	7	70	1.0	0.74	1.57	5.1	3.12	19.0	0.25	5	10600	18	42	1.1	4.0	<2	2.8	840	3.0	1.1	1.45	700
12	6.2	370	14	16.6	39	8	70	0.9	0.67	1.65	4.4	3.47	20.0	0.24	4	10600	20	51	1.0	4.1	<2	3.0	770	2.9	1.5	1.62	720
34	6.7	390	13	15.5	41	9	66	0.7	0.79	1.70	4.9	4.03	19.0	0.28	4	11500	23	41	1.1	4.4	<2	2.8	1000	2.6	1.5	1.61	730
16	7.6	380	12	15.1	40	9	69	0.9	0.84	1.76	4.9	3.98	20.0	0.27	4	10900	20	45	1.2	4.3	<2	2.8	900	2.7	1.6	1.64	730
16	8.1	390	12	15.0	42	9	65	1.0	0.85	1.79	5.3	3.14	20.0	0.31	7	11700	21	38	1.2	4.5	<2	2.9	750	2.9	1.4	1.67	740
25	5.3	390	12	14.9	40	9	65	1.5	0.80	1.68	5.1	3.15	20.0	0.28	6	11600	22	34	1.1	4.3	<2	2.8	560	2.9	1.2	1.66	760
17	7.1	340	11	15.6	39	7	61	<0.5	0.69	1.54	4.2	3.71	19.0	0.24	4	10500	20	41	1.0	4.0	<2	3.0	900	2.5	1.3	1.60	700
13	6.8	440	14	14.6	38	9	70	0.9	0.74	1.70	5.5	3.38	20.0	0.26	4	10100	22	50	1.0	4.1	<2	2.9	1100	2.8	1.2	1.75	710
17	7.3	410	13	13.3	39	9	70	1.2	0.73	1.69	4.5	3.31	19.0	0.24	4	10100	18	43	1.1	4.0	<2	2.8	950	2.5	1.1	1.35	720
16	6.7	360	14	16.0	36	8	68	0.7	0.73	1.57	4.9	3.36	19.0	0.23	4	10900	19	46	1.0	4.1	<2	2.9	960	2.5	1.6	1.55	720
16	7.2	350	11	14.4	36	8	63	0.9	0.71	1.56	4.2	3.33	19.0	0.24	5	10200	18	45	1.0	3.9	<2	2.8	1100	2.3	1.1	1.56	720

* first row of data shows determination limits

Table 4: Standard V6c - Concentrations in Ash Determined by ICP-ES

Al	B	Cd	Cu	Li	Mg	Mn	Ni	P	Pb	V
pct	ppm	ppm	ppm	ppm	pct	ppm	ppm	pct	ppm	ppm
0.01*	2	0.2	1	2	0.01	1	1	0.001	3	2
1.09	166	3.0	133	9	1.96	673	67	0.682	191	25
1.26	184	3.4	140	12	2.22	755	78	0.742	193	28
0.95	133	3.1	110	5	1.82	629	61	0.551	163	24
1.14	173	3.2	129	7	2.10	787	73	0.690	194	26
1.13	170	3.4	126	5	2.10	876	71	0.701	183	25
1.11	143	2.9	129	6	2.12	692	66	0.643	179	25
1.13	142	3.0	129	7	2.10	709	71	0.637	178	26
1.16	157	3.1	176	5	2.08	780	70	0.585	179	24
1.10	138	3.0	125	4	2.01	708	64	0.559	184	24
1.07	136	2.9	128	6	1.99	673	70	0.549	170	25
1.11	146	2.9	126	8	2.04	734	67	0.586	172	25
1.18	149	3.2	126	9	2.07	736	70	0.647	179	25
1.15	156	2.9	181	8	2.10	809	69	0.590	194	24
1.14	166	3.0	137	7	2.09	747	70	0.591	200	25
1.13	150	3.0	123	8	2.02	711	69	0.633	172	25
1.07	139	2.9	118	7	1.89	682	61	0.594	169	24
1.17	160	3.1	132	9	2.10	843	71	0.654	176	26
1.09	156	3.1	127	8	1.96	727	70	0.624	175	25
1.06	153	2.8	121	5	1.92	700	64	0.587	171	24

* first row of data shows determination limits

Table 5: Laboratory Duplicates - Concentration in Ash Determined by INAA

Vial Number	Au ppb	As ppm	Ba ppm	Br ppm	Ca pct	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe pct	Hf ppm	K pct	La ppm	Lu ppm	Mo ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
	5*	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	0.05	2	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
AL95/424	<5	1.1	2500	71	22.9	6	4	19	1.8	<0.03	0.16	0.9	26.60	1.9	<0.05	<2	1660	<5	200	0.4	0.5	<2	0.3	<300	0.2	<0.1	<0.05	1800
AL95/425	<5	1.0	2500	77	21.1	6	5	16	1.9	<0.03	0.15	<0.5	26.20	2.0	0.06	<2	1690	<5	180	0.4	0.5	<2	0.3	<300	<0.1	<0.1	0.29	1800
AL95/434	14	3.4	2300	30	15.0	23	7	32	1.6	0.48	1.11	3.2	19.90	13.0	0.26	<2	5640	17	100	0.5	4.0	<2	2.2	3500	3.1	1.1	1.35	1200
AL95/435	18	2.9	2200	28	15.5	23	6	30	2.2	0.39	0.98	2.9	20.10	12.0	<0.05	<2	5450	13	120	0.4	3.8	<2	2.0	3300	2.5	<0.1	1.04	1200
AL95/462	10	1.9	5600	27	20.5	<3	7	19	<0.5	<0.03	0.13	<0.5	25.20	1.6	<0.05	<2	1560	<5	170	0.3	0.3	<2	0.2	<300	0.1	<0.1	<0.05	1600
AL95/463	13	0.9	5200	27	18.7	<3	7	26	1.5	<0.03	0.14	<0.5	21.70	1.5	<0.05	<2	1510	<5	130	0.2	0.3	<2	0.2	340	<0.1	<0.1	0.21	1500
AL95/488	8	1.5	3300	50	17.3	<3	8	16	0.8	<0.04	0.12	<0.5	29.00	1.3	<0.05	<2	2500	<5	180	0.3	0.2	<2	0.2	750	<0.1	<0.1	<0.05	2900
AL95/489	8	1.0	3000	50	16.3	<3	7	13	<0.5	<0.03	0.11	<0.5	26.90	1.2	<0.05	<2	2240	12	160	0.5	0.2	<2	0.2	700	<0.1	<0.1	<0.05	2700
AL95/500	25	<0.5	1700	24	15.8	4	2	18	<0.5	<0.03	0.15	<0.5	24.50	1.3	0.05	<2	1100	<5	60	0.3	0.3	<2	0.2	860	<0.1	0.5	<0.05	1900
AL95/501	23	1.5	1700	23	17.1	<3	2	19	1.0	<0.03	0.18	<0.5	25.40	1.4	<0.05	<2	1210	<5	71	0.3	0.3	<2	0.2	1200	0.2	<0.1	<0.05	1900
AL95/540	17	2.3	5200	31	19.6	12	7	13	1.1	<0.03	0.44	2.0	24.80	5.9	0.09	<2	5190	8	150	0.6	1.4	<2	0.8	1200	1.1	<0.1	0.52	1700
AL95/541	18	1.8	5100	34	19.2	11	5	15	1.2	<0.03	0.45	2.3	22.70	6.2	0.08	<2	5070	<5	130	0.4	1.4	<2	0.8	1100	0.9	<0.1	0.48	1600
AL95-544	14	2.2	1200	49	22.2	10	5	26	1.0	0.14	0.43	1.3	24.10	5.3	0.08	<2	2980	7	170	0.6	1.4	<2	0.8	<300	1.1	<0.1	0.42	1800
AL95-545	19	1.7	1300	51	20.1	10	5	25	2.0	<0.02	0.48	1.4	25.80	5.7	0.08	<2	3080	<5	160	0.6	1.5	<2	0.9	<300	1.1	0.5	0.44	1900
AL95/583	13	<0.5	2200	33	23.0	3	4	8	<0.5	0.09	0.14	<0.5	24.70	1.7	<0.05	<2	2090	<5	47	0.2	0.3	<2	0.2	710	<0.1	<0.1	<0.05	2000
AL95/584	<5	1.1	2200	30	22.9	<3	4	9	<0.5	<0.02	0.11	1.0	25.80	1.5	<0.05	<2	2080	<5	47	0.4	0.3	<2	0.2	940	0.3	<0.1	0.17	2000
AL95/606	30	6.0	3100	38	10.7	50	15	37	2.7	1.02	1.44	5.3	17.80	25.0	0.41	2	8390	26	110	0.6	5.3	3	4.6	770	4.7	1.6	2.28	1200
AL95/607	30	4.7	2900	37	11.5	49	14	36	1.9	1.08	1.49	5.3	16.20	24.0	0.38	<2	7860	27	97	0.6	5.2	<2	4.6	<300	4.7	1.4	2.45	1100
AL95/627	21	1.1	3600	33	27.9	6	4	18	1.2	<0.03	0.22	<0.5	18.70	2.8	<0.05	<2	2130	<5	210	0.6	0.4	<2	0.3	670	<0.1	<0.1	0.18	1900
AL95/628	27	1.9	3500	34	25.9	<3	4	20	<0.5	<0.03	0.19	<0.5	17.20	3.0	0.08	<2	2080	<5	170	0.4	0.5	<2	0.3	1300	0.3	<0.1	0.20	2000
AL95/643	12	0.8	960	29	15.6	3	4	60	0.7	<0.02	0.13	<0.5	28.70	0.9	<0.05	<2	6350	<5	93	0.3	0.4	<2	0.1	1200	0.2	<0.1	0.16	1600
AL95/644	15	<0.5	950	33	15.1	<3	5	59	<0.5	<0.03	0.18	<0.5	29.10	1.0	<0.05	<2	6490	<5	100	0.2	0.5	<2	0.1	1100	0.4	<0.1	<0.05	1600

* first row of data shows determination limits

Table 5 (cont'd): Laboratory Duplicates - Concentration in Ash Determined by INAA

Vial Number	Au ppb	As ppm	Ba ppm	Br ppm	Ca pct	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe pct	Hf ppm	K pct	La ppm	Lu ppm	Mo ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
	5*	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	0.05	2	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
AL95/670	<5	2.7	2800	45	17.1	5	9	52	1.0	<0.03	0.26	<0.5	27.90	1.9	<0.05	<2	2450	<5	290	0.5	0.7	<2	0.3	830	<0.1	<0.1	0.17	2000
AL95/671	<5	2.4	2800	43	16.6	5	9	49	0.9	<0.03	0.25	<0.5	25.90	1.7	<0.05	<2	2250	<5	280	0.4	0.7	<2	0.2	1200	<0.1	<0.1	0.24	1900
AL95/683	16	2.7	1900	43	19.7	11	7	25	<0.5	0.20	0.42	0.7	22.60	4.8	0.06	<2	2860	<5	160	0.8	1.2	<2	0.8	800	0.7	<0.1	0.24	2000
AL95/684	7	1.6	1400	28	16.9	5	3	15	0.8	0.06	0.21	<0.5	23.10	2.5	<0.05	<2	1090	<5	160	0.3	0.6	<2	0.3	770	0.2	<0.1	0.17	2300
AL95/690	12	2.5	1400	57	21.8	8	6	52	1.5	<0.02	0.45	0.8	23.70	4.5	<0.05	<2	5140	<5	140	0.8	1.2	<2	0.6	770	0.5	<0.1	0.32	2400
AL95/691	15	3.2	1400	54	22.5	11	6	48	1.2	<0.02	0.37	0.7	23.70	3.9	0.06	<2	5000	<5	150	0.9	1.1	<2	0.6	<300	0.9	<0.1	0.34	2300
AL95/712	8	1.9	1900	26	17.6	6	5	12	<0.5	<0.03	0.36	0.8	21.20	3.2	0.09	<2	2860	<5	120	0.3	1.1	<2	0.5	940	0.3	<0.1	0.30	1500
AL95/713	8	1.9	2000	29	16.4	7	5	14	0.6	<0.03	0.37	<0.5	25.30	3.3	<0.05	<2	2900	<5	100	0.3	1.2	<2	0.5	1000	0.4	<0.1	0.20	1500
AL95/727	7	1.0	740	19	19.3	<3	3	32	<0.5	<0.02	0.12	<0.5	18.10	1.0	<0.05	<2	2070	<5	100	0.2	0.2	<2	<0.1	300	<0.1	0.4	<0.05	960
AL95/728	7	1.0	730	20	20.1	<3	3	33	<0.5	<0.02	0.10	<0.5	18.20	1.0	<0.05	<2	2170	9	110	1.4	0.2	<2	0.2	430	<0.1	<0.1	<0.05	940
AL95/753	6	1.4	380	31	19.8	<3	3	12	0.8	<0.03	0.14	<0.5	24.90	1.6	<0.05	<2	1320	<5	350	0.2	0.4	<2	0.2	<300	<0.1	<0.1	<0.05	1400
AL95/754	8	1.1	330	30	19.3	3	2	10	1.0	<0.03	0.17	0.5	21.70	1.7	<0.05	<2	1350	<5	330	0.4	0.4	<2	0.2	<300	<0.1	<0.1	<0.05	1300
AL95/774	16	<0.5	5400	49	20.9	<3	5	10	0.9	<0.03	<0.05	<0.5	15.50	1.5	<0.05	<2	3600	<5	72	0.3	0.2	<2	<0.1	1100	<0.1	0.7	<0.05	2500
AL95/775	24	<0.5	5300	44	18.7	<3	4	13	<0.5	<0.03	0.09	<0.5	15.20	1.2	<0.05	<2	3700	<5	86	0.2	0.2	<2	0.1	1100	<0.1	<0.1	<0.05	2300
AL95/783	7	1.6	2100	20	15.5	8	5	18	0.9	0.17	0.29	0.9	17.80	4.0	0.08	<2	3980	<5	130	0.4	0.9	<2	0.7	890	0.4	<0.1	0.29	1400
AL95/784	10	1.9	2300	22	17.1	6	5	14	<0.5	<0.02	0.26	<0.5	16.90	3.2	0.06	<2	4760	<5	120	0.4	0.8	<2	0.5	1000	0.5	<0.1	0.34	1400
AL95/797	<5	1.6	1300	24	12.6	19	10	48	1.4	0.41	1.00	2.1	14.70	9.5	0.13	<2	7900	7	140	0.4	3.4	<2	1.5	1200	2.1	0.8	0.68	1300
AL95/798	<5	1.3	1300	29	11.8	16	9	52	1.4	0.29	0.93	2.1	14.40	8.8	0.12	<2	7530	<5	150	0.4	3.2	<2	1.5	1300	1.9	0.7	0.67	1200
AL95/821	9	<0.5	1800	22	13.9	<3	3	13	3.3	<0.02	0.12	<0.5	26.00	1.3	<0.05	<2	1690	<5	240	0.3	0.3	<2	0.2	760	<0.1	<0.1	0.06	1700
AL95/822	9	0.6	1800	23	13.8	<3	3	13	3.5	<0.02	0.12	0.6	24.10	1.2	<0.05	<2	1620	<5	250	0.3	0.3	<2	0.2	870	<0.1	0.2	<0.05	1700

* first row of data shows determination limits

Table 6: Laboratory Duplicates - Concentration in Ash Determined by ICP-ES

Packet Number	Al pct	B ppm	Cd ppm	Cu ppm	Li ppm	Mg pct	Mn ppm	Ni ppm	P pct	Pb ppm	V ppm
	0.01*	2	0.2	1	2	0.01	1	1	0.001	3	2
ICP95-424	0.27	366	5.6	126	<2	2.48	16401	21	2.584	60	6
ICP95-425	0.28	375	5.6	126	<2	2.52	16615	21	2.598	60	6
ICP95-434	1.04	257	6.6	133	11	2.13	10410	72	3.274	41	13
ICP95-435	1.02	260	6.4	133	12	2.11	10331	71	3.258	40	12
ICP95-462	0.42	243	13.5	145	<2	2.04	16749	40	1.829	27	4
ICP95-463	0.44	250	14.9	148	<2	2.08	17243	40	1.841	30	3
ICP95-488	0.48	317	10.6	154	2	2.51	18281	34	2.734	35	5
ICP95-489	0.50	327	10.8	161	<2	2.54	18548	32	2.874	39	4
ICP95-500	0.18	242	6.7	131	<2	1.75	35997	12	4.545	51	8
ICP95-501	0.20	248	7.2	133	<2	1.76	35919	13	4.580	48	9
ICP95-540	0.81	259	10.8	167	3	2.51	22427	73	2.845	36	7
ICP95-541	0.79	261	10.5	167	3	2.48	22466	73	2.800	40	6
ICP95-544	0.48	292	11.1	126	3	2.00	24770	23	1.921	41	9
ICP95-545	0.46	280	10.4	120	2	1.91	23674	19	1.825	40	7
ICP95-583	0.30	272	20.6	140	<2	2.44	11974	73	1.595	27	2
ICP95-584	0.30	272	20.1	138	<2	2.39	11618	69	1.562	26	2
ICP95-606	1.43	215	6.5	102	15	1.61	47874	35	1.105	71	19
ICP95-607	1.44	214	6.3	103	15	1.60	47789	36	1.112	73	20
ICP95-627	0.73	263	16.0	157	<2	2.28	17064	39	1.751	76	14
ICP95-628	0.67	248	14.9	145	2	2.14	15918	35	1.647	71	13

* first row of data shows determination limits

Table 6 (cont'd): Laboratory Duplicates - Concentration in Ash Determined by ICP-ES

Packet Number	Al pct	B ppm	Cd ppm	Cu ppm	Li ppm	Mg pct	Mn ppm	Ni ppm	P pct	Pb ppm	V ppm
	0.01*	2	0.2	1	2	0.01	1	1	0.001	3	2
ICP95-643	0.77	275	6.1	157	<2	2.76	8425	37	3.378	18	2
ICP95-644	0.75	265	6.1	154	<2	2.73	8342	37	3.371	16	1
ICP95-670	0.50	303	8.7	129	2	2.64	36762	14	2.066	43	9
ICP95-671	0.49	296	8.6	125	2	2.55	35494	13	1.998	48	10
ICP95-683	0.34	397	9.9	156	3	2.24	26553	19	1.318	118	20
ICP95-684	0.38	236	12.5	121	<2	1.86	50115	13	1.741	61	13
ICP95-690	0.41	309	7.9	136	<2	1.91	29496	21	1.288	99	25
ICP95-691	0.38	303	7.8	134	<2	1.86	28770	21	1.261	101	24
ICP95-712	0.59	307	13.7	161	3	2.97	28524	45	2.433	41	15
ICP95-713	0.60	309	13.7	163	<2	2.98	28645	46	2.450	43	15
ICP95-727	0.26	219	3.7	131	<2	2.43	4294	7	1.995	29	2
ICP95-728	0.24	211	3.6	126	3	2.31	4066	7	1.939	25	3
ICP95-753	0.32	267	6.4	140	<2	1.79	7403	14	1.989	36	4
ICP95-754	0.33	274	6.3	146	<2	1.82	7553	14	2.058	36	4
ICP95-774	0.83	216	14.9	121	2	3.29	24492	30	1.826	43	4
ICP95-775	0.85	221	15.8	125	<2	3.33	24804	31	1.821	41	4
ICP95-783	0.72	268	5.8	153	5	2.80	19021	48	1.985	77	9
ICP95-784	0.58	282	5.2	157	4	3.05	21478	42	1.955	73	7
ICP95-797	0.88	173	4.2	123	6	3.05	16132	31	1.384	25	12
ICP95-798	0.85	179	4.2	120	5	3.04	16168	30	1.399	28	12
ICP95-821	0.28	219	18.2	134	<2	2.75	24254	18	1.809	32	4
ICP95-822	0.28	212	17.7	133	<2	2.70	23944	19	1.780	28	4

* first row of data shows determination limits

Table 7: Determination Limits for Elements Analyzed by INA

Element		*Units of Measure*	*Determination Limit*
Gold	Au	ppb	5
Barium	Ba	ppm	10
Bromine	Br	ppm	1
Calcium	Ca	%	0.2
Cerium	Ce	ppm	3
Cobalt	Co	ppm	1
Chromium	Cr	ppm	1
Cesium	Cs	ppm	0.5
Europium	Eu	ppm	0.01
Iron	Fe	%	0.05
Hafnium	Hf	ppm	0.5
Potassium	K	%	0.05
Lanthanum	La	ppm	0.1
Lutetium	Lu	ppm	0.05
Molybdenum	Mo	ppm	1
Rubidium	Rb	ppm	5
Sodium	Na	ppm	10
Neodymium	Nd	ppm	5
Antimony	Sb	ppm	0.1
Scandium	Sc	ppm	0.1
Selenium	Se	ppm	2
Samarium	Sm	ppm	0.1
Strontium	Sr	ppm	300
Thorium	Th	ppm	0.1
Uranium	U	ppm	0.1
Tungsten	W	ppm	1
Ytterbium	Yb	ppm	0.05
Zinc	Zn	ppm	20

Table 8: Determination Limits for Elements Analyzed by ICP-ES

Element		*Units of Measure*	*Determination Limit*
Silver	Ag	ppm	0.3
Aluminum	Al	pct	0.01
Boron	B	ppm	2
Beryllium	Be	ppm	0.2
Cadmium	Cd	ppm	0.2
Copper	Cu	ppm	1
Lithium	Li	ppm	2
Magnesium	Mg	%	0.01
Manganese	Mn	ppm	1
Nickel	Ni	ppm	1
Phosphorus	P	%	0.001
Lead	Pb	ppm	3
Vanadium	V	ppm	2

GEOLOGY

BEDROCK GEOLOGY

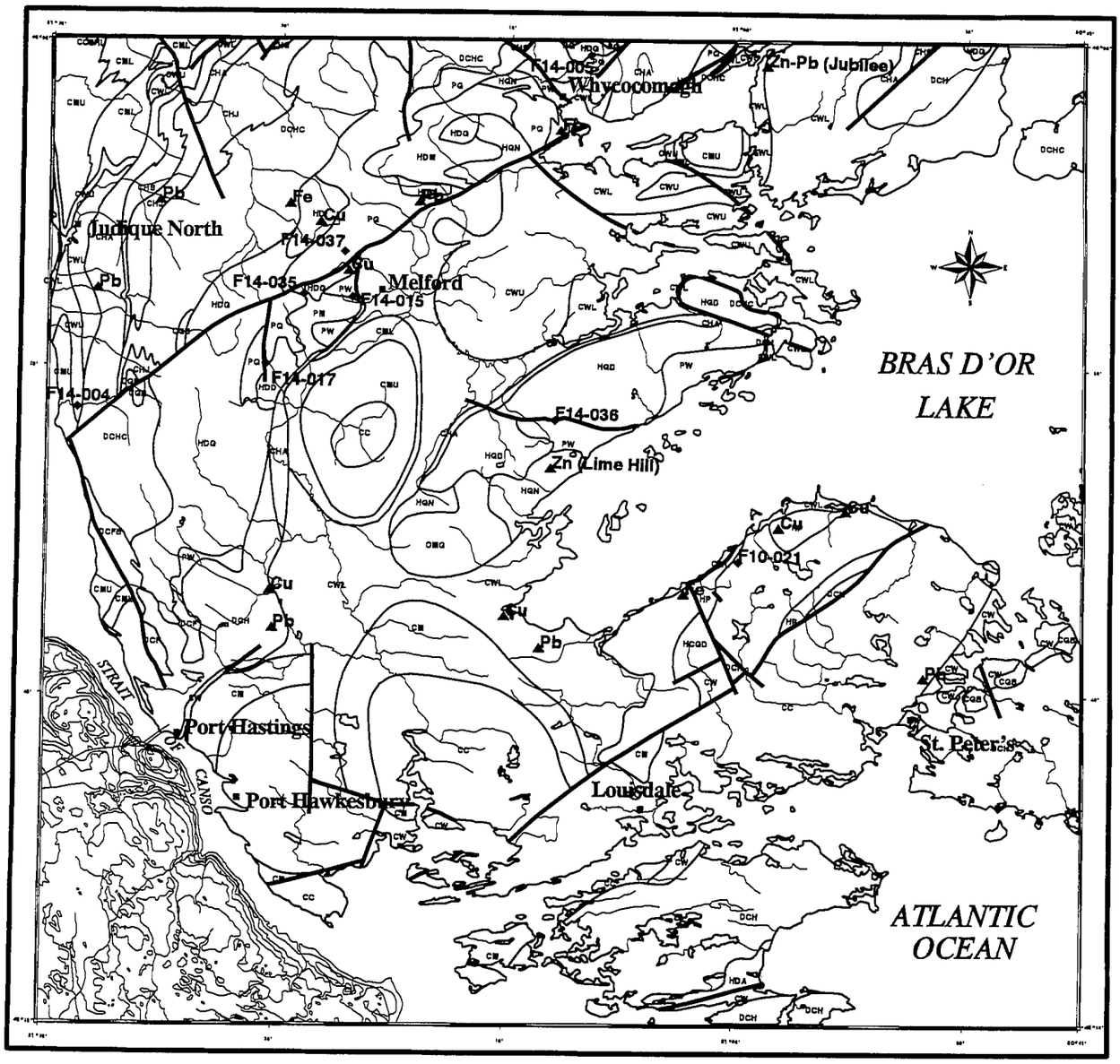
Figure 2 shows the geological contacts of the stratigraphic units and locations of mineral occurrences. The geology, with sample numbers, is shown also on the large coloured geological map provided in the envelope. This map is a simplified digital compilation after Lynch *et al.,* 1995.

The geology of the area is complex, with rocks ranging in age from Helikian to Carboniferous that have been faulted and folded. The Precambrian rocks have been metamorphosed up to amphibolite-grade gneiss, schist, calc-silicate, marble, wacke and quartzite. These comprise the George River Group of Hadrynian to Helikian age. Late Hadrynian to Lower Paleozoic intrusions range in composition from granite to diorite, and form much of the high ground (see digital elevation map, Fig. 3). Basalt and andesite flows occurred during the late Devonian and comprise the Fisset Brook Formation. Overlying the volcanic flows are the early Carboniferous Craignish, Judique, Strathlorne and Ainslie formations of the Horton Group. These formations are dominated by a generally fining-upward sequence of clastic sediments, with periodic incursions of conglomerates and, in the Strathlorne Formation, the deposition of minor micritic limestone. The overlying Windsor Group of the Visean Stage is dominated by carbonates with minor siltstone, and intercalations of evaporite sediments. During the Namurian Stage deposition was mostly siltstone with variable amounts of dolomite, together making up the Mabou Group. After the intrusion of some small plugs of gabbro and diabase, cross-bedded medium to coarse clastic sediments of the Westphalian-Stephanian Cumberland Group were deposited with minor coal, siltstone and shale.

Subsequently, the area has been faulted and folded to give rise to the present association of juxtaposed formations of different age, and several synclinal basins, notably in the centre of the survey area, occupying valleys between significant north-easterly-trending ridges of granodiorite. These features stand out clearly on the digital elevation map (Fig. 3).

MINERALIZATION

Several metallic mineral occurrences are reported in the survey area (Fig. 2, from Gregory *et al.*, 1979, and Nova Scotia Mineral Occurrence Database: NSDNR, 1996). Most are Precambrian in age, and associated with carbonates of the George River Group. Of note is the Lime Hill sphalerite showing on the western shore of Bras d'Or Lake, comprising more than 2 million tonnes of ore grading 2.5% zinc (Chatterjee, 1977; Justino and Sangster, 1987, Hill, 1987). Just east of the survey area, a few kilometres east of Whycocomagh, is the Jubilee Zn/Pb deposit, containing >500,000 tonnes combined Zn/Pb grading >6%, and hosted by carbonates of the Windsor Group (Hein *et al.*, 1988). Other showings are of Pb, Cu, Fe, and a few reports of minor concentrations of disseminated gold. Details of these occurrences are provided in the NSDNR (1996) digital database. The Au occurrences are all prefixed with either F10 or F14 and are summarised in the Table comprising part of Fig. 2.



Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 Kilomètres

UTM Zone 20

Gold Occurrence Number	Gold Occurrence Name and Category	Mineralization	Style of Mineralization
F10-021	Campbell Mountain (Cu)	Au, Ag, Cu	Quartz Vein
F14-004	Craigmore (Au)	Au	Not reported
F14-005	Whycocomagh (Au)	Au, As, Cu	Disseminated
F14-015	Melford	Au, Fe	Not reported
F14-017	Glendale Road (As)	Au, As, Cu, Fe, Pb, Zn	Not reported
F14-035	River Denys Road (As)	Au, As	Disseminated; Fracture Fillings; Pods
F14-036	Kennedy's Big Brook (Fe)	Au, As, Ag, Co, Cu, Fe, Sb	Disseminated; Massive
F14-037	Glen Brook (Diogenes Brook) (Fe)	Au, As, Fe	Disseminated; Fracture Fillings

Fig. 2: Map showing geological units and metallic mineral occurrences.

Base metal locations from Gregory *et al.*, 1979. Gold occurrences (described in Table) from NSDNR (1996)

BEDROCK GEOLOGY

Legend to Fig. 2 (see also large map in envelope for details)

CARBONIFEROUS

WESTPHALIAN-STEPHANIAN

CUMBERLAND GROUP

CC cross-bedded and trough cross-bedded white medium sand arkose, minor siltstone, shale, and coal, equivalent to *Port Hood Formation*

CCPHL *Lower Port Hood Formation*: channelized sandstone deposits, siltstone, shale

NAMURIAN

CGB gabbro, diabase

MABOU GROUP

CMU Upper member including *Pomquet Formation*: red and green siltstone and sandstone, minor conglomerates

CML Lower member including *Hastings Formation*: shale and siltstone, dolomitic siltstone, and thin stromatolitic dolostone beds

CM undifferentiated Mabou Group

VISEAN

WINDSOR GROUP

CWU Upper member including *Herbert River* limestone: red siltstone and sandstone with intercalated shallow marine limestone, dolostone, gypsum and halite

CWL Lower member: limestone variably dolomitic and fossiliferous, red siltstone and thick units of gypsum and halite

CW undifferentiated Windsor Group

LATE DEVONIAN TO CARBONIFEROUS

FAMENNIAN-TOURNAISIAN

HORTON GROUP

CHA *Ainslie Formation*: cross-bedded sandstone and conglomerate, siltstone, mostly fluviatile deposits

CHS *Strathlorne Formation*: grey and red siltstone, sandstone, micritic limestone, conglomerate with carbonate clasts

CHJ *Judique Formation*: red cross-bedded medium to coarse sand, lithic arkose, sandstone, minor conglomerate

DCHC *Craignish Formation*: dominantly conglomerate with red and grey sandstone, thick and thinly bedded, alluvial fan facies

DCH undifferentiated Horton Group

DCFB *Fisset Brook Formation*, basalt member: vesicular porphyritic basalt and andesite, with minor interbedded redbed siltstone and conglomerate

DCF *Fisset Brook Formation*: vesicular basalt, rhyolite, red siltstone, sandstone, conglomerate

ORDOVICIAN

OMG monzogranite

HADRYNIAN-CAMBRIAN

HCGD medium grained granodiorite (includes Capelin Cove pluton)

LATE HADRYNIAN

HGN gneiss

HGD granodiorite

PRINGLE MOUNTAIN GROUP

HP varied basaltic to rhyolitic lapilli tuff and ash tuff, minor rhyolite flows

HELIKIAN-HADRYNIAN

GEORGE RIVER GROUP

PG limestone, marble, dolostone, calc-silicate rock, quartzite, feldspathic arenite, wacke, minor mafic metavolcanic rocks

PM marble, calc-silicate rock, gneiss, minor quartzite

PQ quartzite, psammitic schist, quartzofeldspathic gneiss, minor calc-silicate rock and amphibolite

PW biotite and chlorite schist, metawacke, marble, dolostone calc-silicate rock, quartzite, gneiss, schist, mafic metavolcanic rocks, amphibolite

POLLETS COVE RIVER GROUP

HD monzonite, diorite, gabbro

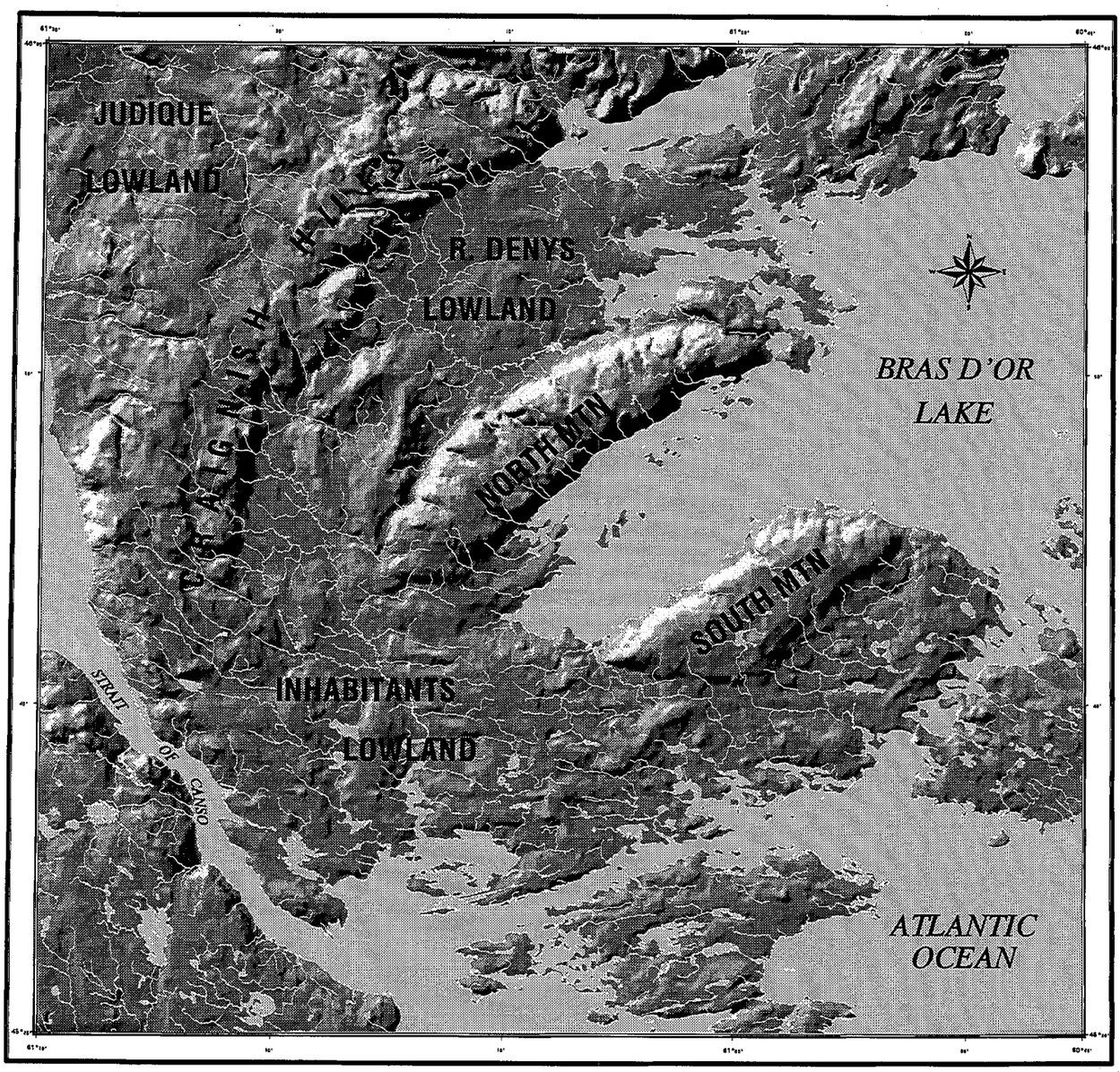
UNCERTAIN AGE

HDM mylonitic granite, diorite, and mylonitic gneiss, biotite-garnet schist

HDG medium grained variably foliated granite

HDD diorite

HDA amphibolite



Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 Kilomètres

Transverse Mercator Projection
Scale Factor 1, Central Meridian 61°10′, Latitude of Origin 45°30′

Fig. 3: Digital Elevation Map Showing Main Physiographic Divisions

QUATERNARY DEPOSITS

The chemistry of trees is influenced partly by bedrock composition, but primarily by the chemical composition of groundwater and surficial deposits. Therefore, consideration of the physical and chemical nature of the glacial deposits is relevant to interpretation of the biogeochemical patterns.

Grant (1994) describes the Quaternary geology of Cape Breton Island in detail. His comprehensive study shows that 90 percent of the survey area is covered with a veneer or thin blanket of Wisconsinan till interspersed with numerous rock outcrops (Grant, 1994, Fig. 40). His map shows three categories of till, differentiated according to thickness and morphological features. Grant's text description assigns source rocks to the tills and identifies four principal categories:

a) reddish, silt/clay tills derived mainly from Carboniferous shale;
b) reddish brown, sandy tills derived mainly from Carboniferous sandstone;
c) brown, sandy, stony tills derived by mixture of Carboniferous conglomerate and Precambrian crystalline rocks;
d) grey and brown, stony, sandy tills derived mainly from crystalline rocks.

Approximately 80 percent of the survey area has a surface till underlain by one or more tills of differing lithology and texture. Grant (1994) notes that `the till sequence, together with various cross-cutting glacial erosional features, documents a succession of several local and regional ice-flows from different directions ..... various cohesive silty tills with a high proportion of transported stones occur on the sedimentary rock lowlands'. The southern part of the study area experienced an early phase of ice movement toward the northeast, followed by dominant flow over the entire area toward the northwest. Later there were minor and more local phases to the southeast, the northeast, and finally toward the southwest.

In addition to the till layers there are local glaciolacustrine and glaciofluvial deposits, and a succession of post-glacial sediments (fluvial, colluvial and organic deposits) creating a high level of complexity to the surficial regime. Clearly these sediments have had a bearing on the chemical signatures of the vegetation. The relative influence of each successive is difficult to assess, especially since tree roots may locally penetrate one sediment layer to extract nutrients from another. Despite these complications regional patterns of element distributions emerge which provide insight to the geochemistry of the surficial environment. These patterns may provide focus for further study whether oriented toward exploration or environmental concerns.

MAP PRODUCTION AND DATA HANDLING

The transparent geological overlay map provided in the pocket, and the large coloured sample location map are digitised computer-plotted compilations based upon the map of Lynch *et al.,* 1995. The digital geology base for this study was created by digitally clipping the appropriate area from the digital base map. The resulting topologically consistent base contains 30 units.

The maps for this report (with the exception of Fig. 1) were all drawn using a Transverse Mercator (TM) projection, using the North American Datum 1927 (NAD27). Figure 1 is part of a Digital Chart of the World (DCW) 1 : 1,000,000, which is a non-projected (geographic Latitude/Longitude) compilation.

The coastline, drainage and roads for the page size maps (1 : 350 000 scale) were obtained in AutoCad DXF digital format from Geomatics Canada of the Department of Natural Resources Canada. The digital base for these maps was produced by splicing together four 1 : 50,000, NAD27, Universal Transverse Mercator (UTM) Zone 20, digital bases (11F/14, 11F/15, 11F/11, 11F/10) and then clipping the appropriate sub-area. The colour insert base was produced by clipping the study area from a 1 : 250 000 NAD27, UTM Zone 20, ARC/INFO export file (E00) of Cape Breton bedrock geology produced by the Geological Survey of Canada (Lynch *et al.*, 1995).

The proportional dot maps were generated using AML (ARC/INFO Macro Language). The macro, with its corresponding input menu, prompts the user to input percentile break points and an appropriate scaling exponent for each element to be mapped. Proportional dots are then generated, using the ARC/INFO SPOTSIZE, POINTSPOT and SPOT commands, with the user specifying an appropriate minimum and maximum dot size. For the purposes of this Open File, analytical values for a particular element that were greater than or equal to the 98th percentile were plotted at the maximum dot size; values less than the 98th percentile were scaled according to the user defined exponent. Exponents for individual elements were carefully chosen to provide the best view of the analytical data. Accordingly, care should be exercised when attempting to compare different elements plotted with different exponents. Element concentrations below analytical detection limits were reduced to half of the detection limit for data plotting and statistical calculations. For samples with duplicate analyses, data from the first of each duplicate pair was plotted.

A digital elevation map of south-western Cape Breton Island is provided (Fig. 3, and transparent overlay in envelope) for additional assistance in interpreting the element distribution maps. This map was produced from Digital Terrain Elevation Data (DTED) provided by CCRS (Canada Centre for Remote Sensing). Complete elevation coverage for the survey area was obtained by merging 1° x 1° DTED tiles, and then clipping the appropriate sub-area. The resulting cell size was approximately 97 x 97m, with a horizontal circular error (CE) of less than 130 m and a vertical linear error (LE) of less than ±30 m. ARC/INFO's GRID module was used to perform the raster compilation and to create the shaded relief map.

ELEMENT DISTRIBUTION MAPS

Interpretation of the element distribution maps requires some consideration of the role of chemical elements in plant function. Some comments are given in this section to assist in this interpretation. These notes deal first with those elements determined by INAA, followed by those determined by ICP-ES. This sequence is the same as the element listings in Appendix A and the statistical summaries in Appendix B.

For determinations by INAA the first element listed is Au, because of its common interest, after which elements are arranged alphabetically by chemical symbol. For determinations by ICP-ES, elements are arranged alphabetically by chemical symbol.

Since the present study is the fifth of its kind in Nova Scotia using balsam fir twigs, Tables 9 and 10 are provided for comparison with data from different parts of the province. Surveys were conducted between 1987 and 1995 using the same sampling methods, and all sample preparation was conducted in the GSC laboratory of the senior author. The INAA data in Table 9 are summarised as median values of element data sets, all provided by the same analytical laboratory (Activation Laboratories) under consistent analytical conditions. The ICP-ES data in Table 10 also show median concentrations, and were all obtained on an aqua regia digestion of ash samples. No ICP-ES data were obtained for samples from the first survey (Open File 2002). Min-En Laboratories, Vancouver, provided data given in Open Files 2757 and 2758. Data in the remaining two Open Files were provided by Acme Analytical Laboratories, Vancouver. Throughout the entire analytical program one standard ash sample of conifer tissues has been inserted within each batch of 20 samples to ensure consistency in analytical accuracy. GSC standard `V2' was used for the early surveys and when that was exhausted it was superseded by `V6c'.

These Tables show that there is remarkable consistency in median concentrations of many elements, and they provide a clear assessment of `background' concentrations across the province. In the following comments with respect to individual elements, reference can be made to these tables to assess the magnitude of local concentrations of elements.

Table 9: Mean concentrations of elements in balsam fir twig ash from surveys in Nova Scotia: Determinations by Instrumental Neutron Activation Analysis (INAA)

		OF 3344[1] Southwest Cape Breton Island n=365	OF 2758[2] Southeast Cape Breton Island n=491	OF 2002[3] Southeast Nova Scotia n=593	OF 3221[4] Central Nova Scotia n=786	OF 2757[5] Southwest Nova Scotia n=455
Au	ppb	12	5	7	8	<5
As	ppm	1.8	2.7	2.3	3.3	2.7
Ba	ppm	2000	1500	1100	2500	1300
Br	ppm	30	33	19	33	30
Ca	%	16.9	16.2	15.2	18.7	18.4
Ce	ppm	5	6	8	7	6
Co	ppm	4	5	5	5	3
Cr	ppm	18	14	23	17	6
Cs	ppm	1.0	1.6	2.7	1.5	2.7
Eu	ppm	<0.01	<0.01	0.06	<0.01	<0.01
Fe	%	0.24	0.39	0.34	0.32	0.28
Hf	ppm	0.6	0.7	0.9	0.9	0.6
K	%	23.4	20.3	22.2	23.6	20.8
La	ppm	2.6	3.3	4.1	4.5	3.2
Lu	ppm	<0.05	0.06	<0.05	0.06	<0.05
Na	ppm	2460	3020	2920	1945	3135
Nd	ppm	<5	<5	<5	<5	<5
Rb	ppm	160	170	260	250	270
Sb	ppm	0.4	0.6	0.4	0.6	0.6
Sc	ppm	0.7	1.0	0.9	0.9	0.8
Se	ppm	<2	<2	<2	<2	<2
Sm	ppm	0.4	0.5	0.6	0.6	0.5
Sr	ppm	780	1100	860	980	1400
Ta	ppm	<0.5	<0.5	<0.5	<0.5	<0.5
Th	ppm	0.3	0.6	0.7	0.6	0.5
U	ppm	<0.1	<0.1	<0.5	<0.1	<0.1
W	ppm	<1	<1	<1	<1	<1
Yb	ppm	0.22	0.28	0.34	0.31	0.26
Zn	ppm	1900	1900	2000	2100	2000
Ash Yield	%	2.10	2.12	2.08	2.00	2.00

1 This study
2 Dunn, et al., 1994b
3 Dunn, et al., 1989
4 Dunn, et al., 1996
5 Dunn, et al., 1994a

Table 10: Mean concentrations of elements in balsam fir twig ash from surveys in Nova Scotia: Determinations by ICP-ES after aqua regia digestion

		OF 3344[1] Southwest Cape Breton Island n=365	OF 2758[2] Southeast Cape Breton Island n=491	OF 2002[3] Southeast Nova Scotia n=593	OF 3221[4] Central Nova Scotia n=786	OF 2757[5] Southwest Nova Scotia n=455
Ag	ppm	<0.3	0.6	-	0.5	1.5
Al	%	0.53	0.71	-	0.66	0.57
B	ppm	262	221	-	368	222
Be	ppm	<0.2	<0.2	-	0.3	<0.2
Cd	ppm	8.6	7.9	-	8	5.5
Cu	ppm	148	165	-	166	164
Ga	ppm	-	<2	-	-	3.5
Li	ppm	2	<2	-	3	<2
Mg	%	2.63	3.43	-	3.87	3.42
Mn	%	2.08	2.68	-	2.03	1.11
Mo	ppm	1*	2	-	<1	2
Ni	ppm	29	62	-	53	38
P	%	2.24	3.56	-	2.34	2.84
Pb	ppm	48	134	-	57	113
Sr	ppm	545	-	-	586	-
Ti	ppm	-	106	-	-	83
V	ppm	8	25	-	23	28

* Determined by INAA (quality of ICP-ES data was inadequate)

1 This study
2 Dunn, et al., 1994b
3 Dunn, et al., 1989
4 Dunn, et al., 1996
5 Dunn, et al., 1994a

TRANSPARENT OVERLAYS

A transparent overlay at the same scale as the element distribution maps is provided to help locate individual samples (identified by sample number on the folded coloured map, Appendix C), and to relate their positions to main communities, bedrock geology and mineral occurrences. A second transparent overlay is a digital elevation map, showing roads, streams and topographic features.

DISTRIBUTION MAPS OF ELEMENTS DETERMINED BY INAA

Gold (Au)

Gold is not known to be essential for plant growth and health. Consequently, patterns of Au distribution reflect zones of relative Au enrichment in soils, groundwater and near surface rocks. Background levels of Au in the ash of balsam fir twigs are commonly less than 5 ppb Au. In the survey area the median concentration (an estimate of background) of 12 ppb Au is appreciably higher than the median for Au in other survey areas of Nova Scotia, suggesting that south-west Cape Breton Island is a `geochemical province' of weak gold enrichment. Median values (11 - 13 ppb) are similar for the five basic categories of rock adopted for broad classification of the survey area (Appendix B, p. B1, and Table 12).

Balma (1997), as part of his thesis, undertook a factor analysis of the analytical data set in an attempt to identify a factor in which Au is a dominant component. He found that the fourth factor, which accounted for 5.9% of the data variation, had factor loadings >0.5 for Au, Br, and K. The Au/Br association is of interest in that it has been noted in biogeochemical studies near zones of Au mineralization from elsewhere in Canada (Dunn, 1986; Dunn and Hoffman, 1986). Thus, by mapping the factor scores associated with factor four, it is possible to identify those areas where this association is dominant and, by inference, the areas where biogeochemical data indicate preferred areas for Au exploration (Fig. 4).

Arsenic (As)

Arsenic is renowned for its toxicity, yet plants (especially Douglas-fir) can accumulate extraordinary amounts without exhibiting any visible harmful affects (Warren *et al.*, 1964; Dunn and Scagel, 1989). Arsenic is an essential element for the metabolism of carbohydrates in fungi and algae, and a few ppm As in most conifer tissues is to be expected. The median concentration of 1.8 ppm As is lower than elsewhere in Nova Scotia (Table 9). The statistics sheet (Appendix B, p.B2) shows that samples from terrain underlain by extrusive rocks (Fisset Brook Formation and Pringle Mountain Group) and metamorphic rocks of the George River Group have relatively low background concentrations of As (1.2 ppm). In general the western half of the survey area has slightly more arsenic than the east, especially in areas of clastic sediments of the Cumberland and Mabou groups.

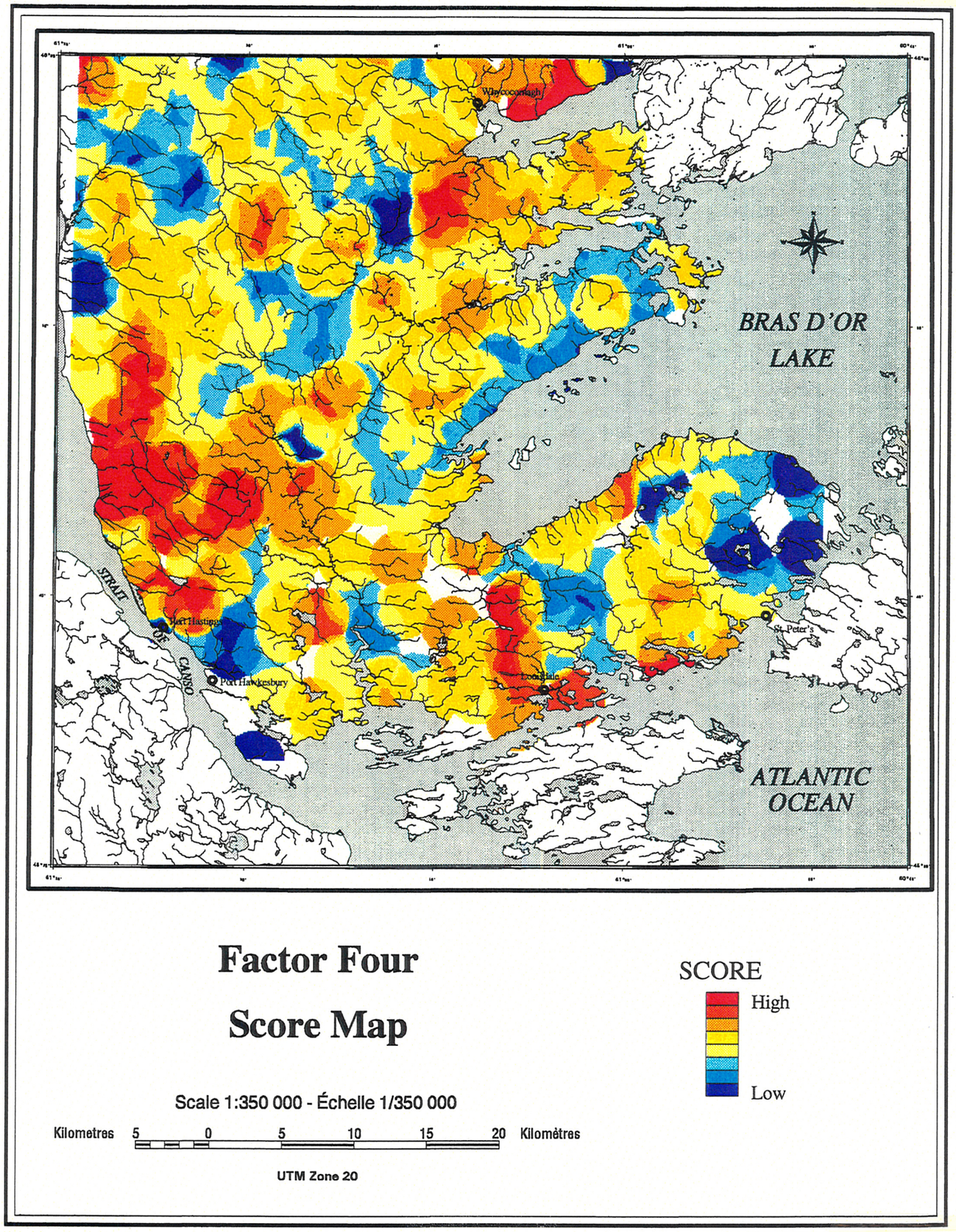


Fig. 4: Plot of scores for Factor 4 (Au, Br, K) from factor analysis of data set

Barium (Ba)

All samples yielded substantially more barium than the INAA detection limit of 10 ppm Ba. Balsam fir twigs commonly contain approximately 1000 ppm Ba. In the survey area the median of 2000 ppm Ba attests to the relative enrichment of Ba in southwestern Cape Breton Island. Highest concentrations (maximum of 6600 ppm Ba) occur in areas with clastic and chemical sediments (carbonates and evaporites) of the Cumberland and Mabou groups, and clastic sediments of the Horton Group in the northwestern part of the survey area. There is a notable area of enrichment associated with the synclinal structure (Fig. 3) in the River Denys Lowland.

Bromine (Br)

Bromine is a volatile element, present in most, if not all terrestrial plants, but it is not known to be an essential element. It can occur in many forms as complexes within plants. Some Br complexes volatilise during the ashing process, causing losses of up to 90 percent of the Br contained within the plant tissues. The median value of 30 ppm Br is in close accord with Br concentrations in balsam fir twig ash from elsewhere in Nova Scotia (Table 9). As discussed above (section on `Gold'), in some environments there is a Au/Br association in plant ash from zones of mineralization (Dunn, 1986). Within the survey area some of highest concentrations of Br occur near sites of Au enrichment in twigs, approximately 10 km north of Port Hastings. A second area with high Br is located a few km south of Whycocomagh near a site yielding moderate enrichment of Au.

Calcium (Ca)

Calcium is a major `building block' element, essential for the rigidity of cell walls in most plants. The variations in Ca content of the twigs may influence the distribution of some trace elements. For example a statistical analysis of multi-element data sets commonly reveals a strong association of Ca with Ba and Zn, although within the survey area this association is not apparent. The statistical summary of the Ca data (p. B5) shows there is little variation among trees growing over different substrates except for enrichment over rocks of the George River Group.

Cerium (Ce): see Lanthanum and other Rare Earth Elements

Cobalt (Co)

Traces of Co are required by some plants to assist in the fixation of major nutrients (e.g. N, S). One ppm Co in ash is all that is required by most plants (Kabata-Pendias and Pendias, 1984), but conifer twigs commonly have approximately 5 ppm Co. Within the survey area the median content of Co in the balsam fir twigs is 4 ppm. Most sites with above background concentrations of Co (maximum 15 ppm) occur in the south, between St. Peter's and Port Hastings

Chromium (Cr)

Chromium is a non-essential element for which precise INAA data are obtained at low ppm levels. The median concentration of 18 ppm Cr is similar to that for balsam fir from elsewhere in Nova Scotia (Table 9). However, there are zones of unusual enrichment (maximum of 100 ppm Cr) associated with the synclinal structure of clastic sediments comprising the Mabou Group (River Denys Lowland) and foliated granite lying to the west (Craignish Hills). Most Cr in rocks is structurally incorporated in crystal lattices of spinel group minerals and it is not readily released to tree roots from these sources. Usually, it is only where a source of weakly bound Cr is present (e.g. Cr mica, serpentinized ultramafic rocks, or the rare Cr carbonate) that concentrations such as those found here are encountered. The source of the Cr is unknown.

Cesium (Cs)

This alkali metal performs no known essential function in plant tissues, and is usually present at less than 3 ppm Cs in conifer twig ash. Although more geochemical partitioning of Cs from Rb occurs in plant tissues than in rocks, both metals are enriched in trees from areas where there are alkali metal-rich phases in granitic bodies. This enrichment is apparent in two areas underlain by felsic intrusive rocks in the east-central (Hadrynian granodiorite, North Mountain [Fig. 3]) and north-eastern (Hadrynian gneiss, Craignish Hills [Fig. 3]) parts of the survey area. Comparison of the maps of Cs and Rb shows that elsewhere in the survey area there is a greater level of partitioning of these metals.

Europium (Eu): See Lanthanum and other Rare Earth Elements

Iron (Fe)

Iron is essential for photosynthesis and is a major constituent of chlorophyll. In addition, there is a residual content of Fe that reflects the composition of the substrate. Statistical analysis of the data (p. B11) shows that, compared to other lithological groups, Fe concentrations are appreciably lower (0.15% Fe) over metamorphic rocks of the George River Group, and extrusive rocks of the Fisset Brook Formation and the Pringle Mount Group.

Hafnium (Hf)

Hafnium it is not known to play an essential role in plant metabolism, yet the ash of conifer twigs commonly contains 1 ppm Hf. Hafnium levels are usually higher where Fe concentrations are high because the two elements are associated in plants. This is the dominant association, although Zr may also control the uptake of Hf by plants due to the close geochemical affinities of these elements.

Potassium (K)

Potassium has no structural role in plants, but it serves a number of catalytic roles and is required in large amounts (Bidwell, 1979). It is very important in the overall metabolism of plants. The ranges of concentrations present are normal levels for conifer twigs (Table 9). There is relative enrichment of K in fir twigs from trees on foliated granite forming the Craignish Hills (Fig. 3), probably because of the potassic feldspar in the bedrock.

Lanthanum (La) and other Rare Earth Elements [REE]

Because of their chemical coherence the rare earth elements are considered as a separate group. Data provided by the low cost multi-element INAA package used in this study includes determinations of the rare earth elements lanthanum (La), cerium (Ce), neodymium (Nd), samarium (Sm), europium (Eu), terbium (Tb), ytterbium (Yb), and lutetium (Lu). Of these rare earths, only Tb consistently yields concentrations below the detection level (0.5 ppm) and is excluded from the data listings and discussion. Maps of REE show very similar distribution patterns, with concentrations generally higher in the east than the west. No sample yielded an unusually high concentration of any of the REE, and in general they closely follow Fe.

Lutetium (Lu):See Lanthanum and other Rare Earth Elements

Molybdenum (Mo)

Molybdenum is required in trace amounts by most plants for nitrogen fixation and nitrate reduction. Concentrations are usually <2 ppm Mo in the ash of conifer twigs, although over highly alkaline soils the trees are able to absorb Mo more readily, and therefore slightly higher levels may be expected. Within the survey area Mo concentrations are not exceptional, with only a few isolated occurrences of Mo up to 6 ppm.

Sodium (Na)

Median concentrations of Na are similar over the differing rock substrates, except for a moderate deficiency over rocks of the metamorphosed rocks of the George River Group. Local enrichment occurs a few kilometres north of Port Hastings in an area yielding some of the highest Au levels of the survey area.

Neodymium (Nd): See Lanthanum and other Rare Earth Elements

Rubidium (Rb)

There is an antagonism between K and Rb in plants (Kabata-Pendias and Pendias, 1984) because of their competition for the same binding sites, resulting in different distribution patterns for the two elements. Cesium is also involved in this competition, and in trees is more closely associated with Rb than K, especially where they grow on alkali-rich granites (cf. maps of Cs and Rb distributions). Background levels of Rb in balsam fir twigs

are commonly around 250 ppm, although compared to the rest of Nova Scotia there is relative depletion throughout much of southern Cape Breton Island (Table 9). In the survey area highest concentrations (maximum of 940 ppm Rb) occur as a north-easterly belt of enrichment in the north, coincident with felsic intrusive rocks of Hadrynian age that form the Craignish Hills.

Antimony (Sb)

Excellent analytical precision is obtained for Sb by INAA down to sub-ppm levels in ash. Although Sb in soluble forms can be taken up readily by plants, it is considered a non-essential element (Kabata-Pendias and Pendias, 1984) and it is usually present in sub-ppm amounts (Table 9). Throughout the survey area, antimony is present at levels close to usual background concentrations for balsam fir, reaching a maximum of only 1.9 ppm Sb.

Scandium (Sc)

Data on the essentiality of Sc in biologic systems are inconclusive (Horovitz, 1988). If required at all, Sc is needed only in `ultra-trace' amounts, and therefore its presence in twigs is controlled essentially by the chemistry of the substrate and by the distribution of other elements. In the survey area Sc shows the usual high correlation with Fe that is found in plants.

Selenium (Se)

Traces of Se are essential for some plants. Selenium occurs in combination with many compounds, some of which break down to release volatile chemical species of Se during the ashing process. Consequently, it is probable that the Se content of the twig ash is not proportional to the total content of the dry tissue. Analytical precision by INAA at low ppm levels of Se is poor. As a result, anomalies are mostly isolated and bear no relationship to known mineralization within the survey area.

Samarium (Sm): See Lanthanum and other Rare Earth Elements

Strontium (Sr)

INAA has poor sensitivity to traces of Sr, and analytical precision is inferior to that for most other elements considered in this study. However, Sr concentrations are well above detection limits in all samples, such that the areas of Sr enrichment depict significant regional variations.

Strontium is essential for some plant species, but its general essentiality still needs confirmation. It performs a function similar to Ca in plants, and may be incorporated into their structural components. However, interactions between Ca and Sr are complex and, as demonstrated by the distribution maps for these elements, they do not closely follow one another. In the survey area highest concentrations occur in association with sediments of the Mabou Group (maximum of 5800 ppm Sr - site #2033).

Thorium (Th)

Thorium has low solubility and is not essential for plant growth. Its concentration in plant ash is typically < 1 ppm, and even over zones of Th-rich mineralization (e.g. allanite with > 5000 ppm Th in northern Saskatchewan) only a few ppm accumulate in the tissues (Dunn and Hoffman, 1986). Relative to the rest of the survey area, there is relative enrichment (maximum of 4.7 ppm Th) over sediments of the Mabou and Cumberland groups.

Uranium (U)

Although U_3O_8 has high solubility, it rarely exceeds concentrations of more than 2 ppm in plant ash, and background concentrations are commonly <0.1 ppm U (Table 9). There are a number of notable exceptions, particularly in northern Saskatchewan where enrichments in spruce twigs are locally more than three orders of magnitude (Dunn, 1983). No significant enrichment of U occurs within the survey area.

Ytterbium (Yb): See Lanthanum and other Rare Earth Elements

Zinc (Zn)

Zinc is essential for carbohydrate and protein metabolism, therefore differences of a few 100 ppm Zn in ash are probably related to the health of the tree rather than subtle changes in substrate chemistry. However, in the survey area there is a range in concentration from 960 - 4200 ppm Zn indicating that the regional pattern of Zn distribution is reflecting broad differences across the area. Spatial patterns of Zn concentrations are not confined to any single stratigraphic formation, however there are two north-easterly-trending zones of Zn enrichment which are mostly over the rocks of Hadrynian age that form the Craignish Hills and North Mountain. Some of the highest concentrations occur in the general vicinity of the Lime Hill zinc deposit (see Fig. 2).

DISTRIBUTION MAPS OF ELEMENTS DETERMINED BY ICP-ES

Aluminum (Al)

All dry vegetation samples were placed in Al trays for ashing, therefore some contamination from this source is inevitable. However, the amount of Al contributed from this source is small compared to the concentrations (typically more than 0.5%) that occur in the ash of conifer twigs. The aqua regia extraction used for releasing metals from ash into solution is not `total' for Al, but good precision was obtained for duplicate samples (Table 6). Tests undertaken to compare data obtained on an ash standard by ICP-ES (aqua regia digestion) with some INAA data (determinations for short-lived isotopes) indicate that the acid digestion releases approximately 50% of the Al. Highest concentrations of Al in the survey area are mostly over clastic sediments of the Cumberland and Mabou groups.

Boron (B)

Borosilicate test tubes were used for the acid digestion of the ash samples. This digestion may release 5 - 10 ppm B from the borosilicate, but this is insignificant in comparison with the hundreds of ppm B present in the ash. Tests indicate that the analytical procedure provides data, which represent about 50% of the true concentrations of B in the samples. Precision, however, is excellent (Table 6).

Boron is essential for plant growth, and it is believed to play an important role in the translocation of sugars. Within the survey area the median and range of B concentrations are typical for balsam fir (Table 10), and there are no significant enrichments. Some of the highest concentrations occur over carbonates and evaporites of the Windsor Group in the northeastern part of the survey area (River Denys Lowland).

Cadmium (Cd)

Although there is a strong geochemical association between Cd and Zn in many geochemical environments, commonly this is not evident in plant tissues because of the *requirement* that plants have for Zn but not for Cd. However, Cd is easily absorbed by plants and may therefore be expected to reflect relative Cd concentrations in the soils and groundwater. Absolute concentrations differ among plant species because Cd can be captured by a variety of organic compounds in cell walls and therefore not all will be transported to the tree extremities. The Cd content of samples from extrusive rocks and metamorphic rocks of the George River Group is lower than elsewhere in the survey area. Although concentrations are locally high (maximum of 52.5 ppm Cd) there are no obvious trends in Cd distributions.

Copper (Cu)

Data obtained by ICP-ES from the aqua regia leach are both precise and accurate. Copper plays a fundamental role in plant metabolism. It assists in respiration, photosynthesis, nitrogen fixation and valence changes, and it is present in many micro-components of plants (small and large molecules, chloroplasts, mitochondria etc.). As a consequence, the background concentration of Cu in ash of the twigs (median 148 ppm Cu for this study) is high compared to many trace elements.

The interpretation of Cu distribution patterns in tree tissues should be approached with caution, since laboratory studies report numerous antagonistic and synergistic interactions with both major and minor elements. Kabata-Pendias and Pendias (1984) review these briefly. However, despite the essentiality of Cu and the complex metabolic roles that it may play, substantial differences among survey samples are more likely to reflect significant differences in the Cu content of the substrate than the relatively small differences attributable to micronutrient functions. Within the present survey area the range in Cu concentrations is quite small (99 - 244 ppm) and not diagnostic of any significant concentration of Cu in the substrate. No clear trends are apparent, except perhaps for a weak association with Zn,

following a north-easterly trend in association with rocks of Hadrynian age in the north (Craignish Hills).

Lithium (Li)

Lithium commonly follows Rb and Cs in nature. In balsam fir twigs it is less abundant than Rb but slightly enriched with respect to Cs. It is not known to be essential to plant metabolism, and its high solubility (except where firmly bonded to clay minerals) causes Li enrichment in soils and waters to be readily reflected in plant tissues. There are no notable concentrations of Li in the survey area. Highest concentrations (maximum of 15 ppm Li) are in trees growing over clastic sediments of the Mabou and Cumberland groups.

Magnesium (Mg)

Magnesium is a macronutrient that plays several important roles in plant health, including photosynthesis and numerous enzyme reactions. From a biogeochemical prospecting perspective, major differences in Mg concentrations in plants can indicate significant differences in the underlying lithology, but smaller differences are not known to be of value in delineating zones of mineralization. Table 10 shows that the median Mg concentration in southwest Cape Breton is appreciably lower than elsewhere in the province, perhaps reflecting a relative paucity of mafic to ultramafic rocks and dolomite. Highest concentrations occur in trees growing over rocks of the George River Group (maximum of 4.84% Mg).

Manganese (Mn)

Manganese is highly enriched in balsam fir twigs. It is an essential element which is readily taken up by plants, especially where the acidity of the ground is high. In acidic environments there is a Mn/Fe antagonism, which is extended to elements with a broad affinity for Fe. Statistics on p. B35 show that trees from sites overlying the clastic sediments and intrusive rocks (mostly granitic), which generate relatively acidic soils, contain the highest concentrations of Mn.

Nickel (Ni)

The presence of Ni may assist in the translocation of nitrogen in some plants, but its general essentiality is unproven. When in solution, plants readily take up Ni, therefore it may be expected that the Ni content of the twigs is positively correlated with Ni concentrations in groundwater. INAA has low sensitivity to Ni (detection limit of 50 ppm Ni in ash). In contrast, excellent precision (Table 6) and accuracy are obtained by ICP-ES down to the minimum level (7 ppm Ni) recorded for this data set. In general, Ni concentrations in balsam fir from southwest Cape Breton Island are lower than those from other areas of Nova Scotia that have been surveyed (Table 10). Nickel concentrations are highest (maximum of 142 ppm Ni) in trees growing over sediments of the Cumberland and Mabou groups to the east of

Port Hastings, and also in the centre of the survey area where enrichments are coincident with high levels of Cr.

Phosphorus (P)

Phosphorus plays a vital role in plant energy metabolism, and it is extremely important as a structural part of many organic compounds. Its uptake by trees may be antagonised by excess Ca which, by comparing maps showing distribution patterns of Ca and P, appears to take place in the balsam fir twigs because most sites with high Ca have low P. Similarly, high levels of P may influence the uptake of numerous trace metals, although this effect appears to be subordinate to the over-riding effect of the chemistry of the substrate. Phosphorus levels are quite low in comparison with those in balsam fir from other parts of the province (Table 10).

Lead (Pb)

Despite the known toxic effects of Pb it occurs naturally in all plants, and in small traces Pb may even be an essential element (Broyer *et al.*, 1972). It is taken up mainly by root hairs and stored as a pyrophosphate in cell walls. On average, Pb concentrations in the survey area are lower than those found in balsam fir from other parts of Nova Scotia (Table 10). Some of the highest concentrations occur along North Mountain

Vanadium (V)

The essentiality of V for plants other than green algae has not been proven. Roots easily take up soluble V, and it may play a similar role to Mo in fixing nitrogen. Vanadium concentrations in southwest Cape Breton Island are substantially lower than concentrations in other parts of Nova Scotia. Table 10 shows that the median value of 8 ppm V is only a third of that found elsewhere. The distribution of V is different from all other elements determined, except for a coincidence with Ni enrichment near Port Hawkesbury and Port Hastings. Most samples with concentrations greater than 20 ppm V are from trees growing on clastic sediments of the Cumberland Group.

OTHER ELEMENTS: (TUNGSTEN, SILVER, BERYLLIUM)

Tungsten (W) - The detection limit for W by INAA is 1 ppm in ash, which is above the usual concentrations in tree tissues, and analytical precision at this level is poor.

Silver (Ag) - Silver is not known to be essential to plant life, and can become toxic to plants by substituting for K in membranes and thereby inhibiting the absorption of other cations by roots (Hendrix and Higinbotham, 1974). However, at the sub-ppm concentrations present within the study area (and most natural environments) the inhibiting effect of Ag on the uptake of other elements is insignificant.

Beryllium (Be) - There is usually less than 2 ppm Be in soils, and because it is a non-essential element for plant growth (in high concentrations it is toxic), its presence in the

substrate is reflected in the balsam fir twigs by concentrations of mostly less than 0.2 ppm Be.

NOTES ON THE BIOGEOCHEMICAL DATA LISTINGS

(APPENDICES A and B)

Appendix A contains lists of field data and all analytical data obtained for the balsam fir twig ash. Appendix B provides some simple statistical analyses of the data by treating the data set as a whole, and by dividing the data according to the underlying bedrock geology by lithology. Abbreviations used in the appendices are explained in Tables 11 and 12.

ACKNOWLEDGEMENTS

The co-operation, assistance, and advice provided by personnel of the Nova Scotia Dept. of Natural Resources (NSDNR) are greatly appreciated. In particular we thank Paul Lombard and two of his assistants for undertaking some of the sampling, and Dr. P.J. Rogers (formerly NSDNR) for his active support throughout this study. Thanks, too, to Martin McCurdy for his review of this report. This project is a contribution to a Canada-Nova Scotia Co-operation Agreement on Mineral Development (1992-1995).

Table 11: Abbreviations Used in Appendix A

Map Sheet	National topographic system (NTS): First three characters refer to 1:250,000 scale quadrangle; remaining two characters identify the 1:50,000 scale map sheet within the quadrangle.
Zone, Easting and Northing	The Universal Transverse Mercator (UTM) zone followed by easting and northing co-ordinates in metres.
Twig Min Age Twig Max Age	The minimum age of each length of twig collected. The maximum age of each length of twig collected.
Slope	0 = flat ground 1 = slight incline followed by downward compass direction (e.g. 1N = slight downward incline to the north) 2 = moderate incline 3 = steep incline
Land Class	Land Classification: type of vegetation cover and degree of surface water saturation. First letter: D = dry; M = moist; W = wet Second letter: O = open; M = moderately dense; D = dense Third letter: W = woodland; B = bog
Rock Unit	Abbreviation used on large coloured map

Table 12: Abbreviations Used in Appendix B

Rock Type	In view of the many different bedrock units in the survey area, rock types have been broadly grouped according to lithology, derived from published geological maps, mostly that of Lynch *et al.,* 1995: **Clast. sed.** - Clastic sediments; mostly sandstone, siltstone and some coal **Chem. sed.** - Chemical sediments; i.e. carbonates and evaporites **Int. rock** - Intrusive rocks; mostly granite and granodiorite **Ext. rock** - Extrusive rocks; mostly basalt and andesite **Meta. G.R.** - Metamorphic rocks of the George River Group
N dl Cum %	N = number of samples dl = determination limit Cum % - cumulative frequency (as a percentage)

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Appendix A

Data Listings

(Field and Analytical)

Abbreviations are explained in Table 11 (page 33)

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
1001	11F11	20	620648	5065163	5	7	3W	DDW	CMU
1002	11F11	20	621959	5066368	6	7	1NW	DMW	HDG
1003	11F11	20	622512	5065217	5	6	0	DMW	HDG
1004	11F11	20	624833	5062675	4	6	1S	DML	DCH
1005	11F11	20	623079	5064148	4	6	1	MMW	HDG
1006	11F11	20	622809	5066575	6	7	0	DMW	HDG
1008	11F11	20	624378	5066604	4	5	0	DMW	HDG
1009	11F14	20	620777	5069735	3	6	0	DMW	DCHC
1010	11F14	20	622013	5070437	4	5	1S	DMW	DCHC
1011	11F14	20	621974	5074671	4	5	0	DMW	DCHC
1012	11F14	20	622495	5072776	4	5	1S	DMW	DCHC
1014	11F11	20	619892	5066562	3	5	2W	DMW	DCFB
1017	11F14	20	643938	5087919	6	7	0	MMW	CWU
1018	11F14	20	644931	5087086	4	5	1NE	DMW	CWU
1019	11F14	20	646672	5086341	6	7	0	MMW	CWL
1020	11F14	20	644946	5085833	6	7	0	MMW	CWU
1021	11F14	20	643929	5084655	6	7	1E	MMW	CWU
1022	11F14	20	642362	5084269	6	7	1N	MMW	CWU
1023	11F14	20	642305	5086485	6	7	0	MMW	CWU
1024	11F14	20	646968	5087884	5	7	2N	DMW	CWL
1025	11F14	20	649668	5088402	5	7	0	MMW	CWL
1026	11F14	20	652405	5089456	6	7	0	DMW	CMU
1027	11F14	20	654449	5090087	5	6	0	DMW	CMU
1028	11F14	20	654359	5087974	5	7	0	DMW	CWU
1029	11F14	20	652940	5085788	6	7	0	MMW	CWU
1030	11F14	20	651090	5086607	6	7	0	MMW	CWL
1031	11F14	20	649140	5085744	5	7	0	DMW	CWU
1032	11F14	20	647008	5084411	4	6	1SW	DMW	CWU
1033	11F14	20	646107	5082147	5	7	1E	DMW	CWL
1034	11F14	20	651591	5094364	6	7	3SW	DMW	CHA

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
1001	2.72	65	4.0	1100	190	12.7	8	9	15	<0.5	0.18	0.54	1.7	32.40	6.2	<2	0.12	5190	<5	87	0.4	1.7	<2	0.9	<300	0.5	<0.1	0.62	1600
1002	2.29	78	2.7	490	89	18.4	5	6	9	<0.5	<0.02	0.28	<0.5	26.40	3.3	2	<0.05	5170	<5	210	0.7	0.8	<2	0.5	860	0.2	<0.1	0.32	1700
1003	2.04	33	2.7	1700	110	16.9	5	8	7	1.2	<0.03	0.34	0.8	28.50	3.9	<2	0.07	6480	<5	240	0.4	1.0	<2	0.5	<300	0.7	<0.1	0.34	1700
1004	2.52	21	4.5	2300	83	19.4	10	5	13	1.9	<0.03	0.49	1.7	23.10	5.3	<2	0.06	4220	<5	150	0.5	1.5	<2	0.8	<300	1.0	<0.1	0.44	3000
1005	2.18	16	2.2	1800	61	25.2	8	4	8	2.9	<0.03	0.27	<0.5	20.10	4.0	<2	<0.05	2660	<5	290	0.4	0.8	<2	0.5	850	0.4	<0.1	<0.05	2300
1006	2.13	22	2.5	2000	98	16.9	<3	3	2	0.9	<0.03	0.14	<0.5	28.70	1.6	<2	<0.05	2040	<5	110	0.3	0.3	<2	0.2	520	<0.1	<0.1	<0.05	1900
1008	2.05	30	2.7	2200	130	19.5	11	7	40	<0.5	<0.03	0.33	<0.5	29.00	6.8	<2	<0.05	7200	<5	180	0.5	0.6	<2	0.8	<300	<0.1	<0.2	0.43	2800
1009	2.37	25	1.9	760	100	12.5	<3	5	7	5.9	<0.03	0.27	0.9	31.40	2.4	<2	<0.05	1980	<5	340	0.4	0.5	<2	0.4	820	0.1	<0.1	<0.05	2400
1010	2.75	12	1.9	2100	85	16.1	<3	5	16	5.3	<0.03	0.20	<0.5	29.20	2.1	<2	<0.05	8620	<5	310	0.4	0.5	<2	0.3	780	0.3	<0.1	<0.05	2400
1011	2.17	26	2.3	2400	140	15.7	<3	8	5	1.6	<0.03	0.15	<0.5	33.00	1.4	<2	<0.05	2270	<5	320	0.3	0.3	<2	0.2	750	<0.1	<0.1	<0.05	2000
1012	2.42	40	3.1	1200	88	15.1	12	5	8	1.7	<0.02	0.45	2.3	28.50	5.1	<2	0.12	7700	<5	190	0.6	1.2	<2	0.8	640	1.0	<0.1	0.56	2400
1014	2.28	11	1.1	2300	89	14.4	4	5	14	1.1	0.22	0.16	<0.5	29.80	1.8	<2	0.05	2670	<5	44	0.4	0.4	<2	0.2	830	<0.1	<0.1	0.26	2400
1017	2.28	<5	1.8	640	96	14.3	5	13	19	3.5	<0.02	0.28	<0.5	31.50	2.6	<2	<0.05	4410	<5	330	0.4	0.7	<2	0.4	590	0.3	<0.1	0.30	1600
1018	2.36	<5	1.1	2500	71	22.9	6	4	19	1.8	<0.03	0.16	0.9	26.60	1.9	<2	<0.05	1660	<5	200	0.4	0.5	<2	0.3	<300	0.2	<0.1	<0.05	1800
1019	2.31	11	1.6	1700	92	21.9	8	5	17	0.8	0.18	0.25	<0.5	26.00	3.9	<2	<0.05	1520	<5	180	0.5	0.8	<2	0.6	640	0.7	<0.1	0.34	1800
1020	2.18	<5	3.2	2000	130	23.4	7	6	17	<0.5	0.28	0.33	<0.5	19.60	3.3	<2	0.05	2100	<5	160	0.5	0.9	<2	0.5	830	0.8	<0.1	0.21	1900
1021	2.44	14	2.4	2000	92	21.6	5	4	11	0.8	<0.02	0.20	<0.5	22.80	2.7	<2	<0.05	3750	<5	100	0.4	0.6	<2	0.4	520	0.4	<0.1	0.23	1800
1022	2.41	13	3.9	1300	170	21.3	6	6	15	<0.5	<0.02	0.30	<0.5	24.00	3.5	<2	<0.05	2610	<5	200	0.4	0.9	<2	0.5	1400	<0.1	<0.1	<0.05	1600
1023	2.43	58	1.3	1200	53	19.0	9	3	9	2.3	<0.02	0.42	1.4	24.80	4.6	<2	0.05	2000	<5	400	0.5	1.3	3	0.7	2000	0.9	<0.1	0.52	2100
1024	2.51	19	1.3	3100	28	24.0	<3	4	10	<0.5	<0.02	0.14	0.7	20.90	2.4	<2	<0.05	1390	<5	82	0.4	0.3	<2	0.3	430	0.2	<0.1	0.16	1500
1025	3.18	8	1.6	1400	27	15.3	12	4	22	0.9	0.32	0.61	1.8	22.00	6.3	<2	0.14	4220	<5	170	0.5	2.2	<2	1.0	480	1.7	0.5	0.73	1200
1026	3.25	14	3.4	2300	30	15.0	23	7	32	1.6	0.48	1.11	3.2	19.90	13.0	<2	0.26	5640	17	100	0.5	4.0	<2	2.2	3500	3.1	1.1	1.35	1200
1027	2.73	11	2.9	1400	22	13.2	23	6	30	1.5	0.44	1.02	2.5	21.00	12.0	<2	0.19	5890	15	93	0.5	3.6	<2	2.0	490	2.6	1.0	1.23	1700
1028	2.18	18	2.4	630	32	16.9	5	4	21	0.8	0.12	0.40	<0.5	24.70	3.2	<2	0.06	3130	<5	94	0.5	0.9	<2	0.5	780	0.3	<0.1	0.27	1800
1029	2.43	14	2.2	890	37	15.0	13	4	20	1.5	0.19	0.58	1.8	26.60	6.5	2	0.11	3070	6	200	0.5	1.9	<2	1.0	440	1.4	0.7	0.62	1400
1030	1.99	19	2.0	2400	20	26.0	3	4	15	<0.5	<0.02	0.18	<0.5	18.60	1.9	<2	<0.05	2420	<5	50	0.5	0.4	<2	0.2	710	0.4	<0.1	0.15	1200
1031	2.27	17	1.7	1700	41	15.5	11	8	21	1.8	<0.02	0.56	1.4	22.90	6.0	<2	0.08	3300	<5	210	0.5	1.7	<2	0.9	720	0.8	0.4	0.62	1400
1032	2.27	16	1.8	1200	31	24.6	5	4	17	0.9	<0.02	0.24	<0.5	20.00	2.8	<2	0.05	3200	<5	97	0.5	0.7	5	0.4	440	<0.1	0.5	0.27	1800
1033	2.07	17	1.4	1900	34	24.0	8	4	17	<0.5	<0.02	0.31	<0.5	22.90	3.4	<2	<0.05	2750	<5	150	0.5	0.8	<2	0.5	510	0.3	<0.1	0.31	2100
1034	2.08	24	<0.5	1500	62	14.0	<3	6	3	2.5	<0.03	0.16	<0.5	34.80	1.6	<2	<0.05	3300	<5	520	0.5	0.3	<2	0.1	560	<0.1	0.7	<0.05	2200

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
1001	0.77	185	12.3	137	2	2.03	10928	16	2.929	37	9
1002	0.96	277	6.8	125	<2	3.05	24506	32	1.881	74	15
1003	0.62	295	12.6	188	<2	2.35	29905	20	2.916	67	11
1004	0.63	240	38.6	163	2	1.76	26459	54	2.699	63	21
1005	0.48	306	5.0	163	<2	2.81	8058	27	1.986	63	18
1006	0.59	283	13.1	177	2	2.17	16526	70	3.596	32	5
1008	0.34	390	6.4	194	<2	2.64	12091	22	1.882	55	8
1009	0.56	276	13.3	140	2	3.08	28078	29	2.402	45	8
1010	0.31	305	13.0	150	2	1.96	20673	19	3.386	63	11
1011	0.61	302	18.9	171	2	2.69	29145	54	2.488	35	6
1012	0.70	254	21.1	202	4	2.33	21740	16	2.876	65	11
1014	0.63	342	13.6	184	2	2.65	6882	41	3.761	28	3
1017	0.73	348	1.9	178	3	2.64	22675	28	2.681	61	8
1018	0.27	366	5.6	126	<2	2.48	16401	21	2.584	60	6
1019	0.43	345	5.9	112	4	2.12	24766	25	1.784	119	12
1020	0.22	332	6.4	143	2	2.74	21399	11	1.553	83	14
1021	0.32	445	7.1	153	4	2.70	14935	25	2.003	64	10
1022	0.44	358	6.9	143	3	2.15	16362	31	2.205	71	13
1023	0.30	308	13.7	130	4	1.72	26489	16	1.590	66	14
1024	0.46	324	12.7	134	2	2.50	19935	33	2.303	48	5
1025	0.57	274	8.9	137	9	1.49	25615	19	2.563	37	10
1026	1.04	257	6.6	133	11	2.13	10410	72	3.274	41	13
1027	1.02	213	13.4	156	9	2.03	32567	37	2.440	51	13
1028	0.56	328	3.9	179	5	3.65	11965	28	2.867	62	9
1029	0.73	384	5.1	132	5	3.30	25624	31	2.309	62	12
1030	0.25	322	4.4	203	3	2.65	6657	22	2.806	43	6
1031	0.92	290	4.2	176	7	2.91	41052	38	3.109	60	12
1032	1.02	342	6.0	177	4	2.47	9193	22	2.643	69	10
1033	0.37	389	7.7	197	3	2.21	14793	22	1.995	81	15
1034	0.83	288	8.8	191	2	2.97	28110	31	4.020	51	5

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
1035	11F14	20	648798	5092017	5	6	3S	DMW	CHA
1036	11F14	20	648114	5094300	6	7	3S	DMW	CHA
1037	11F14	20	644493	5093488	5	7	3SW	DMW	CHA
1038	11F14	20	643091	5095068	6	7	0	DOW	CHA
1039	11F14	20	642668	5093551	5	7	3S	DMW	HGN
1040	11F14	20	640155	5093350	6	7	3N	DMW	PG
1041	11F14	20	637437	5092917	6	7	1N	DMW	DCHC
1042	11F14	20	636732	5094755	6	7	0	DMW	DCHC
1043	11F14	20	642914	5089286	4	5	3SE	DMW	HGN
1044	11F14	20	640841	5089899	4	5	0	MMW	HGN
1045	11F14	20	642786	5091199	5	7	0	MMW	PQ
1046	11F14	20	639618	5091846	4	7	0	MMW	HDM
1047	11F14	20	639910	5090880	4	7	1W	MMW	HDG
1048	11F14	20	638886	5090717	3	5	1N	MMW	HDG
1049	11F14	20	637425	5090651	6	9	2SE	MMW	HDM
1050	11F14	20	637063	5091799	5	7	3NW	DMW	PG
1051	11F14	20	635681	5089315	4	5	0	MMW	HDM
1052	11F14	20	637347	5088227	5	7	0	DMW	HDM
1053	11F14	20	633536	5091323	5	7	0	MMW	DCHC
1056	11F14	20	632411	5089795	5	8	0	MMW	PG
1059	11F14	20	630718	5090685	5	6	0	DMW	DCHC
1060	11F14	20	630935	5088882	4	6	1E	DMW	DCHC
1061	11F14	20	631125	5088845	5	6	1E	DMW	DCHC
1064	11F14	20	633339	5086390	6	8	2S	DMW	PG
1065	11F14	20	635470	5086327	6	8	3S	DMW	PG
1067	11F14	20	637648	5085851	5	6	1SE	DMW	CWL
1069	11F14	20	644212	5078986	6	7	2SE	DMW	CWU
1070	11F14	20	640839	5077890	5	7	1SW	DMW	CWU
1071	11F14	20	638081	5080594	5	7	0	MMW	CWU
1072	11F14	20	639388	5082974	5	6	0	DMW	CWU

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INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
1035	2.36	48	1.3	1300	32	18.4	<3	4	15	1.4	<0.04	0.19	<0.5	27.20	1.8	<2	<0.05	3780	<5	100	0.3	0.5	<2	0.2	650	<0.1	<0.2	<0.05	1600
1036	2.35	<5	<0.5	1300	43	14.3	<3	2	11	<0.5	0.15	0.16	<0.5	34.10	1.3	<2	<0.05	1180	<5	250	0.6	0.3	<2	0.2	<300	0.2	<0.1	<0.05	2300
1037	1.95	14	<0.5	2500	34	14.8	5	3	19	7.8	<0.03	0.26	<0.5	31.70	3.0	<2	<0.05	3020	<5	530	0.6	0.7	<2	0.4	580	0.7	<0.1	0.40	2300
1038	2.56	9	1.7	3300	32	17.5	<3	4	13	0.9	<0.02	0.14	<0.5	27.60	1.8	<2	<0.05	3110	<5	100	0.5	0.4	<2	0.2	800	<0.1	<0.1	<0.05	1900
1039	2.25	8	2.3	1800	32	20.8	10	4	18	2.2	<0.02	0.41	1.1	19.10	6.1	<2	0.09	2490	<5	320	0.5	1.2	<2	0.9	1000	1.0	<0.1	0.38	1800
1040	2.04	10	2.2	3000	27	21.9	7	4	19	0.9	<0.02	0.30	0.9	15.90	4.2	<2	<0.05	2520	<5	160	0.4	0.8	<2	0.5	1100	0.5	<0.1	0.35	3100
1041	1.93	11	1.2	1400	19	20.0	<3	3	9	2.9	<0.02	0.14	0.6	25.20	1.4	<2	<0.05	3100	<5	370	0.4	0.3	<2	0.2	1000	<0.1	<0.1	0.10	2100
1042	2.30	21	2.0	1500	32	15.3	7	4	16	<0.5	<0.03	0.19	<0.5	32.70	2.9	<2	0.07	1780	<5	270	0.6	0.6	<2	0.4	720	<0.1	<0.1	0.25	2200
1043	2.14	<5	1.9	2700	38	19.2	<3	6	13	1.4	0.13	0.16	<0.5	21.80	1.4	<2	<0.05	2210	<5	430	0.6	0.3	<2	0.2	1200	0.4	<0.1	0.20	3000
1044	2.08	8	1.8	650	90	14.0	4	5	21	7.3	<0.02	0.23	0.7	30.50	2.3	3	<0.05	2360	<5	710	0.4	0.6	<2	0.3	790	0.2	<0.1	0.16	2800
1045	1.76	16	2.0	370	27	11.6	5	2	26	7.5	<0.02	0.29	0.6	28.70	2.6	<2	0.05	4210	<5	870	0.4	0.8	<2	0.3	640	0.4	<0.1	0.23	2200
1046	1.99	14	1.5	2000	33	14.0	3	3	21	6.9	<0.02	0.15	<0.5	32.00	1.4	<2	<0.05	1790	<5	630	0.5	0.3	<2	0.2	960	0.3	<0.1	<0.05	2800
1047	2.11	15	1.0	1700	27	20.1	<3	3	13	3.0	<0.02	0.16	<0.5	26.10	1.9	<2	<0.05	1770	<5	310	0.5	0.4	<2	0.2	870	0.2	<0.1	0.24	2900
1048	2.39	9	<0.5	1800	22	13.9	<3	3	13	3.3	<0.02	0.12	<0.5	26.00	1.3	<2	<0.05	1690	<5	240	0.3	0.3	<2	0.2	760	<0.1	<0.1	0.06	1700
1049	1.97	19	2.3	2700	22	19.1	5	4	20	5.3	<0.01	0.25	<0.5	21.90	3.1	<2	<0.05	2100	<5	300	0.6	0.6	<2	0.5	640	0.3	<0.1	0.18	2500
1050	2.28	12	1.4	1300	22	19.8	<3	2	13	0.9	<0.02	0.11	<0.5	27.80	1.1	<2	<0.05	1420	<5	270	0.5	0.2	<2	0.1	640	<0.1	<0.1	<0.05	2100
1051	2.07	14	1.4	1600	23	17.1	3	3	21	0.8	<0.02	0.17	0.6	27.70	1.6	<2	0.06	1500	<5	300	0.4	0.4	<2	0.2	1400	<0.1	<0.1	<0.05	2500
1052	2.00	17	1.8	770	20	21.1	<3	2	15	2.8	<0.02	0.18	<0.5	21.60	1.6	2	<0.05	1450	<5	400	0.4	0.4	<2	0.2	910	0.3	<0.1	<0.05	2600
1053	2.34	10	1.9	5600	27	20.5	<3	7	19	<0.5	<0.03	0.13	<0.5	25.20	1.6	<2	<0.05	1560	<5	170	0.3	0.3	<2	0.2	<300	0.1	<0.1	<0.05	1600
1056	2.57	6	1.1	1300	27	24.9	4	2	21	<0.5	<0.02	0.19	0.6	23.00	2.0	<2	<0.05	3240	<5	160	0.4	0.5	<2	0.3	690	0.3	<0.1	<0.05	1800
1059	2.55	6	2.5	2000	22	14.3	10	6	28	1.3	<0.02	0.49	1.4	17.90	5.3	4	0.08	2680	10	110	0.4	1.5	<2	0.8	670	0.9	<0.1	0.42	1600
1060	2.31	8	1.6	2400	21	14.0	5	3	24	0.9	<0.02	0.28	1.0	22.10	2.7	<2	<0.05	2310	<5	100	0.3	0.8	<2	0.4	420	0.5	<0.1	0.19	1600
1061	2.08	11	1.5	1100	24	18.0	<3	2	19	0.9	<0.02	0.14	<0.5	16.50	1.4	<2	<0.05	1730	<5	180	0.5	0.3	<2	0.2	500	0.3	<0.1	0.16	1200
1064	2.12	16	1.1	1000	16	14.0	<3	2	14	1.7	<0.02	0.11	<0.5	21.50	1.0	<2	<0.05	847	<5	380	0.3	0.2	<2	0.2	660	<0.1	<0.1	0.10	1900
1065	2.26	<5	0.8	1200	16	9.6	<3	3	14	1.8	<0.02	0.11	<0.5	24.50	1.1	<2	<0.05	845	<5	280	0.3	0.2	<2	0.1	530	0.1	<0.1	0.14	1800
1067	2.86	14	1.5	1700	17	19.7	5	3	13	0.6	<0.02	0.28	0.8	16.90	2.8	<2	0.06	1980	<5	220	0.4	0.8	<2	0.5	750	0.3	<0.1	0.24	2200
1069	2.81	20	2.4	1400	30	14.8	11	7	20	1.9	<0.03	0.47	1.3	20.30	4.2	<2	0.08	4440	<5	200	0.4	1.4	<2	0.7	1200	0.7	<0.1	0.34	1400
1070	2.01	13	1.4	1200	22	11.5	3	3	19	1.3	<0.02	0.26	0.8	23.40	2.5	<2	<0.05	2590	7	250	0.4	0.7	<2	0.4	520	0.6	<0.1	0.29	1500
1071	1.98	13	2.1	1000	38	13.2	4	4	5	1.0	<0.03	0.26	<0.5	19.80	2.1	<2	0.05	3030	<5	84	0.2	0.6	<2	0.3	1000	0.3	<0.1	<0.05	2100
1072	1.94	8	3.8	1000	29	11.7	14	5	28	2.7	<0.02	0.71	1.3	16.70	7.0	<2	0.12	2510	12	240	0.8	2.1	<2	1.1	1000	1.2	0.8	0.54	1300

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
1035	0.47	177	4.9	127	<2	1.66	13764	36	2.400	28	3
1036	0.19	207	8.6	139	<2	1.59	5270	32	3.310	23	3
1037	0.61	226	6.5	131	<2	2.55	22338	33	2.185	48	8
1038	0.41	216	9.5	120	<2	2.18	12855	29	2.571	28	3
1039	0.72	241	5.2	129	2	2.81	10470	31	1.710	76	12
1040	0.65	252	8.3	189	<2	3.05	18105	34	2.508	81	13
1041	0.40	242	6.4	160	2	3.46	11305	21	2.088	39	6
1042	0.50	194	4.5	130	<2	2.86	7534	38	2.155	50	7
1043	0.69	233	11.7	156	2	3.63	21900	41	3.327	61	8
1044	0.46	236	6.0	160	<2	2.57	29146	22	2.072	61	11
1045	0.60	320	4.1	173	2	3.63	24869	35	3.666	80	17
1046	0.47	249	10.8	143	<2	2.74	45730	40	2.735	37	6
1047	0.32	266	10.5	134	<2	2.46	25787	20	1.723	52	10
1048	0.28	219	18.2	134	<2	2.75	24254	18	1.809	32	4
1049	0.30	240	18.4	137	<2	2.54	21505	17	1.381	61	12
1050	0.51	267	9.3	143	<2	2.45	13794	33	2.341	14	4
1051	0.58	257	16.5	170	<2	2.96	34467	37	2.969	32	6
1052	0.35	283	15.0	170	<2	2.36	33406	46	2.701	52	15
1053	0.42	243	13.5	145	<2	2.04	16749	40	1.829	27	4
1056	0.16	195	23.5	124	<2	2.08	3891	20	1.451	16	3
1059	0.47	285	7.1	107	5	1.82	15215	31	1.488	39	8
1060	0.47	257	5.5	157	2	1.89	16574	31	1.851	34	7
1061	0.23	239	5.5	143	<2	2.16	10015	28	2.065	44	10
1064	0.35	257	13.7	153	<2	2.44	22789	36	2.229	35	6
1065	0.35	227	4.9	137	<2	2.54	17553	26	2.153	42	7
1067	0.16	252	7.0	127	<2	1.31	13161	15	1.483	29	6
1069	0.65	202	9.5	127	2	1.86	14092	23	1.631	39	9
1070	0.64	319	2.7	200	2	3.17	11148	26	2.252	54	8
1071	0.61	254	5.6	153	<2	2.87	7951	40	2.183	34	9
1072	0.89	254	6.6	137	4	3.35	13457	29	2.042	94	19

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
1073	11F14	20	639507	5084437	6	7	0	DOF	CWU
1075	11F14	20	638182	5094773	5	6	2SW	DMW	DCHC
1076	11F14	20	634506	5094740	5	7	2NW	DMW	PG
1077	11F14	20	635517	5093848	6	7	3SE	DMW	PG
1078	11F14	20	635985	5091983	5	7	1NE	DMW	PG
1080	11F14	20	634230	5092206	5	7	2NW	DMW	PG
1081	11F14	20	631194	5092952	6	7	1N	MMW	DCHC
1082	11F14	20	638662	5070390	5	6	1NW	MDW	HGD
1083	11F14	20	639217	5069098	5	6	2NW	DMW	HGN
1084	11F14	20	642370	5074528	5	6	2NW	DMW	HGD
1085	11F14	20	643025	5074551	4	5	2S	DOW	HGD
1086	11F14	20	643935	5073931	4	5	1NE	DOW	PW
1088	11F14	20	645459	5073335	4	5	1SW	DOW	PW
1090	11F14	20	650349	5076064	4	5	0	WOW	HGD
1092	11F14	20	642891	5068869	4	5	3SE	DMW	HGN
1095	11F14	20	638242	5089045	4	6	2SE	DMW	HDM
1096	11F11	20	653444	5095534	5	6	3SW	DMW	PQ
2001	11F11	20	637212	5065389	5	7	2SW	MMW	OMG
2002	11F11	20	638456	5065143	5	6	3SE	MMW	OMG
2004	11F11	20	640401	5064900	4	5	1NE	MMW	CWL
2005	11F11	20	639865	5066573	5	7	2NE	MOW	OMG
2006	11F11	20	639761	5067726	5	7	1NE	MOW	OMG
2007	11F11	20	641300	5063344	6	9	0	MOL	CWL
2008	11F11	20	642826	5064660	5	7	1E	DOW	CWL
2011	11F14	20	618512	5073017	4	7	1NE	MMW	CHA
2012	11F14	20	618824	5073512	4	7	1	WMW	CHA
2014	11F14	20	619898	5074178	5	7	1NW	MMW	CHA
2016	11F14	20	619340	5076570	5	7	0	MMW	CHA
2017	11F14	20	620813	5076086	5	7	1SE	MMW	CHJ
2020	11F14	20	618585	5079032	4	7	0	WMW	CWL

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
1073	2.10	<5	1.3	2700	19	16.8	<3	3	17	<0.5	<0.03	0.17	<0.5	15.50	1.8	<2	<0.05	2150	7	50	0.3	0.4	<2	0.2	1400	0.4	<0.1	0.19	2400
1075	2.09	15	2.4	1700	19	14.7	8	2	13	1.0	0.16	0.46	0.9	25.00	5.0	<2	0.08	2620	<5	200	0.4	1.3	<2	0.8	830	1.1	<0.1	0.33	1800
1076	2.45	22	1.1	1600	30	25.7	4	2	15	2.1	<0.02	0.16	0.5	16.00	2.0	<2	<0.05	2180	<5	210	0.4	0.4	<2	0.3	1100	<0.1	<0.1	0.13	2000
1077	2.13	14	0.8	1800	27	22.1	4	4	10	2.0	<0.02	0.14	<0.5	21.10	1.6	<2	<0.05	1210	<5	170	0.4	0.3	<2	0.2	550	0.4	<0.1	<0.05	1700
1078	2.14	18	2.0	750	28	19.5	6	2	14	0.8	<0.02	0.23	0.5	27.00	2.8	<2	<0.05	2980	<5	190	0.3	0.7	<2	0.4	420	0.4	<0.1	0.16	1500
1080	2.05	16	<0.5	3300	32	20.9	3	2	5	<0.5	<0.02	0.18	<0.5	26.70	2.5	<2	<0.05	1980	<5	190	0.5	0.4	4	0.2	550	<0.1	<0.1	<0.05	1800
1081	2.04	<5	1.1	1400	45	18.9	3	6	11	1.1	<0.02	0.33	0.8	21.10	3.6	<2	0.06	2810	<5	200	0.5	0.9	<2	0.5	980	0.4	0.5	0.33	1700
1082	1.81	14	0.8	700	29	15.7	3	3	11	5.9	<0.02	0.14	<0.5	26.10	1.6	<2	<0.05	1310	<5	520	0.4	0.3	<2	0.2	720	<0.1	<0.1	<0.05	2200
1083	1.97	10	0.8	2700	24	19.6	<3	3	10	1.2	<0.02	0.10	0.7	21.80	1.4	<2	<0.05	651	<5	150	0.3	0.3	<2	0.2	470	0.1	<0.1	<0.05	2300
1084	2.31	10	2.6	2100	23	21.9	6	3	16	2.9	<0.02	0.28	0.8	21.20	2.9	<2	<0.05	2150	<5	220	0.5	0.8	<2	0.5	860	0.6	<0.1	0.38	2100
1085	2.21	10	1.9	2700	22	21.8	5	1	15	1.0	0.13	0.12	<0.5	21.30	1.7	<2	<0.05	3280	<5	230	0.2	0.3	<2	0.2	<300	<0.1	<0.1	0.14	2400
1086	2.10	10	1.7	3400	28	22.6	4	8	16	1.2	<0.03	0.19	0.9	21.50	2.4	<2	<0.05	3490	<5	100	0.5	0.4	<2	0.3	660	<0.1	<0.1	<0.05	2800
1088	1.92	8	1.5	3300	50	17.3	<3	8	16	0.8	<0.04	0.12	<0.5	29.00	1.3	<2	<0.05	2500	<5	180	0.3	0.2	<2	0.2	750	<0.1	<0.1	<0.05	2900
1090	2.09	9	1.3	580	24	13.6	3	2	17	1.4	<0.02	0.14	<0.5	28.70	1.4	<2	<0.05	1500	<5	180	0.3	0.3	<2	0.2	500	0.2	<0.1	0.13	2000
1092	2.49	<5	0.7	1500	14	14.5	3	3	11	<0.5	<0.02	0.08	<0.5	25.70	0.9	<2	<0.05	1310	<5	160	0.2	0.2	<2	<0.1	680	<0.1	<0.1	<0.05	1600
1095	2.33	<5	1.8	2400	22	13.9	6	2	11	0.8	<0.03	0.16	0.8	29.50	2.9	4	<0.05	1400	<5	170	0.2	0.4	<2	0.4	<300	<0.1	0.5	0.12	3200
1096	1.93	7	<0.5	1300	21	19.5	<3	3	9	1.1	<0.03	0.13	<0.5	20.20	0.9	<2	<0.05	1760	<5	230	0.3	0.3	<2	0.1	730	<0.1	<0.1	<0.05	2600
2001	1.79	11	2.1	1900	25	17.0	5	5	24	1.1	<0.03	0.24	<0.5	21.90	2.5	<2	0.05	2210	5	200	0.6	0.6	<2	0.4	1100	0.3	<0.1	<0.05	2100
2002	2.04	11	2.0	2600	20	16.5	4	3	24	0.7	<0.02	0.22	<0.5	22.70	2.0	<2	<0.05	3050	<5	190	0.5	0.6	4	0.3	1200	0.3	<0.1	0.18	1300
2004	2.15	<5	1.8	4000	26	17.5	7	5	20	0.9	<0.04	0.31	1.2	25.00	2.5	<2	<0.05	2430	<5	110	0.4	0.7	<2	0.4	810	0.4	<0.1	0.25	3200
2005	1.94	6	1.5	3100	27	16.0	9	4	17	1.0	<0.03	0.27	0.6	23.90	3.3	<2	0.07	1580	<5	180	0.5	0.7	<2	0.5	1000	0.5	<0.1	0.27	1800
2006	2.02	27	1.5	1900	20	15.3	4	4	20	11.0	<0.02	0.18	<0.5	22.10	2.2	4	<0.05	1690	<5	530	0.5	0.5	<2	0.3	1100	0.3	<0.1	0.14	3100
2007	2.28	25	<0.5	1700	24	15.8	4	2	18	<0.5	<0.03	0.15	<0.5	24.50	1.3	<2	0.05	1100	<5	60	0.3	0.3	<2	0.2	860	<0.1	0.5	<0.05	1900
2008	1.78	9	2.8	3300	35	14.5	9	4	27	<0.5	<0.04	0.49	1.4	25.40	4.4	<2	0.12	2930	<5	59	0.7	1.3	<2	0.7	930	0.7	<0.1	0.32	2300
2011	2.00	<5	<0.5	3400	38	17.8	<3	3	18	<0.5	<0.03	0.14	<0.5	20.60	1.7	<2	<0.05	5130	<5	170	0.2	0.3	<2	0.2	1300	<0.1	<0.1	<0.05	2100
2012	2.26	6	1.5	2800	29	12.4	6	5	20	1.3	<0.03	0.30	1.2	28.60	2.8	<2	0.05	4480	<5	240	0.3	0.8	<2	0.5	1200	0.5	<0.1	0.28	1800
2014	1.90	11	1.9	2600	32	14.8	6	5	27	0.8	<0.03	0.22	0.7	22.50	2.4	<2	<0.05	2960	10	120	0.5	0.6	<2	0.3	<300	0.2	<0.1	0.13	2300
2016	2.47	7	1.9	4400	22	16.5	11	2	26	<0.5	<0.03	0.57	1.3	17.90	5.5	<2	0.09	2650	9	140	0.4	1.6	3	1.1	2700	1.0	<0.1	0.56	1400
2017	1.57	9	2.5	3000	34	13.4	3	8	21	0.9	<0.03	0.15	<0.5	23.70	1.9	<2	<0.05	5460	6	170	0.5	0.4	<2	0.2	980	<0.1	<0.1	0.24	1900
2020	3.09	5	1.5	1800	22	16.4	7	5	22	1.2	<0.02	0.29	1.0	21.20	3.1	<2	0.07	2520	7	110	0.3	0.8	<2	0.5	700	0.5	<0.1	0.29	1700

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
1073	0.55	243	11.3	146	<2	2.31	18040	39	2.192	38	5
1075	0.54	261	6.0	141	2	2.72	17904	24	2.574	36	6
1076	0.23	206	10.6	115	<2	1.89	4835	11	1.533	32	5
1077	0.32	230	8.9	167	<2	2.72	14427	38	2.790	45	6
1078	0.16	230	2.6	135	<2	2.47	2871	13	1.939	67	9
1080	0.35	253	17.0	155	<2	2.67	9190	80	2.624	31	2
1081	0.58	298	5.4	139	<2	2.38	19247	22	1.766	77	12
1082	0.45	249	4.1	150	<2	3.39	6261	37	2.437	48	8
1083	0.42	268	15.1	154	<2	2.52	27835	30	2.457	53	11
1084	0.53	281	9.5	131	2	2.80	22038	22	2.487	46	8
1085	0.09	335	11.6	153	<2	2.31	16368	9	2.147	43	6
1086	0.36	333	10.9	171	<2	2.86	17167	37	2.219	38	5
1088	0.48	317	10.6	154	2	2.51	18281	34	2.734	35	5
1090	0.26	336	5.8	138	<2	3.11	14172	26	2.254	41	6
1092	0.44	258	6.2	110	<2	2.91	10680	35	3.220	19	<2
1095	0.36	247	42.5	172	<2	2.46	10925	61	3.646	38	5
1096	0.16	406	14.2	188	<2	3.47	28107	21	4.387	48	6
2001	0.56	329	8.7	185	<2	3.23	26788	49	2.553	86	16
2002	0.72	298	4.7	177	<2	3.02	13947	46	3.508	50	13
2004	0.28	291	28.5	211	<2	2.08	23400	15	2.971	42	9
2005	0.58	299	11.9	225	<2	2.73	36760	22	4.351	69	14
2006	0.56	272	18.3	171	<2	3.47	28222	46	3.733	74	11
2007	0.18	242	6.7	131	<2	1.75	35997	12	4.545	51	8
2008	0.78	274	7.8	212	<2	1.96	21530	29	3.015	67	17
2011	0.56	291	9.8	177	<2	2.60	16616	38	2.739	24	3
2012	0.58	292	13.3	167	<2	1.93	34653	16	3.280	33	5
2014	0.53	284	16.1	185	2	2.87	29112	62	2.669	58	8
2016	0.44	268	6.0	145	3	2.69	13394	14	2.691	45	8
2017	0.70	228	21.0	157	<2	2.57	46658	70	3.858	52	5
2020	0.54	281	5.6	122	<2	3.11	39404	19	3.360	56	7

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
2023	11F14	20	621571	5078973	4	5	1SW	MMW	DCHC
2024	11F14	20	624867	5079148	5	7	1	WMW	HDG
2025	11F14	20	622774	5079731	5	7	3	MMW	DCHC
2026	11F14	20	621464	5081148	5	7	0	MMW	CHJ
2028	11F14	20	617691	5080327	5	7	0	WMW	CWU
2029	11F14	20	618100	5084764	5	7	3S	MMW	CWL
2031	11F14	20	618936	5087019	5	6	0	MMW	CWU
2032	11F14	20	621553	5091426	6	7	0	MMW	CML
2033	11F14	20	620393	5089767	4	6	0	MMW	CML
2034	11F14	20	617406	5088512	6	7	1W	WMW	CMU
2035	11F14	20	617797	5090331	5	7	0	MOW	CMU
2036	11F14	20	618599	5092617	5	7	0	MMW	CMU
2037	11F14	20	620024	5091792	5	6	1S	MOW	CML
2039	11F14	20	621628	5089389	5	6	0	MOW	CHA
2041	11F14	20	621373	5087728	5	7	-	-	CHA
2042	11F14	20	623864	5088254	5	6	0	DOL	CHJ
2043	11F14	20	623290	5089836	5	6	1NW	DOW	CHS
2044	11F14	20	626058	5089653	6	7	-	DOW	CHJ
2045	11F14	20	623500	5091114	5	7	2N	DOW	CHJ
2046	11F14	20	621672	5093235	6	7	0	WMW	CML
2047	11F14	20	619772	5094399	4	6	0	MMW	CML
2049	11F14	20	621492	5085374	5	7	1W	DMW	CHJ
2050	11F14	20	622706	5086087	7	8	1W	DMW	CHJ
2051	11F14	20	618352	5075278	4	7	0	MMW	CWU
2052	11F14	20	619051	5083317	5	7	1NW	MMW	CHA
2055	11F14	20	620788	5084043	5	7	1SW	DMW	CHJ
2056	11F14	20	620066	5085492	4	5	1W	MML	CHA
2057	11F14	20	627963	5093675	6	7	0	DOW	CHJ
2058	11F14	20	627774	5091211	5	7	1S	DMW	CHJ
2059	11F14	20	629509	5092262	5	7	1N	DMW	DCHC

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
2023	2.34	23	1.9	2100	32	13.5	<3	2	6	0.5	<0.03	0.18	0.7	24.40	2.0	<2	<0.05	2480	13	52	0.3	0.5	<2	0.2	640	0.2	0.6	0.16	1700
2024	2.31	11	2.0	3300	51	17.1	12	5	18	1.4	0.15	0.50	2.1	19.10	5.1	<2	0.11	3230	<5	230	0.4	1.6	<2	0.9	800	1.1	0.5	0.48	2000
2025	2.22	9	2.4	1600	54	15.5	13	5	20	3.7	<0.03	0.54	2.0	21.70	5.9	<2	0.10	3290	<5	170	0.6	1.8	<2	1.0	590	1.5	<0.1	0.63	2100
2026	1.85	17	1.1	2200	38	15.0	7	3	11	<0.5	<0.03	0.20	<0.5	30.60	3.4	<2	<0.05	2600	<5	200	0.3	0.5	<2	0.3	810	0.3	<0.1	0.22	1700
2028	1.91	6	1.7	3800	39	14.0	6	5	19	0.8	<0.03	0.41	1.4	19.30	3.4	<2	0.08	3990	<5	230	0.4	1.2	<2	0.5	1300	0.7	<0.1	0.31	1500
2029	2.47	<5	2.1	2000	29	14.5	7	3	19	<0.5	0.19	0.40	0.9	18.70	4.0	<2	0.07	2670	9	40	0.5	1.0	<2	0.6	740	0.5	<0.1	0.38	980
2031	2.35	<5	2.7	2600	41	20.1	9	3	21	0.8	<0.03	0.42	1.2	19.40	4.7	<2	0.06	2590	<5	41	0.6	1.2	<2	0.7	2000	0.9	<0.1	0.38	2300
2032	2.25	6	1.2	2800	38	14.6	6	5	16	0.7	0.12	0.33	1.0	23.90	3.4	<2	0.05	5740	<5	59	0.3	1.0	<2	0.5	970	0.5	<0.1	0.26	1800
2033	2.55	8	3.2	1700	21	13.1	8	3	19	0.8	<0.02	0.46	1.4	22.50	4.2	<2	0.09	2940	<5	64	0.4	1.4	<2	0.7	5800	0.7	0.5	0.52	1700
2034	3.11	<5	2.9	1500	31	9.2	6	6	12	0.8	0.17	0.26	<0.5	26.30	1.8	<2	<0.05	5000	<5	140	0.4	0.6	<2	0.3	840	0.2	<0.1	0.20	1100
2035	2.56	<5	2.1	2600	25	9.1	11	5	18	1.0	<0.03	0.44	1.7	20.80	4.6	<2	0.09	2940	6	70	0.4	1.4	<2	0.7	760	0.7	<0.1	0.44	1600
2036	2.85	10	4.9	1800	18	18.6	25	5	27	1.7	0.45	0.99	3.0	15.90	13.0	2	0.18	4290	12	130	0.5	3.3	<2	2.0	620	2.5	<0.1	1.17	1800
2037	2.68	13	2.5	3000	55	17.9	9	5	9	1.7	0.29	0.47	1.4	24.50	5.0	<2	<0.05	2890	<5	42	0.4	1.5	<2	0.7	1000	0.5	0.4	0.58	1600
2039	2.54	<5	2.6	3900	26	21.1	7	3	18	1.6	0.21	0.34	1.5	19.80	4.0	<2	0.05	3290	<5	170	0.5	1.0	<2	0.6	950	0.9	0.4	0.35	2100
2041	2.34	<5	3.4	1800	31	9.9	18	4	27	2.0	0.30	0.69	2.0	17.00	8.4	<2	0.13	5620	8	150	0.5	2.3	<2	1.3	920	1.6	0.5	0.90	1400
2042	2.71	<5	4.3	2200	41	14.2	13	9	21	2.0	<0.03	0.57	2.5	24.10	6.8	<2	0.11	3880	12	180	0.4	1.8	<2	1.1	600	1.6	<0.1	0.62	1700
2043	2.44	8	1.8	2800	29	18.5	<3	5	16	0.6	<0.02	0.19	<0.5	21.60	2.2	<2	<0.05	2390	<5	130	0.3	0.5	<2	0.3	1200	0.4	<0.1	<0.05	1500
2044	2.51	<5	2.6	3800	25	19.0	<3	3	17	<0.5	<0.03	0.19	<0.5	20.10	2.5	<2	<0.05	3600	<5	87	0.4	0.6	<2	0.3	550	0.5	<0.1	0.20	1600
2045	2.38	6	1.5	1300	27	14.6	4	3	14	<0.5	0.17	0.18	0.7	24.90	2.0	<2	<0.05	2690	<5	61	0.3	0.5	<2	0.3	750	0.2	<0.1	0.19	2000
2046	2.41	10	2.5	1600	40	17.6	13	4	26	<0.5	<0.02	0.57	1.7	20.10	7.3	3	0.10	4260	5	180	0.5	2.0	<2	1.2	690	1.8	<0.1	0.69	1500
2047	2.48	<5	3.6	2600	41	13.9	16	5	26	1.2	0.27	0.75	2.3	20.80	8.2	<2	0.15	4620	9	93	0.5	2.6	<2	1.3	1000	1.5	0.8	0.78	1700
2049	2.48	9	2.5	1000	29	14.8	9	5	19	1.2	<0.02	0.41	1.1	25.90	4.6	<2	0.08	2780	<5	200	0.4	1.3	<2	0.7	680	0.6	<0.1	0.57	1800
2050	2.25	13	3.9	4100	39	24.4	7	4	26	1.1	<0.03	0.35	<0.5	20.60	3.8	<2	<0.05	2040	<5	100	0.6	1.0	<2	0.6	630	0.7	<0.1	0.30	2400
2051	2.10	21	2.7	4100	33	20.2	7	6	23	0.7	<0.02	0.40	1.5	17.00	3.8	3	0.06	7020	<5	70	0.8	1.0	<2	0.5	1400	0.9	<0.1	0.36	2000
2052	2.69	29	2.7	3900	23	21.9	18	3	18	1.4	<0.02	0.56	2.0	20.10	8.0	<2	0.14	2630	<5	64	0.4	2.0	<2	1.3	870	1.7	0.4	0.73	1500
2055	2.46	32	2.0	6000	22	20.5	8	3	18	<0.5	<0.02	0.22	<0.5	20.80	4.2	<2	<0.05	2350	<5	82	0.4	0.7	<2	0.4	760	0.6	<0.1	0.24	1800
2056	2.60	27	1.5	2200	63	19.3	4	7	11	0.9	<0.02	0.21	<0.5	25.60	2.2	<2	<0.05	2590	<5	230	0.5	0.6	<2	0.3	1000	0.2	<0.1	0.22	1800
2057	3.04	8	3.4	1100	25	18.3	25	5	26	1.9	0.44	1.21	3.2	15.90	14.0	<2	0.24	4370	11	150	0.6	4.4	<2	2.1	400	3.0	0.8	1.27	1300
2058	2.01	11	3.4	3500	40	20.4	6	5	5	<0.5	<0.02	0.28	1.3	21.00	3.2	<2	<0.05	2140	<5	130	0.5	0.8	<2	0.4	730	0.7	<0.1	0.22	1800
2059	2.55	17	2.3	5200	31	19.6	12	7	13	1.1	<0.03	0.44	2.0	24.80	5.9	<2	0.09	5190	8	150	0.6	1.4	<2	0.8	1200	1.1	<0.1	0.52	1700

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ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
2023	-	-	-	-	-	-	-	-	-	-	-
2024	0.72	261	16.2	154	4	1.96	25372	42	2.725	52	9
2025	0.76	279	9.6	160	3	2.83	32744	28	2.385	70	13
2026	0.49	303	12.1	190	<2	2.47	9484	28	2.251	35	5
2028	0.46	258	18.0	163	2	2.01	74566	11	2.829	47	9
2029	0.57	250	8.1	136	2	2.96	9710	41	3.759	56	10
2031	0.60	283	7.4	144	5	2.58	7808	102	1.720	36	9
2032	0.65	252	6.8	147	3	2.87	15650	33	2.836	33	6
2033	0.41	263	8.2	163	3	2.61	13110	23	2.441	45	11
2034	0.45	220	5.9	118	2	2.48	34753	25	3.087	44	7
2035	0.81	277	7.3	132	3	2.89	31244	49	2.738	75	11
2036	1.01	203	3.8	109	8	1.78	19046	20	1.307	61	17
2037	1.09	283	9.7	169	3	2.78	20396	43	3.009	27	10
2039	0.43	269	9.4	131	2	2.04	27802	12	1.586	53	11
2041	1.13	260	7.3	186	7	2.93	30093	44	2.317	66	17
2042	0.73	228	6.2	120	4	2.82	44911	14	2.407	81	13
2043	0.64	257	13.2	142	2	2.75	23761	27	2.604	42	7
2044	0.54	249	6.2	149	6	2.92	11486	28	4.077	38	7
2045	0.60	309	5.9	185	<2	3.64	17968	49	2.341	36	4
2046	0.70	266	1.7	130	5	2.73	12053	18	1.601	75	14
2047	0.84	247	8.4	160	5	3.44	18253	18	2.081	57	13
2049	0.76	244	13.3	131	2	3.50	20782	26	2.957	56	13
2050	0.35	305	10.4	161	2	2.48	22836	17	2.511	79	19
2051	0.56	286	14.7	181	3	3.81	34415	30	2.627	61	12
2052	0.70	255	10.8	131	9	1.95	9497	26	2.341	70	12
2055	0.65	250	40.5	157	2	3.23	17518	71	3.359	51	7
2056	0.62	221	15.6	147	<2	2.30	29640	24	2.029	37	4
2057	0.81	318	5.2	105	7	1.86	17952	20	1.341	65	15
2058	0.56	344	9.2	128	2	2.36	36963	25	2.482	79	17
2059	0.81	259	10.8	167	3	2.51	22427	73	2.845	36	7

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
2060	11F14	20	629281	5089593	5	7	0	MOW	DCHC
2061	11F14	20	626031	5092477	5	7	1N	DMW	CHJ
2062	11F14	20	627219	5089985	5	7	1N	MMW	DCHC
2064	11F14	20	627890	5087820	5	7	2NW	DMW	DCHC
2066	11F14	20	627961	5086096	5	7	0	DMW	DCHC
2068	11F14	20	628216	5084116	5	7	0	DOL	DCHC
2069	11F14	20	628299	5082767	5	7	0	DMW	HDG
2073	11F14	20	630104	5084535	5	7	0	MMW	HD
2074	11F14	20	630167	5082414	5	7	1W	DMW	PG
2076	11F14	20	636257	5083501	5	7	0	MOF	CWL
2078	11F14	20	634335	5083011	5	7	0	DMW	CWL
2079	11F14	20	634466	5081889	5	7	2N	DMW	CWL
2080	11F14	20	634596	5080724	5	7	1S	DOW	CWL
2081	11F14	20	633582	5079282	5	7	2S	DOW	CWL
2083	11F14	20	632154	5076810	4	6	0	DMW	CML
2084	11F14	20	630151	5074490	5	6	1NE	DMW	CML
2086	11F14	20	628750	5073341	5	7	1E	DMW	HDG
2087	11F11	20	644167	5062270	5	7	0	DOW	CWL
2088	11F11	20	645515	5061967	5	7	1SW	DMW	CWL
2089	11F11	20	647522	5061140	5	7	0	DMW	CWL
2090	11F11	20	652080	5064080	4	5	1NW	DOW	HP
2092	11F11	20	652868	5064386	4	7	1NW	DOW	HP
2094	11F11	20	653704	5065056	4	7	2NW	DMW	HP
2095	11F11	20	650347	5063165	4	7	0	DMW	HP
2097	11F14	20	631022	5076844	5	7	3	DOW	CHA
2098	11F14	20	630154	5078742	7	8	2E	DOW	PQ
2100	11F14	20	629069	5076128	5	6	0	DOW	HDD
2102	11F14	20	632492	5082736	6	8	0	DML	PG
2104	11F14	20	632469	5085046	6	8	0	MMW	PG
2105	11F14	20	631507	5086469	5	7	0	DOW	HD

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
2060	2.50	<5	3.0	3500	28	18.7	14	10	16	1.4	<0.02	0.82	2.3	18.90	7.8	<2	0.14	7780	5	230	0.8	2.6	<2	1.2	890	1.5	0.6	0.85	1900
2061	2.14	17	1.4	3100	25	19.3	6	3	15	0.7	<0.02	0.16	0.8	24.50	1.8	<2	<0.05	2750	<5	120	0.5	0.4	<2	0.2	940	0.2	<0.1	<0.05	2100
2062	2.58	14	2.2	1200	49	22.2	10	5	26	1.0	0.14	0.43	1.3	24.10	5.3	<2	0.08	2980	7	170	0.6	1.4	<2	0.8	<300	1.1	<0.1	0.42	1800
2064	2.36	19	1.6	4900	40	19.6	4	7	12	1.2	0.14	0.16	<0.5	23.20	4.5	<2	0.05	2190	<5	250	0.5	0.4	<2	0.3	860	0.3	<0.1	0.25	2000
2066	2.24	10	1.4	3700	29	22.4	5	2	18	0.8	<0.02	0.21	0.9	24.30	2.7	<2	<0.05	1970	7	220	0.3	0.5	<2	0.3	490	0.2	<0.1	0.22	2100
2068	2.35	12	1.7	1100	33	20.9	6	3	18	1.2	<0.02	0.30	<0.5	23.60	3.3	3	<0.05	2550	<5	280	0.6	0.8	<2	0.4	1300	0.7	<0.1	0.20	2100
2069	1.99	13	1.8	2700	38	14.5	6	6	5	1.3	<0.03	0.23	0.6	32.80	2.5	<2	<0.05	2570	<5	410	0.6	0.6	<2	0.3	<300	<0.1	<0.1	0.23	1800
2073	1.96	30	1.8	2200	51	20.0	4	5	17	2.3	<0.03	0.18	<0.5	30.90	2.0	<2	<0.05	4330	<5	390	0.6	0.5	<2	0.3	<300	0.2	<0.1	<0.05	2600
2074	1.97	21	2.1	1300	35	12.7	4	6	17	2.1	<0.03	0.18	<0.5	32.10	2.5	<2	<0.05	3740	<5	580	0.6	0.6	<2	0.3	830	0.2	<0.1	0.29	2000
2076	2.39	38	1.0	630	52	24.1	4	2	19	<0.5	<0.02	0.17	<0.5	26.90	1.7	<2	<0.05	3460	11	95	0.5	0.4	<2	0.2	1200	<0.1	<0.1	<0.05	1600
2078	2.38	11	1.8	2000	24	19.6	12	3	17	0.9	0.25	0.46	1.4	21.00	7.8	<2	0.08	2860	7	99	0.4	1.4	<2	1.2	550	1.1	0.4	0.65	1500
2079	2.23	21	1.2	1300	31	20.8	4	2	18	1.1	<0.02	0.16	<0.5	20.30	1.5	<2	<0.05	2600	<5	180	0.3	0.4	<2	0.2	690	0.1	<0.1	0.16	1800
2080	2.27	26	1.1	2800	82	19.0	5	4	21	1.1	<0.02	0.19	<0.5	23.90	2.8	<2	<0.05	3830	<5	94	0.4	0.5	<2	0.3	680	<0.1	<0.1	0.20	1800
2081	2.11	20	2.6	5600	24	25.7	4	3	17	1.0	<0.02	0.19	<0.5	14.60	3.0	<2	<0.05	1460	<5	160	0.5	0.5	<2	0.3	570	0.3	<0.1	0.11	2300
2083	2.03	19	0.9	3700	34	24.3	6	6	19	1.0	<0.03	0.28	<0.5	17.70	3.0	<2	0.06	2040	<5	86	0.4	0.7	<2	0.4	1200	<0.1	<0.1	0.23	1800
2084	2.14	14	1.8	3600	37	20.7	5	3	19	1.0	<0.02	0.28	<0.5	22.00	3.5	<2	<0.05	1780	<5	200	0.5	0.8	<2	0.5	510	0.3	<0.1	0.28	2300
2086	2.70	12	2.3	1300	38	19.2	10	3	21	2.7	<0.03	0.34	1.5	21.80	4.3	<2	0.08	4010	<5	330	0.5	1.1	<2	0.6	410	0.9	<0.1	0.55	2300
2087	2.34	11	1.7	2800	33	18.0	8	3	20	0.8	<0.02	0.36	<0.5	21.50	4.2	<2	<0.05	2420	<5	39	0.4	1.1	<2	0.6	2600	0.7	<0.1	0.33	1800
2088	1.94	36	1.8	1700	26	18.0	4	5	20	1.1	<0.02	0.17	<0.5	29.20	1.7	<2	0.06	4170	<5	93	0.4	0.4	<2	0.2	990	0.3	<0.1	0.29	1700
2089	2.01	13	1.5	4400	27	21.7	5	2	20	0.7	0.14	0.18	0.8	22.10	2.8	<2	<0.05	1750	<5	79	0.3	0.4	<2	0.4	1300	<0.1	<0.1	0.22	2500
2090	2.33	30	1.1	1800	35	18.9	<3	3	17	0.9	<0.03	0.16	0.7	25.20	1.9	<2	<0.05	2450	<5	77	0.5	0.4	<2	0.3	750	0.3	<0.1	<0.05	1700
2092	2.14	8	<0.5	2500	19	18.3	<3	5	11	0.9	<0.02	0.07	<0.5	22.80	0.9	<2	<0.05	1660	<5	150	0.6	0.2	<2	0.1	730	<0.1	<0.1	<0.05	2200
2094	1.95	13	2.2	3500	26	21.9	<3	2	18	1.1	<0.02	0.15	0.5	19.20	1.4	<2	<0.05	3700	<5	130	0.3	0.3	<2	0.2	570	<0.1	<0.1	0.17	2100
2095	2.38	12	2.9	3400	25	20.5	4	5	16	0.8	<0.02	0.19	1.1	19.50	2.1	3	<0.05	4490	<5	110	0.4	0.5	<2	0.3	1300	<0.1	<0.1	0.22	1900
2097	2.64	12	<0.5	4300	32	19.1	7	3	9	0.9	0.21	0.23	<0.5	24.50	3.8	<2	<0.05	3060	<5	110	0.3	0.7	<2	0.4	<300	0.7	<0.1	0.25	1500
2098	1.73	14	0.9	3300	23	24.7	<3	3	11	1.5	<0.03	0.10	<0.5	16.60	2.0	<2	<0.05	2310	<5	220	0.4	0.2	<2	0.2	860	<0.1	<0.1	0.13	1800
2100	2.29	8	1.0	1100	23	17.1	3	7	12	4.0	<0.02	0.16	0.7	26.40	2.3	<2	<0.05	1790	7	310	0.2	0.5	3	0.3	550	0.6	<0.1	0.25	1800
2102	1.97	12	1.8	3600	32	17.2	5	3	16	1.5	<0.03	0.17	<0.5	28.00	2.0	<2	<0.05	1830	<5	230	0.4	0.5	4	0.3	910	<0.1	<0.1	<0.05	2000
2104	1.80	13	2.6	1500	40	22.0	<3	4	18	2.2	<0.03	0.23	0.6	24.40	2.0	<2	0.06	2840	<5	380	0.6	0.6	<2	0.3	1000	0.3	<0.1	0.34	2700
2105	1.84	26	1.2	850	36	17.6	4	3	15	5.1	0.21	0.18	<0.5	26.80	1.7	<2	<0.05	2460	<5	380	0.5	0.4	<2	0.3	<300	<0.1	<0.1	0.27	2800

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
2060	0.90	225	19.2	140	4	2.75	27954	24	2.119	94	16
2061	0.52	348	14.8	163	<2	2.08	31900	28	2.388	53	7
2062	0.48	292	11.1	126	3	2.00	24770	23	1.921	41	9
2064	0.50	266	7.4	179	2	3.28	14143	44	2.203	29	4
2066	0.26	266	5.2	166	<2	1.96	4397	12	1.757	41	6
2068	0.54	270	6.3	119	2	2.95	13576	19	2.264	50	13
2069	0.59	268	15.0	163	<2	3.12	42181	29	2.867	76	8
2073	0.34	283	15.0	183	<2	2.83	19073	22	1.837	30	5
2074	0.82	236	11.6	160	4	2.75	30552	42	3.135	42	7
2076	0.11	250	3.9	154	<2	2.19	3352	15	1.906	42	6
2078	0.63	247	9.9	131	5	2.65	7207	23	2.523	48	9
2079	0.42	269	9.1	131	<2	2.64	19196	16	2.260	51	7
2080	0.39	231	12.2	159	<2	1.89	7324	25	2.310	32	6
2081	0.35	269	23.5	141	<2	2.66	12755	20	1.886	101	19
2083	0.58	282	9.6	167	<2	1.72	36854	33	2.385	83	16
2084	0.30	261	9.9	176	3	2.19	35004	15	2.203	73	15
2086	0.39	251	15.8	154	4	1.90	55402	21	3.588	45	13
2087	0.76	325	4.5	186	3	3.05	8620	84	2.748	47	10
2088	0.66	262	8.3	157	3	3.12	14357	29	2.605	55	6
2089	0.54	270	30.8	147	2	2.61	14469	47	1.937	64	10
2090	0.42	219	8.5	144	2	2.14	5771	27	3.270	41	6
2092	0.60	219	9.5	148	<2	3.07	17050	45	2.628	17	<2
2094	0.22	249	5.7	133	<2	2.95	5392	22	2.043	45	6
2095	0.15	259	16.1	152	3	1.84	13642	9	1.659	37	6
2097	0.52	226	21.4	148	2	1.66	14495	77	3.534	39	8
2098	0.51	299	9.5	189	<2	3.82	11373	64	2.898	37	7
2100	0.38	235	9.3	129	2	3.28	19021	23	2.434	22	4
2102	0.39	258	7.4	153	2	3.29	22665	29	3.958	50	11
2104	0.54	321	8.7	155	2	3.40	14192	25	1.978	53	10
2105	0.43	344	18.6	202	3	3.34	26377	24	2.284	48	7

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
2106	11F14	20	639905	5089511	6	8	0	MMW	HDM
2108	11F14	20	630912	5094508	6	8	0	MMW	DCHC
2109	11F14	20	630873	5093682	5	8	0	MMW	DCHC
2112	11F14	20	624763	5068607	5	8	0	MMW	HDG
2113	11F14	20	622633	5067901	4	8	0	DOW	DCHC
2115	11F14	20	620249	5071537	5	7	0	DML	DCHC
2116	11F14	20	625605	5072590	4	5	0	DDL	HDG
2117	11F14	20	623767	5077169	5	7	0	MMB	HDG
2118	11F14	20	622930	5093905	5	7	0	DMW	CML
2120	11F11	20	631007	5054509	4	7	0	DDW	CC
2121	11F11	20	632483	5055622	5	7	0	DMW	CWL
2122	11F11	20	636666	5060704	5	7	0	DMW	CM
2123	11F11	20	634858	5056822	6	8	0	MOW	CM
2124	11F11	20	637218	5058214	5	7	0	DMW	CC
2125	11F11	20	640193	5060911	5	7	0	DMW	CM
2126	11F11	20	648377	5058139	6	7	0	DMW	CWL
2127	11F11	20	648442	5054754	5	7	0	DMW	CWL
2128	11F11	20	645555	5055084	5	6	0	DDW	CC
2129	11F11	20	643964	5056443	5	6	0	DMW	CC
2130	11F11	20	640718	5057500	5	6	0	DMW	CC
2131	11F11	20	638699	5056085	5	7	0	MMB	CC
2132	11F11	20	638717	5053759	5	7	1SE	DMW	CC
2133	11F11	20	636533	5053523	5	7	0	MMW	CC
2134	11F11	20	634696	5050693	5	7	0	DDS	CC
2135	11F11	20	631991	5051403	6	7	0	MMW	CC
2136	11F11	20	630758	5046918	6	8	1S	DOW	CC
2137	11F11	20	635091	5048878	5	7	1S	DMW	CC
2138	11F11	20	637387	5051264	5	7	0	MMW	CM
2139	11F11	20	648637	5049922	7	8	0	DDW	CC
2140	11F11	20	652697	5051645	6	8	0	DMW	CC

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
2106	1.95	10	2.0	740	85	13.1	4	3	20	9.1	<0.03	0.15	<0.5	30.50	1.5	<2	<0.05	1020	<5	710	0.4	0.4	<2	0.2	1000	0.3	<0.1	<0.05	2700
2108	2.76	<5	1.3	1600	36	23.8	5	3	11	0.9	<0.02	0.17	<0.5	20.30	2.2	<2	<0.05	1500	8	160	0.5	0.5	<2	0.3	1300	0.4	<0.1	0.12	1300
2109	2.23	20	0.8	1500	24	19.8	3	2	10	1.2	<0.02	0.16	0.6	27.40	2.1	<2	<0.05	1510	<5	220	0.4	0.5	<2	0.3	790	0.4	<0.1	0.17	2100
2112	1.95	11	1.6	1600	36	17.3	4	4	12	1.9	<0.03	0.18	1.0	26.40	3.7	<2	<0.05	2820	<5	250	0.5	0.5	<2	0.5	680	<0.1	<0.1	0.27	3100
2113	1.94	12	2.7	6600	38	18.5	<3	2	13	<0.5	0.23	0.16	<0.5	27.10	2.4	<2	<0.05	1670	<5	120	0.3	0.4	<2	0.3	620	0.4	<0.1	<0.05	2800
2115	2.42	19	1.2	830	32	13.1	3	4	9	5.6	<0.02	0.18	0.7	25.30	2.1	<2	<0.05	1750	<5	940	0.4	0.5	<2	0.3	720	<0.1	<0.1	0.22	2400
2116	2.31	<5	1.4	840	25	13.8	5	2	11	<0.5	<0.02	0.14	<0.5	34.80	1.5	<2	<0.05	2350	9	260	0.3	0.3	<2	0.2	590	<0.1	<0.1	<0.05	1900
2117	2.16	31	1.9	1300	29	15.4	4	2	13	1.1	<0.02	0.19	<0.5	29.30	2.1	<2	0.06	1530	<5	190	0.4	0.5	<2	0.3	520	<0.1	<0.1	0.17	2200
2118	2.29	13	<0.5	2200	33	23.0	3	4	8	<0.5	0.09	0.14	<0.5	24.70	1.7	<2	<0.05	2090	<5	47	0.2	0.3	<2	0.2	710	<0.1	<0.1	<0.05	2000
2120	2.15	8	1.6	1000	22	21.1	10	8	11	<0.5	<0.02	0.38	0.8	20.10	4.7	<2	0.05	1910	9	180	0.5	1.0	<2	0.8	1300	0.8	<0.1	0.46	1900
2121	2.03	15	2.3	2200	30	20.3	6	10	18	0.8	<0.02	0.34	<0.5	18.90	4.4	<2	0.06	2130	<5	150	0.6	1.1	<2	0.6	590	0.8	0.7	0.30	1000
2122	1.97	21	2.1	4900	32	19.1	<3	5	21	<0.5	<0.03	0.20	1.2	22.90	2.2	<2	<0.05	2210	<5	140	0.6	0.4	3	0.3	1000	<0.1	<0.1	<0.05	1900
2123	2.04	35	2.1	3200	22	16.2	6	4	21	<0.5	<0.02	0.30	<0.5	28.80	3.0	<2	<0.05	2950	<5	76	0.4	0.6	<2	0.4	850	0.5	0.4	0.28	1800
2124	2.17	9	2.3	5200	31	23.9	11	3	15	0.7	<0.03	0.35	1.5	17.20	5.2	<2	0.07	3840	9	70	0.6	0.9	<2	0.9	2000	0.8	<0.1	0.45	1800
2125	1.83	18	1.6	3100	51	21.8	7	5	25	1.0	<0.03	0.29	1.3	23.40	3.5	<2	<0.05	2890	<5	78	0.5	0.9	<2	0.6	840	0.7	<0.1	0.41	2100
2126	1.96	12	1.1	3600	95	19.8	4	15	13	1.1	<0.03	0.21	<0.5	25.30	2.6	<2	<0.05	2020	<5	130	0.4	0.6	<2	0.4	2200	<0.1	<0.1	0.34	1600
2127	1.74	43	2.4	2500	61	18.3	12	9	25	1.2	<0.03	0.46	1.7	22.70	5.8	<2	0.08	2870	<5	150	0.6	1.5	3	0.9	1200	1.1	<0.1	0.63	2300
2128	1.92	25	1.4	1900	38	17.8	4	5	18	0.9	<0.02	0.19	0.7	22.00	2.3	<2	0.07	2000	8	140	0.4	0.5	<2	0.3	970	0.7	<0.1	0.17	1600
2129	2.03	22	1.4	2500	42	19.2	7	6	18	<0.5	0.19	0.26	0.9	21.30	2.9	<2	0.06	4690	<5	130	0.4	0.7	<2	0.5	1100	0.6	<0.1	0.33	1800
2130	1.95	13	2.0	2200	56	15.3	7	4	17	1.0	<0.03	0.25	0.7	24.40	2.5	<2	<0.05	1920	<5	140	0.4	0.6	<2	0.3	1100	0.4	<0.1	0.20	1900
2131	2.29	12	3.9	3900	19	15.3	32	6	29	1.4	0.65	1.14	4.6	15.80	17.0	<2	0.30	4350	21	79	0.5	3.4	<2	2.9	740	3.1	1.4	1.71	1700
2132	2.00	6	2.2	2600	35	17.2	13	8	20	1.9	<0.03	0.55	1.8	18.30	6.7	<2	0.10	2590	7	210	0.6	1.4	<2	1.1	820	1.2	<0.1	0.62	2700
2133	1.77	10	1.7	3400	29	17.3	5	7	18	0.7	<0.02	0.21	0.9	22.50	2.4	<2	<0.05	2990	<5	140	0.3	0.6	<2	0.3	860	0.3	<0.1	<0.05	2100
2134	2.07	10	2.7	1800	33	19.4	11	12	23	1.2	0.17	0.50	1.4	25.60	6.7	<2	0.11	2930	<5	190	0.5	1.2	<2	1.0	470	0.8	0.6	0.49	1800
2135	1.86	13	2.5	920	37	22.0	10	6	12	<0.5	0.19	0.44	0.8	22.00	6.4	<2	0.10	2900	7	170	0.5	0.9	<2	1.0	880	0.7	0.8	0.54	1800
2136	1.88	6	4.4	1700	29	16.5	18	6	24	1.4	0.26	1.00	1.4	17.80	9.1	4	0.14	2860	12	130	0.5	2.2	4	1.4	740	1.2	<0.1	0.84	1600
2137	2.14	11	1.8	2000	43	17.3	22	12	23	1.7	0.41	0.65	2.3	15.80	10.0	<2	0.18	3420	<5	140	0.4	2.0	<2	1.8	850	1.9	<0.1	1.19	2500
2138	2.09	14	3.4	2000	33	15.1	14	5	25	1.8	0.25	0.60	2.6	22.30	7.7	3	0.12	3240	<5	200	0.5	1.8	<2	1.4	760	1.5	<0.1	0.78	1300
2139	2.35	42	1.3	860	31	22.1	3	6	12	1.3	<0.02	0.16	<0.5	20.10	1.8	<2	<0.05	1840	<5	210	0.6	0.4	<2	0.3	1300	0.3	<0.1	0.17	1900
2140	2.92	30	6.0	3100	38	10.7	50	15	37	2.7	1.02	1.44	5.3	17.80	25.0	2	0.41	8390	26	110	0.6	5.3	3	4.6	770	4.7	1.6	2.28	1200

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
2106	0.56	297	16.1	195	<2	3.11	19948	56	4.017	53	7
2108	0.76	219	2.2	99	2	2.46	8348	29	1.934	40	6
2109	0.52	285	3.5	147	<2	2.78	11566	22	1.673	45	6
2112	0.48	247	52.5	160	2	2.65	43873	40	1.617	60	10
2113	0.36	284	8.8	200	<2	2.84	8586	27	2.572	44	11
2115	0.61	230	14.0	138	3	2.82	34612	25	2.427	49	10
2116	0.35	218	13.4	125	<2	1.84	19485	15	2.922	39	7
2117	-	-	-	-	-	-	-	-	-	-	-
2118	0.30	272	20.6	140	<2	2.44	11974	73	1.595	27	2
2120	1.10	286	10.1	185	2	3.37	20747	59	2.053	64	24
2121	0.78	260	9.0	156	2	2.64	36082	79	1.827	55	24
2122	0.49	308	9.7	184	<2	2.60	39989	65	2.503	94	19
2123	0.67	255	7.2	173	2	2.42	10351	63	2.692	71	7
2124	0.74	368	6.2	159	2	2.30	16147	44	1.382	98	16
2125	0.49	286	6.6	190	<2	2.92	16255	42	2.460	70	10
2126	0.55	304	6.1	157	2	3.14	25016	71	1.663	62	10
2127	0.95	298	5.6	185	3	3.38	28546	39	2.127	76	18
2128	0.54	280	16.3	173	<2	2.74	47983	32	2.563	75	10
2129	0.67	300	11.1	159	<2	1.96	37405	40	2.242	74	13
2130	0.72	312	6.9	174	<2	3.52	33190	38	3.389	61	12
2131	1.06	270	4.3	154	9	1.93	18207	35	1.446	45	17
2132	0.97	261	15.1	145	2	2.98	41856	42	2.267	111	24
2133	0.62	343	10.3	224	2	3.31	42851	75	2.085	47	10
2134	0.77	293	8.9	203	3	1.92	40692	43	2.353	100	44
2135	0.59	280	6.1	154	<2	2.39	21475	48	1.509	93	49
2136	0.81	275	9.7	234	4	3.28	37390	141	2.185	61	125
2137	0.79	283	14.1	169	5	2.02	40782	49	1.419	47	25
2138	0.61	388	6.3	152	4	2.23	43661	39	1.691	48	21
2139	0.46	240	13.1	126	<2	2.89	29588	67	1.584	52	7
2140	1.43	215	6.5	102	15	1.61	47874	35	1.105	71	19

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
2141	11F10	20	658844	5054622	6	8	0	MMB	CC
2142	11F10	20	662854	5056108	6	9	0	DOW	CC
2143	11F11	20	643657	5066162	6	8	0	DMW	CWL
2144	11F11	20	645548	5066612	6	7	0	MDW	CWL
2145	11F14	20	648475	5084248	7	10	1	DOW	CWU
2146	11F14	20	650975	5084149	5	10	0	DOW	CWU
2147	11F14	20	652131	5087968	5	10	1N	DOW	CWU
3001	11F11	20	628438	5063063	6	9	3	M	DCH
3002	11F11	20	628798	5064731	6	7	-	-	DCH
3003	11F11	20	630356	5064939	6	7	0	WOB	CWL
3004	11F11	20	632095	5065404	6	9	0	WOB	CWL
3005	11F11	20	633337	5063154	5	6	1N	MML	CWL
3006	11F11	20	635378	5064386	3	6	1N	MMW	CWL
3007	11F11	20	634230	5065675	5	7	1W	DMW	CWL
3009	11F14	20	629983	5070694	5	8	0	WOB	CHA
3010	11F14	20	629017	5067829	5	9	-	-	DCH
3011	11F11	20	631170	5067258	5	9	0	WOB	CWL
3012	11F11	20	628516	5066761	5	8	0	WOB	DCH
4001	11F11	20	636356	5066691	5	7	1SW	DML	OMG
4003	11F14	20	637049	5069157	5	7	1NW	DMW	HGN
4005	11F14	20	638446	5071194	7	9	1W	DMW	HGD
4007	11F14	20	640331	5074292	4	6	1NW	DMW	CHA
4008	11F14	20	642156	5076424	3	4	0	MOW	CWL
4009	11F14	20	643508	5076887	4	6	0	MMS	CWL
4010	11F14	20	644107	5077462	4	5	0	MMW	CWL
4013	11F14	20	646341	5078024	4	5	1N	DOW	HGD
4014	11F14	20	648733	5079063	4	5	1N	DOW	CHA
4016	11F14	20	652438	5080408	5	7	1N	DMW	CWL
4017	11F14	20	651150	5080129	6	7	0	WMW	CWL
4019	11F14	20	654767	5081557	5	6	1N	DMW	HGD

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
2141	2.62	23	1.8	2100	37	18.1	4	5	11	<0.5	<0.03	0.25	0.9	28.70	3.4	<2	<0.05	3680	<5	210	0.7	0.8	<2	0.4	1100	0.7	<0.1	<0.05	2200
2142	1.90	14	2.0	2000	56	20.8	10	6	19	1.5	0.22	0.54	0.9	23.80	5.5	<2	0.09	3490	<5	92	0.3	1.6	<2	0.8	1000	0.9	<0.1	0.46	2700
2143	2.15	20	<0.5	2300	27	14.7	<3	4	16	<0.5	<0.03	0.18	<0.5	24.70	2.2	<2	0.06	2100	<5	160	0.5	0.6	7	0.3	<300	0.3	<0.1	<0.05	2100
2144	2.18	11	1.6	1400	65	11.7	11	4	19	1.1	<0.02	0.38	1.5	31.00	5.5	<2	0.09	2580	<5	350	0.3	1.2	<2	0.8	580	1.1	0.8	0.68	1800
2145	2.26	8	1.9	930	56	17.3	10	5	17	1.5	<0.02	0.37	1.1	27.90	5.0	<2	0.08	2200	<5	230	0.4	1.1	<2	0.8	350	0.9	<0.1	0.41	1300
2146	2.03	20	1.8	780	33	17.1	8	3	22	1.0	<0.02	0.38	4.7	26.30	4.6	<2	0.09	3100	<5	160	0.4	1.4	<2	0.7	540	1.0	0.6	0.51	2200
2147	2.13	32	0.9	1700	23	17.9	<3	8	20	<0.5	<0.02	0.15	3.3	28.20	1.8	<2	<0.05	2590	10	69	0.5	0.5	<2	0.2	620	0.4	<0.1	0.26	1600
3001	2.04	37	2.6	3000	32	16.9	6	4	8	1.0	<0.03	0.28	3.3	29.00	3.1	<2	0.06	3570	<5	220	1.2	0.8	<2	0.4	340	0.5	<0.1	0.23	2300
3002	2.47	68	4.2	2300	78	15.3	3	5	11	0.9	<0.03	0.24	3.1	27.90	2.7	<2	<0.05	3600	<5	210	0.4	0.7	<2	0.3	410	0.3	<0.1	<0.05	1800
3003	2.32	19	3.0	2700	39	13.5	7	6	19	1.2	<0.03	0.24	<0.5	30.40	3.3	<2	<0.05	1630	<5	200	0.3	0.6	<2	0.5	520	0.7	<0.1	<0.05	1900
3004	2.71	24	<0.5	2200	56	20.8	9	5	14	1.0	<0.03	0.43	1.7	27.60	5.7	<2	0.10	2320	<5	110	0.5	1.4	<2	0.9	690	1.1	0.2	0.54	2200
3005	3.11	27	3.3	1400	36	13.4	35	6	28	3.5	0.63	1.11	3.6	28.10	20.0	<2	0.33	5650	25	290	0.6	4.3	<2	3.1	610	4.4	1.0	1.80	1400
3006	2.70	31	<0.5	1400	33	18.6	5	2	14	0.9	<0.02	0.21	<0.5	25.30	2.3	<2	<0.05	2140	<5	100	0.8	0.5	<2	0.3	2300	0.4	0.3	0.26	1500
3007	2.56	21	1.8	1100	42	16.6	7	6	16	<0.5	<0.03	0.25	<0.5	28.90	3.1	<2	<0.05	3380	<5	93	0.5	0.7	<2	0.5	1200	0.6	<0.1	0.19	1400
3009	2.08	22	3.3	810	47	18.4	7	2	15	1.5	0.21	0.25	<0.5	31.10	2.6	<2	<0.05	2640	<5	320	0.6	0.7	<2	0.3	1200	<0.1	<0.1	<0.05	1800
3010	2.70	15	2.2	2600	54	23.2	9	5	18	<0.5	<0.03	0.38	<0.5	25.60	4.8	<2	<0.05	2510	<5	110	0.5	1.1	<2	0.7	610	1.1	<0.2	0.49	2500
3011	2.67	28	4.6	410	43	13.5	25	4	22	1.5	0.35	0.92	3.4	27.60	12.0	<2	0.20	4200	13	240	0.4	2.9	<2	2.0	810	2.8	1.0	1.35	1400
3012	2.93	21	1.8	1400	39	20.4	7	7	11	1.1	<0.03	0.22	0.9	30.80	2.6	<2	<0.05	2140	<5	180	0.6	0.6	<2	0.4	670	0.7	<0.1	<0.05	1600
4001	2.18	21	1.1	3600	33	27.9	6	4	18	1.2	<0.03	0.22	<0.5	18.70	2.8	<2	<0.05	2130	<5	210	0.6	0.4	<2	0.3	670	<0.1	<0.1	0.18	1900
4003	2.27	12	0.8	1100	15	20.8	<3	3	16	9.8	<0.02	0.22	<0.5	25.30	1.2	<2	<0.05	1180	<5	530	0.5	0.3	2	0.1	840	<0.1	<0.1	0.16	1600
4005	1.88	14	1.8	2300	32	18.6	4	3	15	9.5	<0.02	0.25	<0.5	21.30	2.4	<2	<0.05	1990	<5	380	0.4	0.6	3	0.3	930	<0.1	<0.1	0.21	2000
4007	2.69	21	3.4	1600	20	13.7	21	6	27	4.9	0.52	0.97	2.6	21.20	10.0	<2	0.21	4960	8	190	0.6	3.7	<2	1.7	490	2.3	0.5	1.05	1300
4008	2.46	32	1.0	2000	18	14.3	4	3	11	2.1	<0.02	0.26	1.1	30.40	2.5	<2	0.07	1380	<5	200	0.3	0.8	<2	0.3	630	0.2	<0.1	<0.05	2000
4009	2.11	26	1.9	2400	23	17.1	4	5	15	0.9	<0.02	0.31	1.1	23.80	2.9	<2	0.05	3590	<5	230	0.4	1.0	<2	0.4	1300	0.4	<0.1	<0.05	2300
4010	2.39	21	2.9	600	19	11.4	13	5	10	0.9	<0.02	0.58	1.4	27.50	5.8	<2	0.11	3410	<5	210	0.4	1.9	<2	0.9	710	1.2	0.4	0.60	1600
4013	2.78	11	2.3	690	36	14.4	12	5	74	1.7	0.33	0.62	1.5	27.20	6.4	2	0.12	3230	<5	310	0.4	2.0	<2	1.0	950	1.4	<0.1	0.60	1700
4014	2.36	12	2.3	1800	17	12.2	16	5	92	1.8	0.33	0.62	1.9	25.20	7.6	<2	0.12	3690	<5	310	0.5	2.1	<2	1.2	580	1.5	<0.1	0.65	2200
4016	2.12	14	0.8	2900	23	20.4	<3	3	77	0.6	<0.02	0.16	<0.5	23.60	1.7	<2	<0.05	1540	<5	150	0.2	0.5	<2	0.2	820	<0.1	<0.1	0.19	2700
4017	2.18	12	1.8	2100	22	15.2	4	4	21	2.6	<0.02	0.21	0.9	26.70	2.1	<2	<0.05	2000	<5	340	0.3	0.6	3	0.3	1100	0.3	<0.1	0.15	1900
4019	1.81	12	1.7	2300	25	21.4	5	4	40	<0.5	<0.02	0.23	0.6	18.90	2.5	<2	<0.05	3550	<5	120	0.3	0.7	<2	0.3	1300	0.2	<0.1	0.22	2600

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
2141	0.30	248	6.0	151	<2	1.85	11426	29	1.771	31	5
2142	0.77	249	7.7	162	<2	3.35	24203	52	1.722	58	12
2143	0.49	229	11.4	139	<2	2.82	41238	26	3.103	37	3
2144	0.34	267	4.2	131	<2	2.69	37238	15	2.154	64	6
2145	0.42	243	3.1	109	<2	2.84	11447	20	1.444	55	8
2146	0.44	381	4.5	143	<2	2.63	20685	17	1.732	47	6
2147	0.60	294	8.1	176	<2	2.69	7494	57	2.928	36	4
3001	-	-	-	-	-	-	-	-	-	-	-
3002	-	-	-	-	-	-	-	-	-	-	-
3003	0.40	243	6.4	140	<2	2.84	29356	46	2.565	52	10
3004	0.62	272	5.9	153	<2	1.94	26651	23	1.581	54	12
3005	1.10	227	2.6	103	8	2.38	10756	28	1.585	59	19
3006	0.37	233	12.3	145	<2	2.31	17834	43	2.547	45	6
3007	0.38	230	7.5	122	5	1.63	37476	21	1.647	62	9
3009	-	-	-	-	-	-	-	-	-	-	-
3010	0.32	262	5.9	130	2	2.11	34465	17	1.865	90	17
3011	0.98	293	5.7	123	4	2.94	13227	26	2.040	73	24
3012	0.38	291	4.8	140	<2	2.97	21634	42	1.818	43	9
4001	0.73	263	16.0	157	<2	2.28	17064	39	1.751	76	14
4003	0.49	216	12.6	132	<2	3.58	21930	41	2.132	40	4
4005	0.57	280	10.0	164	2	3.26	15541	31	1.975	58	5
4007	1.01	227	5.7	143	8	2.65	30690	22	2.686	88	13
4008	0.53	245	4.0	137	<2	2.67	9636	34	1.742	28	3
4009	0.34	255	8.6	136	4	2.28	15432	15	1.919	37	7
4010	0.78	313	4.1	112	3	2.60	17078	21	1.790	32	8
4013	0.83	252	4.5	122	5	3.10	12247	30	1.989	37	6
4014	1.13	212	10.6	132	4	2.89	24033	29	1.973	44	8
4016	0.35	276	28.1	169	<2	2.38	11688	17	1.883	25	4
4017	0.30	300	6.2	131	<2	2.29	47021	12	1.579	30	4
4019	0.84	291	9.5	171	<2	3.24	10584	21	1.737	84	6

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
4020	11F15	20	656667	5082611	3	5	0	MMW	CWL
4021	11F15	20	658740	5081939	5	7	0	MMW	CWL
4022	11F15	20	660221	5080365	3	4	1W	DOW	CWL
4023	11F14	20	631491	5071267	3	5	1SW	MM1	CMU
4026	11F14	20	632868	5073837	5	7	1S	DMW	CMU
4027	11F14	20	634199	5075038	7	9	1SW	DMW	CMU
4028	11F14	20	635238	5073952	5	7	1S	MMW	CC
4029	11F14	20	635848	5072435	5	7	1NW	MMW	CMU
4031	11F14	20	634518	5071813	5	7	1N	MMW	CC
4032	11F14	20	635067	5070175	5	7	0	MMW	CMU
4033	11F14	20	637001	5072438	5	7	1E	MMW	CMU
4034	11F14	20	637114	5074063	5	7	1E	MMW	CMU
4035	11F14	20	637003	5075162	3	5	1E	MMW	CMU
4036	11F14	20	634545	5076441	3	5	2SW	MOW	CMU
4037	11F14	20	631190	5074763	5	8	1SW	MMW	CMU
4038	11F14	20	632221	5075606	5	7	1SW	MMW	CMU
4039	11F14	20	633506	5077160	5	7	0	MMW	CML
4040	11F14	20	635142	5077646	5	7	1N	MMW	CMU
4041	11F14	20	637026	5076695	4	8	1NE	MOW	CMU
4042	11F14	20	638103	5076442	5	7	1NE	MMW	CWL
4043	11F14	20	627676	5069273	5	6	1E	MMW	HDG
4044	11F14	20	626161	5070524	6	7	0	DMW	HDG
4045	11F14	20	624621	5071301	5	7	2NE	MMW	HDG
4047	11F14	20	626633	5071325	7	8	0	MMW	HDG
4048	11F14	20	626920	5073276	4	5	0	DML	HDG
4050	11F14	20	624385	5073677	5	7	0	WMW	HDG
4051	11F14	20	624500	5075414	6	7	0	WMW	HDG
4052	11F14	20	623128	5075906	5	6	0	MOW	HDG
4053	11F14	20	622773	5077510	6	7	1NW	DMW	DCHC
4054	11F14	20	625600	5075900	5	6	1E	DML	HDG

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
4020	2.44	8	1.0	460	22	13.5	4	3	15	3.3	<0.02	0.23	<0.5	26.90	1.5	<2	<0.05	2190	<5	460	0.2	0.7	<2	0.3	1000	0.5	<0.1	0.16	1900
4021	1.47	23	2.0	2500	23	14.9	10	6	22	0.5	0.17	0.38	1.6	20.90	4.4	<2	0.07	2450	<5	160	0.3	1.1	<2	0.7	1100	0.7	<0.1	0.42	2300
4022	2.48	12	0.8	960	29	15.6	3	4	60	0.7	<0.02	0.13	<0.5	28.70	0.9	<2	<0.05	6350	<5	93	0.3	0.4	<2	0.1	1200	0.2	<0.1	0.16	1600
4023	2.37	16	1.6	2800	21	14.2	10	13	84	2.4	0.15	0.41	1.6	25.50	4.5	<2	0.11	2240	<5	230	0.5	1.2	<2	0.7	990	1.1	<0.1	0.54	1600
4026	2.30	11	2.1	2100	17	20.8	6	3	72	<0.5	<0.02	0.24	<0.5	23.50	2.4	<2	<0.05	1550	7	76	0.3	0.6	<2	0.4	1800	0.3	<0.1	0.19	2000
4027	2.15	14	2.1	5100	19	16.9	9	4	100	1.1	<0.02	0.44	1.4	19.70	4.5	<2	0.09	1880	<5	120	0.6	1.4	<2	0.7	1400	0.8	<0.1	0.35	2000
4028	2.06	9	2.2	2700	20	19.4	7	6	77	0.9	<0.02	0.37	1.1	21.60	3.7	<2	0.05	1940	<5	66	0.4	1.1	<2	0.5	1200	0.7	<0.1	0.37	2500
4029	2.25	26	3.4	2700	110	13.8	3	11	61	<0.5	<0.03	0.26	1.2	30.40	2.4	<2	<0.05	1970	<5	63	0.5	0.9	4	0.4	<300	<0.1	<0.1	<0.05	2000
4031	2.20	29	<0.5	4400	30	20.2	5	5	7	0.9	<0.03	0.25	<0.5	23.60	2.0	<2	<0.05	4120	<5	32	0.4	0.7	<2	0.3	1000	<0.1	<0.1	0.22	2000
4032	2.70	24	1.8	4400	31	16.7	<3	5	47	0.8	0.22	0.25	<0.5	26.70	2.0	<2	<0.05	1870	6	130	0.4	0.8	<2	0.2	880	0.5	<0.1	<0.05	1500
4033	2.05	19	1.6	3200	23	16.1	7	5	85	0.6	<0.02	0.24	0.8	16.20	2.8	<2	0.05	2110	<5	89	0.3	0.8	<2	0.4	1000	0.4	0.6	0.13	1800
4034	2.08	13	2.6	2700	21	13.8	5	6	69	0.6	<0.02	0.36	1.0	23.70	3.5	<2	0.09	4450	<5	95	0.5	1.1	<2	0.5	1600	0.7	<0.1	0.34	2000
4035	2.63	8	<0.5	3000	26	14.7	4	6	71	<0.5	0.12	0.24	<0.5	25.30	1.5	<2	<0.05	2290	13	160	0.3	0.7	7	0.2	910	0.2	<0.1	<0.05	1800
4036	2.10	8	1.3	3800	18	14.6	3	3	70	<0.5	<0.02	0.17	<0.5	22.70	1.5	<2	<0.05	1620	<5	190	0.3	0.5	<2	0.2	1300	<0.1	<0.1	<0.05	1100
4037	2.54	5	2.1	3000	17	16.5	12	6	51	0.8	0.19	0.54	1.6	21.90	6.2	<2	0.12	3810	<5	37	0.3	1.8	<2	0.9	970	1.2	0.8	0.60	1600
4038	2.34	7	1.6	4600	31	17.9	<3	3	34	<0.5	<0.02	0.14	<0.5	21.50	1.3	<2	<0.05	1140	<5	87	0.4	0.4	<2	0.2	990	<0.1	<0.1	<0.05	2200
4039	2.15	<5	1.9	4100	25	18.5	5	3	48	<0.5	<0.03	0.28	<0.5	23.50	3.0	<2	<0.05	1620	<5	55	0.5	0.8	<2	0.4	880	0.5	<0.1	0.19	3000
4040	2.34	6	2.5	1500	26	14.6	4	7	66	<0.5	0.13	0.29	0.9	23.90	2.9	<2	<0.05	3060	<5	78	0.4	0.9	<2	0.4	690	0.4	<0.1	0.28	2300
4041	2.15	11	<0.5	3800	24	16.2	<3	4	75	<0.5	0.14	0.21	1.1	29.10	1.4	<2	<0.05	945	<5	66	0.3	0.6	<2	0.2	1800	<0.1	<0.1	<0.05	2900
4042	1.91	11	2.1	3600	27	20.0	5	5	61	<0.5	<0.03	0.26	<0.5	20.40	2.1	<2	0.06	3200	<5	66	0.3	0.7	<2	0.3	2800	<0.1	<0.1	<0.05	1600
4043	1.96	13	3.1	920	37	16.6	12	3	47	0.8	<0.03	0.44	1.8	23.70	5.4	3	0.10	2650	<5	220	0.7	1.5	<2	0.8	630	1.1	0.7	0.49	2900
4044	1.90	12	1.8	3400	26	15.3	<3	3	91	2.5	<0.02	0.22	<0.5	23.50	1.7	<2	<0.05	5850	<5	350	0.5	0.6	<2	0.2	950	0.3	<0.1	<0.05	2300
4045	2.12	9	2.5	2400	29	16.5	4	3	65	<0.5	<0.02	0.31	0.5	23.60	2.4	2	<0.05	2960	<5	150	0.4	0.7	<2	0.3	530	0.3	<0.1	0.24	1600
4047	1.99	6	1.9	950	34	19.4	7	4	68	1.5	<0.02	0.30	<0.5	24.20	3.5	<2	0.06	2080	<5	310	0.6	0.8	<2	0.6	650	<0.1	<0.1	0.20	2300
4048	2.01	11	2.1	900	29	16.3	7	3	78	1.1	<0.02	0.32	0.7	30.60	3.1	<2	0.06	3460	<5	350	0.4	0.9	<2	0.5	1100	0.9	<0.1	0.34	3700
4050	2.18	5	2.3	2000	37	21.5	5	4	60	1.0	0.19	0.28	0.5	21.30	3.1	<2	0.05	3780	<5	140	0.6	0.8	<2	0.4	1100	0.4	0.4	0.25	1700
4051	2.17	8	2.6	2000	54	21.6	6	3	77	0.8	<0.02	0.27	0.7	21.30	2.9	2	0.06	2260	<5	110	0.5	0.7	3	0.4	640	0.6	<0.1	<0.05	1800
4052	2.35	<5	2.7	2800	45	17.1	5	9	52	1.0	<0.03	0.26	<0.5	27.90	1.9	<2	<0.05	2450	<5	290	0.5	0.7	<2	0.3	830	<0.1	<0.1	0.17	2000
4053	2.03	21	2.1	2400	35	15.7	5	5	78	0.9	<0.02	0.22	0.9	28.70	2.2	<2	<0.05	2420	<5	180	0.4	0.6	<2	0.3	1200	0.5	0.4	0.19	1500
4054	2.31	19	2.6	3000	29	16.8	6	4	55	0.9	<0.02	0.25	<0.5	26.30	2.9	<2	<0.05	2400	<5	140	0.5	0.8	<2	0.4	810	0.6	<0.1	<0.05	2100

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
4020	0.79	340	3.7	121	2	4.03	13168	32	2.522	32	2
4021	0.57	248	33.3	135	3	2.96	26068	18	1.812	53	6
4022	0.77	275	6.1	157	<2	2.76	8425	37	3.378	18	2
4023	0.63	224	8.9	126	2	1.85	38398	33	1.763	40	9
4026	0.46	256	14.1	145	<2	2.02	11032	50	1.971	44	7
4027	0.88	205	13.2	142	4	3.52	19281	68	2.252	72	11
4028	0.83	275	14.1	183	4	3.01	19938	37	2.025	52	12
4029	0.48	279	14.2	160	<2	1.87	41404	40	1.627	43	7
4031	0.45	258	6.6	159	2	2.59	25412	28	2.527	46	9
4032	0.50	253	8.9	142	<2	1.69	25196	37	2.315	42	7
4033	0.58	282	23.2	117	2	3.09	46940	30	3.342	56	10
4034	0.68	220	15.0	158	4	2.85	38072	27	2.724	65	20
4035	0.58	256	11.4	128	<2	2.01	25820	53	3.585	36	6
4036	0.69	246	21.9	151	2	2.44	34496	74	3.453	36	4
4037	0.71	207	6.6	162	4	1.90	21134	21	2.584	37	8
4038	0.43	230	12.0	148	2	2.36	27623	113	3.028	27	5
4039	0.54	228	24.9	127	3	2.63	13973	49	2.417	57	11
4040	0.41	214	18.8	148	5	2.50	55809	10	3.155	57	10
4041	0.53	229	22.4	137	<2	2.77	17822	66	2.209	27	3
4042	0.65	283	8.4	158	<2	2.54	17040	38	2.391	60	8
4043	0.65	294	8.2	154	3	2.54	34074	17	2.326	74	15
4044	0.43	416	8.4	168	<2	2.69	42541	14	2.691	49	9
4045	0.37	370	7.8	158	3	1.88	37872	16	2.224	39	7
4047	0.37	362	16.8	188	2	2.38	39535	16	2.127	75	16
4048	0.42	331	19.7	199	3	2.91	28280	14	2.248	48	11
4050	0.34	330	11.6	141	<2	2.09	14375	15	1.464	81	14
4051	0.18	269	4.3	119	2	2.08	15009	8	1.454	79	16
4052	0.50	303	8.7	129	2	2.64	36762	14	2.066	43	9
4053	0.59	281	15.0	156	4	2.90	22011	24	2.457	52	9
4054	0.33	249	19.5	148	3	1.89	19760	11	1.696	62	12

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
4055	11F14	20	624242	5077897	4	6	1N	MOW	HDG
4056	11F14	20	625918	5077218	6	8	0	MMW	HDG
4058	11F14	20	627716	5079025	4	5	0	MMW	HDG
4059	11F14	20	627730	5077371	5	7	0	WMW	PQ
4060	11F14	20	642560	5072261	5	6	0	WOB	HGD
4061	11F14	20	643777	5070688	4	6	0	DMW	HGN
4062	11F14	20	642481	5069428	5	9	1SW	DDW	HGN
4063	11F14	20	640696	5071895	9	11	0	WOB	HGD
4064	11F14	20	640638	5069021	6	8	0	MOW	OMG
4065	11F14	20	644253	5074914	8	10	0	MOL	HGD
4066	11F14	20	647524	5075326	5	7	0	MMW	HGD
4067	11F14	20	649440	5077425	5	8	1W	DMW	HGD
4068	11F14	20	650091	5077010	11	13	0	WOB	HGD
4069	11F14	20	651100	5078592	6	9	0	WOB	HGD
4070	11F14	20	653737	5078763	6	8	0	WMW	HGD
4071	11F14	20	646352	5074758	6	8	0	MOW	HGD
4072	11F14	20	637887	5068289	6	10	0	DMW	OMG
4073	11F11	20	620389	5064218	4	7	1W	DMW	CMU
4074	11F11	20	620908	5062792	5	8	0	MMW	CML
4075	11F11	20	621825	5060482	7	9	1W	DOW	DCH
4076	11F11	20	622994	5058314	5	7	1W	DMW	DCH
4077	11F11	20	624142	5056660	4	8	0	MMW	DCH
4078	11F11	20	626166	5057322	5	6	0	DMW	CM
4080	11F11	20	626269	5060345	4	6	0	DMW	DCH
4082	11F11	20	626792	5064564	6	8	1SE	DMW	DCH
4083	11F11	20	625834	5066145	5	7	1E	DMW	HDG
4086	11F11	20	629745	5061387	4	5	1SE	DMW	DCH
4087	11F11	20	628112	5059237	4	8	1E	DMW	CM
4088	11F11	20	632468	5057275	5	6	0	DMW	CWL
4089	11F11	20	632144	5059309	5	6	1NE	DMW	CWL

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
4055	2.29	12	1.5	1600	22	20.1	3	7	59	4.1	<0.02	0.18	<0.5	21.50	1.4	<2	<0.05	1740	<5	260	0.5	0.4	<2	0.2	760	0.2	<0.1	0.11	1500
4056	2.39	13	4.1	2500	52	18.6	14	4	65	0.9	0.34	0.52	1.9	22.00	6.4	<2	0.12	4840	<5	130	0.6	1.7	<2	1.0	830	1.4	0.7	0.63	2900
4058	2.49	17	5.9	1400	49	20.4	16	5	73	1.9	0.36	0.71	1.6	15.30	7.7	<2	0.14	4710	7	120	1.1	2.1	<2	1.1	1300	1.6	0.4	0.64	1700
4059	1.88	9	5.9	870	30	20.2	4	3	90	4.4	<0.02	0.26	0.5	24.50	2.4	<2	0.07	3570	<5	330	0.6	0.8	<2	0.4	740	0.4	<0.1	0.19	2000
4060	2.07	31	3.0	760	58	17.9	9	5	48	1.1	<0.02	0.35	0.8	22.10	3.4	<2	0.05	1760	<5	140	0.7	0.9	5	0.5	590	0.6	0.6	0.38	2200
4061	2.09	24	1.8	2300	33	16.0	4	4	17	2.2	<0.02	0.17	<0.5	30.50	1.6	<2	<0.05	1370	<5	290	0.4	0.6	<2	0.2	680	0.2	<0.1	0.17	4200
4062	1.90	12	0.8	2100	34	19.4	<3	4	15	4.3	<0.02	0.17	<0.5	23.40	1.2	<2	0.05	1680	<5	360	0.4	0.4	<2	0.2	740	0.1	<0.1	<0.05	3200
4063	2.31	14	2.3	820	47	19.0	6	3	19	7.5	<0.02	0.19	<0.5	27.00	2.3	<2	<0.05	1830	6	300	0.4	0.5	<2	0.4	1200	0.4	<0.1	0.21	1900
4064	1.77	16	2.7	1900	43	19.7	11	7	25	<0.5	0.20	0.42	0.7	22.60	4.8	<2	0.06	2860	<5	160	0.8	1.2	<2	0.8	800	0.7	<0.1	0.24	2000
4065	2.04	12	2.9	2300	42	21.7	9	2	22	1.5	0.16	0.35	0.9	22.00	4.0	<2	<0.05	2740	<5	120	0.7	0.9	<2	0.6	720	0.6	<0.1	0.27	2400
4066	2.26	8	1.2	1800	38	16.7	<3	2	9	2.2	<0.02	0.14	<0.5	24.60	1.3	<2	<0.05	1160	5	200	0.3	0.4	<2	0.2	600	<0.1	<0.1	0.09	1800
4067	2.19	14	1.3	1300	49	20.4	4	5	16	3.4	<0.02	0.13	<0.5	24.40	1.1	<2	<0.05	1890	<5	230	0.3	0.4	<2	0.2	720	<0.1	<0.1	<0.05	3000
4068	1.93	8	1.7	1500	30	18.8	6	3	17	2.1	0.21	0.28	0.7	23.80	3.1	<2	<0.05	3170	<5	140	0.6	0.7	<2	0.5	840	0.5	0.4	0.32	2300
4069	2.11	7	2.7	2900	52	16.1	6	4	17	1.1	0.26	0.25	1.0	21.10	3.2	<2	<0.05	1870	<5	130	0.5	0.7	2	0.5	870	0.5	<0.1	0.17	1900
4070	2.27	12	2.5	1400	57	21.8	8	6	52	1.5	<0.02	0.45	0.8	23.70	4.5	<2	<0.05	5140	<5	140	0.8	1.2	<2	0.6	770	0.5	<0.1	0.32	2400
4071	1.97	20	2.0	560	23	16.4	4	4	68	1.0	<0.02	0.22	0.6	21.80	2.1	<2	<0.05	1890	5	180	0.4	0.6	<2	0.3	470	0.3	<0.1	0.21	2000
4072	2.50	20	2.0	550	24	19.0	5	3	50	1.5	<0.02	0.24	<0.5	22.40	2.3	2	0.06	1830	<5	230	0.4	0.7	<2	0.4	1100	0.4	<0.1	<0.05	1400
4073	2.65	16	3.1	3300	43	19.2	4	6	52	<0.5	<0.03	0.30	<0.5	26.20	2.7	<2	0.07	9050	14	110	0.4	1.0	<2	0.4	1200	0.3	<0.1	<0.05	2400
4074	2.08	8	1.7	2400	23	19.5	9	3	39	<0.5	<0.02	0.39	1.1	22.80	6.2	<2	0.08	3690	9	51	0.5	1.2	<2	0.7	530	0.6	<0.1	0.38	1800
4075	2.09	38	2.4	4200	27	20.9	29	4	67	1.3	0.62	0.72	1.6	21.80	16.0	<2	0.22	3290	16	79	0.4	2.6	<2	2.7	<300	1.7	<0.1	1.09	1300
4076	2.52	16	2.6	1300	40	17.6	10	11	43	<0.5	0.21	0.50	0.8	27.00	4.9	<2	0.10	7070	<5	140	0.5	1.4	<2	0.8	1200	0.8	<0.1	0.58	2000
4077	2.66	8	3.0	1100	20	15.4	12	5	59	0.9	0.23	0.52	0.8	24.70	5.8	<2	0.09	2180	7	190	0.4	1.4	<2	1.0	920	0.8	<0.1	0.39	1700
4078	2.40	11	3.1	850	160	12.4	6	15	37	0.6	<0.02	0.29	0.8	30.70	2.5	<2	<0.05	2010	<5	100	0.4	0.8	<2	0.4	680	<0.1	<0.1	<0.05	2000
4080	2.01	<5	2.1	2100	24	17.9	6	7	19	<0.5	<0.03	0.24	<0.5	27.80	2.6	<2	<0.05	1760	<5	98	0.3	0.7	<2	0.3	780	<0.1	<0.1	<0.05	2000
4082	2.12	13	1.9	3300	27	17.1	5	8	14	1.6	<0.02	0.24	0.9	25.80	2.8	<2	0.06	1530	<5	220	0.4	0.7	<2	0.4	790	0.7	<0.1	0.30	2000
4083	2.19	16	2.3	3300	44	17.5	9	7	67	1.3	<0.02	0.36	1.1	21.80	4.1	<2	0.10	4190	<5	240	0.5	1.1	<2	0.6	1100	0.9	<0.1	0.43	3200
4086	2.36	12	1.6	2000	28	9.5	5	5	44	0.8	0.26	0.26	<0.5	27.30	2.9	<2	<0.05	1490	<5	220	<0.1	0.8	<2	0.4	910	0.6	<0.1	<0.05	1700
4087	2.12	11	2.2	2400	38	14.1	6	9	39	0.9	<0.02	0.32	0.8	30.60	3.8	<2	0.07	3060	<5	130	0.6	1.0	5	0.5	450	0.5	<0.1	0.41	1900
4088	1.79	11	2.2	2000	41	12.0	3	6	92	<0.5	<0.03	0.28	<0.5	30.20	3.2	<2	<0.05	3250	<5	260	0.4	1.0	<2	0.4	860	<0.1	<0.1	0.29	2500
4089	1.92	9	<0.5	2400	30	15.4	10	9	64	0.8	<0.03	0.36	<0.5	25.30	4.4	<2	0.06	2680	<5	160	0.5	0.9	<2	0.7	550	0.5	<0.1	<0.05	1700

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
4055	0.49	294	11.7	162	2	2.10	22706	22	2.643	35	5
4056	0.41	351	5.4	152	5	2.49	9398	15	1.728	68	15
4058	0.78	257	9.6	132	6	2.81	13921	20	1.757	118	31
4059	0.48	305	10.6	134	<2	2.77	14480	21	1.779	71	15
4060	0.40	326	8.1	139	3	2.29	32660	11	1.533	124	16
4061	0.42	279	18.1	131	<2	4.84	9886	19	1.835	36	5
4062	0.30	312	14.8	150	2	2.54	29516	17	1.827	45	8
4063	0.36	254	7.2	112	2	2.52	12919	15	1.309	60	16
4064	0.34	397	9.9	156	3	2.24	26553	19	1.318	118	20
4065	0.21	360	2.1	110	3	2.50	7405	11	1.365	104	16
4066	0.33	295	7.3	119	<2	2.67	25568	13	1.945	35	4
4067	0.43	201	13.3	137	<2	2.10	33780	9	2.130	49	5
4068	0.35	286	5.6	136	<2	1.97	32867	14	1.489	100	18
4069	0.31	316	8.1	121	<2	2.26	66533	12	1.107	88	16
4070	0.41	309	7.9	136	<2	1.91	29496	21	1.288	99	25
4071	0.28	335	13.7	154	<2	2.14	84622	9	1.651	68	12
4072	0.88	389	4.8	121	<2	2.75	14548	28	1.783	62	12
4073	0.52	246	11.1	137	2	2.04	25971	31	2.990	33	8
4074	0.63	267	13.0	190	2	2.80	8549	26	2.204	57	15
4075	0.68	262	2.3	139	9	2.66	2634	18	1.988	33	11
4076	0.83	189	6.5	148	2	3.09	22024	74	1.843	83	21
4077	0.36	271	3.6	125	2	2.99	19312	51	2.138	55	49
4078	0.91	237	10.7	178	<2	2.31	38069	90	4.304	37	20
4080	0.51	266	16.3	173	2	2.68	25289	48	2.465	75	8
4082	0.70	253	7.3	171	<2	3.54	19587	52	2.461	43	9
4083	0.63	245	25.0	184	5	2.92	36394	32	1.766	72	14
4086	0.62	307	9.7	163	2	3.11	23068	61	3.785	48	12
4087	0.61	271	11.6	168	<2	2.94	16637	38	2.050	52	11
4088	0.93	328	17.7	230	<2	3.25	44622	142	2.255	49	13
4089	0.60	311	7.5	170	<2	3.38	41825	28	2.268	81	29

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
4090	11F11	20	632827	5060817	4	5	1E	DOW	CWL
4091	11F11	20	629532	5058176	5	7	0	MMW	CM
4092	11F11	20	628777	5056530	5	6	0	MMW	CC
4093	11F11	20	629032	5054276	5	8	0	DDW	CC
4094	11F11	20	626606	5055254	6	8	1SW	DMW	CM
4095	11F14	20	635864	5087244	7	8	1SW	DMW	HDG
4097	11F14	20	634560	5088292	6	8	1NE	DMW	HDM
4098	11F11	20	621264	5073328	7	8	1SE	MMW	DCHC
4100	11F14	20	617950	5093365	3	4	0	DOW	CMU
4103	11F14	20	628153	5072227	5	7	1E	DMW	HDG
4104	11F14	20	633329	5069241	5	7	2E	DMW	CMU
5001	11F15	20	659922	5080489	3	4	0	MMW	CWL
5002	11F15	20	656997	5082733	4	5	0	MMW	CWL
5003	11F14	20	657460	5080060	5	6	1N	MDW	HGD
5004	11F15	20	656924	5079709	4	6	1E	MMW	DCHC
5005	11F15	20	656113	5077818	5	6	1S	MMW	PW
5006	11F15	20	654027	5077347	6	8	3SE	DDW	PW
5007	11F15	20	653192	5076859	6	7	2SW	MMW	PW
5008	11F15	20	651977	5075951	7	9	2SW	MDW	PW
5009	11F15	20	650663	5074560	5	6	2SW	MDW	HGD
5011	11F14	20	648385	5073385	7	7	2SE	MDW	PW
5012	11F14	20	647243	5072642	9	10	2SE	MDW	PW
5013	11F14	20	646465	5071600	6	8	2SE	MDW	HGN
5014	11F14	20	646209	5071188	10	10	2SE	MDW	HGN
5015	11F14	20	644908	5070222	8	8	2SE	MDW	HGN
5016	11F14	20	644721	5070045	6	8	2SE	MDW	HGN
6001	11F14	20	635972	5079727	5	7	0	WDL	CWL
6003	11F14	20	638570	5078344	6	7	1W	MMW	CWL
6004	11F14	20	640034	5076333	5	6	0	MMW	CWL
6005	11F14	20	641805	5078796	6	7	0	WOW	CWU

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
4090	2.19	8	<0.5	2400	28	17.4	5	9	60	1.6	<0.02	0.26	0.8	26.50	2.5	<2	0.05	1870	<5	310	0.3	0.8	2	0.4	1900	0.7	<0.1	0.26	2000
4091	2.62	8	1.7	1500	23	15.3	9	3	28	0.9	<0.02	0.34	0.9	29.00	3.9	<2	0.09	1820	<5	88	0.4	1.0	<2	0.6	<300	0.8	<0.1	0.39	1400
4092	2.32	<5	4.4	3300	16	12.9	34	8	54	1.4	0.78	1.25	3.4	21.50	17.0	<2	0.30	3640	21	61	0.5	4.0	<2	3.2	610	2.9	1.0	1.56	2500
4093	2.51	15	4.1	1700	18	14.0	48	9	30	1.7	0.84	1.40	3.9	13.80	23.0	6	0.36	4860	28	59	0.7	4.8	<2	3.7	860	3.8	0.6	1.92	2200
4094	2.46	8	1.9	1900	26	17.6	6	5	12	<0.5	<0.03	0.36	0.8	21.20	3.2	<2	0.09	2860	<5	120	0.3	1.1	<2	0.5	940	0.3	<0.1	0.30	1500
4095	2.09	6	2.8	3000	67	17.5	4	5	14	2.3	<0.02	0.16	0.6	24.00	2.2	<2	<0.05	2850	<5	250	0.7	0.4	<2	0.3	780	0.3	<0.1	<0.05	1600
4097	2.05	18	<0.5	810	36	16.8	4	3	18	1.4	<0.02	0.22	0.6	21.40	1.8	<2	<0.05	2210	<5	160	0.6	0.8	<2	0.3	860	0.3	<0.1	<0.05	2400
4098	2.03	<5	2.6	2100	33	17.4	5	3	18	0.9	<0.03	0.20	0.6	24.00	1.5	<2	<0.05	5020	<5	140	0.4	0.6	<2	0.2	800	<0.1	<0.1	<0.05	1700
4100	2.48	76	4.5	3700	23	13.0	16	10	34	1.0	0.24	0.62	1.9	27.30	8.0	4	0.10	2290	<5	54	0.6	1.9	<2	1.0	1800	1.4	<0.1	0.43	2000
4103	2.06	9	1.1	970	19	15.5	<3	2	13	1.4	<0.02	0.14	<0.5	19.50	1.6	<2	<0.05	1710	<5	240	0.3	0.3	<2	0.2	420	<0.1	<0.1	<0.05	1600
4104	2.30	<5	1.8	2800	22	18.8	<3	3	13	<0.5	<0.02	0.15	<0.5	16.40	1.7	<2	<0.05	1290	<5	43	0.3	0.4	<2	0.2	780	0.2	<0.1	<0.05	1500
5001	2.16	10	1.8	760	26	10.9	6	5	13	1.5	<0.03	0.29	<0.5	27.60	2.9	<2	0.07	2950	<5	360	0.2	0.8	<2	0.5	600	0.4	0.6	0.31	1500
5002	2.87	10	2.3	760	17	10.8	11	7	33	0.6	0.31	0.76	1.3	21.80	5.3	<2	0.08	3460	<5	150	0.3	2.8	<2	1.0	1000	0.7	0.4	0.46	1400
5003	2.57	9	<0.5	1600	39	9.8	4	5	14	1.7	0.16	0.16	<0.5	25.70	1.9	<2	<0.05	1800	8	220	0.2	0.5	<2	0.3	420	0.2	<0.1	0.19	1400
5004	2.16	<5	<0.5	2600	22	14.2	<3	2	11	<0.5	<0.02	0.08	<0.5	25.90	0.9	<2	<0.05	986	<5	110	0.1	0.2	2	<0.1	1000	<0.1	<0.1	<0.05	2100
5005	2.43	<5	<0.5	1200	27	12.2	<3	4	13	<0.5	<0.03	0.19	0.8	23.70	1.7	<2	<0.05	2180	<5	100	0.2	0.5	<2	0.3	<300	0.3	<0.1	0.22	1600
5006	1.97	16	1.1	1100	24	13.6	<3	3	55	<0.5	<0.02	0.08	<0.5	24.40	1.2	<2	<0.05	1920	<5	69	0.2	0.2	<2	0.1	680	<0.1	<0.1	0.13	1400
5007	2.38	7	1.0	740	19	19.3	<3	3	32	<0.5	<0.02	0.12	<0.5	18.10	1.0	<2	<0.05	2070	<5	100	0.2	0.2	<2	<0.1	300	<0.1	0.4	<0.05	960
5008	2.14	<5	2.2	570	26	20.6	<3	1	61	1.3	<0.02	0.15	<0.5	17.40	1.4	<2	<0.05	2820	<5	73	0.3	0.4	<2	0.2	620	0.3	<0.1	0.14	1100
5009	1.91	10	1.1	1500	22	18.7	<3	2	57	2.0	<0.02	0.12	<0.5	24.20	1.8	<2	<0.05	1070	<5	190	0.2	0.3	<2	0.2	1100	<0.1	<0.1	<0.05	2000
5011	2.13	<5	0.9	1100	55	16.9	4	3	42	<0.5	<0.02	0.12	<0.5	19.70	1.5	<2	<0.05	2520	<5	140	0.2	0.3	<2	0.2	650	0.5	<0.1	0.12	1000
5012	2.01	12	1.5	1800	37	17.2	<3	4	44	<0.5	<0.03	0.10	0.6	19.20	1.3	<2	<0.05	2490	<5	130	0.3	0.3	<2	0.2	770	<0.1	<0.1	<0.05	2100
5013	2.29	14	1.3	3500	27	21.1	4	2	55	<0.5	<0.02	0.13	0.8	14.40	1.2	2	<0.05	2760	<5	150	0.2	0.3	<2	0.2	1200	0.3	<0.1	<0.05	2700
5014	2.62	17	1.1	2200	26	21.5	3	3	10	0.7	<0.02	0.13	0.5	13.60	1.5	<2	<0.05	1570	<5	86	0.2	0.3	<2	0.2	670	<0.1	<0.1	0.15	1000
5015	2.17	12	<0.5	2000	27	19.8	<3	2	9	<0.5	<0.02	0.08	<0.5	16.20	0.8	<2	<0.05	2040	<5	170	0.2	0.2	<2	<0.1	600	<0.1	<0.1	<0.05	1600
5016	2.38	16	1.0	1600	25	15.1	<3	4	12	1.1	<0.02	0.09	0.5	24.50	1.4	4	<0.05	1240	<5	180	0.2	0.3	<2	0.2	460	0.1	<0.1	<0.05	3000
6001	2.87	7	1.5	3000	26	18.7	6	2	9	0.6	<0.02	0.27	1.0	19.50	3.7	<2	<0.05	1450	<5	82	0.3	0.8	<2	0.6	1600	0.4	0.5	0.26	1200
6003	3.25	13	1.3	3900	86	20.0	<3	5	<1	<0.5	<0.03	0.14	<0.5	19.30	1.3	<2	<0.05	1420	<5	110	1.3	0.3	<2	0.2	<300	<0.1	<0.1	<0.05	1000
6004	2.62	10	0.6	2000	41	14.1	<3	3	13	<0.5	<0.02	0.11	<0.5	24.20	1.1	<2	<0.05	940	<5	77	0.4	0.2	<2	0.2	930	<0.1	<0.1	0.10	2100
6005	2.35	<5	1.6	1600	49	14.0	6	4	17	1.2	<0.02	0.28	0.9	23.90	2.8	<2	0.05	1940	<5	170	0.4	0.7	<2	0.4	1000	0.3	<0.1	0.30	1500

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
4090	0.65	217	17.2	177	3	2.34	32122	58	2.773	40	9
4091	0.21	295	4.0	150	2	2.33	20852	17	2.262	46	21
4092	0.92	293	9.2	185	10	3.02	11141	75	2.327	53	27
4093	1.28	240	9.2	137	5	3.03	37406	90	1.739	72	40
4094	0.59	307	13.7	161	3	2.97	28524	45	2.433	41	15
4095	0.50	300	5.9	190	3	2.79	15546	58	2.444	59	6
4097	0.32	396	6.4	209	2	3.23	20629	35	2.421	74	11
4098	0.20	310	9.6	176	<2	2.83	21850	15	3.222	70	6
4100	0.73	257	6.9	174	3	2.11	8261	46	2.259	28	6
4103	0.45	307	8.0	170	<2	3.14	13232	23	3.432	40	6
4104	0.43	246	7.5	182	2	2.43	16774	33	1.931	36	8
5001	0.60	362	7.0	209	2	2.83	7780	45	2.592	24	5
5002	0.77	222	5.9	117	5	2.56	9010	29	2.919	52	13
5003	0.62	242	14.2	150	3	2.65	27937	24	2.904	37	3
5004	0.07	273	12.4	128	2	1.72	5609	13	1.988	22	2
5005	0.58	245	11.5	146	2	2.42	7720	50	3.205	18	<2
5006	0.59	259	3.4	142	<2	2.82	7842	28	2.278	42	3
5007	0.26	219	3.7	131	<2	2.43	4294	7	1.995	29	2
5008	0.15	142	2.9	111	<2	1.79	1407	10	1.994	51	7
5009	0.55	235	5.1	146	<2	3.14	13872	27	1.876	39	6
5011	0.32	210	1.9	124	2	2.87	4300	14	1.935	42	3
5012	0.42	269	2.0	167	3	3.03	7729	35	2.276	42	7
5013	-	-	-	-	-	-	-	-	-	-	-
5014	-	-	-	-	-	-	-	-	-	-	-
5015	0.16	244	3.3	159	2	2.93	3634	19	1.781	42	5
5016	0.31	225	3.6	106	<2	2.65	5412	16	1.431	47	5
6001	0.30	280	6.9	136	4	1.88	2871	34	1.898	36	6
6003	0.24	267	5.2	106	<2	1.28	9913	15	1.681	26	5
6004	0.52	218	7.0	127	<2	2.47	10193	39	1.898	33	3
6005	0.38	214	3.4	105	<2	2.60	16106	22	1.591	37	6

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
6007	11F14	20	641368	5081186	6	7	0	MMW	CWU
6009	11F14	20	644003	5081908	6	7	1N	MOW	CWU
6011	11F14	20	642389	5082806	6	7	0	MOW	CWU
6014	11F14	20	641025	5088115	6	7	0	MMW	HGN
6017	11F14	20	639046	5087448	6	7	2NW	MOW	HDM
6018	11F14	20	637081	5084653	6	7	0	MMW	CWL
6019	11F14	20	628635	5080039	5	7	0	MOW	HDG
6020	11F14	20	626487	5079757	4	7	0	MOW	HDG
6021	11F14	20	625434	5081950	5	7	0	MMW	DCHC
6023	11F14	20	627265	5082956	5	7	1E	MOW	DCHC
6025	11F14	20	626748	5084226	5	7	0	MOW	DCHC
6026	11F14	20	624613	5084626	5	5	0	MOW	DCHC
6027	11F14	20	624612	5086492	5	7	0	WMW	DCHC
6028	11F14	20	626412	5086488	6	8	0	MMW	DCHC
6029	11F14	20	631953	5080455	5	7	1SE	MOW	PM
6031	11F14	20	624233	5080086	3	5	0	MOW	DCHC
6032	11F14	20	623302	5081379	5	8	0	WMW	DCHC
6033	11F14	20	622986	5083112	5	7	0	MOW	DCHC
6037	11F14	20	623152	5084305	5	8	0	MOW	DCHC
6038	11F14	20	630971	5087399	6	7	0	MOW	HD
6039	11F14	20	628950	5087192	6	7	0	MOW	DCHC
7001	11F11	20	654671	5065885	5	8	1NW	MDW	HP
7003	11F15	20	657526	5068457	6	7	1NW	DMW	HP
7005	11F15	20	658941	5069165	7	13	0N	MOW	HP
7007	11F15	20	660744	5069257	4	6	1NE	DOW	HP
7008	11F15	20	662754	5069532	4	9	2N	DOW	HCGD
7010	11F10	20	668170	5062440	5	7	0	DOW	CC
7011	11F15	20	665362	5068406	5	8	2N	DOW	HCGD
7012	11F10	20	667409	5067773	7	10	2NE	DOW	CC
7013	11F10	20	668755	5065828	6	8	-	-	CC

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
6007	2.46	6	1.7	1900	24	13.0	<3	5	11	<0.5	<0.03	0.13	<0.5	26.70	1.2	4	<0.05	1060	<5	120	0.3	0.3	<2	0.2	760	0.2	<0.1	0.13	1700
6009	2.61	<5	1.9	2600	31	16.7	4	2	13	<0.5	<0.03	0.13	<0.5	25.20	1.5	<2	<0.05	1240	<5	130	0.3	0.3	<2	0.2	600	<0.1	<0.1	<0.05	1300
6011	2.42	5	0.8	1200	17	12.1	4	3	13	0.7	<0.03	0.16	0.9	22.70	2.1	<2	<0.05	1430	<5	120	1.9	0.5	<2	0.3	620	0.2	<0.1	0.22	1800
6014	2.24	<5	1.3	1000	23	14.7	3	3	16	1.2	<0.02	0.13	<0.5	24.10	1.7	<2	<0.05	826	<5	170	0.3	0.4	<2	0.3	600	0.2	<0.1	<0.05	1900
6017	2.68	6	1.4	380	31	19.8	<3	3	12	0.8	<0.03	0.14	<0.5	24.90	1.6	<2	<0.05	1320	<5	350	0.2	0.4	<2	0.2	<300	<0.1	<0.1	<0.05	1400
6018	2.19	12	1.0	2800	19	18.7	<3	3	12	1.2	<0.02	0.11	<0.5	18.30	1.8	<2	<0.05	2070	<5	140	0.3	0.3	<2	0.2	580	<0.1	<0.1	<0.05	2100
6019	1.98	9	2.1	1000	28	17.4	4	3	15	11.0	<0.03	0.22	0.7	20.10	2.1	<2	<0.05	1650	<5	560	0.5	0.6	<2	0.3	1300	0.2	<0.1	0.23	3000
6020	2.39	<5	1.5	2000	20	15.1	5	4	10	1.2	<0.02	0.21	0.8	24.10	2.5	<2	<0.05	1750	<5	230	0.5	0.7	<2	0.4	730	0.4	<0.1	0.32	1900
6021	2.50	<5	1.6	1600	68	13.9	<3	4	11	<0.5	<0.02	0.16	<0.5	25.70	1.6	<2	<0.05	3120	<5	160	0.3	0.4	<2	0.2	<300	0.2	<0.1	0.11	2400
6023	2.20	6	1.3	2000	28	19.9	<3	6	15	0.7	<0.02	0.12	<0.5	20.20	1.6	<2	<0.05	953	<5	110	0.3	0.3	<2	0.2	1200	<0.1	<0.1	<0.05	2100
6025	2.34	6	3.3	3500	31	16.4	16	5	26	1.4	<0.03	0.61	1.9	20.20	9.2	<2	0.12	2540	<5	81	0.4	1.9	<2	1.3	1400	1.3	0.4	0.75	2200
6026	2.74	<5	1.0	1300	26	17.5	<3	4	5	<0.5	<0.02	0.14	<0.5	23.20	1.4	2	<0.05	1240	<5	110	0.3	0.3	<2	0.2	670	<0.1	<0.1	<0.05	2300
6027	2.90	<5	1.4	2100	17	16.6	3	4	26	<0.5	<0.02	0.17	1.2	19.30	2.2	<2	<0.05	1340	<5	84	0.2	0.6	<2	0.3	1200	0.5	<0.1	0.27	2300
6028	2.26	9	1.7	2700	36	9.3	<3	3	10	1.4	<0.03	0.17	<0.5	24.60	1.7	<2	<0.05	1210	<5	200	0.4	0.5	<2	0.3	660	0.1	<0.1	<0.05	1900
6029	2.36	10	1.9	1300	26	13.5	<3	2	15	5.2	<0.02	0.22	0.5	25.00	1.8	<2	<0.05	1500	<5	520	0.4	0.6	<2	0.3	1000	<0.1	<0.1	0.13	2500
6031	2.84	9	1.4	1500	41	11.6	3	7	14	1.1	<0.02	0.18	0.9	25.90	1.8	<2	<0.05	1380	<5	150	0.3	0.5	<2	0.3	570	0.1	<0.1	<0.05	2000
6032	2.18	12	2.3	1800	38	14.6	4	3	13	<0.5	<0.02	0.25	<0.5	21.80	2.4	<2	0.05	5750	<5	130	0.5	0.6	<2	0.4	<300	0.3	<0.1	0.18	1700
6033	2.55	12	1.9	2000	30	16.1	<3	4	15	<0.5	<0.03	0.19	0.8	18.10	2.1	<2	0.05	2460	<5	81	0.5	0.5	<2	0.3	810	<0.1	<0.1	<0.05	2700
6037	2.80	10	2.2	750	29	15.8	8	3	11	0.5	<0.02	0.30	1.0	18.90	3.5	<2	0.06	2100	6	88	0.4	1.0	<2	0.5	730	0.8	0.4	0.34	1100
6038	2.07	10	1.9	640	20	17.1	<3	3	13	1.0	<0.02	0.18	<0.5	21.10	1.6	2	<0.05	3760	<5	200	0.4	0.4	<2	0.2	<300	0.2	<0.1	0.19	3100
6039	2.63	7	1.0	2700	26	9.6	<3	2	14	<0.5	<0.02	0.13	<0.5	29.00	1.3	<2	<0.05	1700	<5	130	0.3	0.3	<2	0.2	950	<0.1	<0.1	0.15	1800
7001	2.27	18	1.2	1500	60	12.9	<3	12	12	<0.5	<0.02	0.10	<0.5	24.20	1.2	<2	<0.05	2280	<5	130	0.3	0.2	<2	0.2	750	<0.1	<0.1	<0.05	1700
7003	1.97	33	1.5	2500	28	15.4	3	4	13	<0.5	<0.02	0.09	<0.5	22.70	1.1	<2	<0.05	2810	<5	71	0.2	0.2	<2	0.1	1100	0.2	<0.1	0.12	2100
7005	2.20	16	<0.5	5400	49	20.9	<3	5	10	0.9	<0.03	<0.05	<0.5	15.50	1.5	<2	<0.05	3600	<5	72	0.3	0.2	<2	<0.1	1100	<0.1	0.7	<0.05	2500
7007	2.35	10	1.2	2300	21	14.3	<3	5	12	1.8	<0.02	0.09	<0.5	22.60	1.3	<2	<0.05	2310	<5	150	0.2	0.2	<2	0.2	720	<0.1	<0.1	<0.05	2100
7008	1.99	12	0.9	2300	31	13.7	4	4	14	0.9	<0.02	0.16	<0.5	23.00	2.2	<2	<0.05	2600	<5	270	0.3	0.4	<2	0.3	1100	<0.1	<0.1	0.13	2300
7010	1.74	9	0.7	1200	23	16.2	<3	4	15	2.0	<0.02	0.11	<0.5	18.90	1.3	<2	<0.05	1140	<5	190	0.2	0.3	2	0.2	650	<0.1	<0.1	0.14	2200
7011	2.87	6	0.8	1700	24	11.5	7	3	10	0.8	<0.02	0.25	<0.5	25.50	3.1	<2	<0.05	2450	<5	180	0.3	0.8	<2	0.5	810	0.1	0.3	0.25	1300
7012	2.03	10	1.1	2100	15	18.6	8	5	14	1.1	0.23	0.33	1.5	13.40	4.0	<2	0.06	1520	<5	72	0.4	1.1	<2	0.7	920	0.6	<0.1	0.41	1800
7013	1.83	7	1.2	2600	42	16.2	7	5	19	0.6	<0.02	0.24	1.0	17.90	3.0	<2	<0.05	1480	<5	130	0.4	0.7	<2	0.5	680	0.4	<0.1	0.25	1900

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
6007	0.40	270	4.2	140	2	1.86	12065	19	2.332	30	3
6009	0.35	288	4.4	124	<2	1.86	7934	33	2.031	29	3
6011	0.66	252	6.2	139	<2	2.84	33437	45	3.984	36	4
6014	0.27	245	6.0	114	<2	3.48	19181	18	2.242	41	6
6017	0.32	267	6.4	140	<2	1.79	7403	14	1.989	36	4
6018	0.42	315	12.9	141	<2	3.00	15525	57	2.064	42	4
6019	0.55	320	11.9	181	3	3.27	22435	34	2.214	69	11
6020	0.42	308	10.3	205	2	2.15	18196	27	2.518	30	6
6021	0.15	256	4.2	119	2	2.52	14609	16	1.553	45	8
6023	0.43	275	15.3	154	<2	1.80	30840	27	1.934	49	6
6025	0.98	200	13.2	143	8	2.54	33429	31	1.822	47	11
6026	0.34	223	6.0	135	2	1.99	23251	18	2.234	33	6
6027	0.40	192	20.3	113	2	2.62	35214	16	1.859	36	5
6028	0.30	324	6.5	157	<2	2.33	74302	14	2.704	53	8
6029	0.43	242	14.2	158	<2	2.81	24321	27	2.464	56	10
6031	0.34	221	11.8	134	<2	2.60	29677	24	2.289	30	5
6032	0.30	242	4.2	149	2	1.74	17073	10	1.980	52	9
6033	0.63	229	13.8	166	4	2.18	26932	47	2.216	47	7
6037	0.34	250	10.9	100	3	1.63	31348	12	2.076	67	9
6038	0.38	275	8.6	175	2	2.25	10658	20	2.245	50	8
6039	0.37	254	13.4	150	2	2.58	20014	46	1.949	30	4
7001	0.74	194	8.2	122	3	2.56	25253	62	2.966	31	2
7003	0.82	224	6.3	153	<2	3.68	12270	52	2.706	23	<2
7005	0.83	216	14.9	121	2	3.29	24492	30	1.826	43	4
7007	0.39	185	7.5	126	2	3.30	19019	58	2.937	50	3
7008	0.55	232	10.7	136	<2	3.46	20895	23	2.314	53	4
7010	0.30	286	13.3	155	2	3.43	47936	20	1.863	44	5
7011	0.48	249	5.6	131	4	2.40	13556	46	1.970	30	4
7012	0.63	244	10.0	142	3	3.10	31134	52	1.892	38	5
7013	0.70	232	10.1	163	3	2.09	37333	31	1.814	67	7

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
7014	11F10	20	669278	5064140	6	9	1	DOW	CC
7015	11F10	20	666303	5059753	6	9	1N	DLW	CC
7016	11F10	20	664642	5058765	6	9	2SW	DDW	CC
7017	11F10	20	664145	5061134	7	9	1E	DOW	CC
7018	11F10	20	663175	5062666	7	9	1NE	DOW	CC
7019	11F10	20	662492	5064026	5	10	1N	DMW	CC
7020	11F10	20	661878	5065686	6	8	1N	DOW	HP
7022	11F10	20	663368	5066737	6	11	1S	DOW	HP
7023	11F10	20	659937	5064081	2	6	2S	DOW	HP
7024	11F10	20	659143	5063761	6	9	1S	DOW	HP
7025	11F10	20	658449	5065410	4	6	1S	DOL	HCGD
7026	11F10	20	658092	5066247	4	9	1S	MOW	HCGD
7027	11F10	20	659583	5060736	8	9	0	DOW	CC
7030	11F10	20	662467	5058688	6	8	0	WOW	CC
7031	11F10	20	660397	5056792	5	7	0	DOW	CC
7032	11F10	20	657626	5056274	7	10	0	DOW	CC
7033	11F11	20	639522	5052190	4	9	1S	DMW	CC
7034	11F11	20	642639	5051461	5	7	0	DOW	CC
7035	11F11	20	645962	5051663	4	8	0	DMW	CC
7036	11F11	20	650545	5054629	4	6	0	DMW	CM
7037	11F11	20	650526	5057989	7	9	0	DOW	HP
7038	11F11	20	651900	5058283	3	5	0	DOL	HP
7039	11F11	20	650631	5059146	6	9	0	DMW	CWL
7041	11F11	20	652010	5056424	6	8	0	DOW	CC
7043	11F11	20	654794	5055410	8	11	0	DOW	CC
7044	11F10	20	656550	5056834	5	6	0	DOW	CC
7045	11F11	20	655384	5058135	5	8	0	DMW	CC
7046	11F11	20	654028	5060098	4	5	0	DMW	CW
7047	11F11	20	651707	5061724	4	6	0	MOL	HP
7048	11F10	20	659498	5058216	4	5	0	DOW	CC

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
7014	2.01	7	1.6	2100	20	15.5	8	5	18	0.9	0.17	0.29	0.9	17.80	4.0	<2	0.08	3980	<5	130	0.4	0.9	<2	0.7	890	0.4	<0.1	0.29	1400
7015	2.29	6	1.8	890	29	10.5	13	6	32	0.9	0.26	0.57	2.1	20.80	7.5	<2	0.14	3220	<5	160	0.4	1.9	<2	1.3	760	1.6	<0.1	0.77	1700
7016	1.92	10	1.6	1300	50	13.9	5	4	53	<0.5	<0.02	0.27	<0.5	23.40	3.0	<2	<0.05	2390	<5	76	0.4	0.7	<2	0.5	840	0.3	<0.1	0.25	2300
7017	2.00	8	1.9	1100	18	13.4	18	4	15	<0.5	0.40	0.67	1.8	18.30	9.3	<2	0.14	3430	11	140	0.5	2.3	<2	1.6	910	1.6	<0.1	0.77	2100
7018	2.33	10	1.5	2600	16	10.3	18	6	28	1.0	0.38	0.68	2.2	19.60	9.5	<2	0.16	3300	6	120	0.3	2.5	<2	1.5	<300	2.0	<0.1	0.79	1500
7019	1.71	16	1.3	2700	14	14.0	11	7	22	0.9	0.30	0.56	1.9	20.00	6.3	<2	0.12	3040	<5	240	0.3	2.0	<2	1.1	750	1.2	0.5	0.58	2000
7020	1.83	11	1.7	1700	25	13.0	4	7	14	<0.5	0.07	0.26	0.9	21.10	2.6	<2	<0.05	3240	<5	130	0.3	0.8	<2	0.3	1000	0.3	0.4	0.20	2100
7022	2.11	10	1.3	1400	27	16.0	7	5	15	0.8	0.14	0.29	1.0	19.60	3.0	<2	<0.05	2910	<5	230	0.5	0.8	<2	0.5	1000	0.4	<0.1	0.28	1600
7023	2.52	11	1.6	1000	110	15.5	3	6	44	1.2	<0.02	0.15	<0.5	22.50	1.9	<2	<0.05	928	<5	190	0.2	0.4	<2	0.3	<300	0.3	<0.1	0.11	1500
7024	2.04	10	0.9	1900	32	18.0	4	2	61	1.3	<0.02	0.15	0.9	19.90	2.0	<2	<0.05	1440	<5	220	0.3	0.4	<2	0.3	750	0.3	<0.1	0.15	2200
7025	1.85	10	<0.5	760	18	15.0	<3	3	46	2.4	<0.02	0.10	<0.5	25.20	1.0	<2	<0.05	1130	<5	270	0.2	0.3	4	0.2	1000	<0.1	0.3	<0.05	2400
7026	1.95	11	2.1	1100	30	13.9	<3	2	66	1.4	<0.02	0.21	<0.5	19.30	2.2	<2	<0.05	1480	<5	180	0.4	0.5	<2	0.3	970	0.3	<0.1	0.15	1700
7027	1.91	<5	1.5	1800	29	13.6	12	7	72	0.8	0.21	0.78	1.9	18.50	8.0	<2	0.13	6050	<5	150	0.5	2.7	<2	1.2	1600	2.0	0.5	0.56	2400
7030	2.88	<5	1.6	1300	24	12.6	19	10	48	1.4	0.41	1.00	2.1	14.70	9.5	<2	0.13	7900	7	140	0.4	3.4	<2	1.5	1200	2.1	0.8	0.68	1300
7031	2.34	11	1.3	570	48	14.1	5	4	12	1.1	<0.02	0.28	0.5	18.30	2.6	<2	0.05	2490	<5	170	0.3	0.8	<2	0.4	900	0.4	<0.1	0.24	2200
7032	2.01	12	0.9	900	31	17.3	7	6	54	<0.5	<0.02	0.23	0.7	18.90	4.5	3	<0.05	1700	<5	140	0.6	0.7	<2	0.5	<300	0.4	<0.1	0.32	1500
7033	2.42	18	2.0	2500	61	10.7	<3	5	7	0.9	<0.04	0.22	0.7	30.00	2.1	<2	<0.05	1390	<5	120	0.5	0.5	<2	0.3	<300	0.1	0.8	<0.05	1900
7034	2.78	8	1.5	1400	37	9.1	5	3	8	0.7	<0.03	0.20	0.8	32.40	2.6	<2	<0.05	1810	<5	200	0.3	0.6	<2	0.4	<300	0.2	<0.1	0.22	1000
7035	2.99	<5	5.2	690	56	12.4	26	6	29	2.5	0.65	0.97	2.7	20.40	14.0	<2	0.23	2740	13	150	0.4	3.0	<2	2.7	<300	2.3	<0.1	1.27	990
7036	2.39	11	0.9	2200	22	14.6	3	4	10	0.8	<0.02	0.11	<0.5	22.70	1.4	<2	<0.05	1540	<5	130	0.4	0.3	<2	0.2	1100	<0.1	<0.1	0.11	1700
7037	2.20	14	1.3	1700	30	13.0	8	4	14	1.5	<0.02	0.25	1.4	22.50	3.7	<2	0.08	1250	<5	180	0.3	0.7	<2	0.6	780	0.4	<0.1	0.36	2100
7038	2.17	10	0.9	540	14	15.3	<3	2	38	1.4	<0.02	0.11	<0.5	22.60	1.2	<2	<0.05	1760	<5	310	0.2	0.3	<2	0.2	660	0.2	<0.1	0.13	1500
7039	2.09	9	<0.5	1500	19	14.2	<3	3	40	0.8	<0.02	0.09	<0.5	23.50	1.8	<2	<0.05	1800	<5	91	0.2	0.3	<2	0.2	990	<0.1	<0.1	<0.05	1800
7041	2.32	12	2.3	1500	24	12.7	9	6	45	1.0	0.17	0.40	1.3	22.00	4.6	<2	0.10	2930	<5	160	0.3	1.2	<2	0.8	980	0.9	<0.1	0.59	1900
7043	2.21	11	1.9	2200	19	15.8	4	4	31	1.0	<0.02	0.23	<0.5	19.30	2.3	<2	<0.05	2320	<5	230	0.4	0.5	<2	0.4	780	0.4	<0.1	0.25	3500
7044	2.42	9	2.7	2400	40	11.9	19	13	50	1.4	0.40	0.66	2.8	22.10	10.0	<2	0.17	2930	9	270	0.3	2.3	<2	1.9	1300	2.2	0.5	1.02	1400
7045	2.35	12	1.0	2700	13	12.5	<3	4	36	0.8	<0.02	0.20	0.8	22.50	2.1	<2	0.05	1650	<5	150	0.2	0.5	3	0.3	710	0.4	<0.1	0.23	2200
7046	1.93	14	1.1	6200	20	15.6	4	2	56	0.6	<0.02	0.14	1.3	24.00	2.2	<2	<0.05	1750	<5	110	0.2	0.4	<2	0.3	880	0.3	<0.1	<0.05	3300
7047	2.28	20	<0.5	2700	26	14.3	<3	4	36	3.5	<0.03	0.16	0.7	24.90	1.6	<2	<0.05	2250	<5	170	0.3	0.3	<2	0.2	<300	<0.1	<0.1	<0.05	2300
7048	2.38	47	<0.5	2200	27	11.0	5	12	6	0.7	<0.03	0.15	<0.5	22.50	1.4	3	<0.05	1480	<5	160	0.3	0.4	<2	0.3	1100	0.2	<0.1	<0.05	1500

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
7014	0.72	268	5.8	153	5	2.80	19021	48	1.985	77	9
7015	0.94	213	5.3	111	7	2.82	37253	32	2.239	51	11
7016	0.50	253	6.9	175	4	2.81	34499	21	1.988	59	11
7017	0.68	225	6.2	134	5	2.39	40244	24	1.613	62	14
7018	0.72	272	11.7	158	7	2.34	59765	40	1.973	31	10
7019	0.67	303	9.5	244	5	3.45	18682	34	2.386	33	8
7020	0.47	273	8.4	178	4	2.52	36896	26	3.350	30	6
7022	0.57	249	5.4	120	4	3.02	31833	20	2.020	47	12
7023	0.51	240	13.2	124	2	2.40	10355	27	2.146	27	4
7024	0.34	240	9.9	151	<2	1.65	27958	13	1.864	41	8
7025	0.46	238	8.6	154	<2	2.16	23761	15	2.008	38	5
7026	0.69	262	7.1	120	<2	2.71	46813	18	1.958	63	12
7027	0.86	240	6.3	171	4	2.42	16957	31	1.985	26	10
7030	0.88	173	4.2	123	6	3.05	16132	31	1.384	25	12
7031	0.58	236	7.8	115	4	3.76	39223	28	2.627	48	8
7032	0.30	245	10.9	148	2	1.94	28470	42	1.449	51	10
7033	0.76	315	4.8	155	<2	3.20	34580	50	2.827	51	11
7034	0.60	321	2.4	132	<2	2.76	20110	37	2.552	43	8
7035	1.22	268	6.5	101	10	1.62	40327	27	1.316	55	16
7036	0.37	213	6.2	127	<2	1.77	37712	33	1.740	40	6
7037	0.48	213	19.8	120	<2	2.94	35204	25	2.251	40	7
7038	0.36	234	4.8	133	<2	2.84	27521	22	2.325	31	3
7039	0.54	236	8.6	138	<2	2.07	22837	37	2.239	22	3
7041	0.64	225	10.5	130	2	2.89	28214	49	2.568	34	9
7043	0.56	222	4.0	106	<2	2.60	13160	31	3.006	49	11
7044	0.80	255	4.3	133	4	2.11	20771	40	1.757	25	8
7045	0.48	250	7.2	185	<2	2.53	26671	45	2.365	20	3
7046	0.65	280	31.4	183	<2	2.41	13849	54	2.350	24	4
7047	0.43	209	12.1	175	<2	2.67	16050	26	2.513	39	6
7048	0.55	208	10.9	118	<2	3.84	58873	65	2.173	32	5

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
Field Data

Site Number	Map Sheet	Zone	Easting	Northing	Twig Min Age	Twig Max Age	Slope	Land Class	Rock Unit
7049	11F10	20	657481	5061758	4	8	0	DMW	HCGD
7050	11F10	20	656309	5059912	6	8	1	DMW	CC
7051	11F11	20	648585	5052854	6	8	0	DOW	CC
7052	11F11	20	644343	5052491	4	8	0	DOW	CC
7053	11F11	20	641773	5052477	7	9	0	MOB	CC

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
INAA Analytical Data

Site Number	Ash %	Au ppb	As ppm	Ba ppm	Br ppm	Ca %	Ce ppm	Co ppm	Cr ppm	Cs ppm	Eu ppm	Fe %	Hf ppm	K %	La ppm	Mo ppm	Lu ppm	Na ppm	Nd ppm	Rb ppm	Sb ppm	Sc ppm	Se ppm	Sm ppm	Sr ppm	Th ppm	U ppm	Yb ppm	Zn ppm
		5	0.5	10	1	0.2	3	1	1	0.5	0.01	0.05	0.5	0.05	0.1	2	0.05	10	5	5	0.1	0.1	2	0.1	300	0.1	0.1	0.05	20
7049	2.05	12	<0.5	3500	52	14.2	9	3	16	2.2	<0.03	0.41	1.5	24.20	4.0	3	0.07	2960	5	280	0.6	1.4	<2	0.6	750	0.7	<0.1	0.39	2600
7050	1.94	19	2.2	1100	44	12.2	5	3	14	<0.5	<0.03	0.19	<0.5	24.60	2.2	<2	<0.05	2410	<5	120	0.4	0.5	<2	0.3	1300	0.2	0.3	0.17	2200
7051	2.46	19	1.8	2800	80	17.0	6	9	17	<0.5	<0.03	0.27	<0.5	17.80	3.7	<2	<0.05	2410	<5	87	0.4	0.6	<2	0.6	560	<0.1	<0.1	<0.05	1700
7052	2.20	32	1.1	2100	26	13.7	5	12	17	<0.5	<0.03	0.24	<0.5	19.40	2.4	<2	<0.05	1800	<5	64	0.3	0.6	<2	0.4	790	0.7	<0.1	<0.05	1700
7053	2.05	8	2.9	1500	33	17.9	8	3	18	<0.5	0.17	0.34	1.1	20.10	5.2	<2	0.06	2090	<5	110	0.5	0.9	<2	0.8	1500	1.0	<0.1	0.35	1600

Reconnaissance Biogeochemical Survey, Southwest Cape Breton - Balsam Fir Twigs; GSC Open File 3344, 1997
ICP-ES Analytical Data

Site Number	Al %	B ppm	Cd ppm	Cu ppm	Li ppm	Mg %	Mn ppm	Ni ppm	P %	Pb ppm	V ppm
	0.01	2	0.2	1	2	0.01	1	1	0.001	3	2
7049	0.40	287	7.3	150	2	2.11	24615	32	1.714	44	13
7050	0.50	277	7.6	153	<2	2.87	19486	27	2.125	50	10
7051	0.80	234	13.6	124	2	2.46	28687	71	1.796	101	15
7052	0.71	245	6.4	138	<2	3.03	53243	37	3.379	66	11
7053	0.52	341	4.0	111	2	2.19	26915	27	1.203	101	21

Appendix B

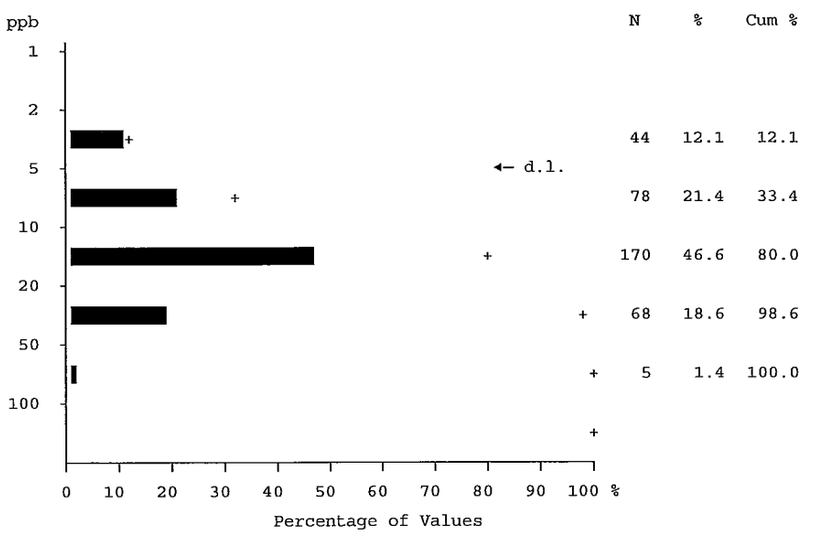
Statistical Summary

Abbreviations are explained in Table 12 (page 33)

Gold (INAA)

Number of values - 365

Determination limit - 5 ppb



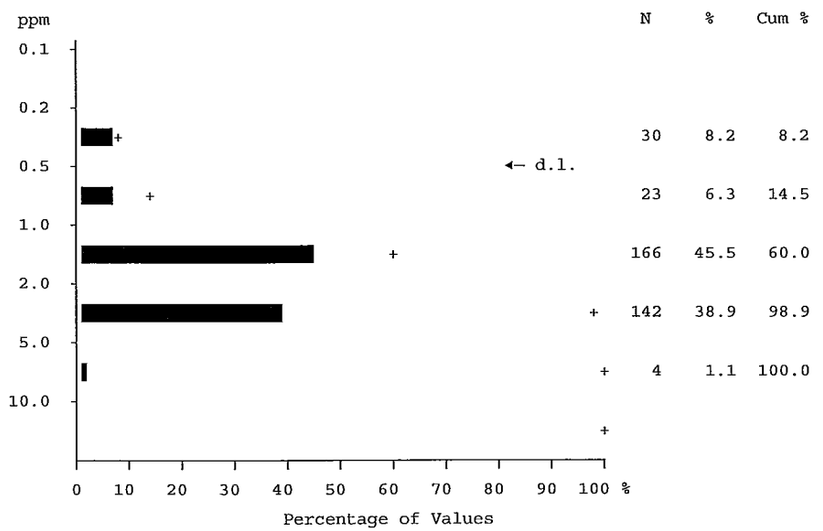
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	44	24	9	4	0	7
Number of missing values	0	0	0	0	0	0
Mean	14.060	14.079	15.340	14.111	14.813	11.039
Standard deviation	10.614	11.863	10.369	10.352	7.278	5.777
Skewness	2.490	2.419	1.367	3.482	1.417	0.139
Kurtosis	9.653	7.863	2.726	17.868	0.754	-0.683
Geometric Mean	11.008	10.524	11.998	11.745	13.573	9.129
Percentiles						
Minimum value	2.500	2.500	2.500	2.500	8.000	2.500
25th	8.000	8.000	8.000	9.000	10.000	7.000
50th	12.000	11.000	13.000	12.000	11.500	12.000
75th	17.000	17.750	20.000	16.000	17.500	16.000
80th	19.800	20.000	21.000	18.400	19.200	16.000
90th	26.000	26.500	29.200	26.700	30.900	18.300
95th	32.000	37.750	36.400	31.000	33.000	22.100
98th	45.720	59.900	50.200	57.300	33.000	24.000
99th	66.020	70.800	58.000	78.000	33.000	24.000
Maximum value	78.000	76.000	58.000	78.000	33.000	24.000

Au

Arsenic (INAA)

Number of values - 365

Determination limit - 0.5 ppm

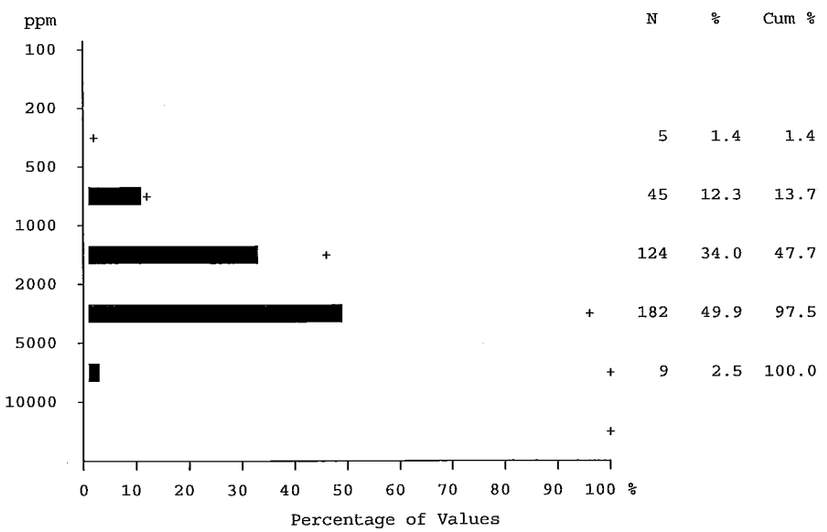


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	30	11	7	5	3	4
Number of missing values	0	0	0	0	0	0
Mean	1.867	2.086	1.717	1.901	1.228	1.426
Standard deviation	0.993	1.048	0.880	0.896	0.698	0.972
Skewness	0.985	0.786	0.609	1.034	0.531	2.441
Kurtosis	2.108	1.062	0.778	4.171	0.044	9.209
Geometric Mean	1.560	1.771	1.437	1.641	0.998	1.164
Percentiles						
Minimum value	0.250	0.250	0.250	0.250	0.250	0.250
25th	1.250	1.500	1.100	1.400	0.900	0.800
50th	1.800	1.900	1.700	1.900	1.200	1.200
75th	2.300	2.600	2.200	2.450	1.575	1.900
80th	2.500	2.700	2.380	2.600	1.660	2.000
90th	3.040	3.400	2.840	2.700	2.410	2.210
95th	3.870	4.275	3.400	3.035	2.900	2.765
98th	4.500	4.780	4.236	5.072	2.900	5.900
99th	5.438	5.480	4.600	5.900	2.900	5.900
Maximum value	6.000	6.000	4.600	5.900	2.900	5.900

Barium (INAA)

Number of values - 365

Determination limit - 10 ppm

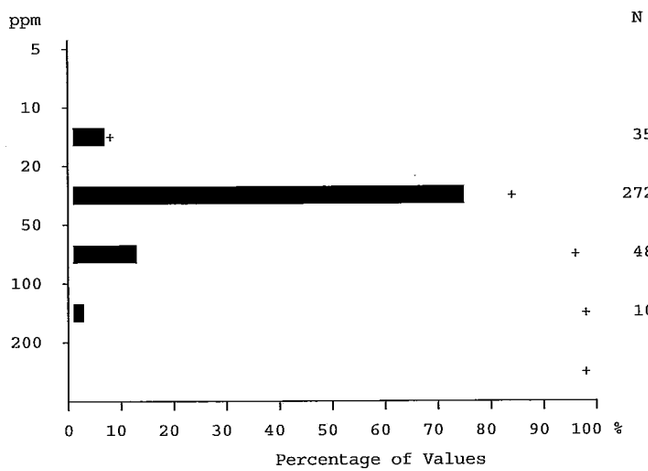


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	2137.945	2414.817	2070.000	1746.944	2258.750	1767.105
Standard deviation	1110.012	1160.275	1138.502	855.505	1150.083	929.257
Skewness	0.988	0.923	1.146	0.320	1.063	0.620
Kurtosis	1.225	0.758	1.739	-0.903	1.067	-0.885
Geometric Mean	1859.476	2152.016	1778.896	1521.205	1997.612	1533.310
Percentiles						
Minimum value	370.000	570.000	410.000	380.000	540.000	370.000
25th	1300.000	1500.000	1200.000	927.500	1550.000	1100.000
50th	2000.000	2200.000	2000.000	1700.000	2100.000	1500.000
75th	2700.000	3000.000	2600.000	2300.000	2650.000	2400.000
80th	3000.000	3300.000	2800.000	2540.000	3120.000	2760.000
90th	3600.000	4000.000	3680.000	3000.000	4070.000	3310.000
95th	4170.000	4825.000	4160.000	3335.000	5400.000	3505.000
98th	5200.000	5480.000	5888.000	3554.000	5400.000	3600.000
99th	5736.000	6210.000	6200.000	3600.000	5400.000	3600.000
Maximum value	6600.000	6600.000	6200.000	3600.000	5400.000	3600.000

Bromine (INAA)

Number of values - 365

Determination limit - 1 ppm



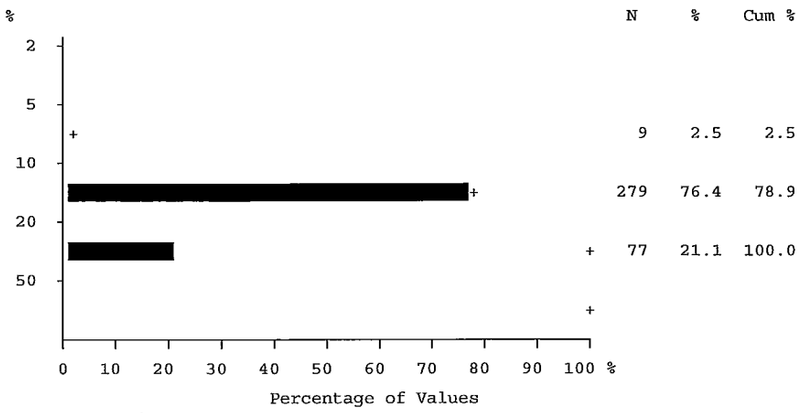
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	36.808	36.207	39.680	38.500	38.500	29.816
Standard deviation	23.396	23.767	27.140	21.543	26.543	13.102
Skewness	2.989	3.512	2.432	2.110	1.556	2.668
Kurtosis	11.607	15.884	6.887	4.951	1.233	9.432
Geometric Mean	32.458	31.990	34.124	34.444	32.720	27.881
Percentiles						
Minimum value	13.000	13.000	17.000	18.000	14.000	14.000
25th	24.000	23.250	24.000	24.000	25.000	23.750
50th	30.000	31.000	30.000	31.500	27.500	27.000
75th	40.000	39.000	41.000	46.500	45.500	32.250
80th	43.000	41.000	51.400	51.000	55.600	34.200
90th	58.800	56.000	83.600	60.100	95.300	41.000
95th	88.700	82.250	95.200	92.150	110.000	56.750
98th	110.000	131.000	149.200	120.800	110.000	90.000
99th	146.800	170.500	170.000	130.000	110.000	90.000
Maximum value	190.000	190.000	170.000	130.000	110.000	90.000

Br

Calcium (INAA)

Number of values - 365

Determination limit - 0.2 %

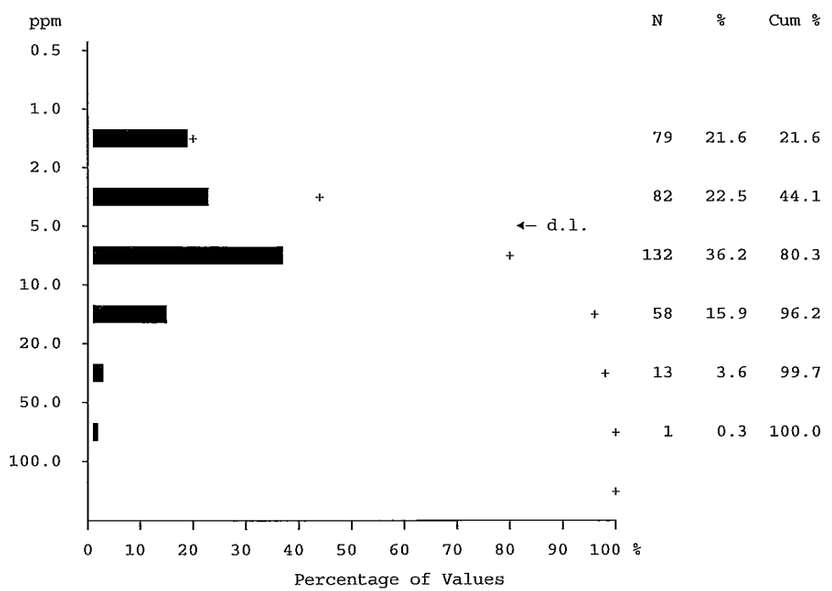


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	16.975	16.353	17.237	17.535	16.413	18.316
Standard deviation	3.527	3.438	3.806	3.045	2.956	3.948
Skewness	0.194	0.083	0.360	0.465	0.476	-0.253
Kurtosis	-0.292	-0.465	-0.686	0.994	-1.256	-0.812
Geometric Mean	16.601	15.980	16.828	17.276	16.173	17.865
Percentiles						
Minimum value	9.100	9.100	10.800	9.800	12.900	9.600
25th	14.300	14.000	14.300	15.425	14.300	14.650
50th	16.900	16.200	16.900	17.100	15.450	19.450
75th	19.500	18.875	20.000	19.475	18.750	20.950
80th	20.080	19.400	20.380	20.040	19.860	21.580
90th	21.640	20.850	23.100	21.570	21.200	22.810
95th	22.970	22.175	24.200	21.835	21.900	24.940
98th	24.668	23.870	25.844	26.658	21.900	25.700
99th	25.700	24.335	26.000	27.900	21.900	25.700
Maximum value	27.900	24.400	26.000	27.900	21.900	25.700

Cerium (INAA)

Number of values - 365

Determination limit - 3 ppm

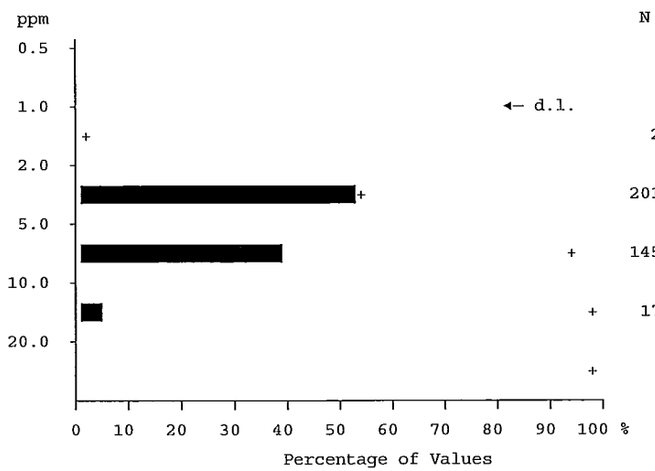


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	79	30	10	12	8	19
Number of missing values	0	0	0	0	0	0
Mean	6.653	8.384	6.693	5.403	3.063	2.987
Standard deviation	6.266	7.866	5.130	3.229	2.048	1.908
Skewness	3.033	2.440	2.836	1.062	1.121	1.519
Kurtosis	13.545	8.079	11.890	0.853	0.144	2.749
Geometric Mean	4.828	5.873	5.346	4.508	2.555	2.527
Percentiles						
Minimum value	1.500	1.500	1.500	1.500	1.500	1.500
25th	3.000	3.000	4.000	3.250	1.500	1.500
50th	5.000	6.000	5.000	5.000	2.250	2.250
75th	8.000	10.000	9.000	6.750	4.000	4.000
80th	9.000	12.000	9.800	8.000	4.000	4.000
90th	13.000	18.000	12.000	10.700	7.300	5.100
95th	18.000	24.500	13.200	12.000	8.000	7.150
98th	25.680	33.400	29.800	15.080	8.000	10.000
99th	34.340	48.700	35.000	16.000	8.000	10.000
Maximum value	50.000	50.000	35.000	16.000	8.000	10.000

Cobalt (INAA)

Number of values - 365

Determination limit - 1 ppm

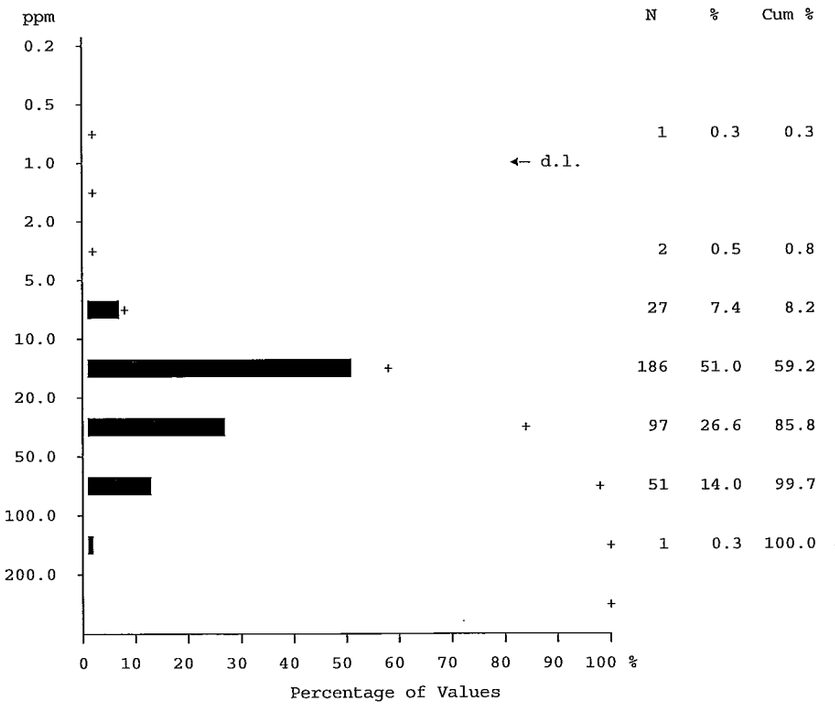


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	4.688	5.348	4.693	3.847	4.750	3.395
Standard deviation	2.385	2.604	2.388	1.598	2.408	1.552
Skewness	1.648	1.408	1.887	1.043	1.456	1.375
Kurtosis	3.548	2.198	4.691	0.775	2.523	1.861
Geometric Mean	4.198	4.819	4.235	3.552	4.267	3.104
Percentiles						
Minimum value	1.000	2.000	2.000	1.000	2.000	1.000
25th	3.000	3.000	3.000	3.000	3.250	2.000
50th	4.000	5.000	4.000	3.000	5.000	3.000
75th	6.000	6.000	5.000	5.000	5.000	4.000
80th	6.000	7.000	6.000	5.000	5.600	4.000
90th	8.000	9.000	8.000	6.700	8.500	6.000
95th	9.000	11.750	9.200	7.000	12.000	8.000
98th	12.000	13.000	13.960	8.540	12.000	8.000
99th	13.680	15.000	15.000	9.000	12.000	8.000
Maximum value	15.000	15.000	15.000	9.000	12.000	8.000

Chromium (INAA)

Number of values - 365

Determination limit - 1 ppm



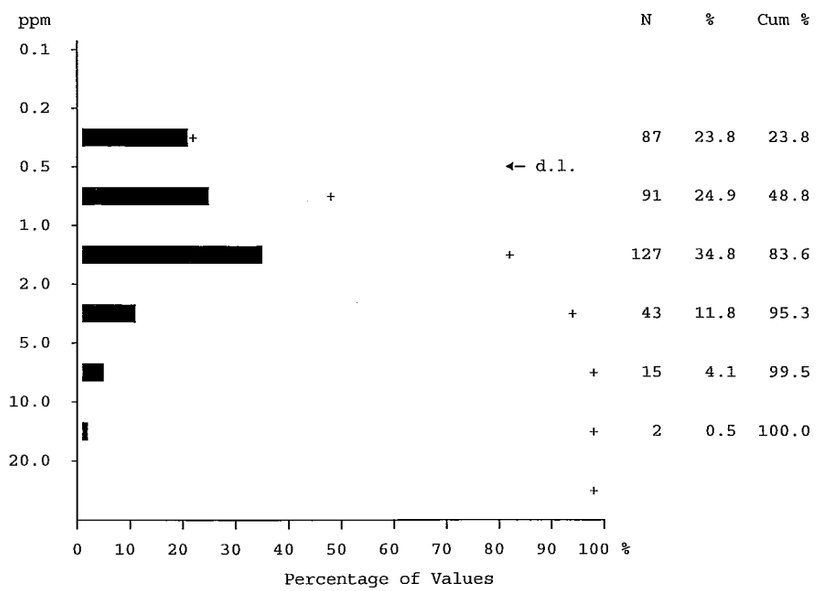
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	1	0	1	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	25.207	25.726	22.327	29.625	21.563	21.816
Standard deviation	19.486	19.810	15.981	23.053	14.873	17.689
Skewness	1.676	1.664	2.433	0.970	1.389	2.127
Kurtosis	2.048	2.181	5.943	-0.506	0.646	4.280
Geometric Mean	19.874	20.277	18.507	22.166	18.257	17.676
Percentiles						
Minimum value	0.500	3.000	0.500	2.000	10.000	5.000
25th	13.000	13.000	15.000	13.000	12.250	12.750
50th	18.000	18.000	19.000	18.000	14.500	16.000
75th	27.000	29.000	22.000	49.500	31.500	21.000
80th	36.000	36.000	22.000	55.800	37.200	27.200
90th	59.400	56.500	46.400	67.700	49.100	55.000
95th	70.700	72.000	61.600	75.050	61.000	62.450
98th	82.080	84.700	84.200	85.020	61.000	90.000
99th	91.340	94.800	92.000	91.000	61.000	90.000
Maximum value	100.000	100.000	92.000	91.000	61.000	90.000

Cr

Cesium (INAA)

Number of values - 365

Determination limit - 0.5 ppm



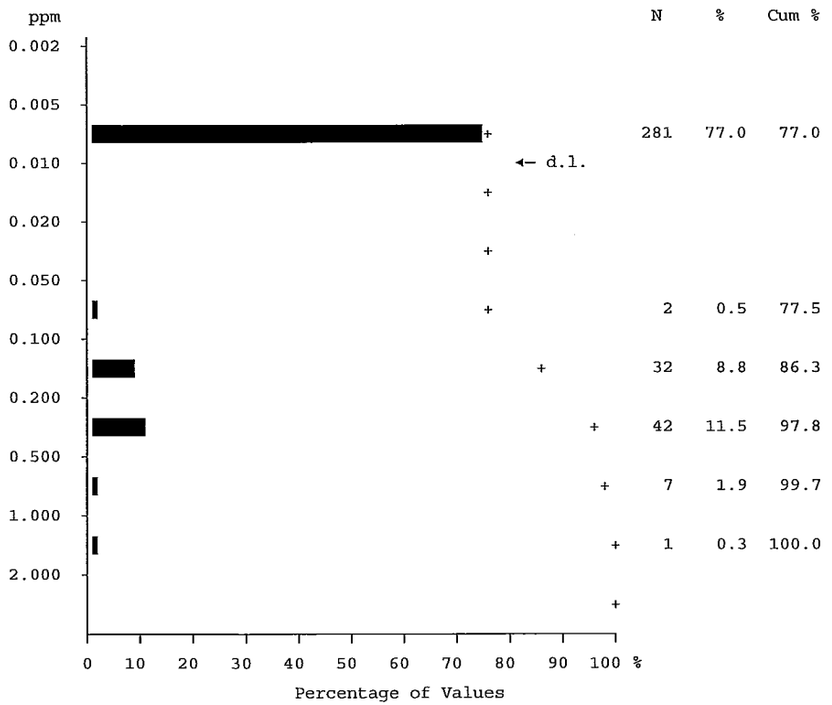
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	87	49	19	6	3	10
Number of missing values	0	0	0	0	0	0
Mean	1.390	1.069	0.993	2.318	1.122	1.918
Standard deviation	1.609	1.075	0.757	2.424	0.775	2.224
Skewness	3.302	3.235	1.558	2.152	1.578	1.980
Kurtosis	13.051	13.729	2.466	4.168	2.887	3.392
Geometric Mean	0.912	0.753	0.756	1.559	0.899	1.105
Percentiles						
Minimum value	0.250	0.250	0.250	0.250	0.250	0.250
25th	0.600	0.250	0.250	1.000	0.800	0.250
50th	1.000	0.900	0.800	1.400	1.000	1.200
75th	1.500	1.375	1.200	2.650	1.375	2.125
80th	1.700	1.400	1.460	2.940	1.460	2.200
90th	2.700	1.900	1.980	5.720	2.310	5.410
95th	4.750	2.650	2.820	9.240	3.500	7.615
98th	7.500	5.510	3.500	11.000	3.500	9.800
99th	9.602	6.565	3.500	11.000	3.500	9.800
Maximum value	11.000	7.800	3.500	11.000	3.500	9.800

Cs

Europium (INAA)

Number of values - 365

Determination limit - 0.01 ppm



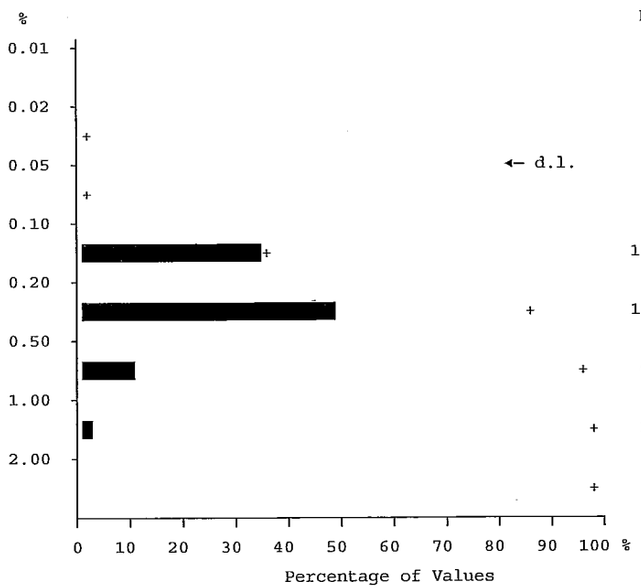
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	281	108	63	60	13	37
Number of missing values	0	0	0	0	0	0
Mean	0.068	0.107	0.046	0.042	0.031	0.008
Standard deviation	0.142	0.181	0.108	0.088	0.062	0.020
Skewness	3.032	2.292	3.086	2.268	2.055	5.686
Kurtosis	11.285	5.935	10.697	4.047	2.985	31.156
Geometric Mean	0.012	0.019	0.009	0.009	0.009	0.005
Percentiles						
Minimum value	0.005	0.005	0.005	0.005	0.005	0.005
25th	0.005	0.005	0.005	0.005	0.005	0.005
50th	0.005	0.005	0.005	0.005	0.005	0.005
75th	0.005	0.170	0.005	0.005	0.005	0.005
80th	0.140	0.210	0.005	0.005	0.044	0.005
90th	0.234	0.355	0.190	0.197	0.164	0.005
95th	0.357	0.473	0.312	0.284	0.220	0.011
98th	0.588	0.741	0.484	0.351	0.220	0.130
99th	0.694	0.903	0.630	0.360	0.220	0.130
Maximum value	1.020	1.020	0.630	0.360	0.220	0.130

Eu

Iron (INAA)

Number of values - 365

Determination limit - 0.05 %



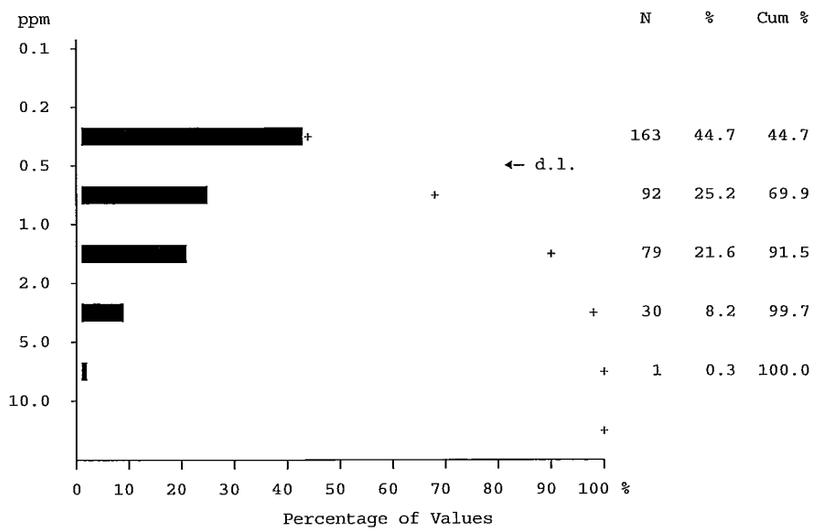
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	1	0	0	0	1	0
Number of missing values	0	0	0	0	0	0
Mean	0.306	0.377	0.314	0.248	0.150	0.165
Standard deviation	0.221	0.268	0.186	0.118	0.072	0.071
Skewness	2.265	1.800	1.813	1.613	0.338	1.265
Kurtosis	6.200	3.161	4.260	3.004	-0.741	1.849
Geometric Mean	0.254	0.310	0.272	0.226	0.131	0.153
Percentiles						
Minimum value	0.025	0.080	0.090	0.100	0.025	0.080
25th	0.160	0.200	0.180	0.160	0.093	0.110
50th	0.240	0.280	0.270	0.220	0.150	0.155
75th	0.360	0.485	0.400	0.280	0.183	0.198
80th	0.410	0.540	0.418	0.324	0.226	0.222
90th	0.570	0.705	0.568	0.417	0.269	0.263
95th	0.741	1.000	0.720	0.507	0.290	0.305
98th	1.081	1.238	1.011	0.669	0.290	0.410
99th	1.224	1.414	1.110	0.710	0.290	0.410
Maximum value	1.440	1.440	1.110	0.710	0.290	0.410

Fe

Hafnium (INAA)

Number of values - 365

Determination limit - 0.5 ppm



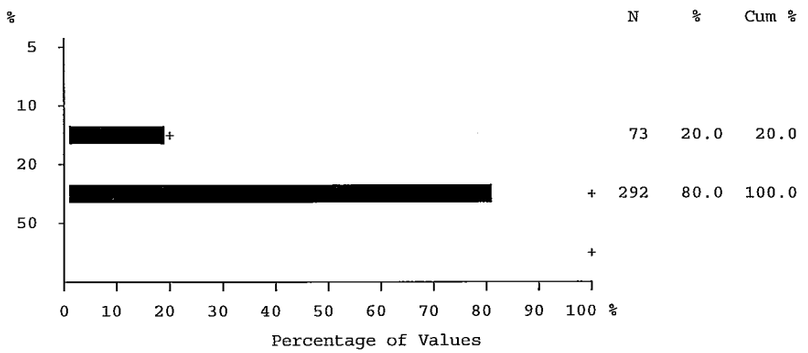
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	163	57	37	40	8	21
Number of missing values	0	0	0	0	0	0
Mean	0.845	1.078	0.874	0.557	0.575	0.436
Standard deviation	0.813	0.938	0.870	0.453	0.386	0.240
Skewness	2.078	1.533	2.078	1.644	0.633	0.974
Kurtosis	5.538	2.844	5.252	2.096	-1.066	-0.145
Geometric Mean	0.580	0.741	0.582	0.433	0.464	0.382
Percentiles						
Minimum value	0.250	0.250	0.250	0.250	0.250	0.250
25th	0.250	0.250	0.250	0.250	0.250	0.250
50th	0.600	0.850	0.700	0.250	0.375	0.250
75th	1.100	1.500	1.300	0.700	0.900	0.600
80th	1.400	1.800	1.400	0.800	0.960	0.620
90th	1.900	2.300	1.700	1.380	1.190	0.810
95th	2.500	3.075	3.320	1.670	1.400	0.910
98th	3.368	3.750	4.128	2.008	1.400	1.100
99th	4.138	4.845	4.700	2.100	1.400	1.100
Maximum value	5.300	5.300	4.700	2.100	1.400	1.100

Hf

Potassium (INAA)

Number of values - 365

Determination limit - 0.05 %

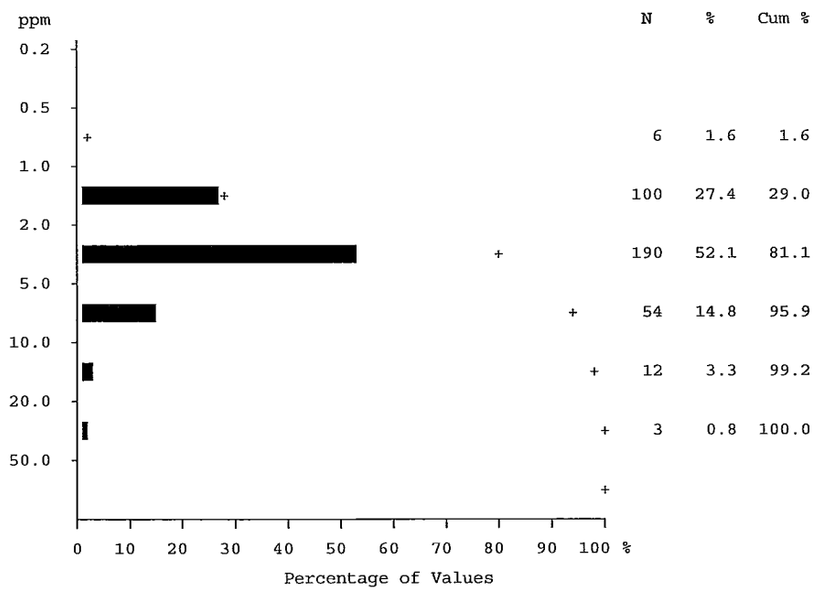


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	23.451	23.232	23.693	24.319	22.162	22.813
Standard deviation	4.180	4.398	3.917	3.709	3.200	4.745
Skewness	0.167	0.314	-0.131	0.481	0.254	-0.087
Kurtosis	-0.262	-0.309	-0.695	0.024	0.416	-0.868
Geometric Mean	23.073	22.819	23.360	24.046	21.945	22.307
Percentiles						
Minimum value	13.400	13.400	14.600	15.300	15.500	13.600
25th	20.500	20.100	20.400	21.650	19.675	19.175
50th	23.400	22.850	23.900	23.850	22.550	23.550
75th	26.150	25.775	26.700	26.400	23.850	25.950
80th	27.000	27.100	27.380	27.400	24.620	27.160
90th	29.000	29.150	28.780	29.440	26.580	29.150
95th	30.670	31.325	30.400	31.285	29.800	30.580
98th	32.400	32.910	31.240	33.880	29.800	32.100
99th	33.374	34.345	31.500	34.800	29.800	32.100
Maximum value	34.800	34.800	31.500	34.800	29.800	32.100

Lanthanum (INAA)

Number of values - 365

Determination limit - 0.1 ppm

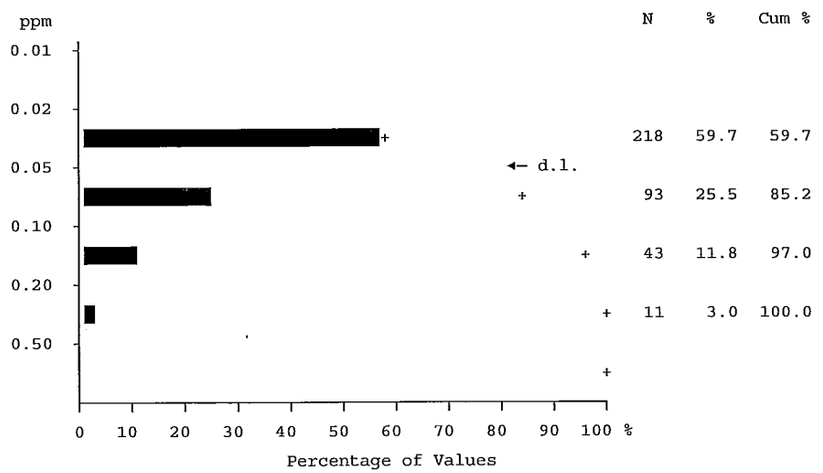


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	3.595	4.548	3.575	2.778	1.825	1.816
Standard deviation	3.112	3.877	2.655	1.408	0.748	0.983
Skewness	3.209	2.473	3.618	1.427	1.013	2.459
Kurtosis	13.947	7.675	18.187	1.875	0.210	7.586
Geometric Mean	2.862	3.546	3.025	2.495	1.701	1.643
Percentiles						
Minimum value	0.800	0.900	0.900	1.000	0.900	0.800
25th	1.800	2.200	2.100	1.700	1.225	1.200
50th	2.600	3.050	2.900	2.350	1.700	1.550
75th	4.200	5.450	4.400	3.300	2.075	2.075
80th	4.700	6.300	4.600	3.780	2.400	2.400
90th	6.700	9.250	5.880	4.710	3.210	2.620
95th	9.270	13.000	7.160	6.400	3.700	4.295
98th	14.000	17.000	15.840	7.286	3.700	6.100
99th	18.020	23.700	20.000	7.700	3.700	6.100
Maximum value	25.000	25.000	20.000	7.700	3.700	6.100

Lutetium (INAA)

Number of values - 365

Determination limit - 0.05 ppm



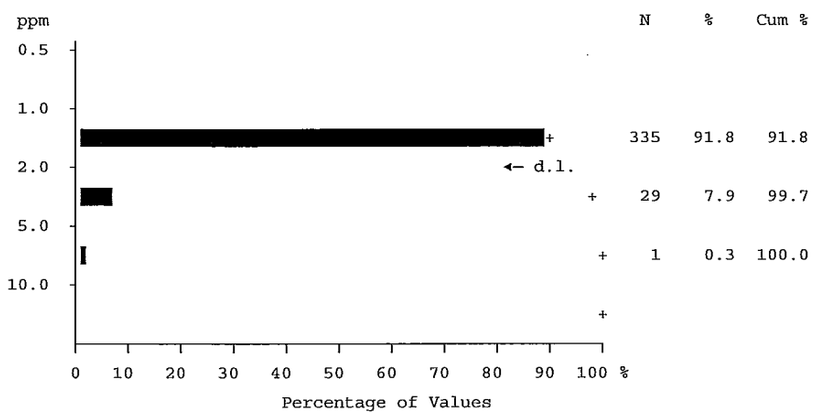
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	218	83	36	52	14	33
Number of missing values	0	0	0	0	0	0
Mean	0.055	0.070	0.055	0.040	0.030	0.030
Standard deviation	0.054	0.068	0.047	0.028	0.015	0.014
Skewness	2.993	2.250	3.207	1.918	2.572	2.755
Kurtosis	11.777	6.142	14.601	2.895	5.546	6.965
Geometric Mean	0.041	0.050	0.044	0.034	0.028	0.028
Percentiles						
Minimum value	0.025	0.025	0.025	0.025	0.025	0.025
25th	0.025	0.025	0.025	0.025	0.025	0.025
50th	0.025	0.025	0.050	0.025	0.025	0.025
75th	0.070	0.090	0.070	0.050	0.025	0.025
80th	0.080	0.110	0.080	0.060	0.025	0.025
90th	0.120	0.140	0.104	0.077	0.059	0.051
95th	0.140	0.218	0.124	0.113	0.080	0.071
98th	0.237	0.300	0.262	0.131	0.080	0.090
99th	0.310	0.377	0.330	0.140	0.080	0.090
Maximum value	0.410	0.410	0.330	0.140	0.080	0.090

Lu

Molybdenum (INAA)

Number of values - 365

Determination limit - 2 ppm

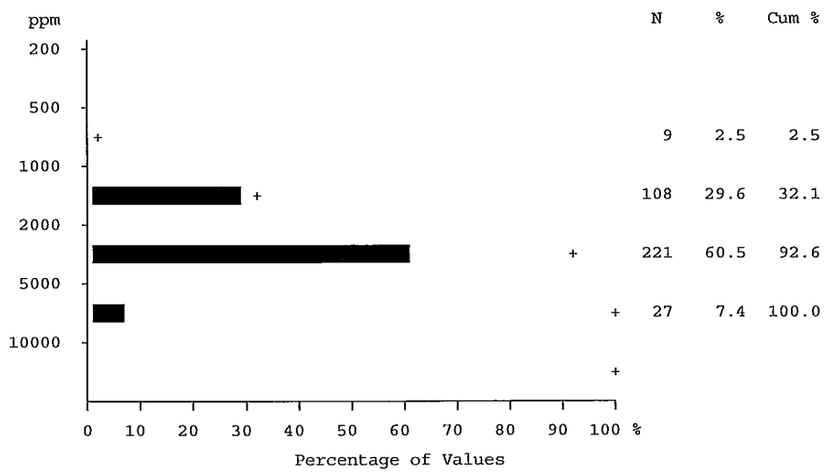


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	335	152	72	61	15	35
Number of missing values	0	0	0	0	0	0
Mean	1.159	1.165	1.080	1.236	1.125	1.158
Standard deviation	0.599	0.658	0.427	0.639	0.500	0.594
Skewness	4.353	4.570	5.586	2.956	3.281	3.726
Kurtosis	20.907	22.998	31.754	8.553	9.363	13.343
Geometric Mean	1.088	1.086	1.043	1.146	1.071	1.087
Percentiles						
Minimum value	1.000	1.000	1.000	1.000	1.000	1.000
25th	1.000	1.000	1.000	1.000	1.000	1.000
50th	1.000	1.000	1.000	1.000	1.000	1.000
75th	1.000	1.000	1.000	1.000	1.000	1.000
80th	1.000	1.000	1.000	1.000	1.000	1.000
90th	1.000	1.000	1.000	2.000	1.600	1.100
95th	2.700	3.000	1.200	3.000	3.000	3.050
98th	4.000	4.000	3.480	4.000	3.000	4.000
99th	4.000	4.700	4.000	4.000	3.000	4.000
Maximum value	6.000	6.000	4.000	4.000	3.000	4.000

Sodium (INAA)

Number of values - 365

Determination limit - 10 ppm



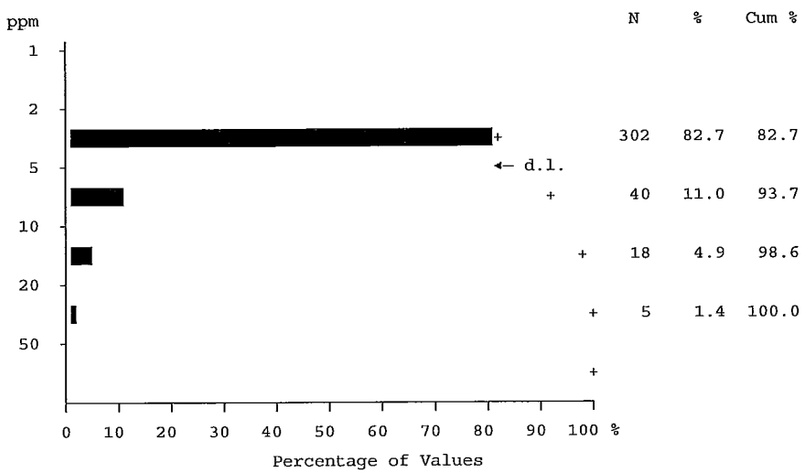
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	2749.345	3021.122	2671.467	2601.111	2484.250	2122.605
Standard deviation	1378.623	1578.195	1141.484	1286.657	966.327	864.726
Skewness	1.651	1.561	1.343	1.460	0.281	0.346
Kurtosis	3.616	2.676	2.607	1.993	-0.820	-0.514
Geometric Mean	2470.009	2693.228	2461.404	2351.011	2296.725	1938.459
Percentiles						
Minimum value	651.000	945.000	940.000	1020.000	928.000	651.000
25th	1795.000	1925.000	1940.000	1742.500	1685.000	1407.500
50th	2460.000	2645.000	2520.000	2210.000	2380.000	2125.000
75th	3245.000	3600.000	3200.000	3140.000	3157.500	2580.000
80th	3566.000	3880.000	3404.000	3352.000	3456.000	2824.000
90th	4444.000	5160.000	4182.000	4596.000	3937.000	3498.000
95th	5634.000	6010.000	4682.000	5408.000	4490.000	3763.500
98th	7158.400	8243.000	6671.600	6868.800	4490.000	4210.000
99th	8066.600	8770.500	7020.000	7200.000	4490.000	4210.000
Maximum value	9050.000	9050.000	7020.000	7200.000	4490.000	4210.000

Na

Neodymium (INAA)

Number of values - 365

Determination limit - 5 ppm



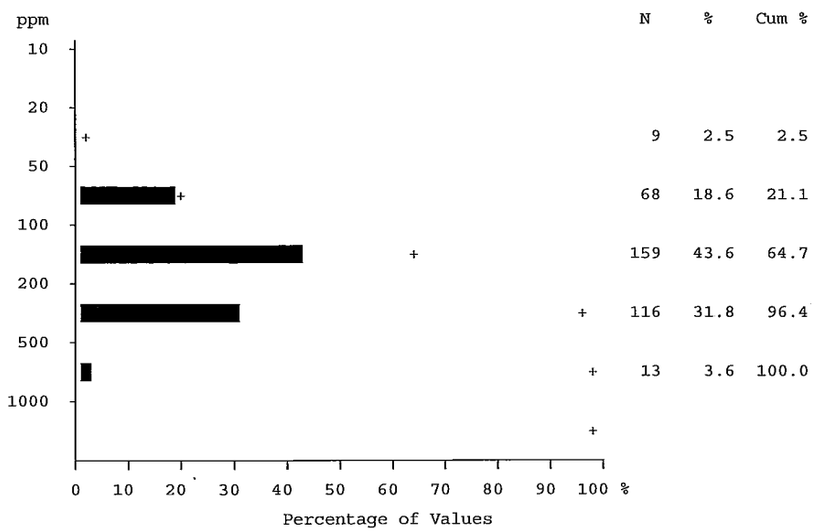
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	302	121	64	63	16	38
Number of missing values	0	0	0	0	0	0
Mean	3.792	4.637	3.653	2.979	2.500	2.500
Standard deviation	3.539	4.498	3.431	1.372	0.000	0.000
Skewness	3.714	2.676	3.961	2.840	-	-
Kurtosis	16.447	8.066	18.764	7.281	-	-
Geometric Mean	3.121	3.564	3.040	2.800	2.500	2.500
Percentiles						
Minimum value	2.500	2.500	2.500	2.500	2.500	2.500
25th	2.500	2.500	2.500	2.500	2.500	2.500
50th	2.500	2.500	2.500	2.500	2.500	2.500
75th	2.500	5.750	2.500	2.500	2.500	2.500
80th	2.500	7.000	2.500	2.500	2.500	2.500
90th	8.000	10.500	7.000	5.000	2.500	2.500
95th	11.000	13.750	11.200	7.000	2.500	2.500
98th	15.680	21.000	18.760	8.540	2.500	2.500
99th	22.360	26.700	25.000	9.000	2.500	2.500
Maximum value	28.000	28.000	25.000	9.000	2.500	2.500

Nd

Rubidium (INAA)

Number of values - 365

Determination limit - 5 ppm



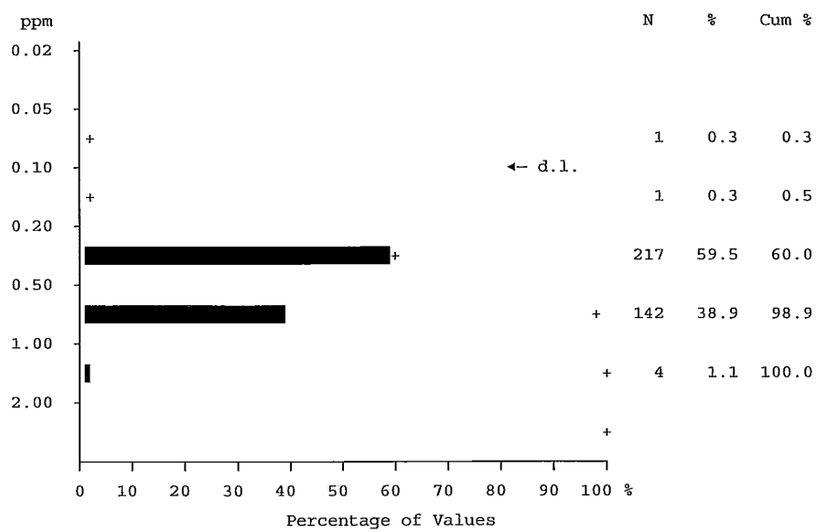
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	185.756	152.695	159.427	256.528	147.750	262.316
Standard deviation	121.493	99.726	89.883	120.622	68.997	180.968
Skewness	2.332	3.747	1.087	1.539	0.551	1.531
Kurtosis	8.429	23.684	0.933	2.693	-0.294	2.026
Geometric Mean	156.659	131.917	136.772	233.961	132.090	216.104
Percentiles						
Minimum value	32.000	32.000	39.000	110.000	44.000	69.000
25th	110.000	89.750	93.000	180.000	85.250	150.000
50th	160.000	140.000	150.000	230.000	140.000	190.000
75th	230.000	190.000	200.000	307.500	187.500	337.500
80th	240.000	200.000	228.000	318.000	208.000	380.000
90th	320.000	235.000	298.000	397.000	254.000	535.000
95th	397.000	310.000	352.000	540.500	310.000	718.000
98th	550.400	475.000	428.800	673.200	310.000	870.000
99th	710.000	673.500	460.000	710.000	310.000	870.000
Maximum value	940.000	940.000	460.000	710.000	310.000	870.000

Rb

Antimony (INAA)

Number of values - 365

Determination limit - 0.1 ppm



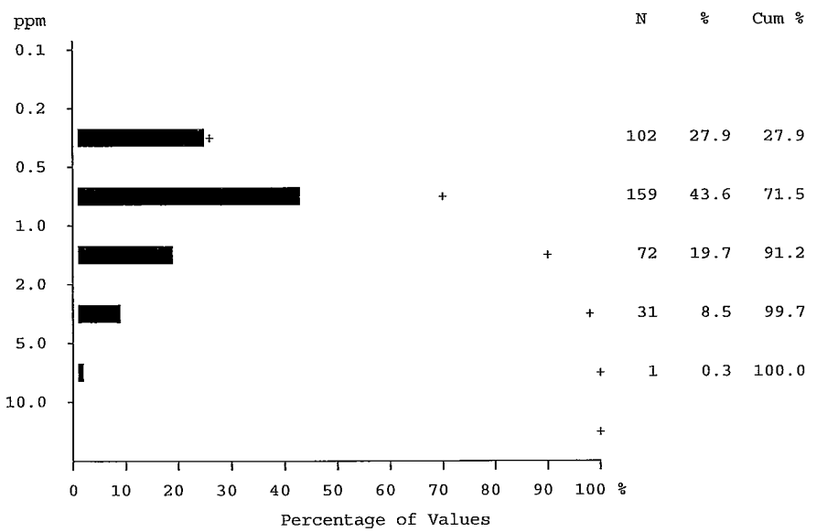
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	1	1	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	0.429	0.431	0.447	0.465	0.331	0.363
Standard deviation	0.169	0.134	0.239	0.166	0.120	0.128
Skewness	2.659	1.095	3.621	0.733	0.747	0.314
Kurtosis	17.784	5.746	17.743	1.517	-0.529	-0.968
Geometric Mean	0.402	0.409	0.409	0.436	0.313	0.341
Percentiles						
Minimum value	0.050	0.050	0.200	0.200	0.200	0.200
25th	0.300	0.300	0.300	0.400	0.225	0.275
50th	0.400	0.400	0.400	0.500	0.300	0.400
75th	0.500	0.500	0.500	0.600	0.400	0.425
80th	0.500	0.500	0.500	0.600	0.460	0.500
90th	0.600	0.600	0.600	0.700	0.530	0.600
95th	0.670	0.600	0.800	0.735	0.600	0.600
98th	0.800	0.700	1.588	0.962	0.600	0.600
99th	1.134	0.940	1.900	1.100	0.600	0.600
Maximum value	1.900	1.200	1.900	1.100	0.600	0.600

Sb

Scandium (INAA)

Number of values - 365

Determination limit - 0.1 ppm

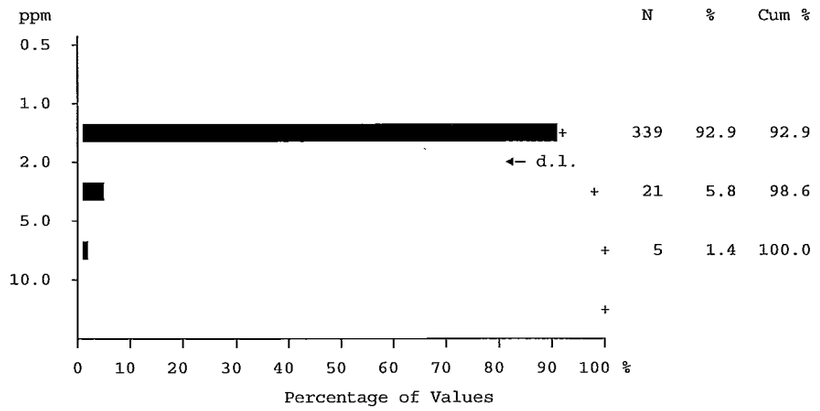


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	0.901	1.143	0.929	0.685	0.394	0.421
Standard deviation	0.780	0.953	0.679	0.393	0.208	0.226
Skewness	2.517	1.959	2.346	1.690	0.869	1.313
Kurtosis	7.707	3.953	7.409	2.843	-0.643	1.723
Geometric Mean	0.696	0.879	0.763	0.602	0.349	0.373
Percentiles						
Minimum value	0.200	0.200	0.200	0.300	0.200	0.200
25th	0.400	0.500	0.500	0.400	0.200	0.275
50th	0.700	0.800	0.800	0.600	0.350	0.350
75th	1.050	1.400	1.100	0.800	0.475	0.600
80th	1.200	1.700	1.280	0.840	0.620	0.600
90th	1.900	2.400	1.780	1.200	0.800	0.800
95th	2.570	3.400	2.320	1.635	0.800	0.820
98th	3.668	4.280	3.572	2.054	0.800	1.200
99th	4.334	4.975	4.300	2.100	0.800	1.200
Maximum value	5.300	5.300	4.300	2.100	0.800	1.200

Selenium (INAA)

Number of values - 365

Determination limit - 2 ppm



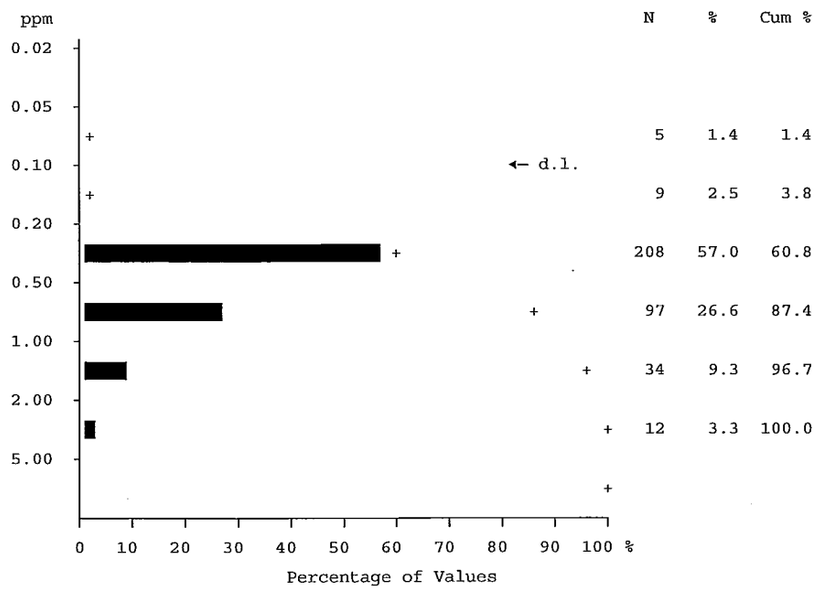
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	339	154	69	65	16	35
Number of missing values	0	0	0	0	0	0
Mean	1.184	1.159	1.227	1.236	1.000	1.184
Standard deviation	0.754	0.717	0.909	0.778	0.000	0.692
Skewness	4.833	5.409	4.661	3.290	-	3.574
Kurtosis	26.010	32.913	23.244	10.148	-	11.496
Geometric Mean	1.090	1.077	1.106	1.123	1.000	1.095
Percentiles						
Minimum value	1.000	1.000	1.000	1.000	1.000	1.000
25th	1.000	1.000	1.000	1.000	1.000	1.000
50th	1.000	1.000	1.000	1.000	1.000	1.000
75th	1.000	1.000	1.000	1.000	1.000	1.000
80th	1.000	1.000	1.000	1.000	1.000	1.000
90th	1.000	1.000	1.000	1.700	1.000	1.100
95th	3.000	2.750	3.000	3.350	1.000	4.000
98th	4.000	4.000	5.960	4.540	1.000	4.000
99th	5.000	5.700	7.000	5.000	1.000	4.000
Maximum value	7.000	7.000	7.000	5.000	1.000	4.000

Se

Samarium (INAA)

Number of values - 365

Determination limit - 0.1 ppm



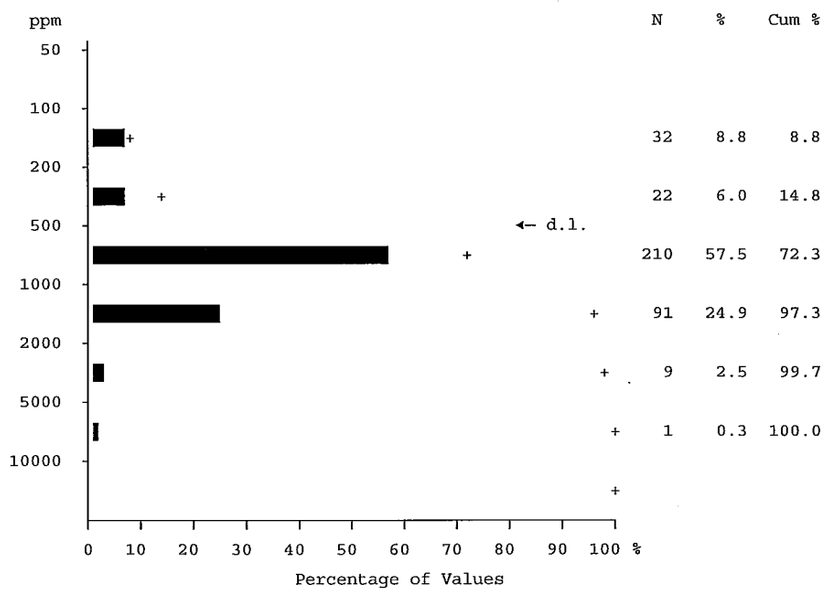
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	5	1	0	0	1	3
Number of missing values	0	0	0	0	0	0
Mean	0.541	0.702	0.536	0.401	0.253	0.241
Standard deviation	0.538	0.687	0.430	0.215	0.141	0.149
Skewness	3.442	2.647	3.379	1.336	0.914	2.204
Kurtosis	16.045	8.805	15.867	1.385	0.351	7.645
Geometric Mean	0.403	0.509	0.437	0.356	0.217	0.203
Percentiles						
Minimum value	0.050	0.050	0.100	0.200	0.050	0.050
25th	0.200	0.300	0.300	0.200	0.200	0.200
50th	0.400	0.400	0.400	0.300	0.200	0.200
75th	0.600	0.800	0.700	0.500	0.300	0.300
80th	0.700	1.000	0.700	0.500	0.300	0.300
90th	1.040	1.450	0.940	0.740	0.530	0.400
95th	1.470	2.075	1.120	0.935	0.600	0.520
98th	2.540	3.110	2.528	1.054	0.600	0.900
99th	3.134	4.015	3.100	1.100	0.600	0.900
Maximum value	4.600	4.600	3.100	1.100	0.600	0.900

Sm

Strontium (INAA)

Number of values - 365

Determination limit - 300 ppm



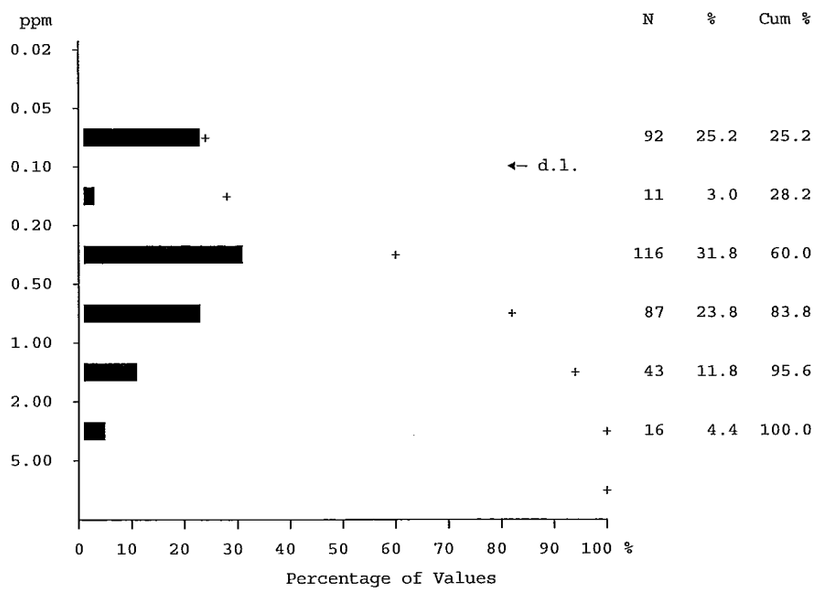
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	32	17	3	9	2	1
Number of missing values	0	0	0	0	0	0
Mean	842.603	876.402	931.600	752.083	771.250	722.632
Standard deviation	498.119	589.200	533.287	320.378	309.233	230.343
Skewness	3.678	4.225	1.485	-0.336	-0.521	0.111
Kurtosis	28.964	30.210	2.234	-0.483	-0.220	0.035
Geometric Mean	719.962	729.951	802.493	651.305	676.214	679.814
Percentiles						
Minimum value	150.000	150.000	150.000	150.000	150.000	150.000
25th	600.000	622.500	590.000	560.000	675.000	600.000
50th	780.000	815.000	780.000	790.000	750.000	680.000
75th	1000.000	1000.000	1200.000	967.500	1000.000	845.000
80th	1100.000	1100.000	1200.000	1040.000	1060.000	928.000
90th	1300.000	1300.000	1720.000	1100.000	1160.000	1100.000
95th	1470.000	1600.000	2220.000	1300.000	1300.000	1200.000
98th	2136.000	2490.000	2696.000	1354.000	1300.000	1200.000
99th	2734.000	4305.000	2800.000	1400.000	1300.000	1200.000
Maximum value	5800.000	5800.000	2800.000	1400.000	1300.000	1200.000

Sr

Thorium (INAA)

Number of values - 365

Determination limit - 0.1 ppm



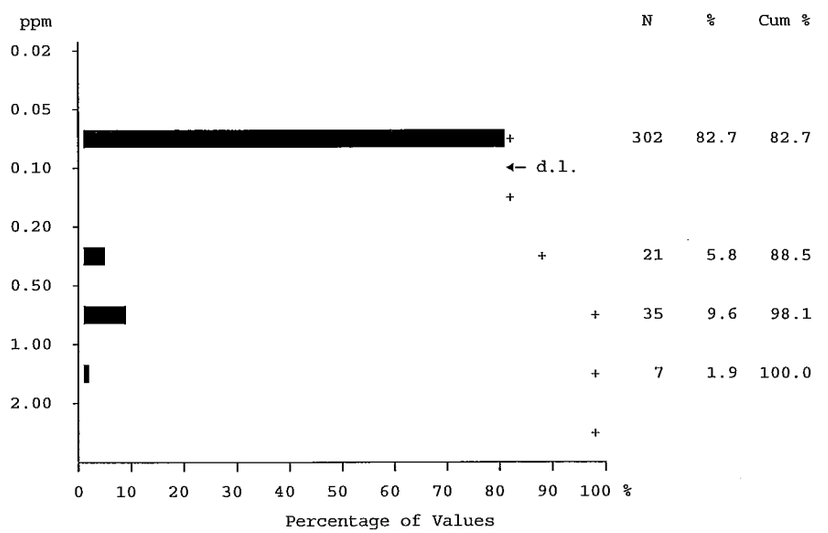
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	92	29	15	23	8	17
Number of missing values	0	0	0	0	0	0
Mean	0.551	0.745	0.567	0.360	0.175	0.199
Standard deviation	0.662	0.792	0.643	0.356	0.139	0.201
Skewness	2.717	1.985	3.410	1.506	0.349	1.805
Kurtosis	9.981	4.822	16.041	2.038	-1.653	4.217
Geometric Mean	0.288	0.407	0.334	0.212	0.121	0.127
Percentiles						
Minimum value	0.050	0.050	0.050	0.050	0.050	0.050
25th	0.050	0.200	0.200	0.050	0.050	0.050
50th	0.300	0.500	0.400	0.300	0.125	0.100
75th	0.700	1.000	0.700	0.500	0.300	0.300
80th	0.800	1.200	0.880	0.600	0.300	0.400
90th	1.240	1.750	1.100	0.900	0.400	0.410
95th	1.770	2.450	1.460	1.205	0.400	0.525
98th	2.868	3.100	3.568	1.508	0.400	1.000
99th	3.338	4.115	4.400	1.600	0.400	1.000
Maximum value	4.700	4.700	4.400	1.600	0.400	1.000

Th

Uranium (INAA)

Number of values - 365

Determination limit - 0.1 ppm



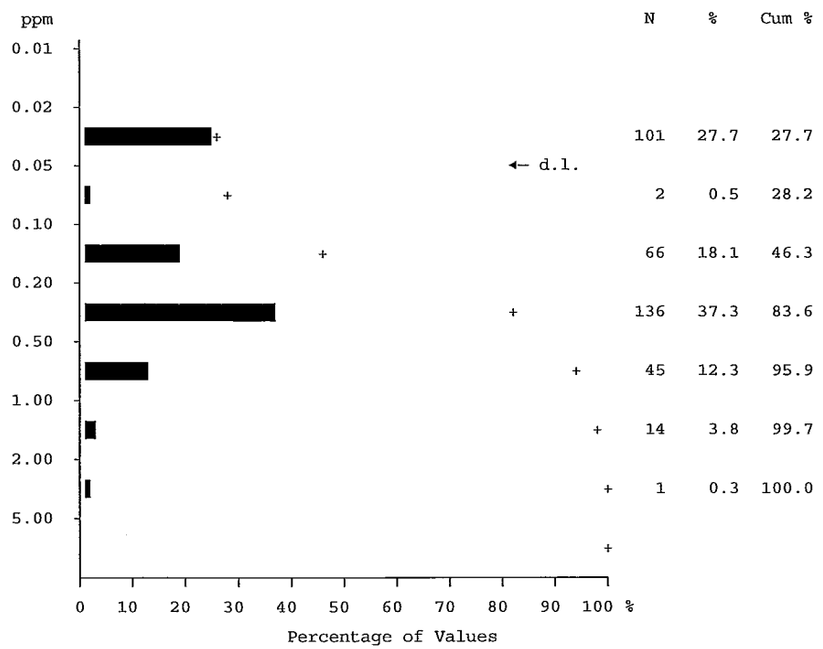
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	302	132	57	62	14	37
Number of missing values	0	0	0	0	0	0
Mean	0.145	0.170	0.175	0.110	0.113	0.059
Standard deviation	0.234	0.276	0.249	0.159	0.179	0.057
Skewness	2.785	2.577	1.834	2.509	2.417	5.686
Kurtosis	8.490	6.960	2.258	5.138	4.622	31.156
Geometric Mean	0.076	0.081	0.088	0.068	0.067	0.053
Percentiles						
Minimum value	0.050	0.050	0.050	0.050	0.050	0.050
25th	0.050	0.050	0.050	0.050	0.050	0.050
50th	0.050	0.050	0.050	0.050	0.050	0.050
75th	0.050	0.050	0.050	0.050	0.050	0.050
80th	0.050	0.050	0.400	0.050	0.050	0.050
90th	0.500	0.600	0.600	0.400	0.490	0.050
95th	0.700	0.800	0.800	0.535	0.700	0.067
98th	0.936	1.070	1.000	0.700	0.700	0.400
99th	1.034	1.470	1.000	0.700	0.700	0.400
Maximum value	1.600	1.600	1.000	0.700	0.700	0.400

U

Ytterbium (INAA)

Number of values - 365

Determination limit - 0.05 ppm



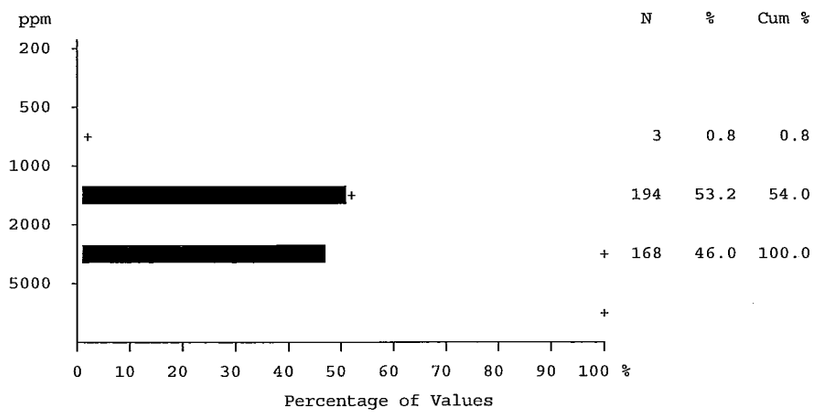
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	101	41	16	21	6	17
Number of missing values	0	0	0	0	0	0
Mean	0.285	0.371	0.297	0.201	0.134	0.117
Standard deviation	0.315	0.388	0.285	0.162	0.108	0.103
Skewness	2.561	1.963	2.632	0.817	0.484	0.906
Kurtosis	9.230	4.928	10.234	0.109	-1.030	-0.055
Geometric Mean	0.153	0.193	0.182	0.125	0.088	0.074
Percentiles						
Minimum value	0.025	0.025	0.025	0.025	0.025	0.025
25th	0.025	0.044	0.130	0.025	0.025	0.025
50th	0.220	0.250	0.260	0.185	0.125	0.125
75th	0.365	0.535	0.360	0.270	0.215	0.163
80th	0.428	0.580	0.418	0.320	0.244	0.192
90th	0.620	0.815	0.620	0.430	0.304	0.295
95th	0.825	1.220	0.690	0.567	0.360	0.351
98th	1.324	1.665	1.566	0.635	0.360	0.380
99th	1.741	2.046	1.800	0.640	0.360	0.380
Maximum value	2.280	2.280	1.800	0.640	0.360	0.380

Yb

Zinc (INAA)

Number of values - 365

Determination limit - 20 ppm



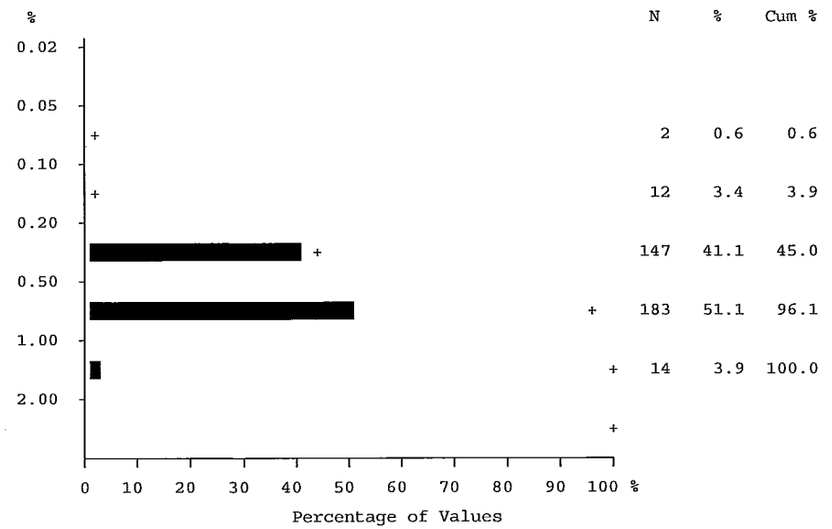
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	0	0	0	0	0	0
Mean	1963.370	1893.841	1803.733	2204.167	2000.000	2106.842
Standard deviation	498.355	411.580	449.344	535.352	314.113	704.001
Skewness	0.780	0.541	0.795	0.461	-0.266	0.609
Kurtosis	1.181	0.969	1.150	-0.488	-1.287	0.272
Geometric Mean	1902.881	1849.787	1751.073	2141.516	1975.768	1993.540
Percentiles						
Minimum value	960.000	990.000	980.000	1300.000	1500.000	960.000
25th	1600.000	1600.000	1500.000	1800.000	1700.000	1600.000
50th	1900.000	1800.000	1800.000	2100.000	2100.000	2000.000
75th	2200.000	2100.000	2100.000	2600.000	2200.000	2700.000
80th	2300.000	2200.000	2180.000	2740.000	2260.000	2800.000
90th	2640.000	2400.000	2300.000	3000.000	2430.000	3010.000
95th	2970.000	2650.000	2540.000	3135.000	2500.000	3250.000
98th	3200.000	2970.000	3248.000	3470.000	2500.000	4200.000
99th	3368.000	3175.000	3300.000	3700.000	2500.000	4200.000
Maximum value	4200.000	3500.000	3300.000	3700.000	2500.000	4200.000

Zn

Aluminum (ICP-ES)

Number of values - 365

Determination limit - 0.01 %



	N	%	Cum %
	2	0.6	0.6
	12	3.4	3.9
	147	41.1	45.0
	183	51.1	96.1
	14	3.9	100.0

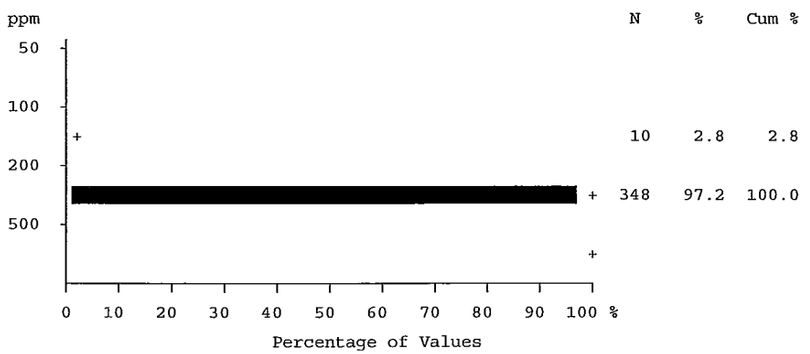
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	0.544	0.613	0.539	0.472	0.497	0.413
Standard deviation	0.221	0.232	0.216	0.169	0.195	0.169
Skewness	0.659	0.599	0.393	0.648	0.138	0.309
Kurtosis	0.649	0.637	-0.344	0.274	-0.907	-0.519
Geometric Mean	0.497	0.566	0.493	0.441	0.456	0.376
Percentiles						
Minimum value	0.070	0.070	0.110	0.090	0.150	0.150
25th	0.380	0.463	0.370	0.350	0.368	0.303
50th	0.530	0.590	0.540	0.430	0.475	0.420
75th	0.670	0.738	0.650	0.570	0.623	0.510
80th	0.720	0.786	0.730	0.590	0.696	0.564
90th	0.830	0.919	0.830	0.720	0.823	0.662
95th	0.961	1.059	0.956	0.834	0.830	0.735
98th	1.098	1.200	1.058	0.925	0.830	0.820
99th	1.167	1.338	1.100	0.960	0.830	0.820
Maximum value	1.430	1.430	1.100	0.960	0.830	0.820

Al

Boron (ICP-ES)

Number of values - 365

Determination limit - 2 ppm

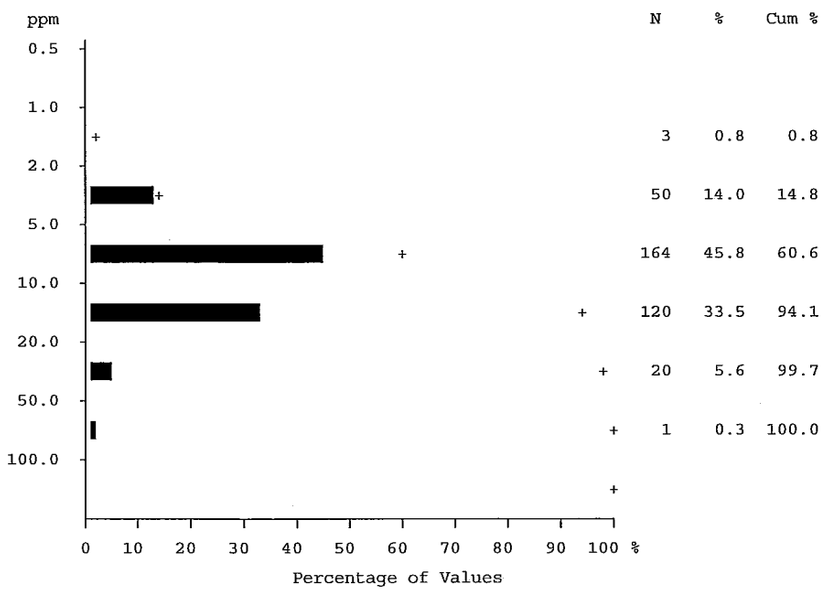


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	269.620	259.438	284.480	290.958	235.313	257.083
Standard deviation	45.272	37.063	47.677	47.275	36.738	47.332
Skewness	0.729	0.404	0.807	0.655	1.313	0.670
Kurtosis	0.875	0.512	0.497	-0.121	1.882	1.421
Geometric Mean	265.986	256.835	280.763	287.339	232.897	252.938
Percentiles						
Minimum value	142.000	173.000	202.000	201.000	185.000	142.000
25th	240.000	230.500	250.000	252.000	213.750	230.000
50th	262.500	257.000	275.000	283.000	229.000	248.500
75th	294.000	282.750	315.000	320.000	249.000	276.500
80th	304.200	286.000	324.800	330.600	255.000	302.600
90th	330.100	306.800	352.000	361.600	293.700	320.300
95th	358.100	320.850	381.600	392.400	342.000	343.950
98th	389.000	347.120	415.880	407.640	342.000	406.000
99th	400.690	375.800	445.000	416.000	342.000	406.000
Maximum value	445.000	388.000	445.000	416.000	342.000	406.000

Cadmium (ICP-ES)

Number of values - 365

Determination limit - 0.2 ppm

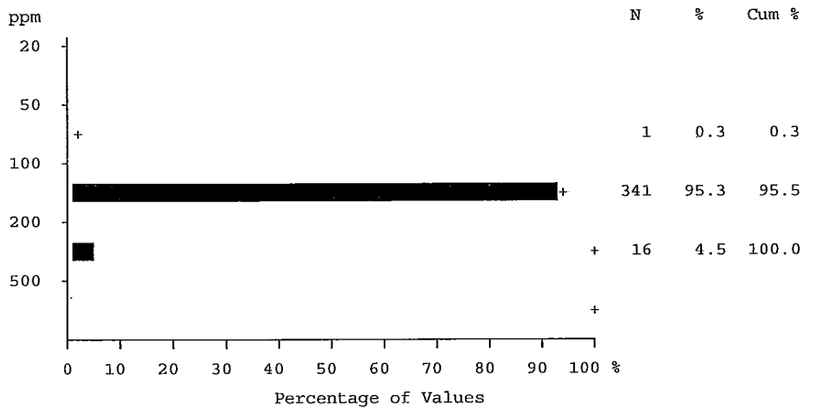


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	10.129	10.176	9.100	11.593	10.244	9.128
Standard deviation	6.384	5.758	6.936	7.784	4.312	5.158
Skewness	2.367	2.028	2.057	2.922	0.603	0.547
Kurtosis	9.193	6.995	3.700	11.587	-0.759	-0.196
Geometric Mean	8.638	8.880	7.449	9.938	9.438	7.586
Percentiles						
Minimum value	1.700	1.700	1.900	2.100	4.800	1.900
25th	6.000	6.225	5.200	7.100	6.600	4.300
50th	8.650	9.300	6.900	9.600	9.000	9.100
75th	13.025	13.200	9.500	15.000	13.500	12.375
80th	13.700	13.480	12.040	15.920	14.380	14.000
90th	17.020	16.280	17.820	18.380	17.210	15.670
95th	21.115	21.095	28.960	21.820	19.800	18.910
98th	30.386	24.526	32.312	48.100	19.800	23.500
99th	39.379	39.341	33.300	52.500	19.800	23.500
Maximum value	52.500	40.500	33.300	52.500	19.800	23.500

Copper (ICP-ES)

Number of values - 365

Determination limit - 1 ppm



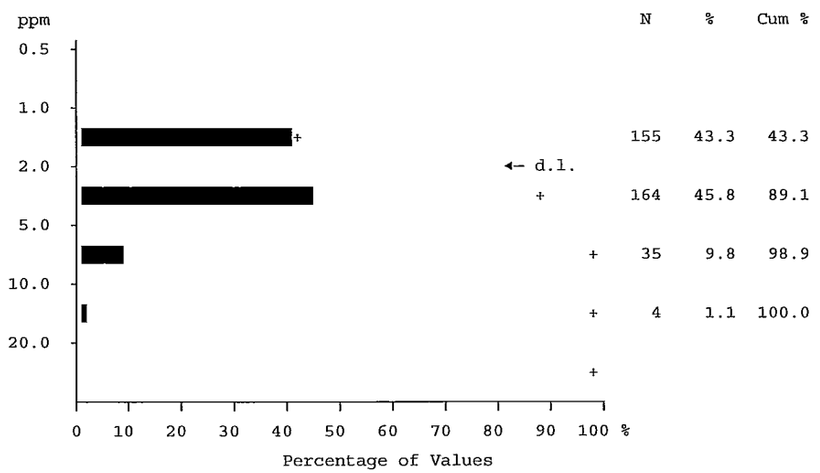
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	150.444	150.350	149.280	155.606	142.750	146.528
Standard deviation	25.789	25.596	28.026	26.006	21.653	22.218
Skewness	0.572	0.566	0.758	0.396	0.580	0.044
Kurtosis	0.308	0.868	0.013	-0.554	-1.092	-0.742
Geometric Mean	148.307	148.236	146.837	153.506	141.283	144.863
Percentiles						
Minimum value	99.000	99.000	103.000	110.000	120.000	106.000
25th	131.000	132.000	131.000	136.000	122.500	131.000
50th	148.000	148.500	141.000	154.000	138.500	151.500
75th	167.000	166.000	169.000	172.000	152.750	159.750
80th	172.200	171.000	176.800	179.400	166.200	164.200
90th	185.000	184.900	190.400	193.200	179.800	177.500
95th	197.100	190.000	209.400	203.200	184.000	189.000
98th	210.640	219.380	220.640	217.960	184.000	189.000
99th	227.050	237.900	230.000	225.000	184.000	189.000
Maximum value	244.000	244.000	230.000	225.000	184.000	189.000

Cu

Lithium (ICP-ES)

Number of values - 365

Determination limit - 2 ppm

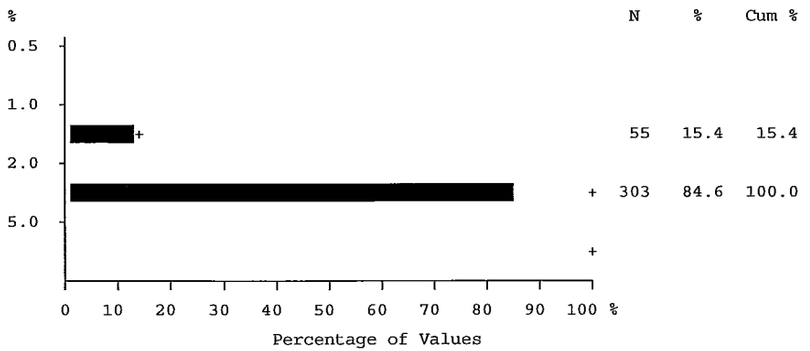


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	155	50	35	39	7	24
Number of missing values	7	4	0	1	0	2
Mean	2.377	2.863	2.373	1.873	1.938	1.417
Standard deviation	1.958	2.388	1.769	1.218	1.063	0.692
Skewness	2.380	2.058	1.500	1.408	0.739	1.800
Kurtosis	7.597	4.924	2.252	1.341	-0.836	3.392
Geometric Mean	1.873	2.209	1.881	1.582	1.694	1.299
Percentiles						
Minimum value	1.000	1.000	1.000	1.000	1.000	1.000
25th	1.000	1.000	1.000	1.000	1.000	1.000
50th	2.000	2.000	2.000	1.000	2.000	1.000
75th	3.000	4.000	3.000	3.000	2.750	2.000
80th	3.000	4.000	4.000	3.000	3.000	2.000
90th	5.000	6.000	5.000	3.800	4.000	2.000
95th	7.000	8.950	5.400	5.000	4.000	3.150
98th	9.000	10.000	8.480	5.560	4.000	4.000
99th	10.000	12.560	9.000	6.000	4.000	4.000
Maximum value	15.000	15.000	9.000	6.000	4.000	4.000

Magnesium (ICP-ES)

Number of values - 365

Determination limit - 0.01 %



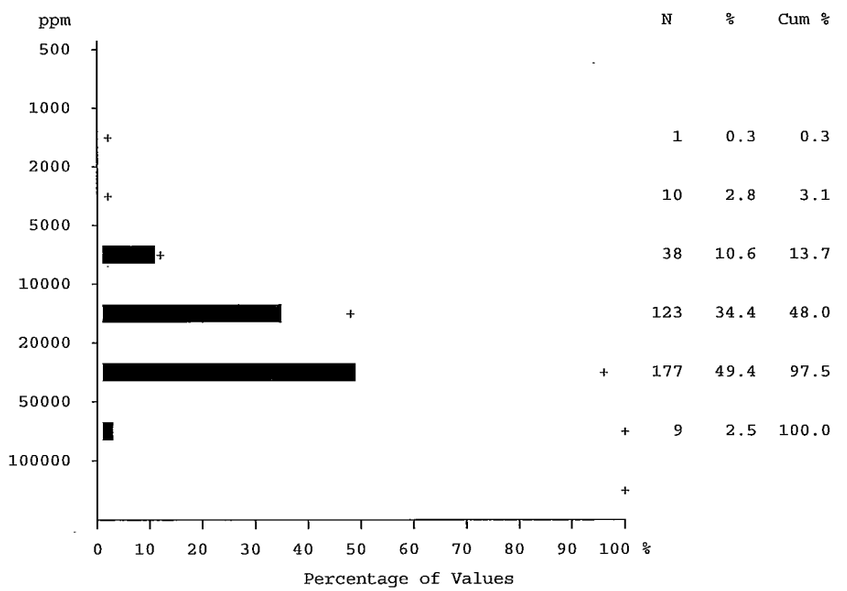
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	2.599	2.542	2.556	2.610	2.720	2.873
Standard deviation	0.532	0.523	0.551	0.461	0.538	0.587
Skewness	0.227	0.131	0.028	0.066	-0.316	0.959
Kurtosis	0.188	-0.717	0.024	-1.111	-0.663	1.671
Geometric Mean	2.544	2.487	2.494	2.569	2.666	2.819
Percentiles						
Minimum value	1.280	1.590	1.280	1.790	1.650	1.790
25th	2.188	2.083	2.190	2.240	2.430	2.513
50th	2.625	2.575	2.610	2.640	2.755	2.790
75th	2.933	2.890	2.870	3.020	3.058	3.230
80th	3.022	2.970	2.960	3.110	3.202	3.442
90th	3.291	3.275	3.270	3.256	3.414	3.630
95th	3.471	3.460	3.434	3.360	3.680	3.973
98th	3.675	3.618	3.916	3.466	3.680	4.840
99th	3.828	3.791	4.030	3.470	3.680	4.840
Maximum value	4.840	3.840	4.030	3.470	3.680	4.840

Mg

Manganese (ICP-ES)

Number of values - 365

Determination limit - 1 ppm



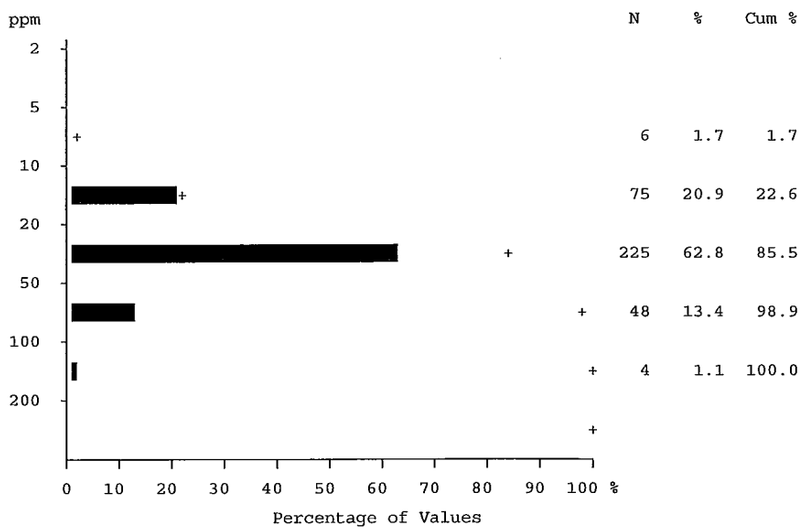
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	22911.209	25479.750	19980.147	25000.141	19724.250	14898.444
Standard deviation	12817.470	12358.510	12646.324	13989.822	10422.787	8812.624
Skewness	1.112	0.774	1.460	1.567	0.141	0.209
Kurtosis	2.169	0.806	2.994	3.682	-1.436	-1.273
Geometric Mean	19349.690	22381.414	16620.952	21751.502	16739.626	11776.387
Percentiles						
Minimum value	1407.000	2634.000	2871.000	6261.000	5392.000	1407.000
25th	13531.250	16621.250	10756.000	14375.000	10833.750	7722.250
50th	20759.000	23159.500	16106.000	22435.000	18034.500	14309.500
75th	29952.000	34488.250	26068.000	32867.000	27848.750	22481.250
80th	33505.600	36526.000	29194.000	34309.800	30283.000	23708.200
90th	39417.100	40773.000	38247.200	42469.000	35711.600	28418.700
95th	44951.950	47827.300	42384.400	50248.600	36896.000	29671.400
98th	55735.740	58198.920	60242.600	76662.840	36896.000	30552.000
99th	69718.290	65434.430	74566.000	84622.000	36896.000	30552.000
Maximum value	84622.000	74302.000	74566.000	84622.000	36896.000	30552.000

Mn

Nickel (ICP-ES)

Number of values - 365

Determination limit - 1 ppm

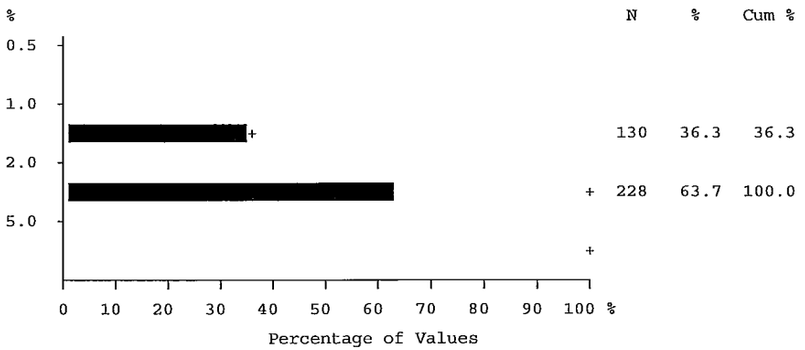


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	33.240	37.813	32.720	25.803	31.563	29.417
Standard deviation	19.207	20.326	21.386	13.633	15.561	14.796
Skewness	1.892	1.570	2.556	1.105	0.605	1.227
Kurtosis	5.909	3.999	8.652	0.752	-0.890	2.209
Geometric Mean	28.855	33.256	28.248	22.714	28.021	26.067
Percentiles						
Minimum value	7.000	10.000	11.000	8.000	9.000	7.000
25th	20.000	24.000	20.000	15.000	22.000	19.000
50th	29.000	32.500	28.000	22.000	26.500	28.500
75th	41.000	48.000	39.000	32.000	44.000	35.750
80th	45.000	50.000	40.800	37.000	49.200	37.600
90th	58.000	67.900	57.000	46.000	59.200	44.400
95th	71.050	74.000	80.000	56.800	62.000	66.400
98th	83.280	90.000	121.200	66.040	62.000	80.000
99th	106.510	123.920	142.000	70.000	62.000	80.000
Maximum value	142.000	141.000	142.000	70.000	62.000	80.000

Phosphorus (ICP-ES)

Number of values - 365

Determination limit - 0.001 %

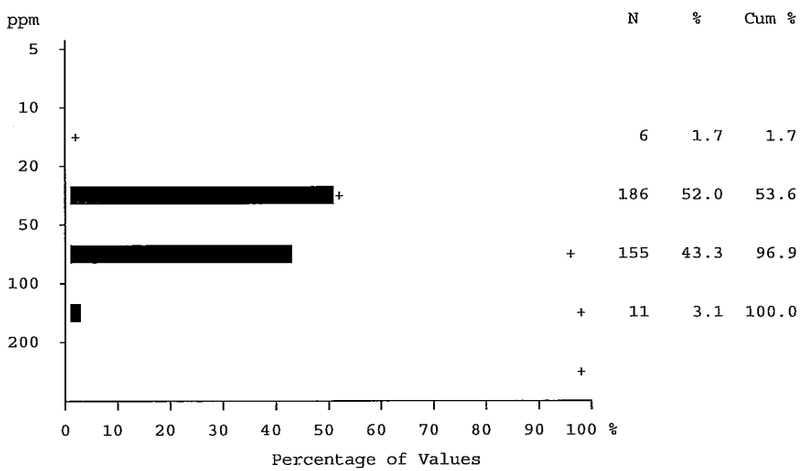


	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	2.319	2.320	2.302	2.247	2.517	2.403
Standard deviation	0.636	0.608	0.608	0.700	0.611	0.698
Skewness	0.863	0.721	1.102	0.913	0.429	0.973
Kurtosis	0.692	0.523	1.554	0.405	-1.038	0.403
Geometric Mean	2.238	2.244	2.230	2.149	2.449	2.314
Percentiles						
Minimum value	1.105	1.105	1.444	1.107	1.659	1.431
25th	1.862	1.899	1.827	1.751	2.026	1.936
50th	2.241	2.256	2.239	2.127	2.419	2.236
75th	2.643	2.599	2.627	2.643	2.959	2.776
80th	2.753	2.720	2.768	2.731	3.148	3.040
90th	3.270	3.269	3.050	3.493	3.473	3.429
95th	3.588	3.450	3.454	3.681	3.761	4.022
98th	4.011	3.984	4.253	4.204	3.761	4.387
99th	4.323	4.166	4.545	4.351	3.761	4.387
Maximum value	4.545	4.304	4.545	4.351	3.761	4.387

Lead (ICP-ES)

Number of values - 365

Determination limit - 3 ppm



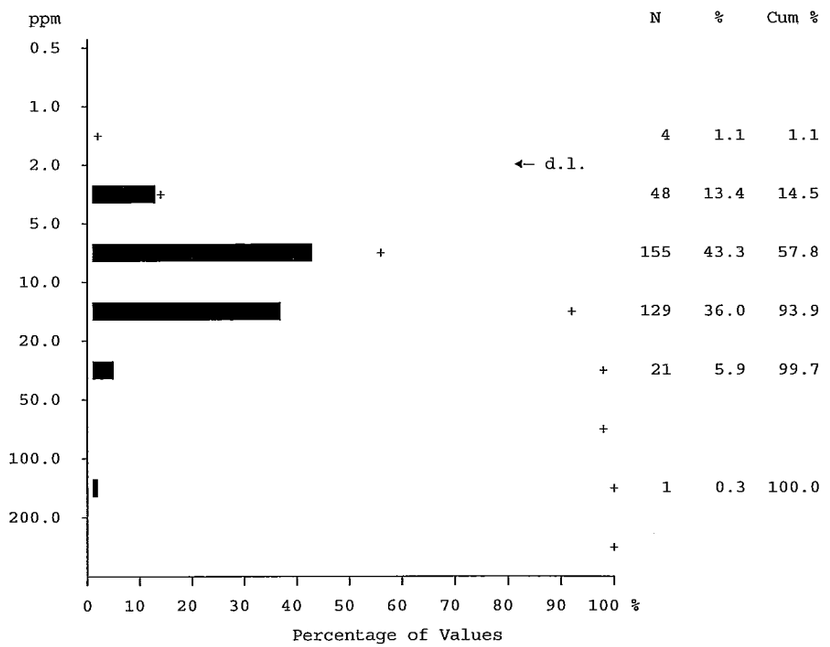
	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	0	0	0	0	0	0
Number of missing values	7	4	0	1	0	2
Mean	51.249	51.450	50.440	58.366	35.625	44.944
Standard deviation	19.804	18.931	19.102	22.669	9.244	16.728
Skewness	0.937	0.814	0.893	0.912	-0.303	0.330
Kurtosis	0.940	0.237	1.193	0.446	-1.041	-0.251
Geometric Mean	47.683	48.215	47.055	54.404	34.352	41.616
Percentiles						
Minimum value	14.000	20.000	18.000	22.000	17.000	14.000
25th	37.000	37.000	36.000	39.000	28.500	35.250
50th	48.000	48.000	49.000	53.000	38.000	42.000
75th	62.000	63.000	62.000	74.000	42.500	53.000
80th	67.000	67.000	63.600	74.600	44.200	59.000
90th	77.000	77.000	74.200	87.600	47.900	72.500
95th	90.150	92.850	85.200	109.600	50.000	80.150
98th	101.000	100.780	109.640	121.360	50.000	81.000
99th	118.000	104.900	119.000	124.000	50.000	81.000
Maximum value	124.000	111.000	119.000	124.000	50.000	81.000

Pb

Vanadium (ICP-ES)

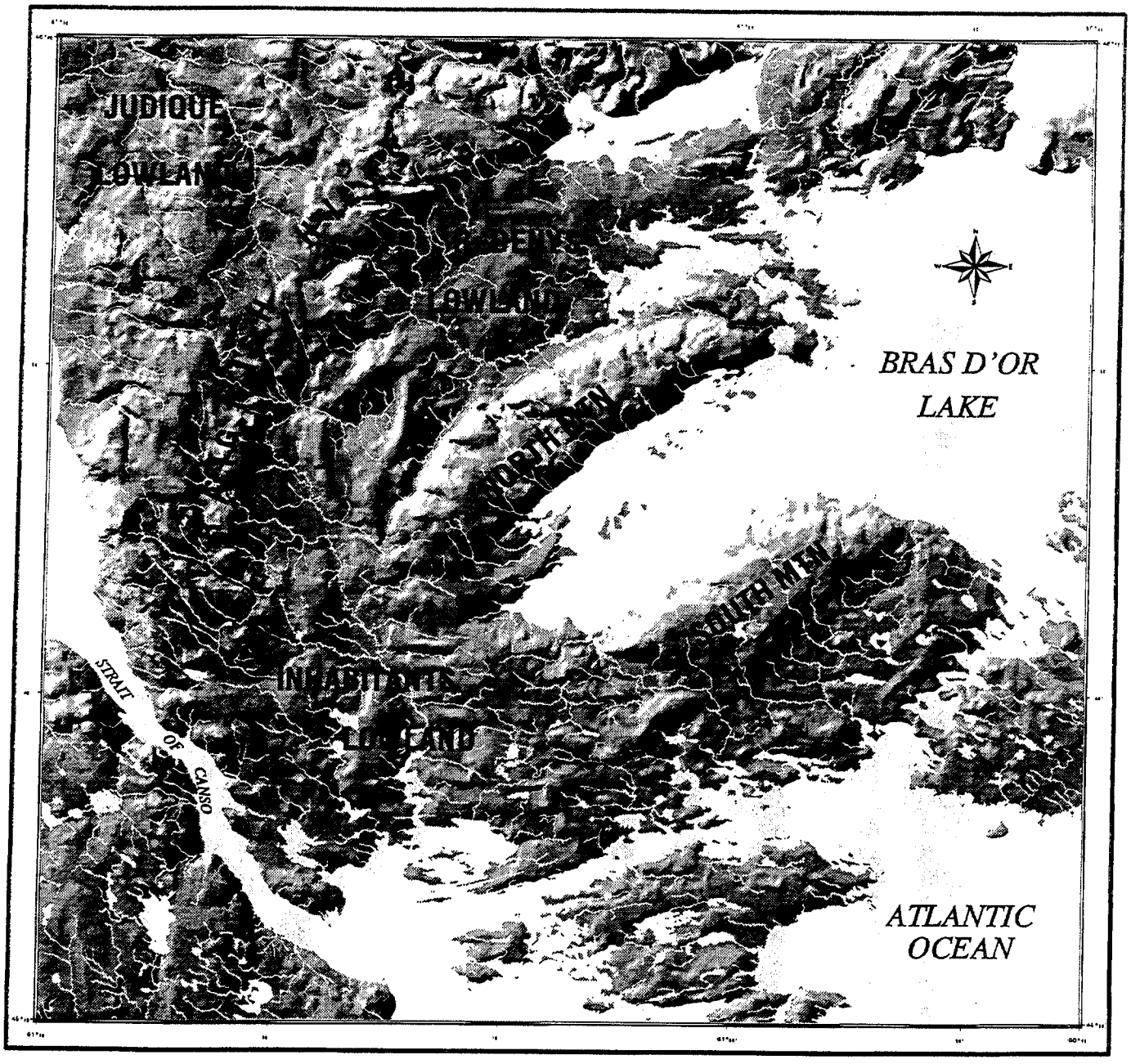
Number of values - 365

Determination limit - 2 ppm



	All units	Clast. Sed.	Chem. Sed.	Int. Rock	Ext. Rock	Meta. G. R.
Number of values	365	164	75	72	16	38
Number of values below d.l.	4	0	0	0	2	2
Number of missing values	7	4	0	1	0	2
Mean	10.089	11.731	9.053	10.296	4.875	6.861
Standard deviation	8.842	11.710	5.372	5.365	2.849	3.826
Skewness	7.009	6.278	1.385	1.091	0.669	0.666
Kurtosis	80.192	53.669	2.131	1.735	0.091	-0.080
Geometric Mean	8.216	9.461	7.704	9.039	4.012	5.715
Percentiles						
Minimum value	1.000	2.000	2.000	3.000	1.000	1.000
25th	6.000	7.000	6.000	6.000	3.000	4.250
50th	8.000	9.000	8.000	9.000	5.000	6.000
75th	12.000	13.000	12.000	14.000	6.000	9.750
80th	13.000	15.000	12.000	15.000	6.600	10.600
90th	17.000	19.900	17.400	16.000	9.200	12.300
95th	21.000	24.000	20.000	18.800	12.000	15.300
98th	28.640	47.900	26.400	28.360	12.000	17.000
99th	46.050	78.640	29.000	31.000	12.000	17.000
Maximum value	125.000	125.000	29.000	31.000	12.000	17.000

REPRODUCE THIS SHEET AS A TRANSPARENCY

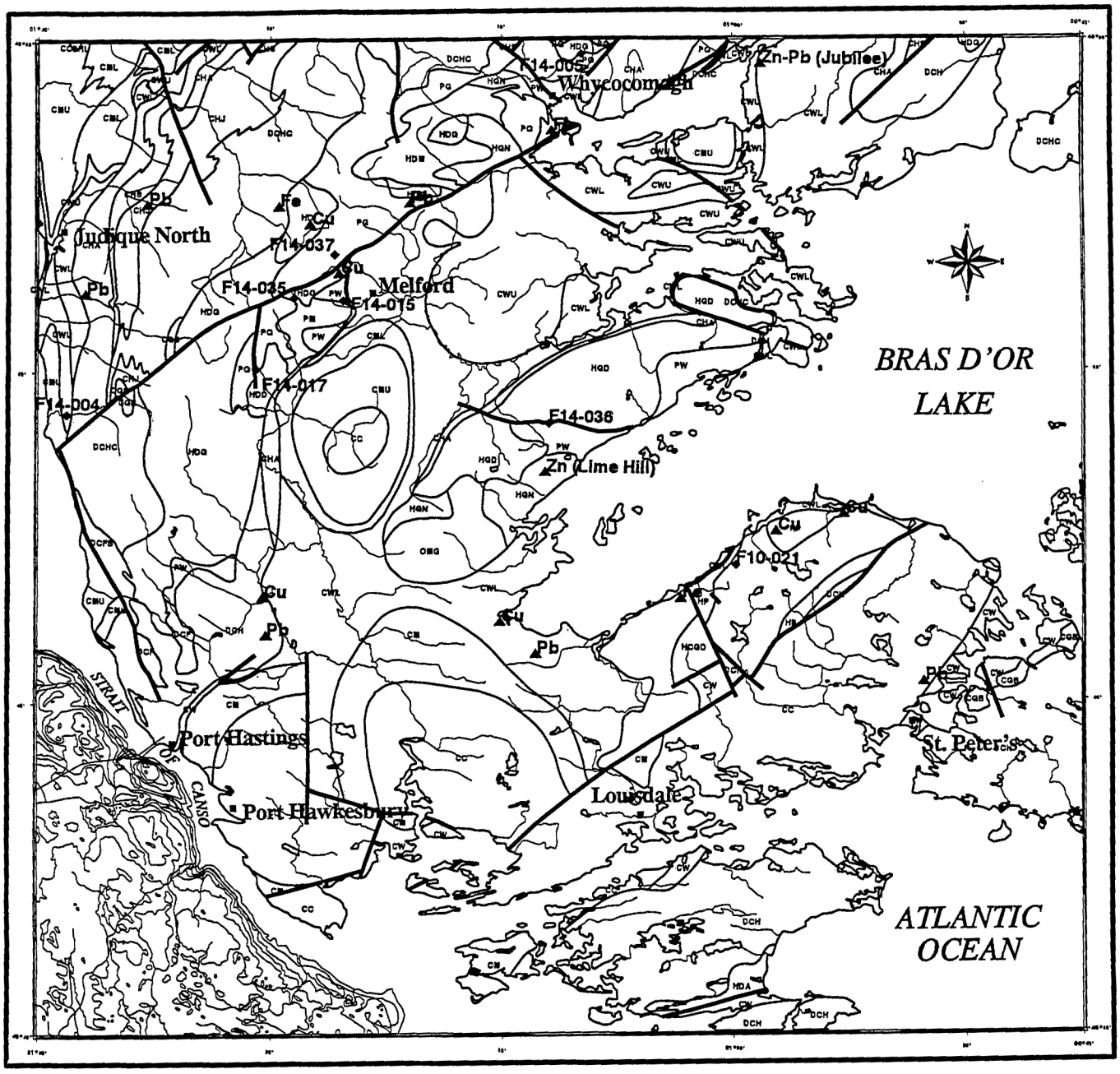


Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 Kilomètres

Transverse Mercator Projection
Scale Factor 1, Central Meridian 61°10′, Latitude of Origin 45°30′

Fig. 3: Digital Elevation Map Showing Main Physiographic Divisions

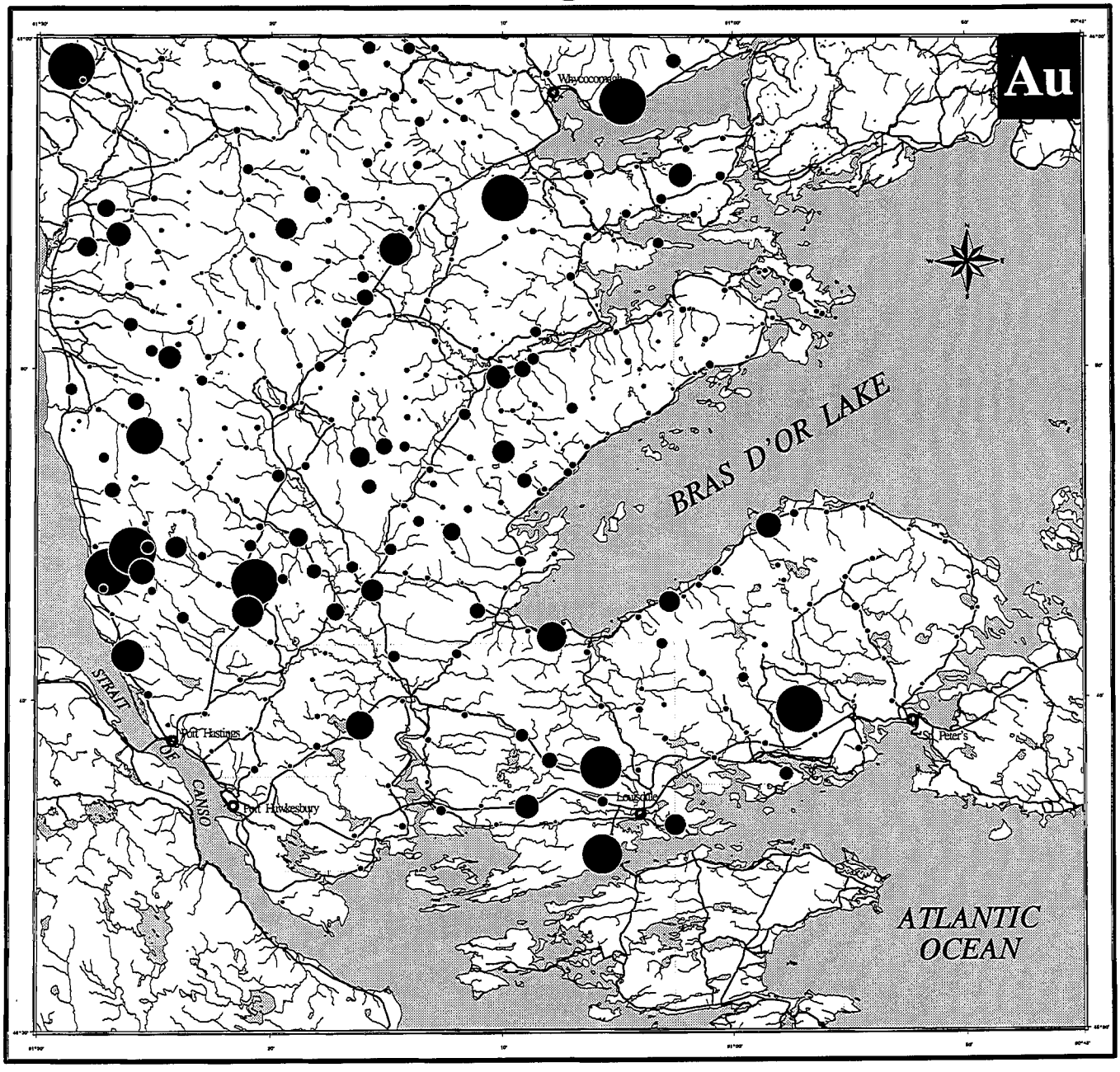


Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



GOLD

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

ppb Au	Percentile
78	Maximum
46	98
32	95
26	90
17	75
12	50
<5	Minimum

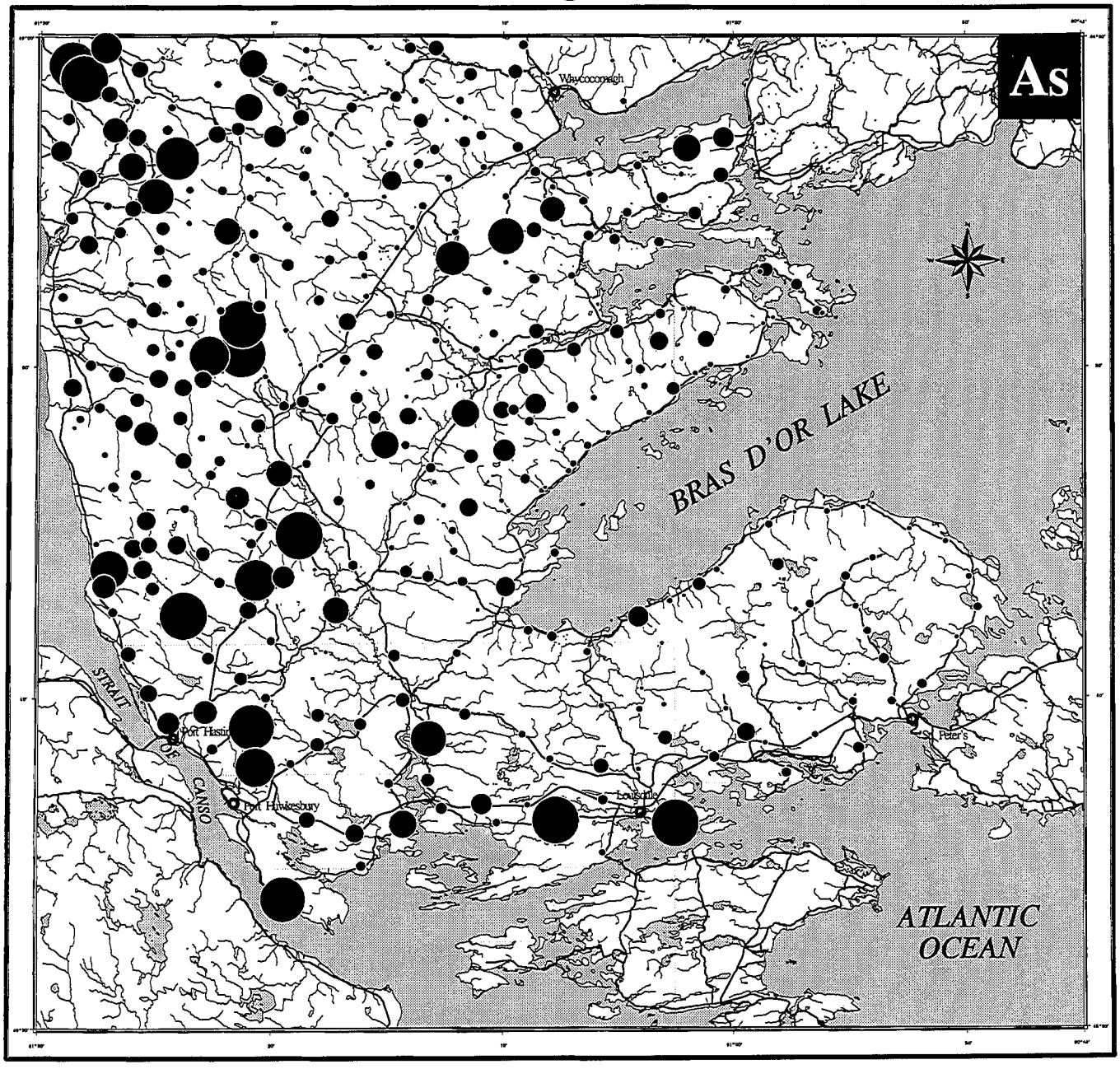
365 Samples
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



ARSENIC

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

INAA

ppm As	Percentile
6.0	Maximum
4.5	98
3.9	95
3.0	90
2.3	75
1.8	50
<0.5	Minimum

365 Samples

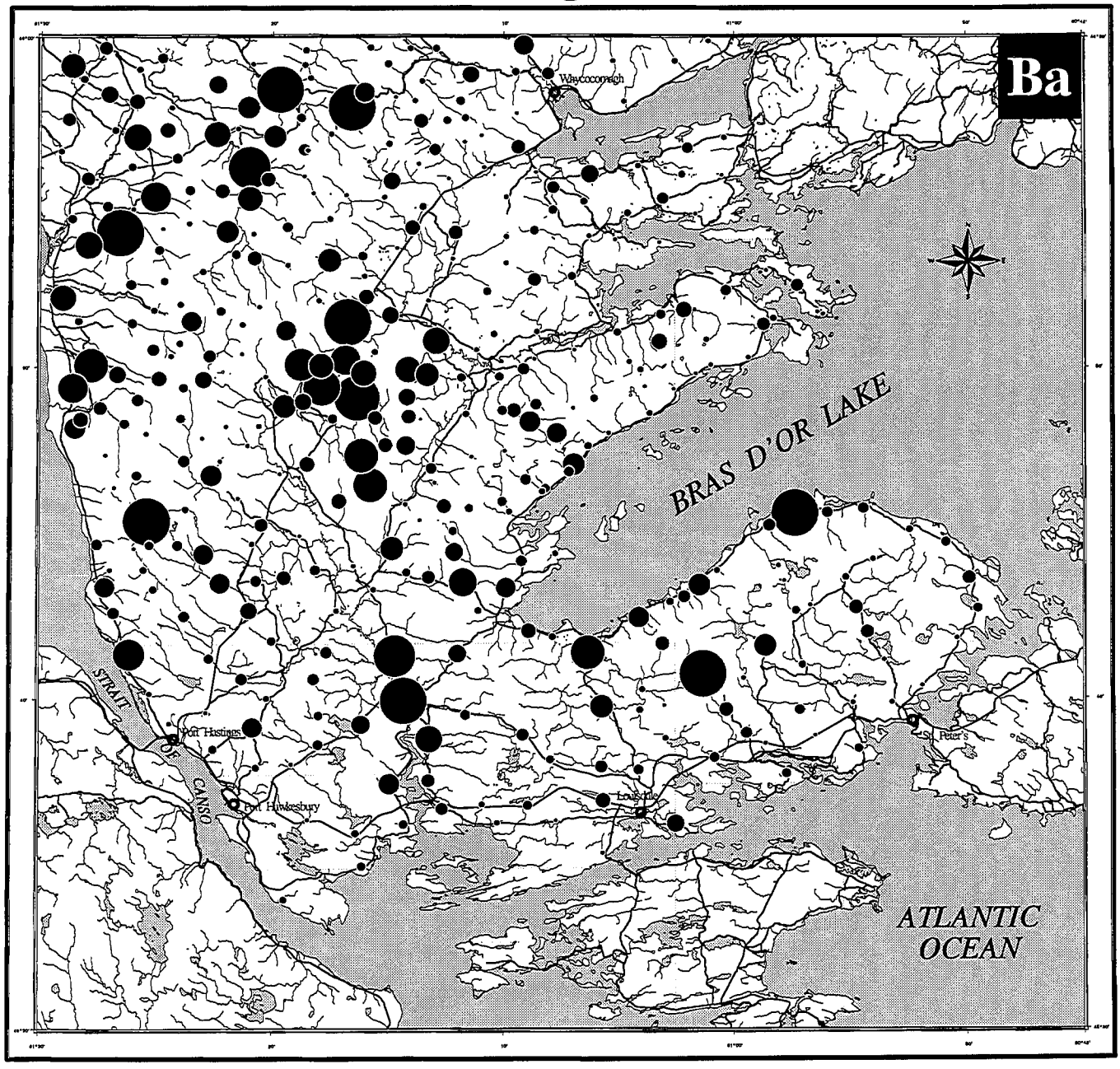
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



BARIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Contribution to Canada-Nova Scotia Cooperation Agreement on Mineral Development (1982-1988) a subsidiary agreement under the Economic and Regional Development Agreement.
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Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

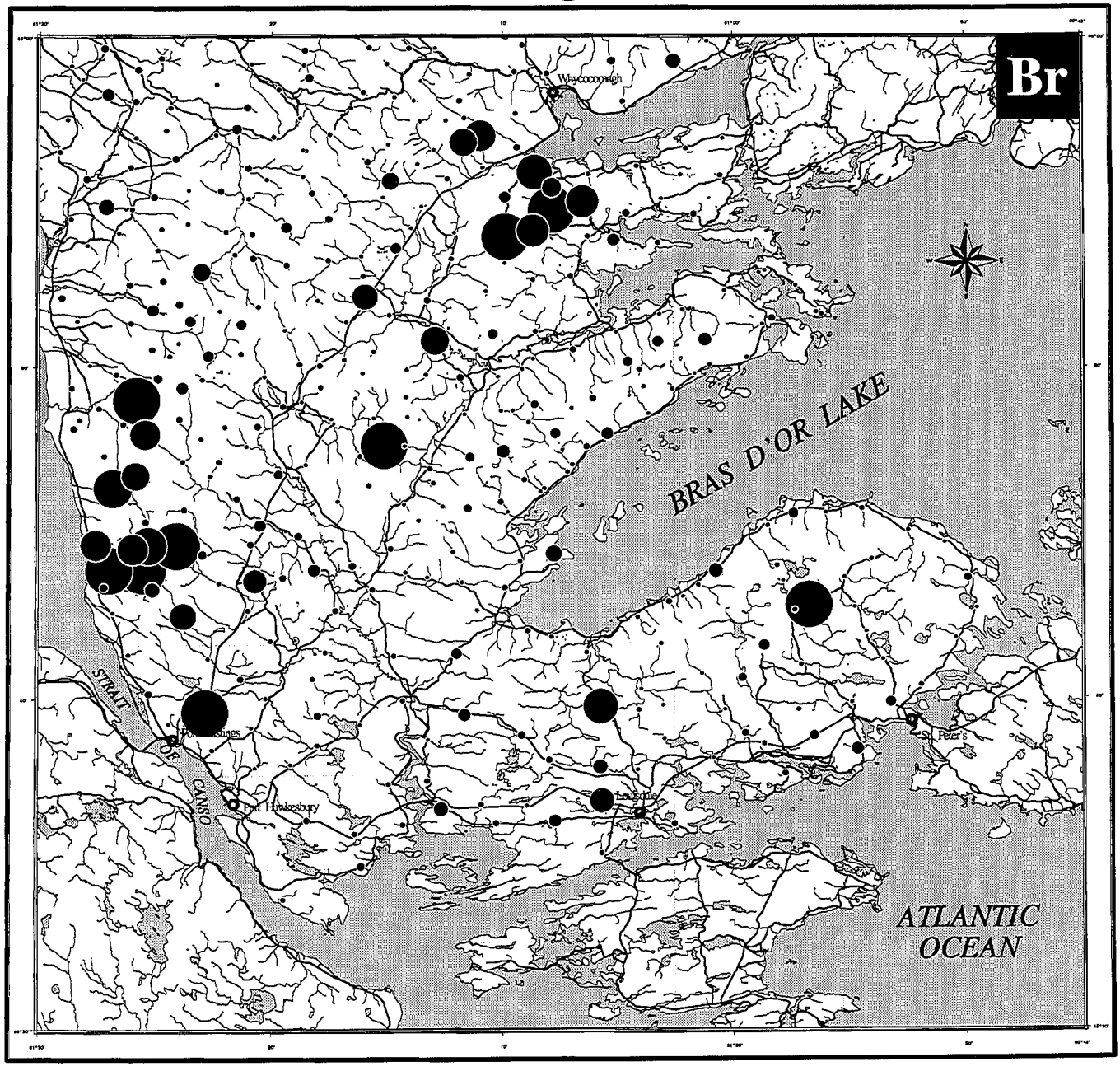
INAA

ppm Ba	Percentile
6600	Maximum
5200	98
4170	95
3600	90
2700	75
2000	50
370	Minimum

365 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



BROMINE

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

ppm Br	Percentile
190	Maximum
110	98
89	95
59	90
40	75
30	50
13	Minimum

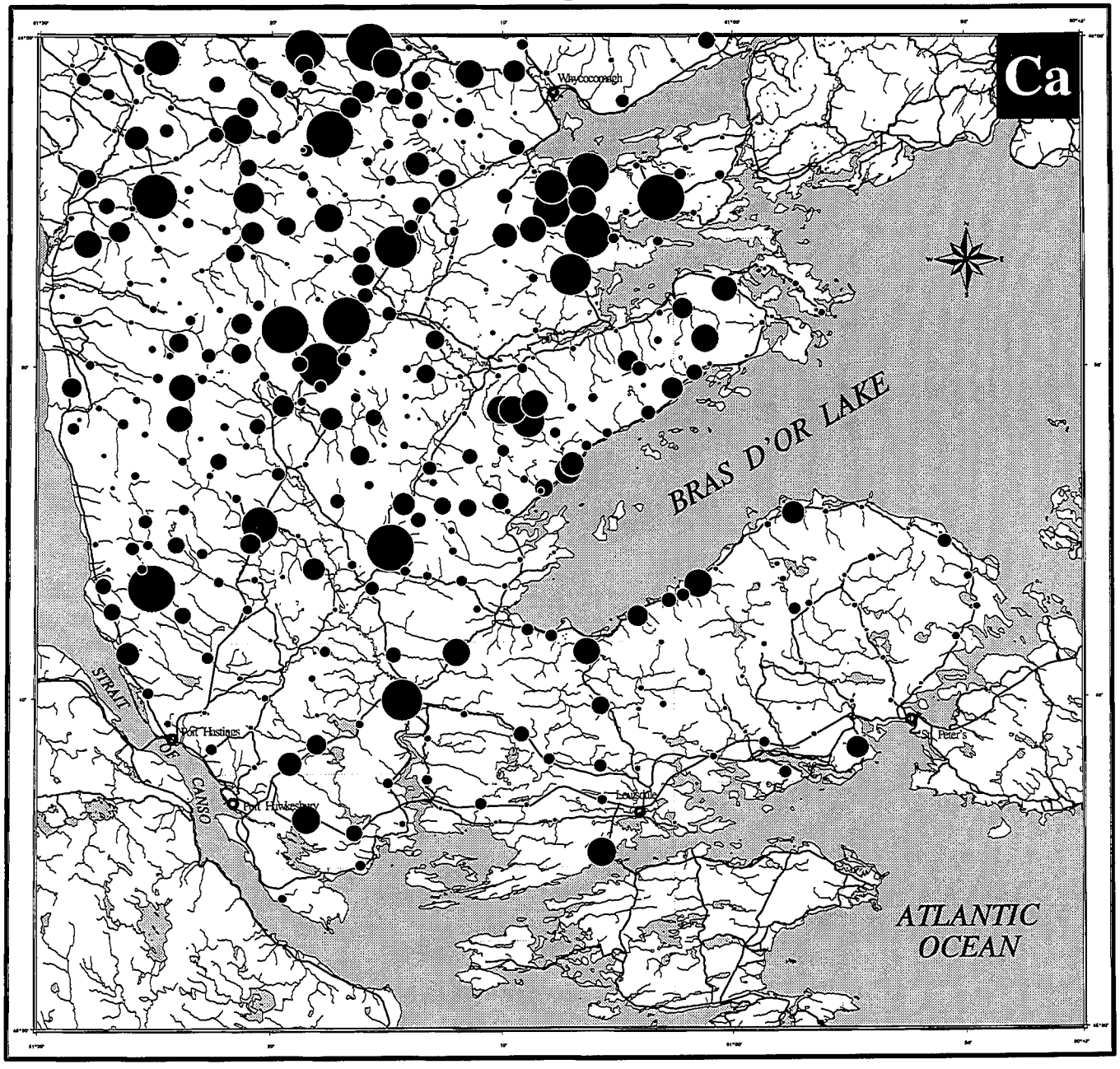
365 Samples
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



CALCIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

pct	Ca	Percentile
27.9	●	Maximum
24.7	●	98
23.0	●	95
21.6	●	90
19.5	●	75
16.9	•	50
9.1	·	Minimum

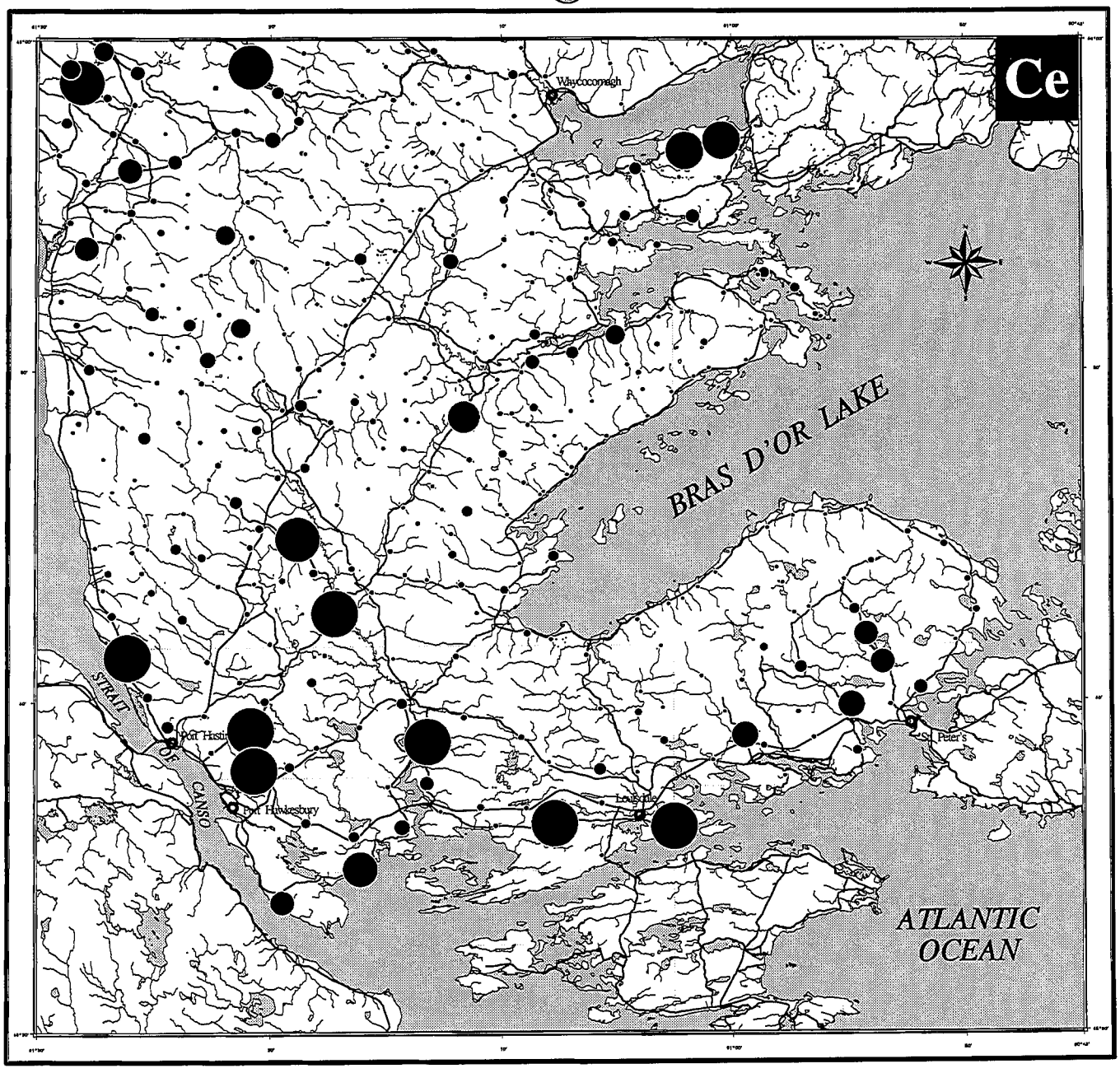
365 Samples
Exponent = 3

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



CERIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

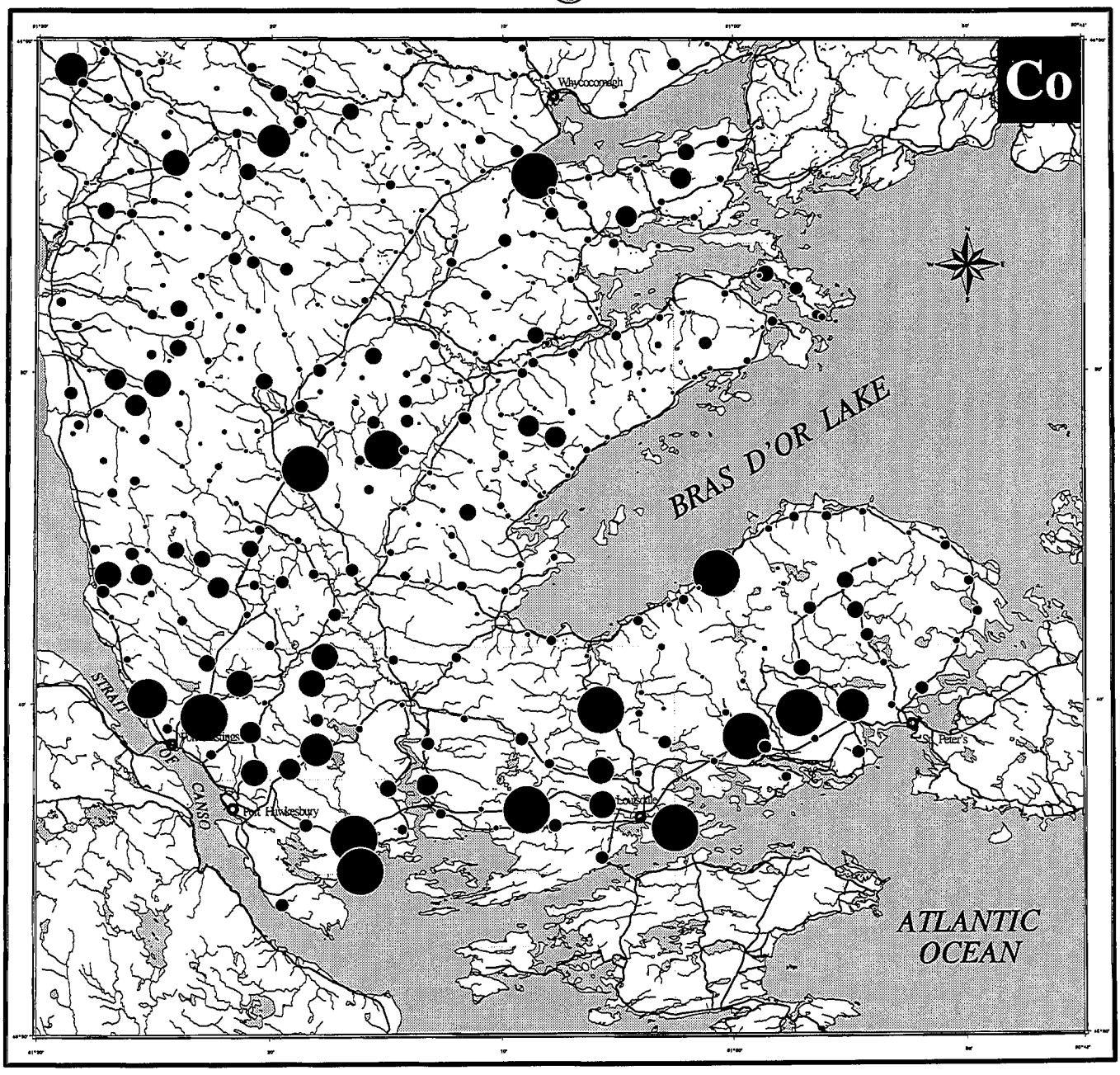
INAA

ppm Ce	Percentile
50	Maximum
26	98
18	95
13	90
8	75
5	50
<3	Minimum

365 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



COBALT

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

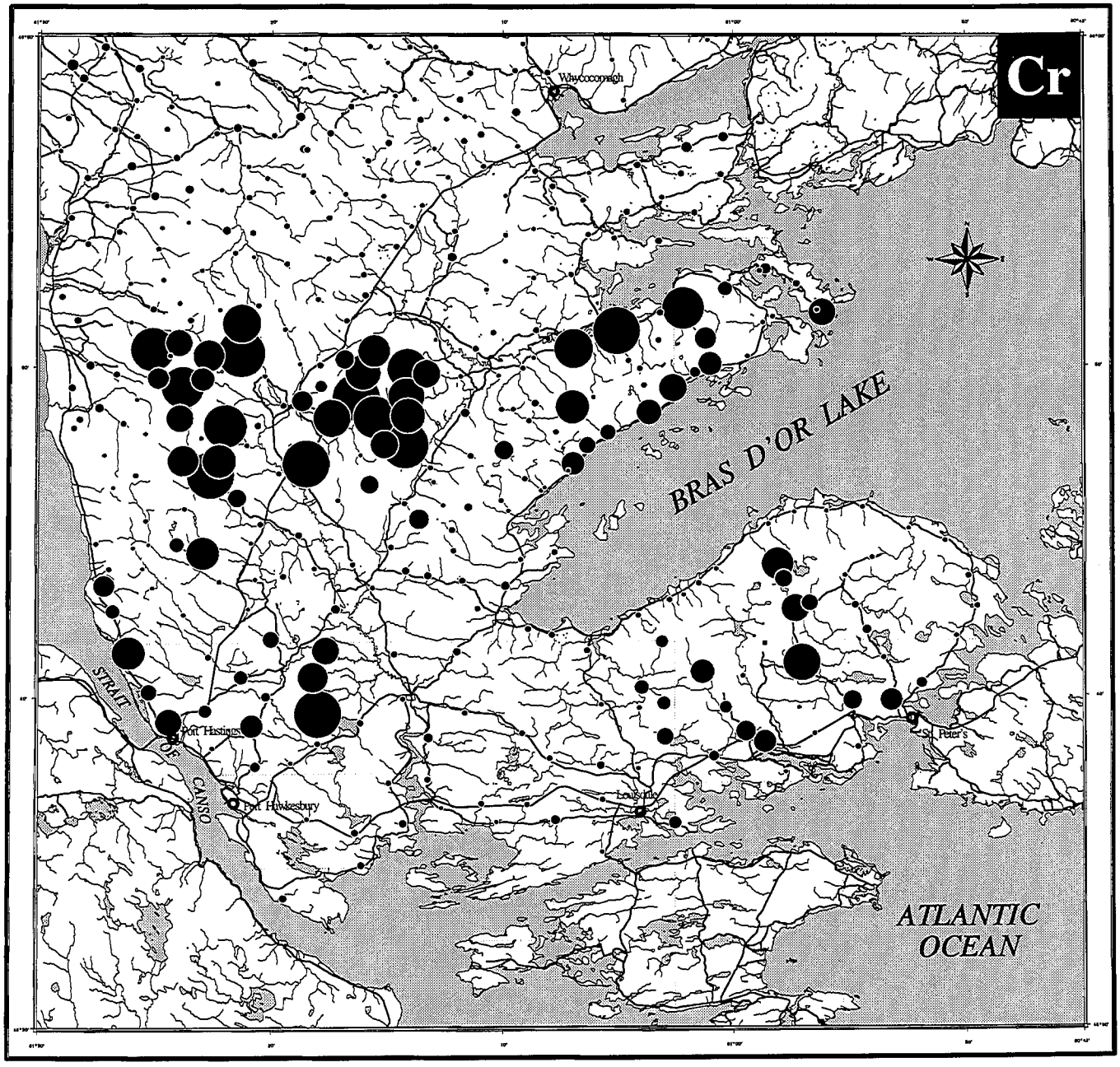
INAA

ppm Co		Percentile
15	●	Maximum
12	●	98
9	●	95
8	●	90
6	•	75
4	•	50
1	·	Minimum

365 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



CHROMIUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

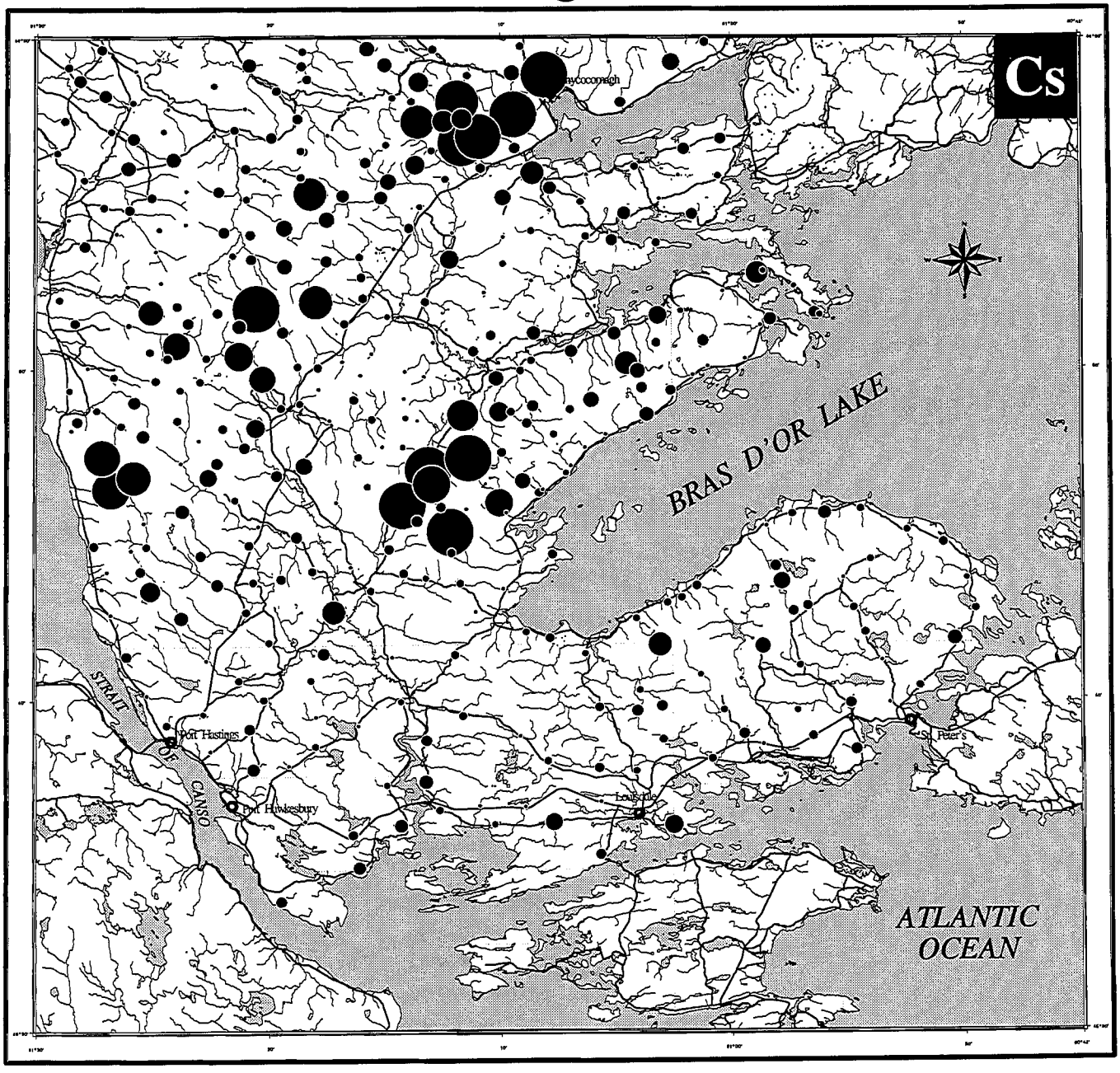
INAA

ppm	Cr	Percentile
100	●	Maximum
82	●	98
71	●	95
59	●	90
27	•	75
18	•	50
<1	·	Minimum

365 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



CESIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

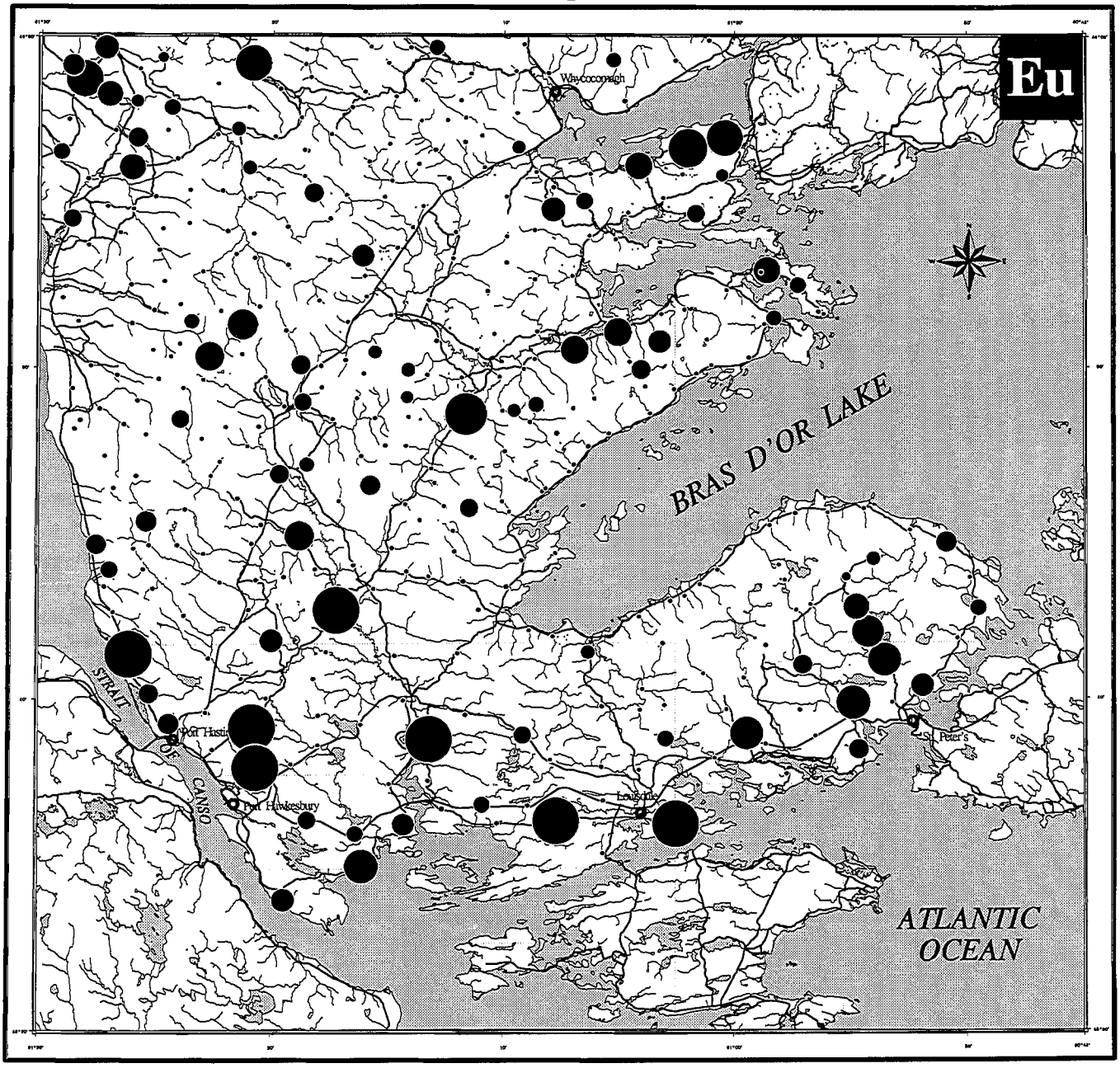
INAA

ppm Cs	Percentile
11.0	Maximum
7.5	98
4.8	95
2.7	90
1.5	75
1.0	50
<0.5	Minimum

365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



EUROPIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
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Canada
Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

INAA

ppm Eu	Percentile
1.02	Maximum
0.59	98
0.36	95
0.23	90
0.02	75
0.02	50
<0.01	Minimum

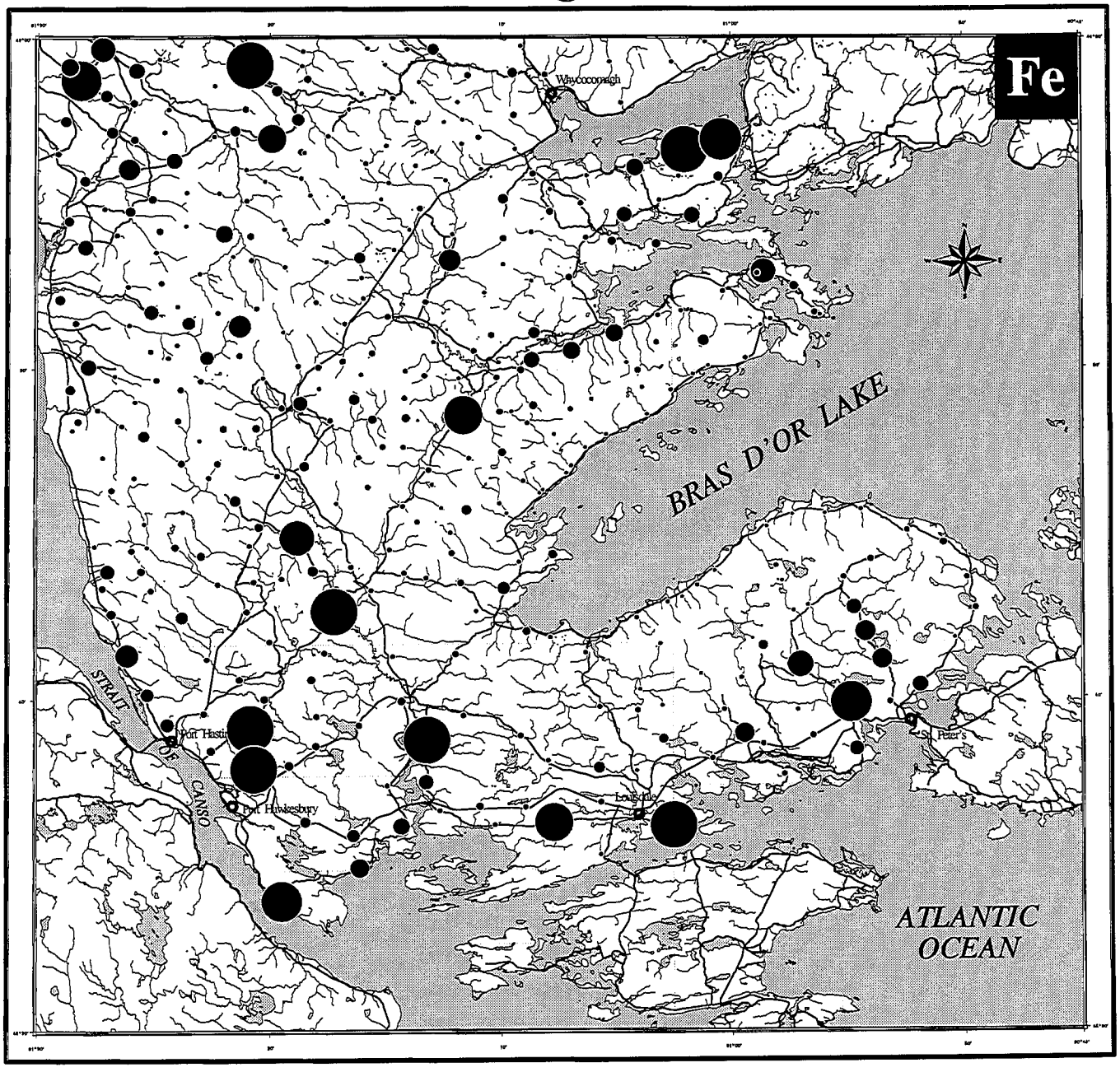
365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

IRON

in

Balsam Fir Twigs

INAA

pct	Fe	Percentile
1.44	●	Maximum
1.08	●	98
0.74	●	95
0.57	●	90
0.36	•	75
0.24	•	50
<0.05	·	Minimum

365 Samples

Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

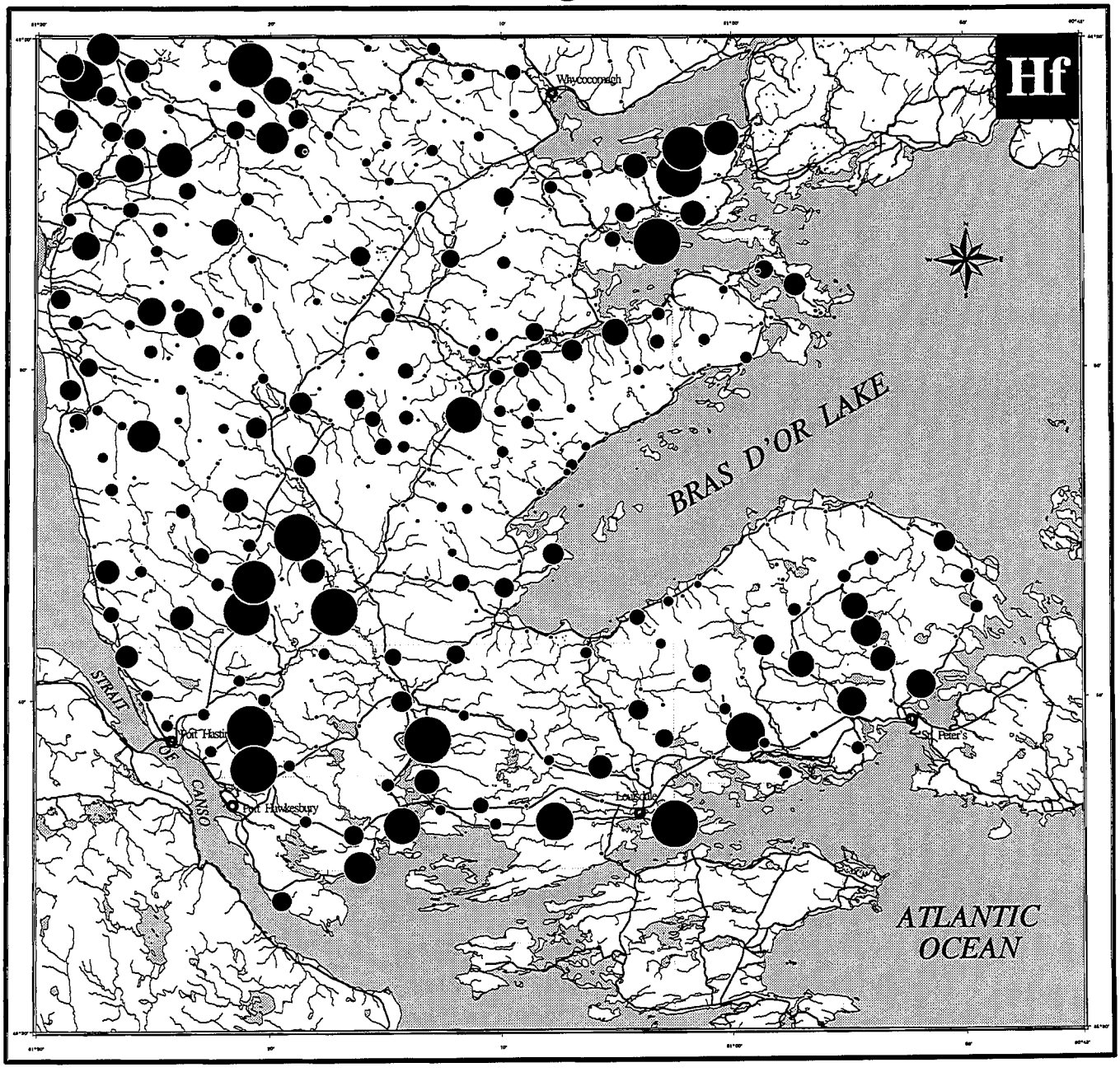
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT | ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

HAFNIUM

in

Balsam Fir Twigs

INAA

ppm Hf	Percentile
5.3	Maximum
3.4	98
2.5	95
1.9	90
1.1	75
0.6	50
<0.5	Minimum

365 Samples

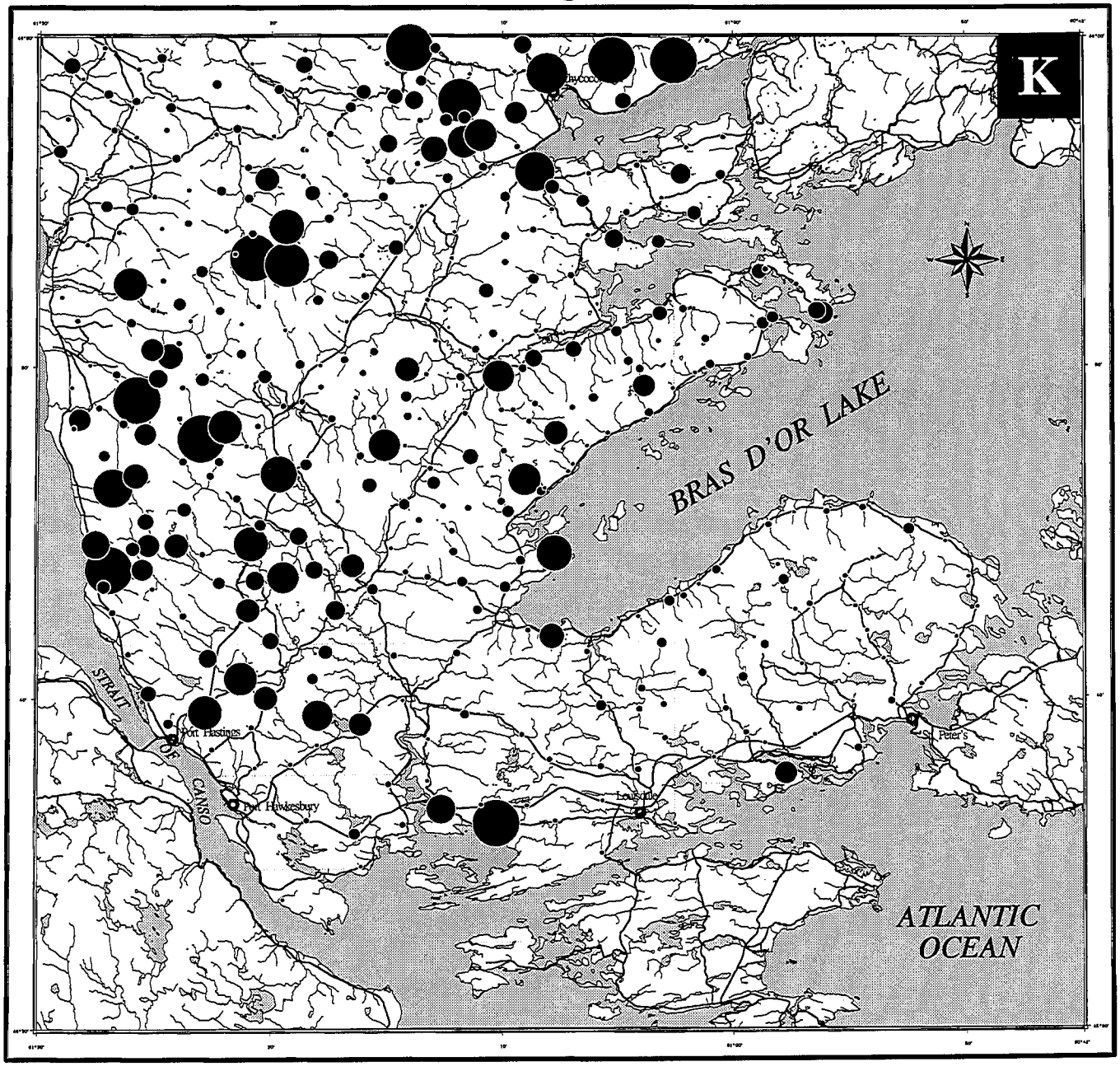
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



POTASSIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPERATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

pct K		Percentile
34.80	●	Maximum
32.40	●	98
30.67	●	95
29.00	●	90
26.15	●	75
23.40	•	50
13.40	·	Minimum

365 Samples
Exponent = 4

Scale 1:350 000 - Échelle 1/350 000

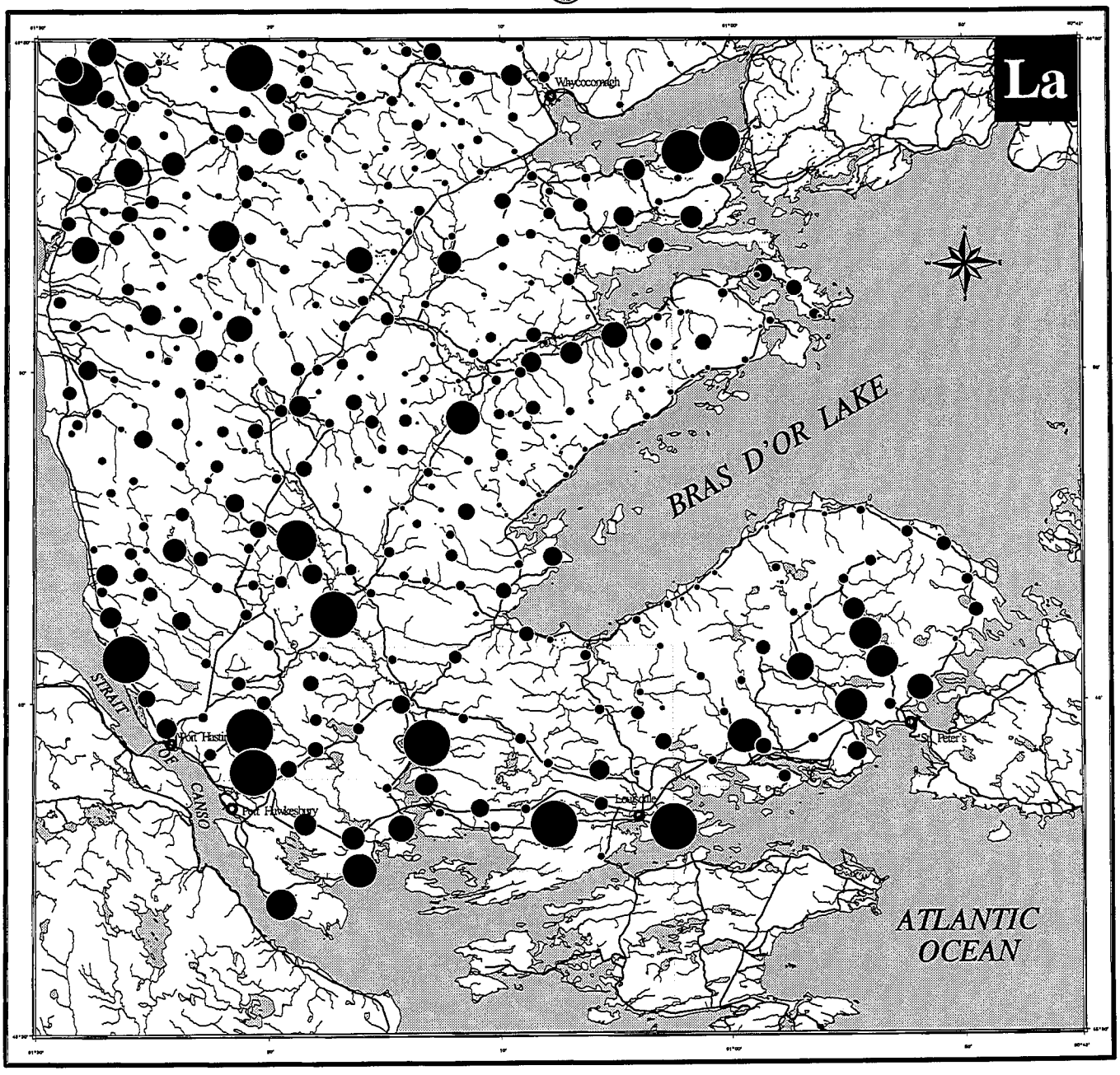
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



LANTHANUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

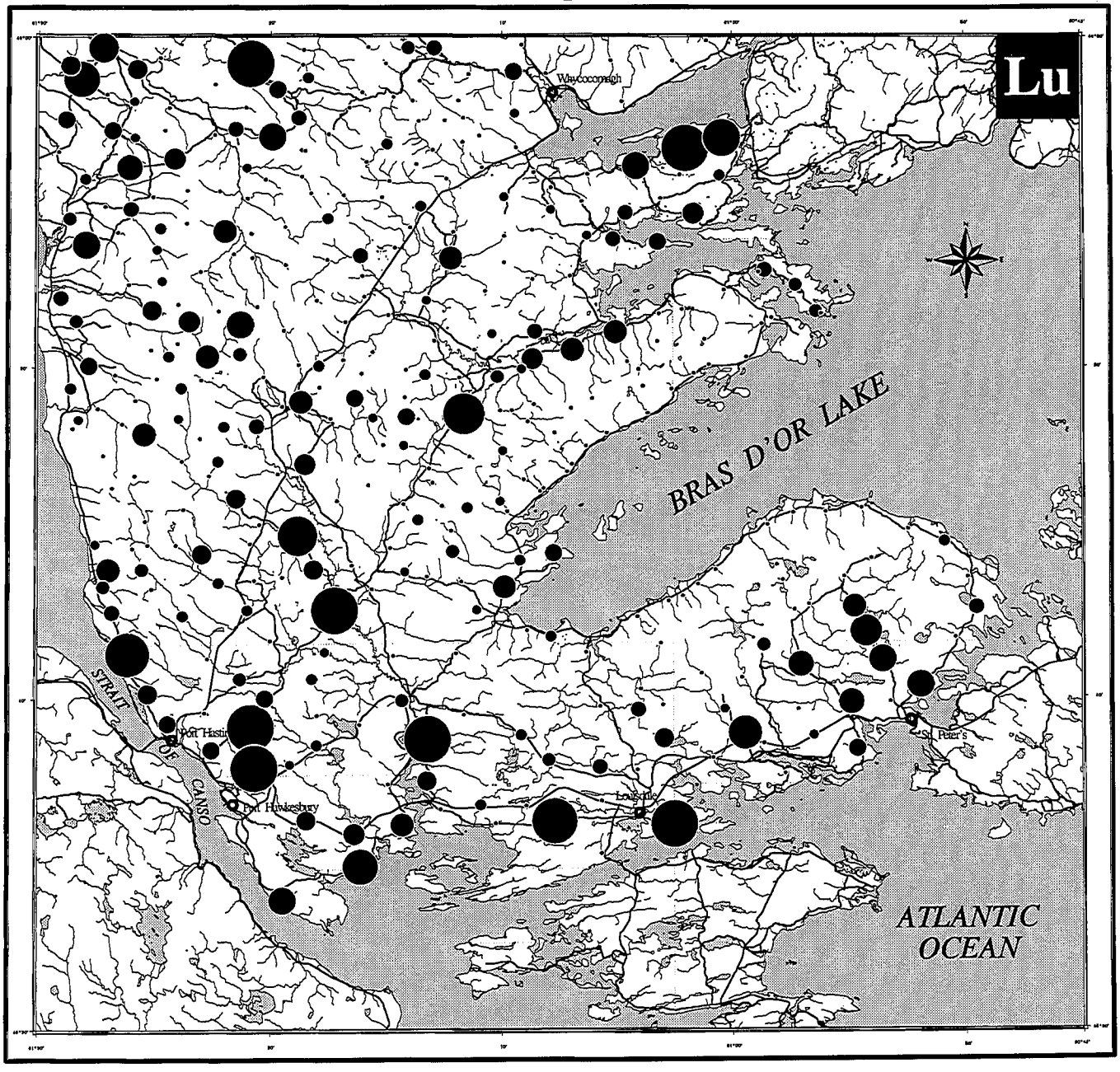
INAA

ppm La	Percentile
25.0	Maximum
14.0	98
9.3	95
6.7	90
4.2	75
2.6	50
0.8	Minimum

365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



LUTETIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

ppm Lu		Percentile
0.41	●	Maximum
0.24	●	98
0.14	●	95
0.12	●	90
0.07	●	75
<0.05	·	50
<0.05	·	Minimum

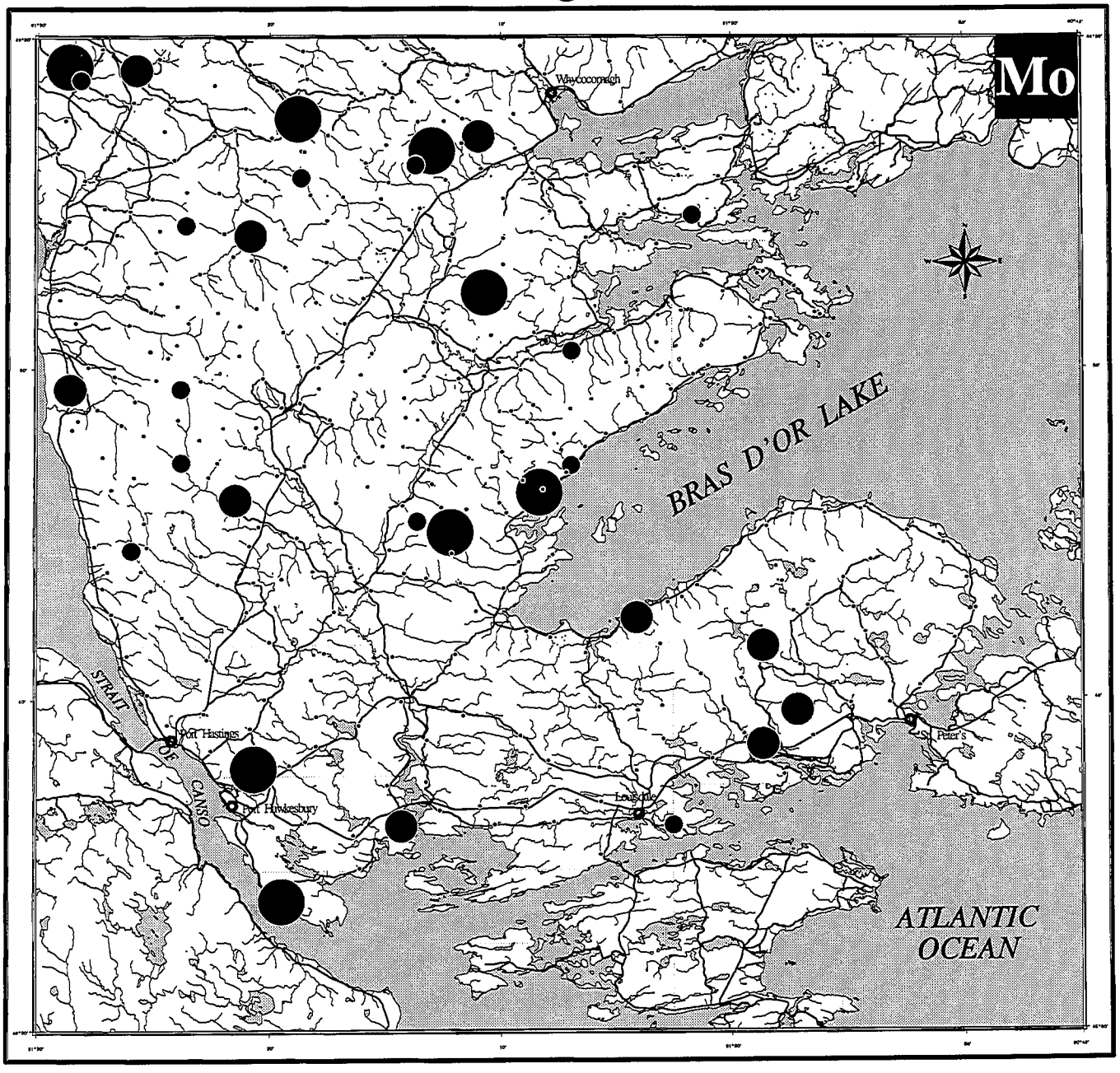
365 Samples
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



MOLYBDENUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

INAA

ppm Mo	Percentile
6	Maximum
4	98
3	95
<2	90
<2	75
<2	50
<2	Minimum

365 Samples

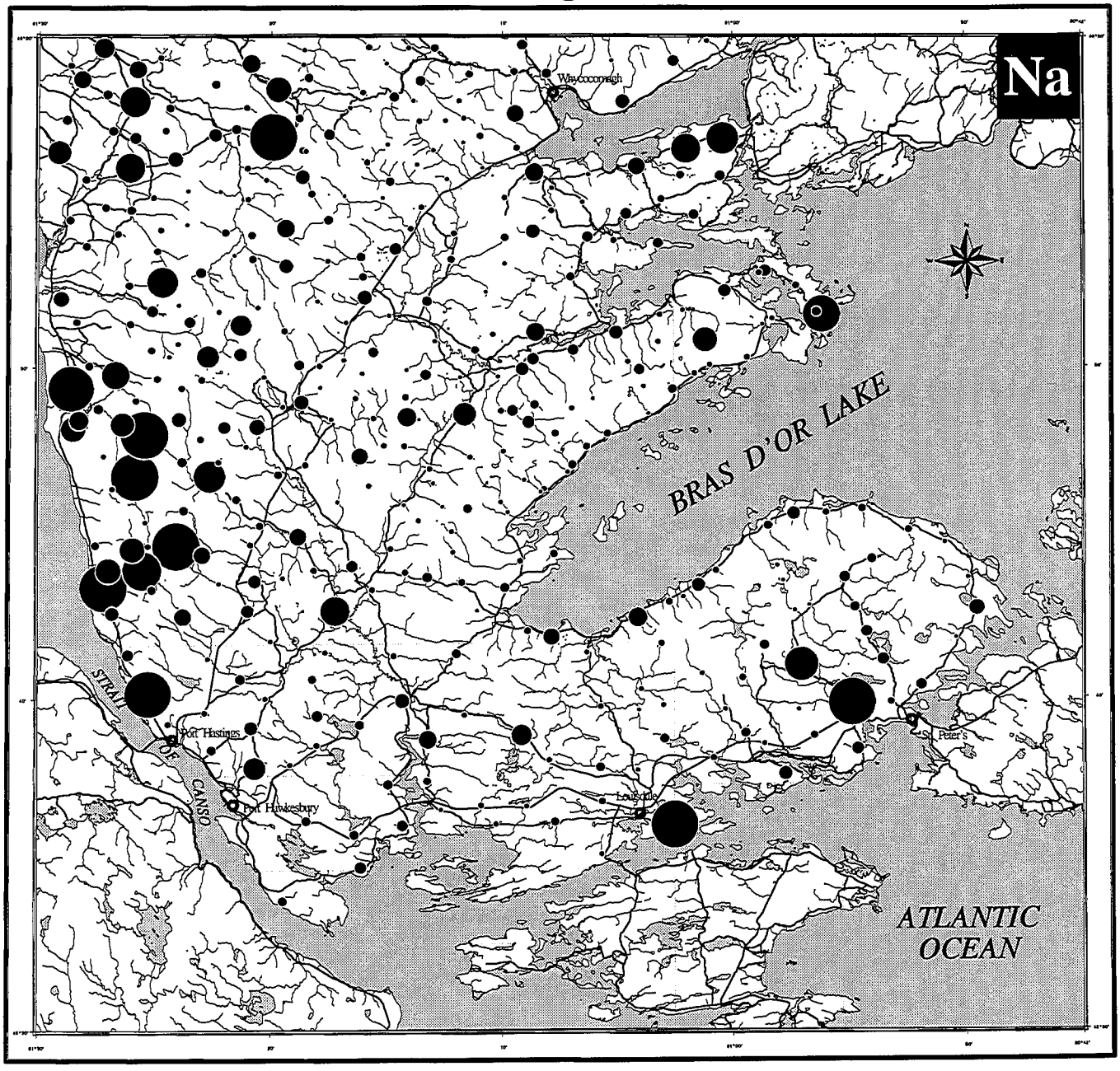
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



SODIUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT | ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

INAA

ppm	Na	Percentile
9050	●	Maximum
7158	●	98
5634	●	95
4444	●	90
3245	•	75
2460	•	50
651	·	Minimum

365 Samples

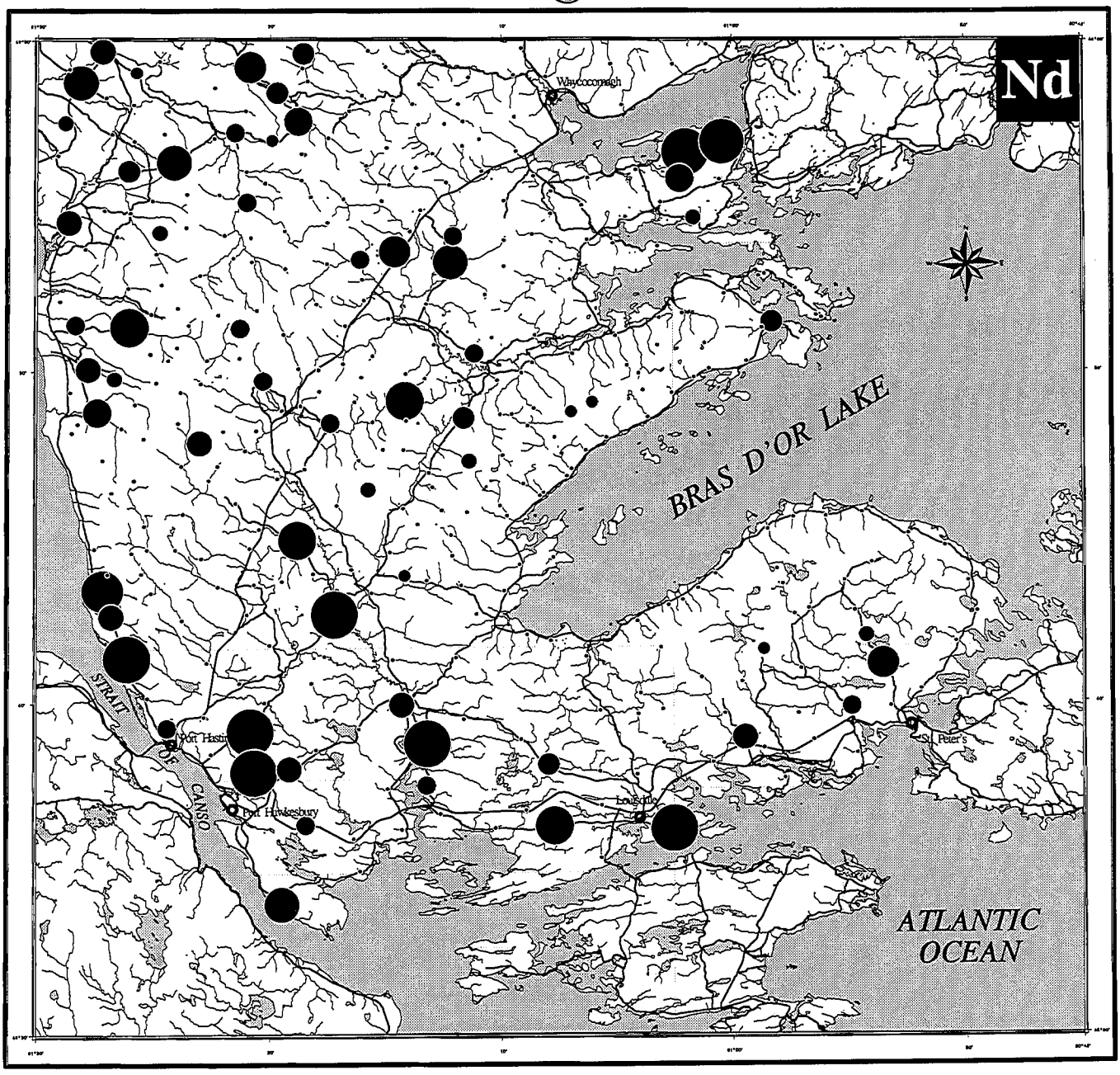
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



NEODYMIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

ppm Nd	Percentile
28	Maximum
16	98
11	95
8	90
<5	75
<5	50
<5	Minimum

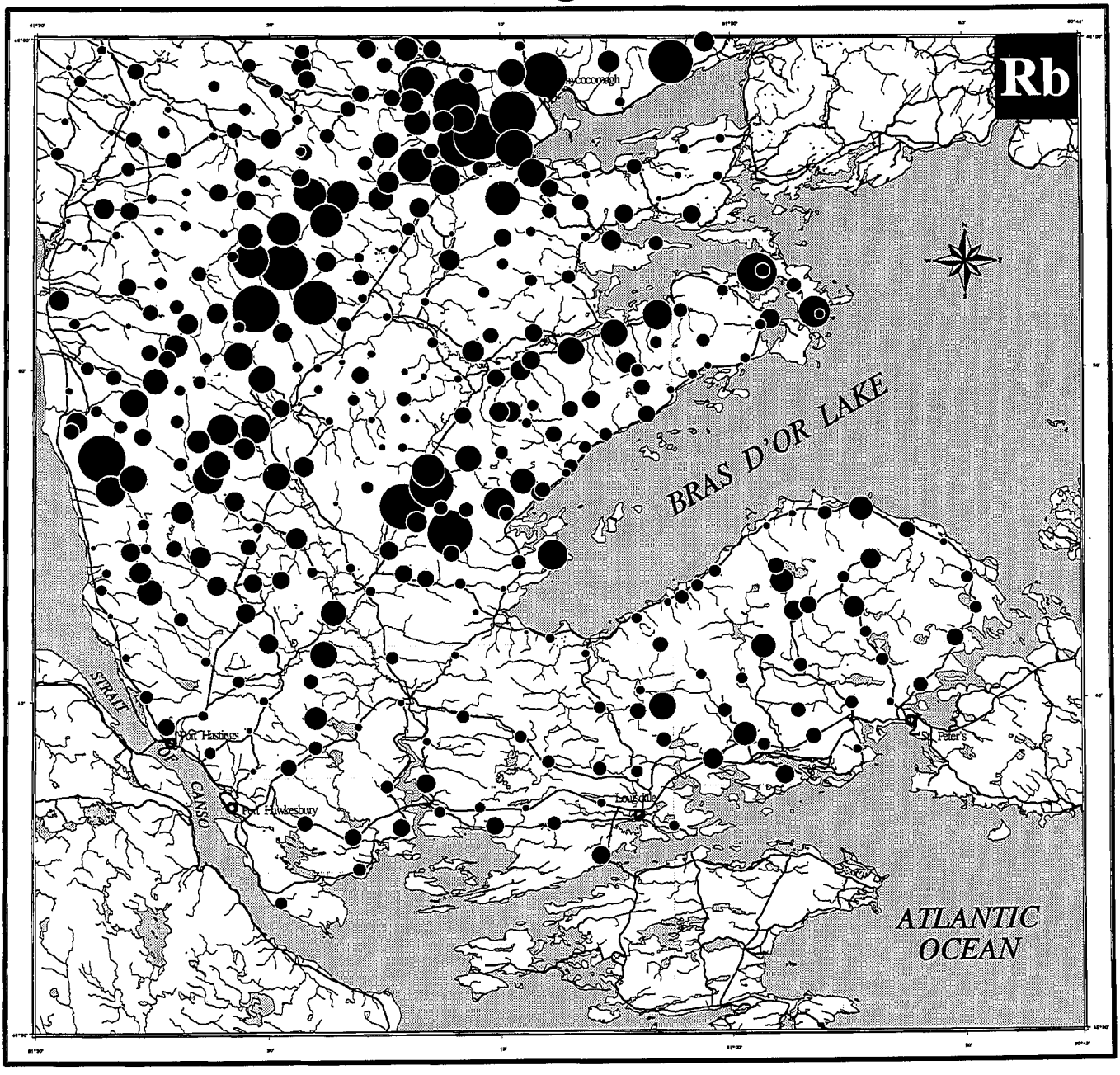
365 Samples
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



RUBIDIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

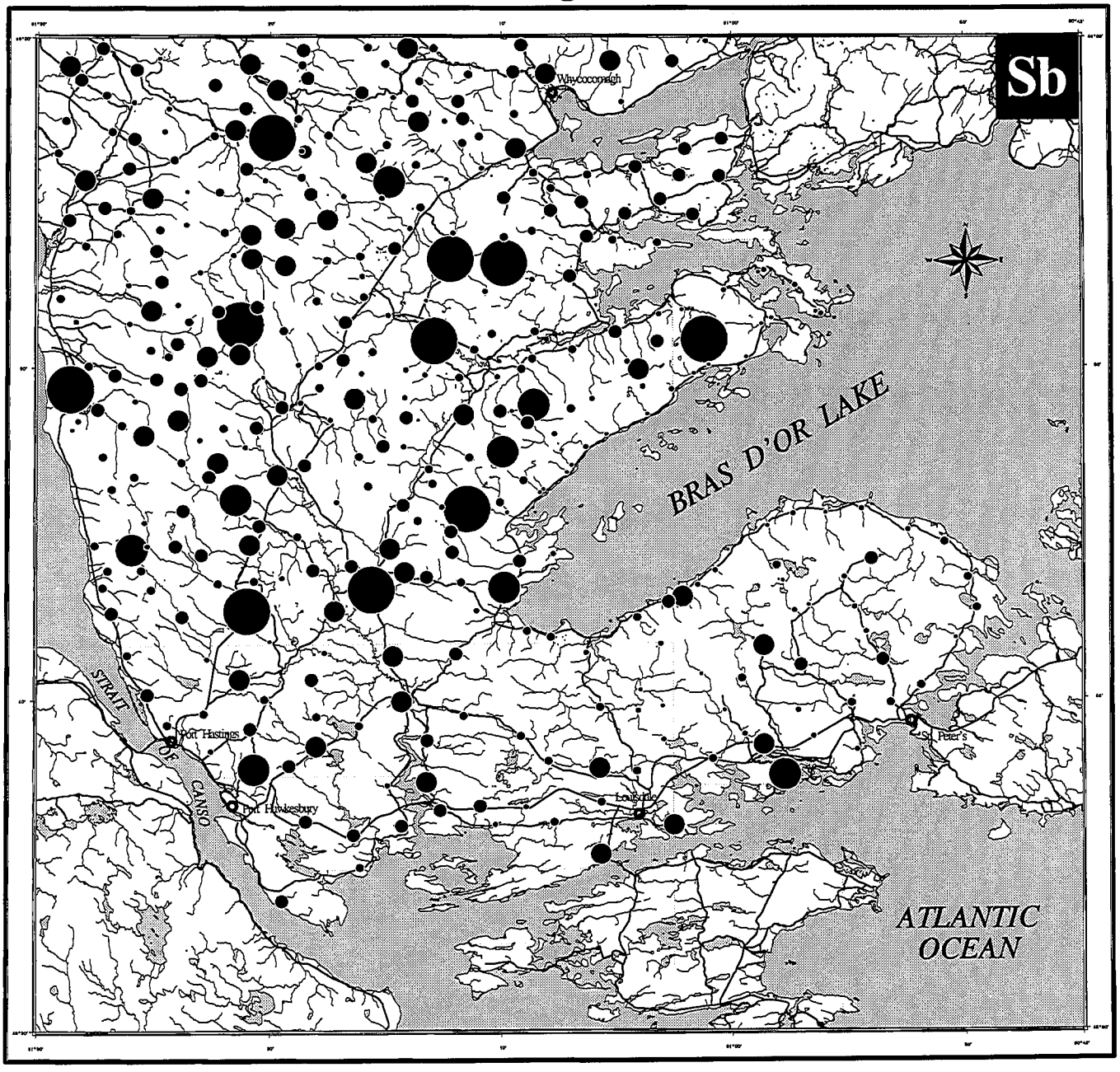
INAA

ppm Rb	Percentile
940	Maximum
550	98
397	95
320	90
230	75
160	50
32	Minimum

365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



ANTIMONY

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

INAA

ppm Sb	Percentile
1.9	Maximum
0.8	98
0.7	95
0.6	90
0.5	75
0.4	50
<0.1	Minimum

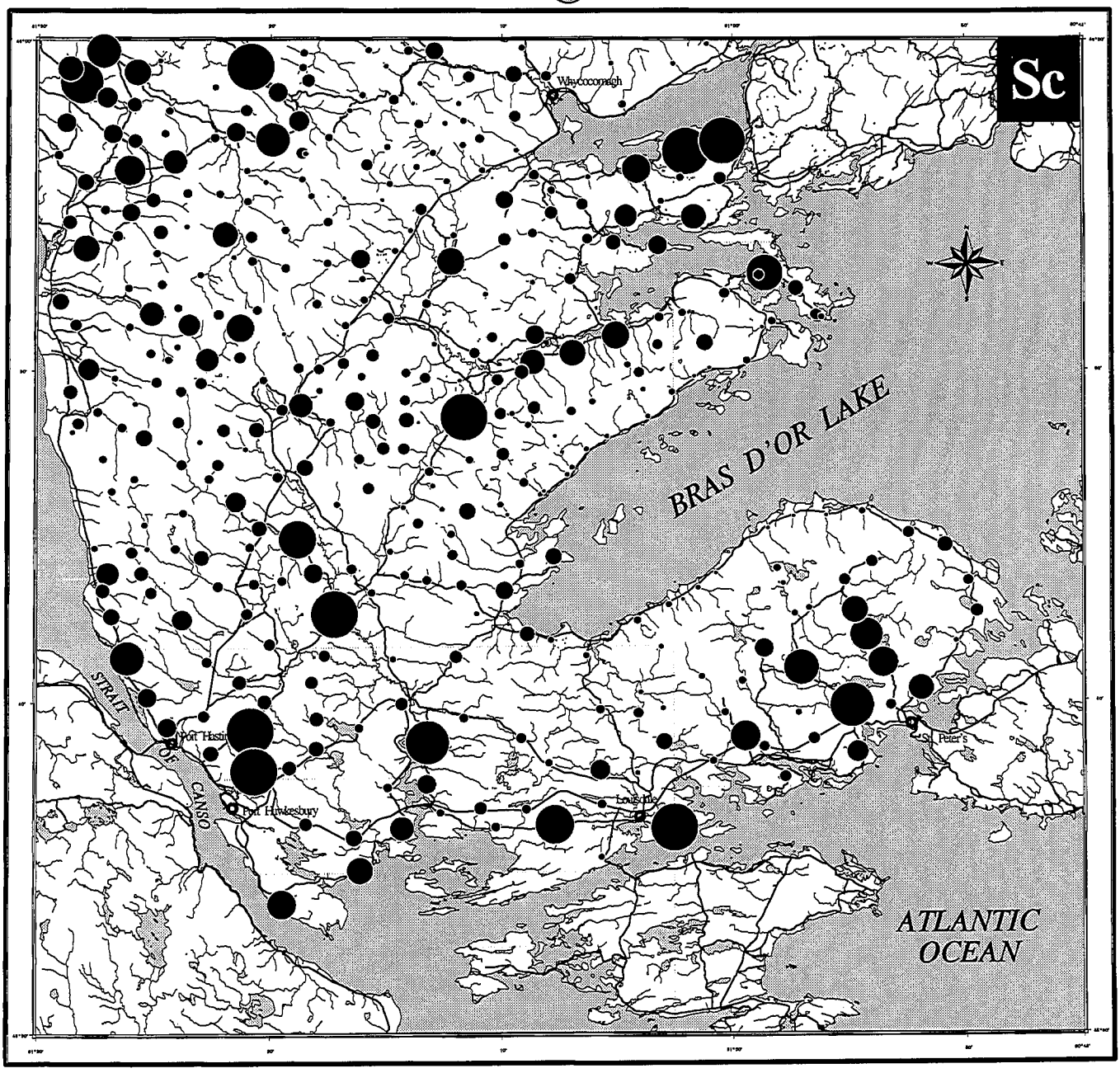
365 Samples
Exponent = 3

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



SCANDIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

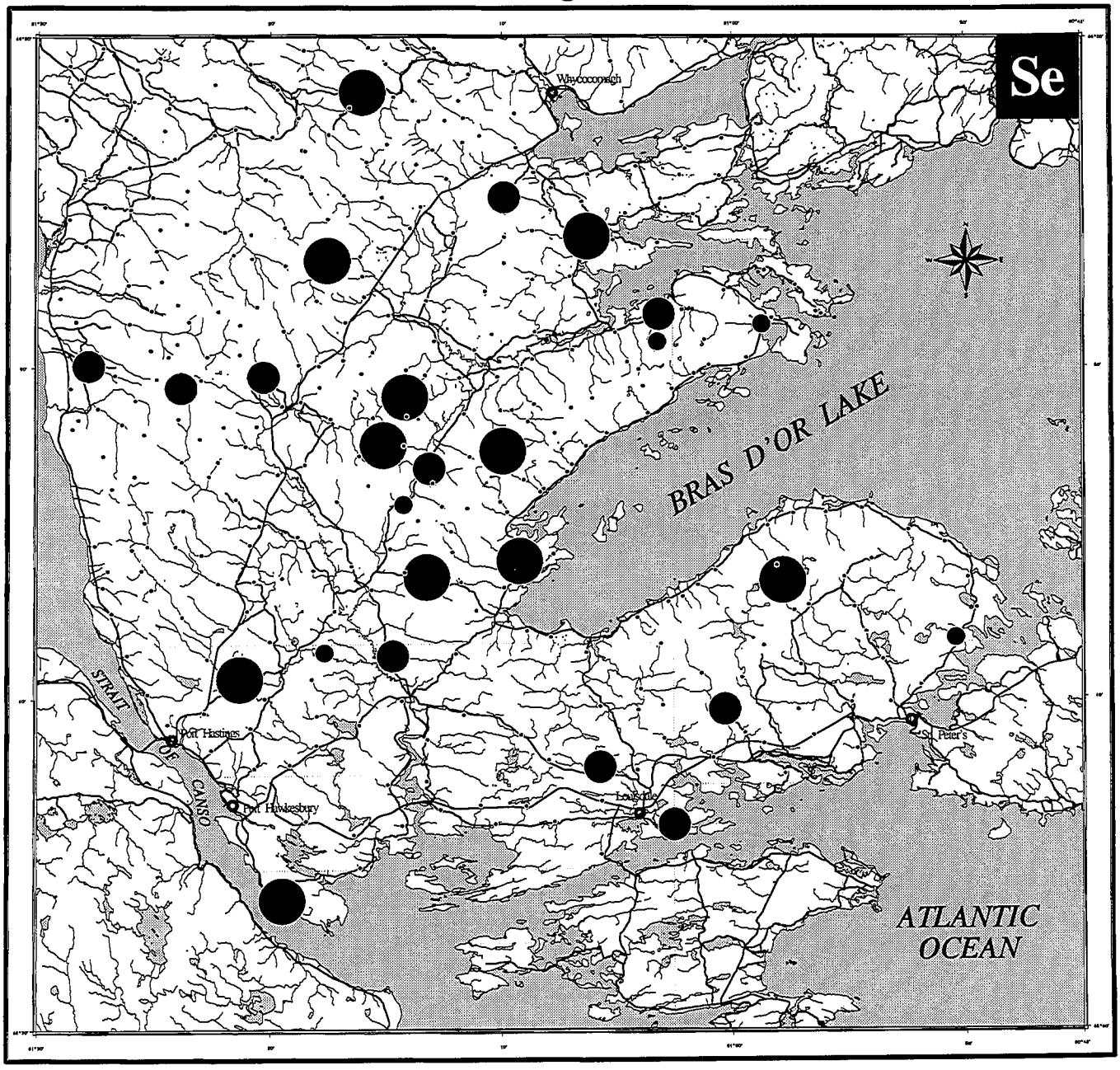
INAA

ppm Sc	Percentile
5.3	Maximum
3.7	98
2.6	95
1.9	90
1.1	75
0.7	50
0.2	Minimum

365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



SELENIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
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Canada | Province of Nova Scotia

INAA

ppm	Se	Percentile
7	●	Maximum
4	●	98
3	●	95
<2	·	90
<2	·	75
<2	·	50
<2	·	Minimum

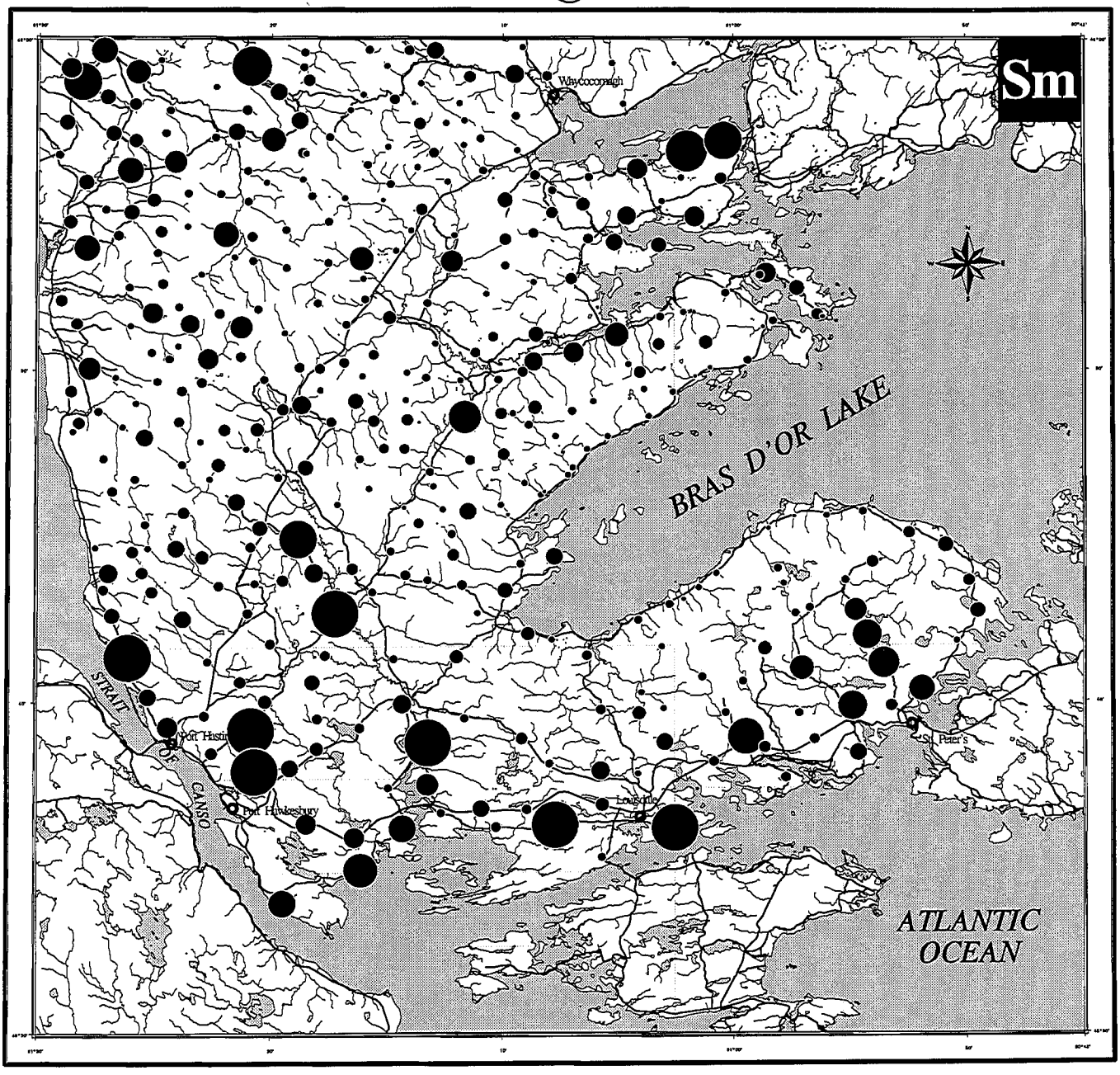
365 Samples
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



SAMARIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

INAA

ppm Sm	Percentile
4.6	Maximum
2.5	98
1.5	95
1.0	90
0.6	75
0.4	50
<0.1	Minimum

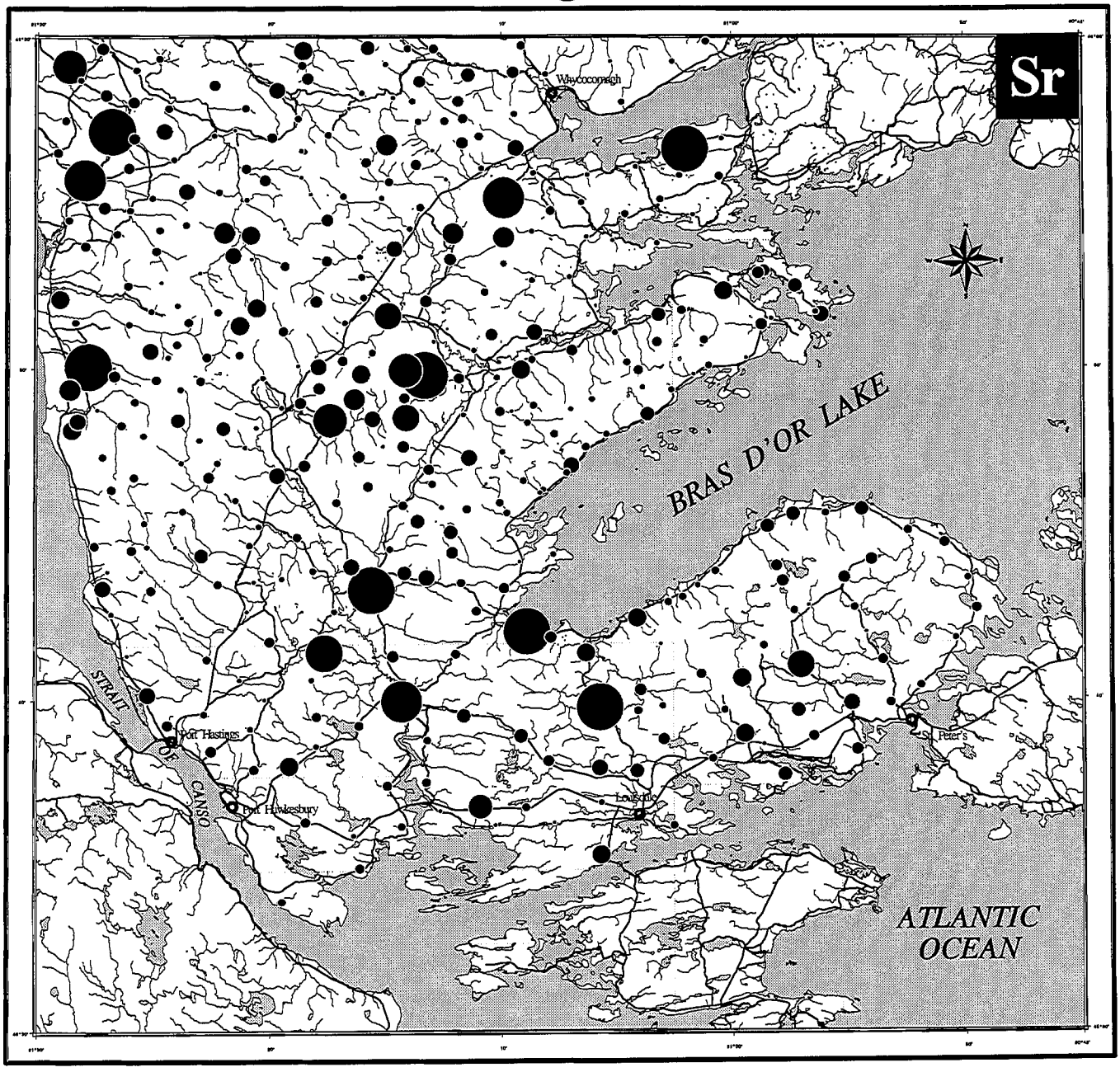
365 Samples

Exponent = 1

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



STRONTIUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

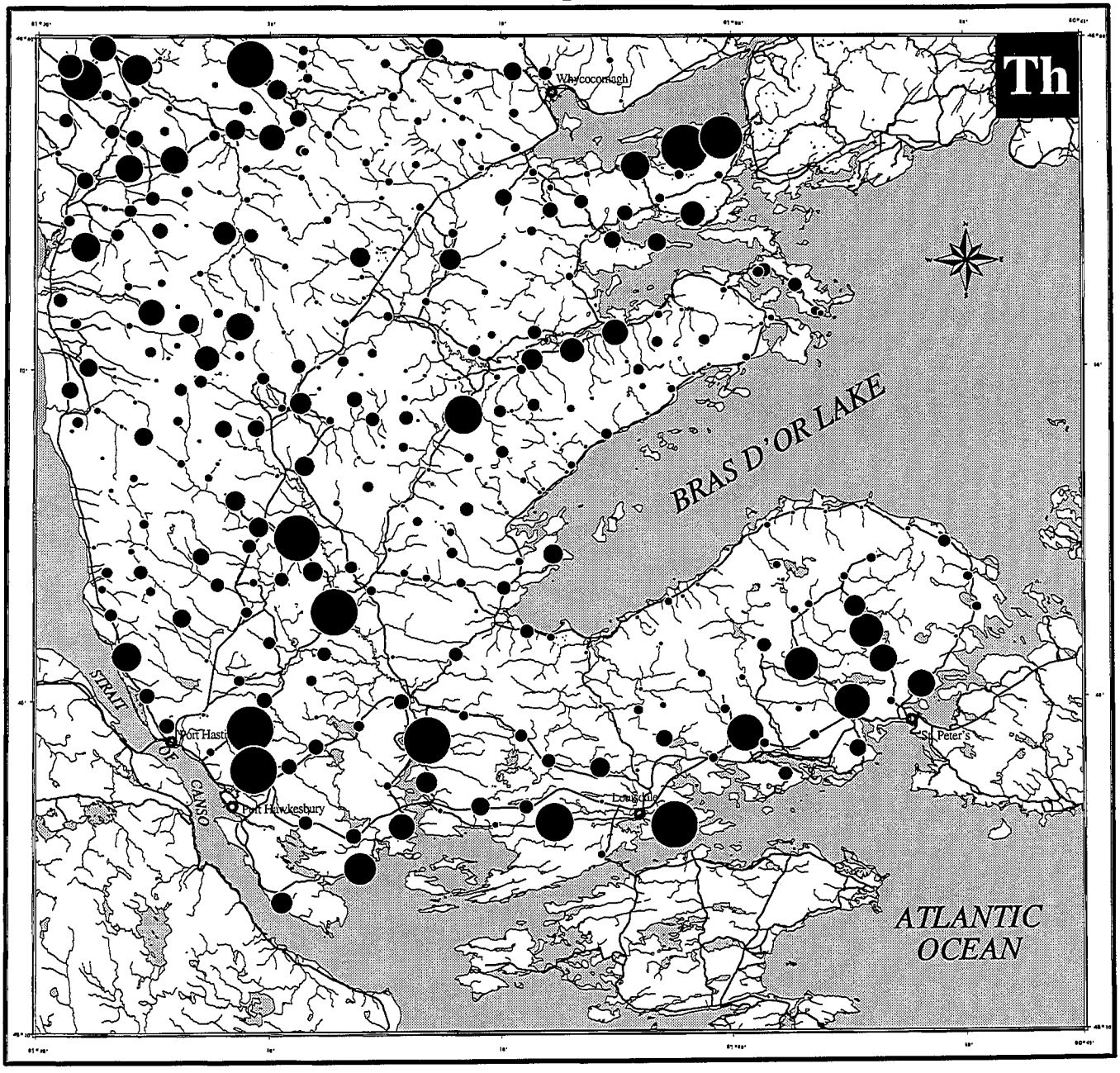
INAA

ppm	Sr	Percentile
5800	●	Maximum
2136	●	98
1470	●	95
1300	●	90
1000	●	75
780	●	50
<300	·	Minimum

365 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



THORIUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

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Canada | Province of Nova Scotia

INAA

ppm Th	Percentile
4.7	Maximum
2.9	98
1.8	95
1.2	90
0.7	75
0.3	50
<0.1	Minimum

365 Samples

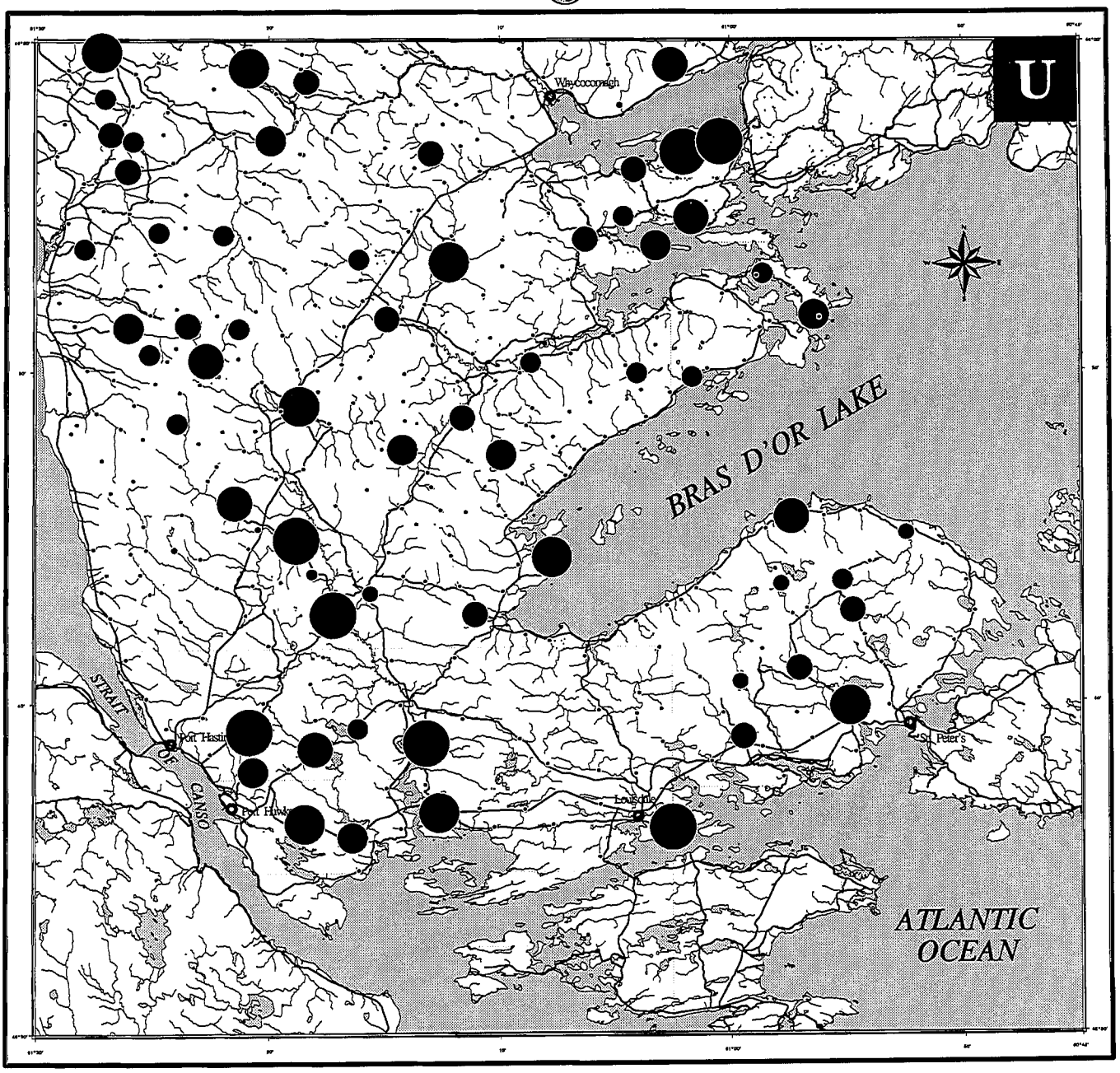
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



URANIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
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Canada
Province of Nova Scotia

INAA

ppm U		Percentile
1.6	●	Maximum
0.9	●	98
0.7	●	95
0.5	●	90
<0.1	·	75
<0.1	·	50
<0.1	·	Minimum

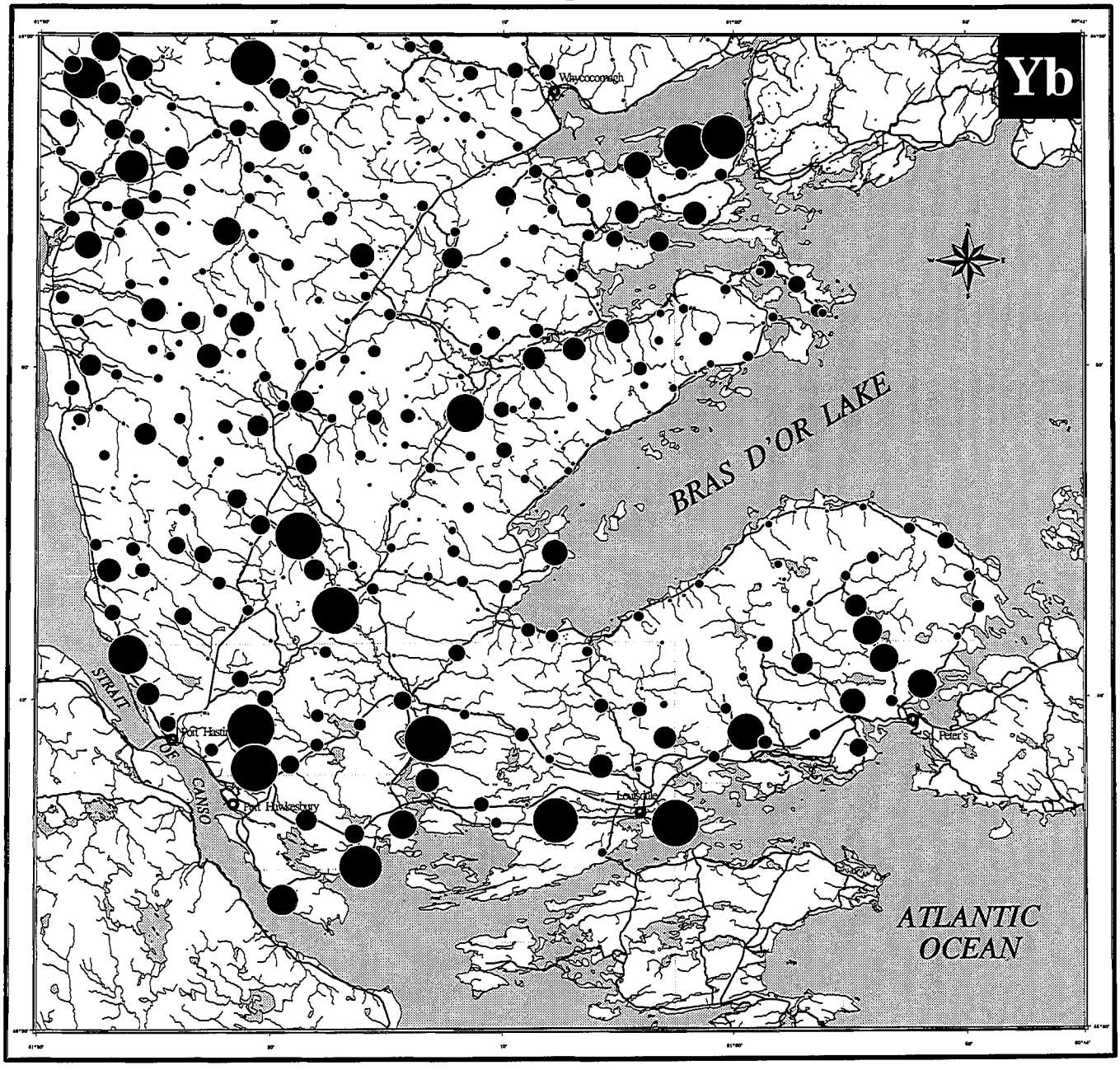
365 Samples
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



YTTERBIUM

in

Balsam Fir Twigs

COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

INAA

ppm Yb	Percentile
2.28	Maximum
1.32	98
0.83	95
0.62	90
0.37	75
0.22	50
<0.05	Minimum

365 Samples

Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

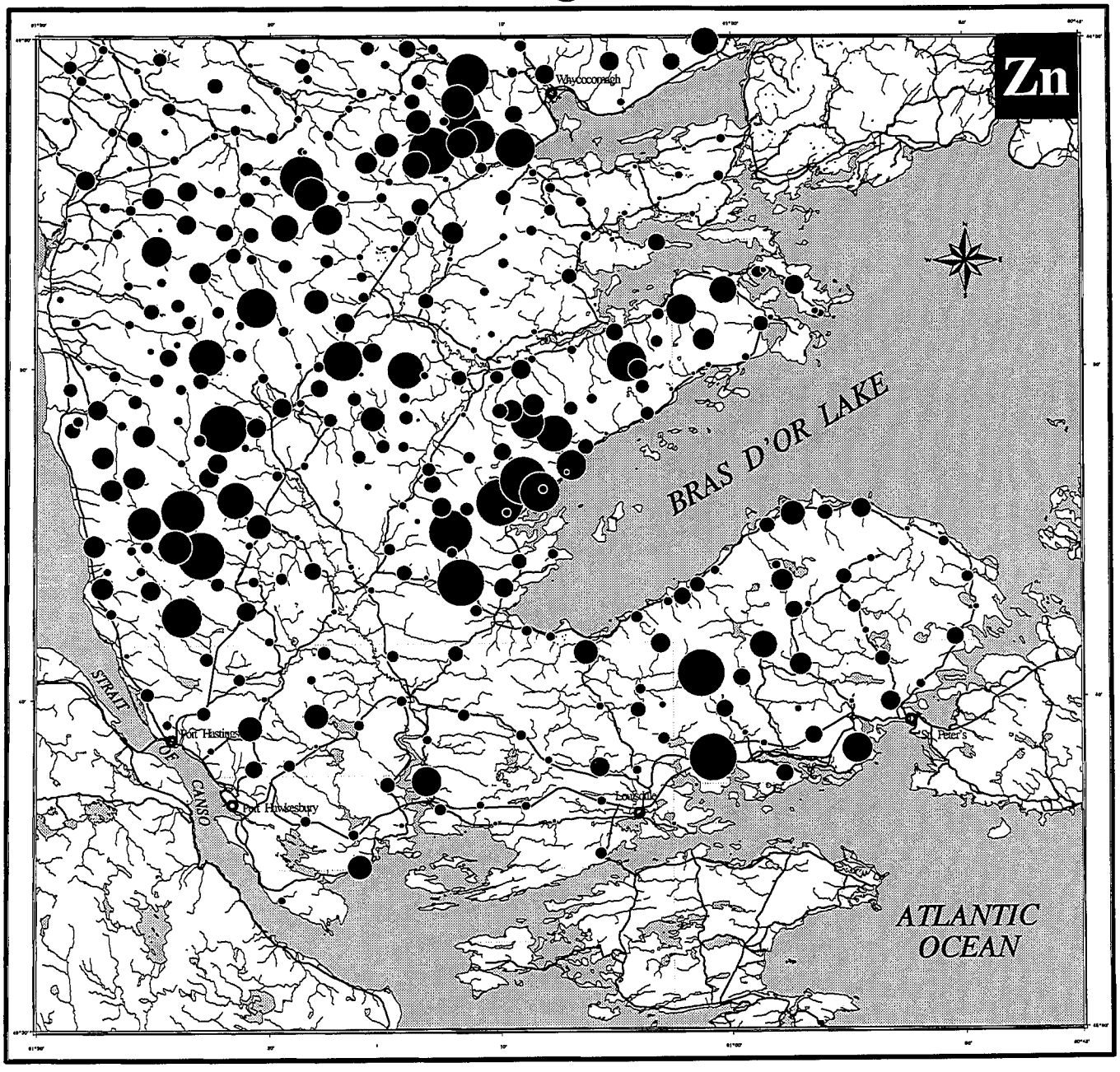
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

ZINC

in

Balsam Fir Twigs

INAA

ppm Zn	Percentile
4200	Maximum
3200	98
2970	95
2640	90
2200	75
1900	50
960	Minimum

365 Samples

Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

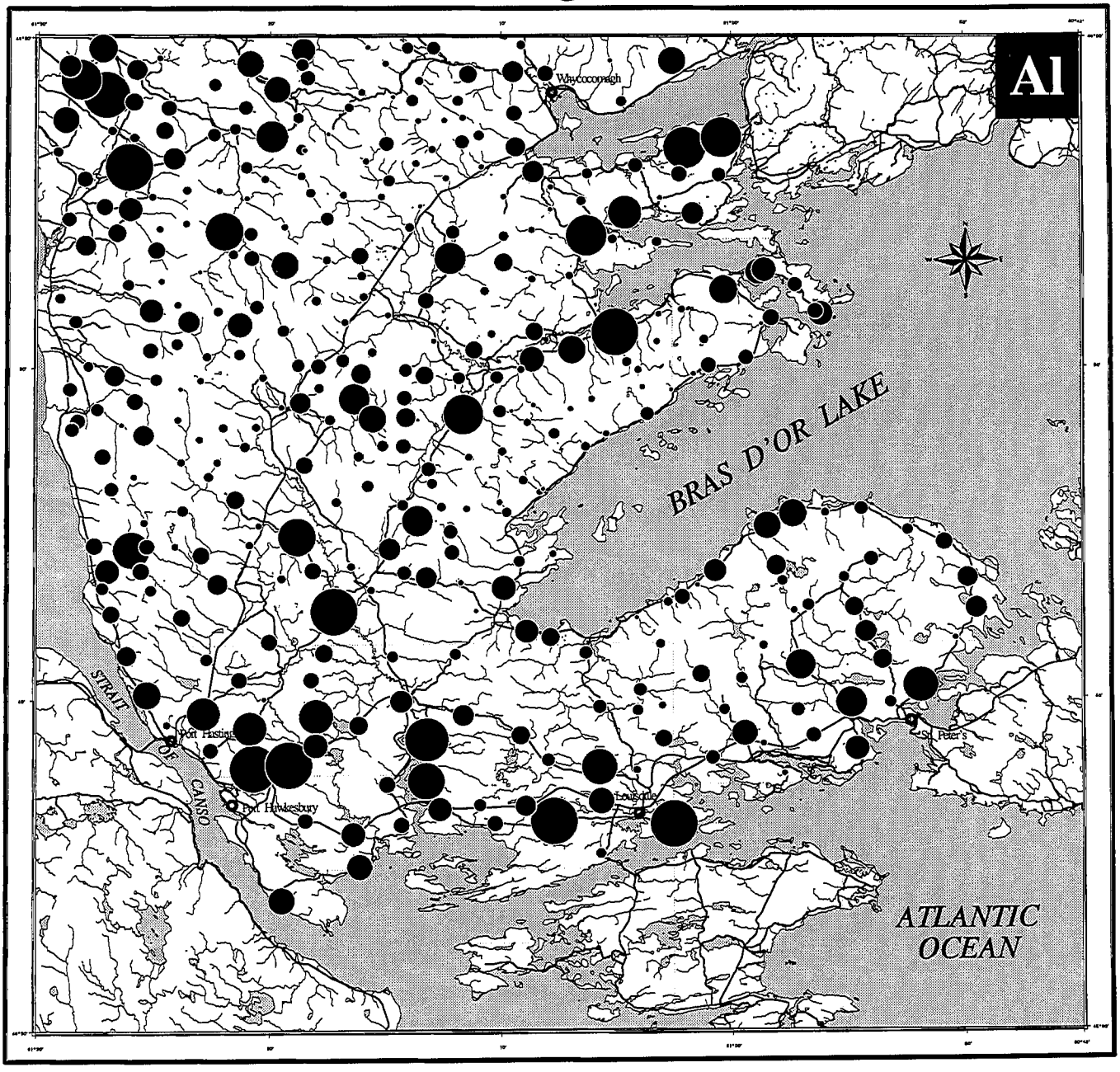
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

ALUMINUM

in

Balsam Fir Twigs

ICP-ES

pct	Al	Percentile
1.43	●	Maximum
1.10	●	98
0.96	●	95
0.83	●	90
0.67	●	75
0.53	●	50
0.07	·	Minimum

358 Samples

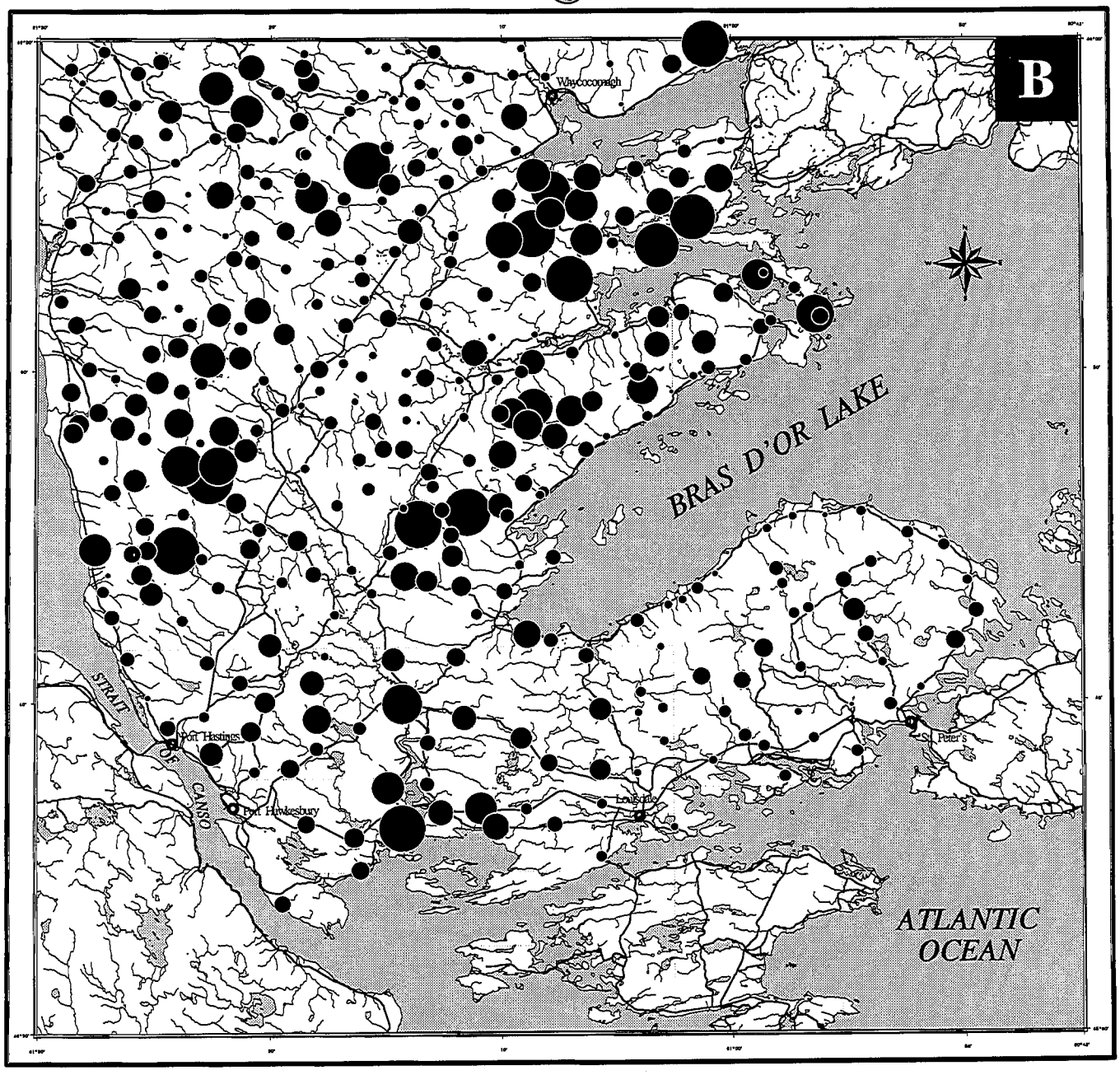
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



BORON

in

Balsam Fir Twigs

ICP-ES

ppm	B	Percentile
445	●	Maximum
389	●	98
358	●	95
330	●	90
294	●	75
262	●	50
142	·	Minimum

358 Samples
Exponent = 2

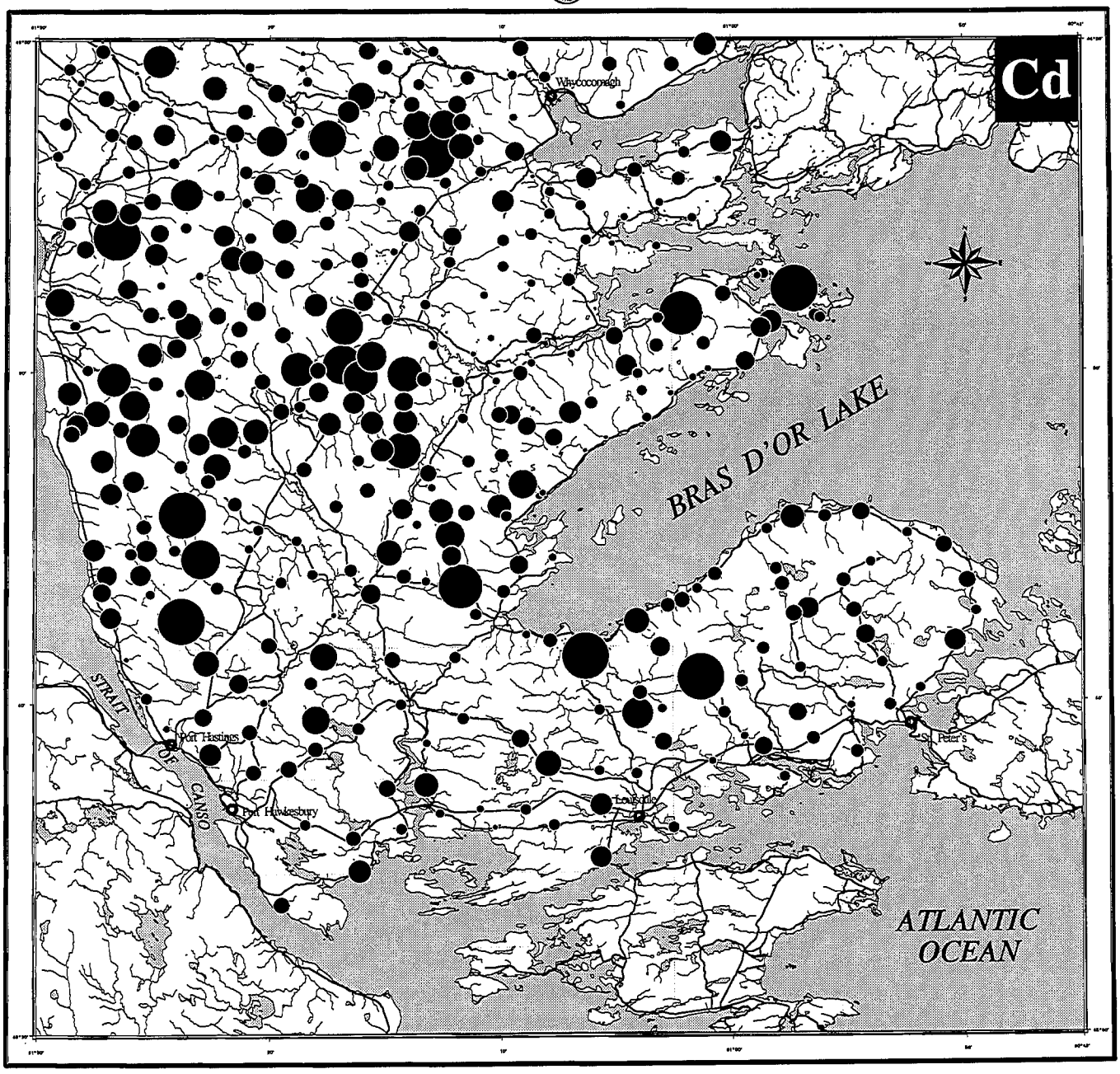
COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



CADMIUM

in

Balsam Fir Twigs

ICP-ES

ppm Cd	Percentile
52.5	Maximum
30.4	98
21.1	95
17.0	90
13.0	75
8.7	50
1.7	Minimum

358 Samples

Exponent = 1

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

Scale 1:350 000 - Échelle 1/350 000

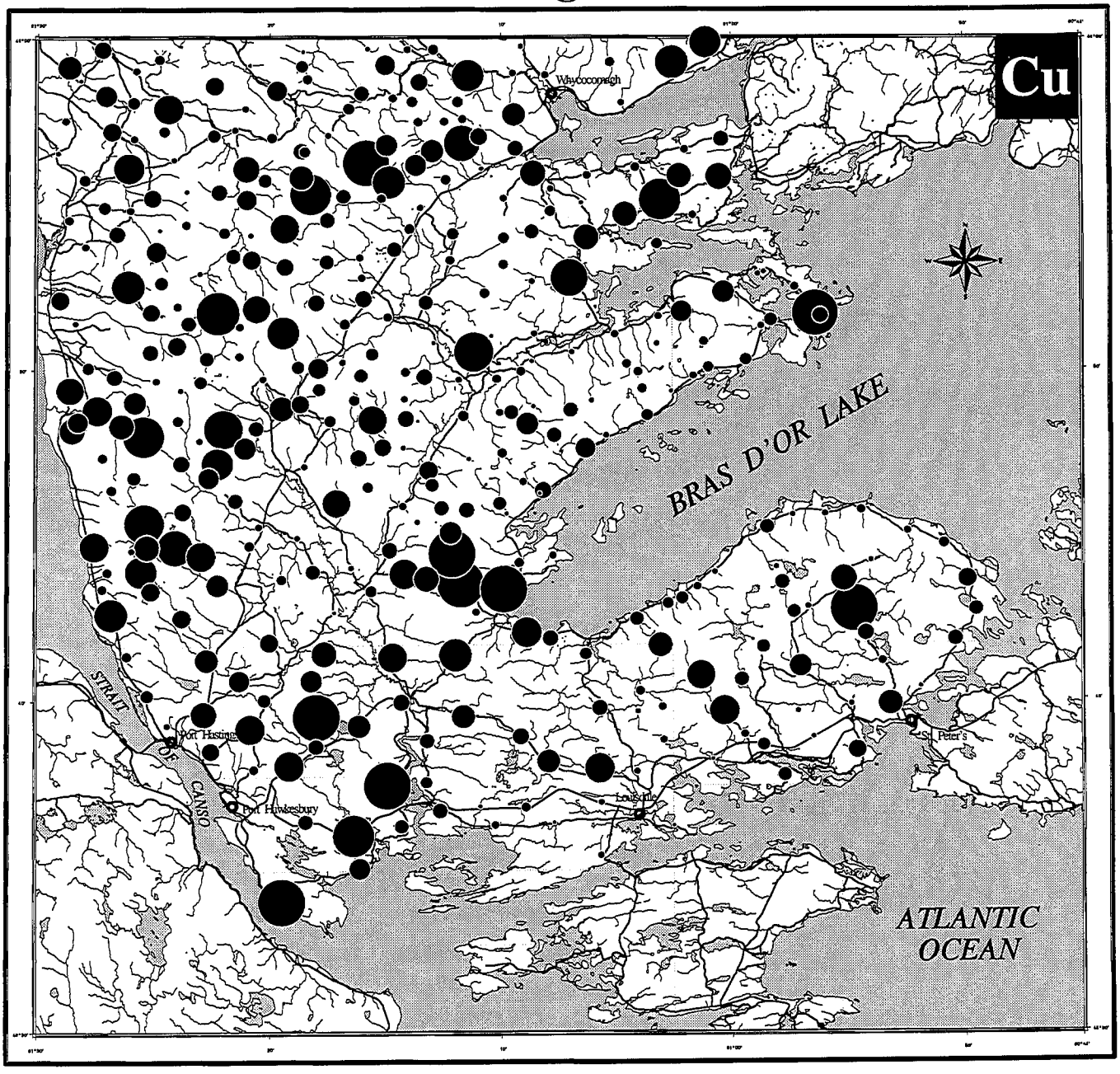
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

COPPER

in

Balsam Fir Twigs

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

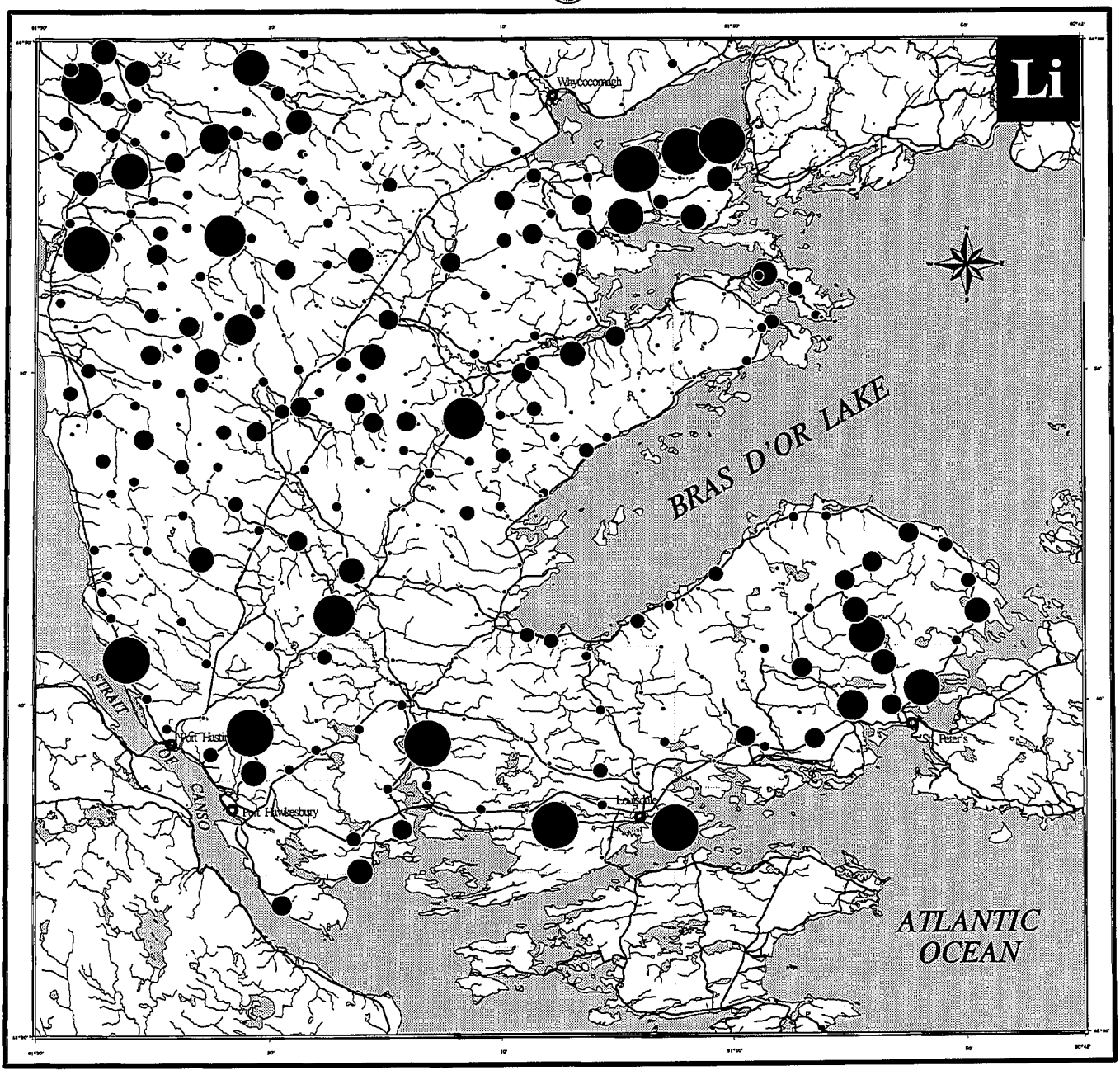
ICP-ES

ppm	Cu	Percentile
244		Maximum
211		98
197		95
185		90
167		75
148		50
99		Minimum

358 Samples

Exponent = 2

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

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Canada | Province of Nova Scotia

LITHIUM

in

Balsam Fir Twigs

ICP-ES

ppm Li	Percentile
15	Maximum
9	98
7	95
5	90
3	75
2	50
<2	Minimum

358 Samples

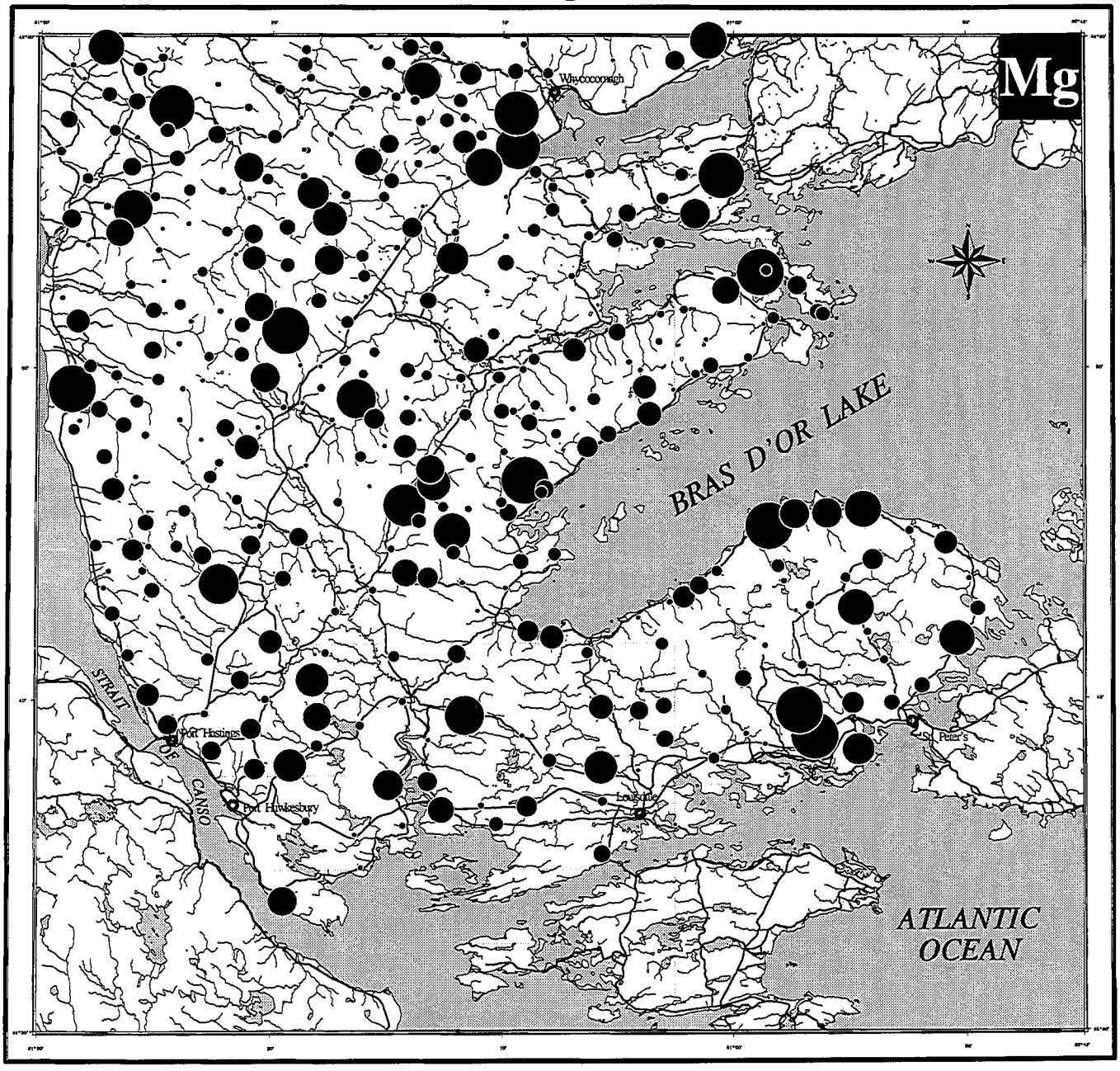
Exponent = 1

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



MAGNESIUM

in

Balsam Fir Twigs

COOPERATION

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Canada | Province of Nova Scotia

ICP-ES

pct	Mg	Percentile
4.84	●	Maximum
3.68	●	98
3.47	●	95
3.29	●	90
2.93	●	75
2.63	●	50
1.28	·	Minimum

358 Samples

Exponent = 3

Scale 1:350 000 - Échelle 1/350 000

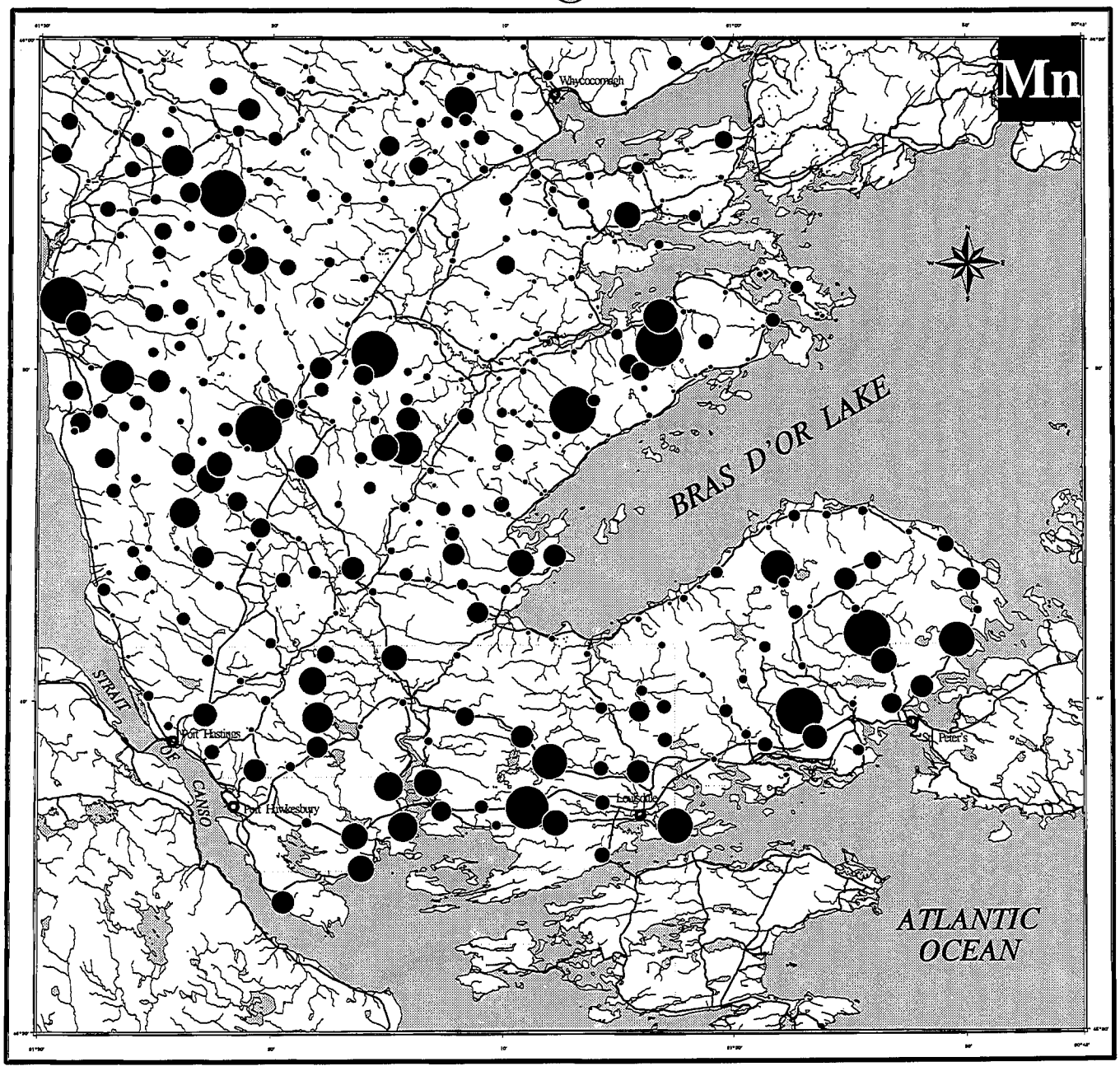
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

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Canada | Province of Nova Scotia

MANGANESE

in

Balsam Fir Twigs

ICP-ES

ppm Mn	Percentile
84622	Maximum
55736	98
44952	95
39417	90
29952	75
20759	50
1407	Minimum

358 Samples

Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

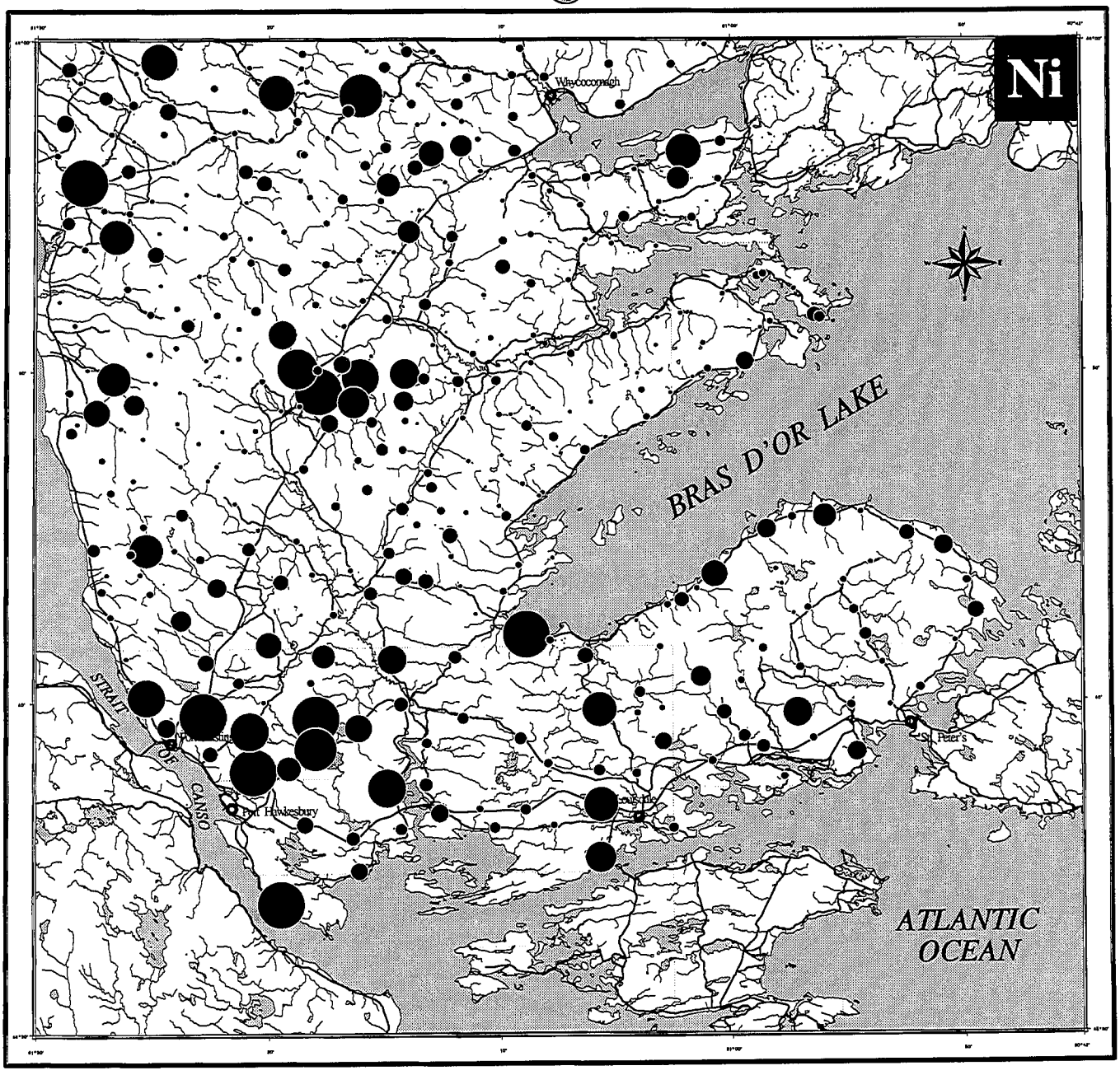
Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

Canada



COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT / ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

NICKEL

in

Balsam Fir Twigs

ICP-ES

ppm Ni	Percentile
142	Maximum
83	98
71	95
58	90
41	75
29	50
7	Minimum

358 Samples

Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada

GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

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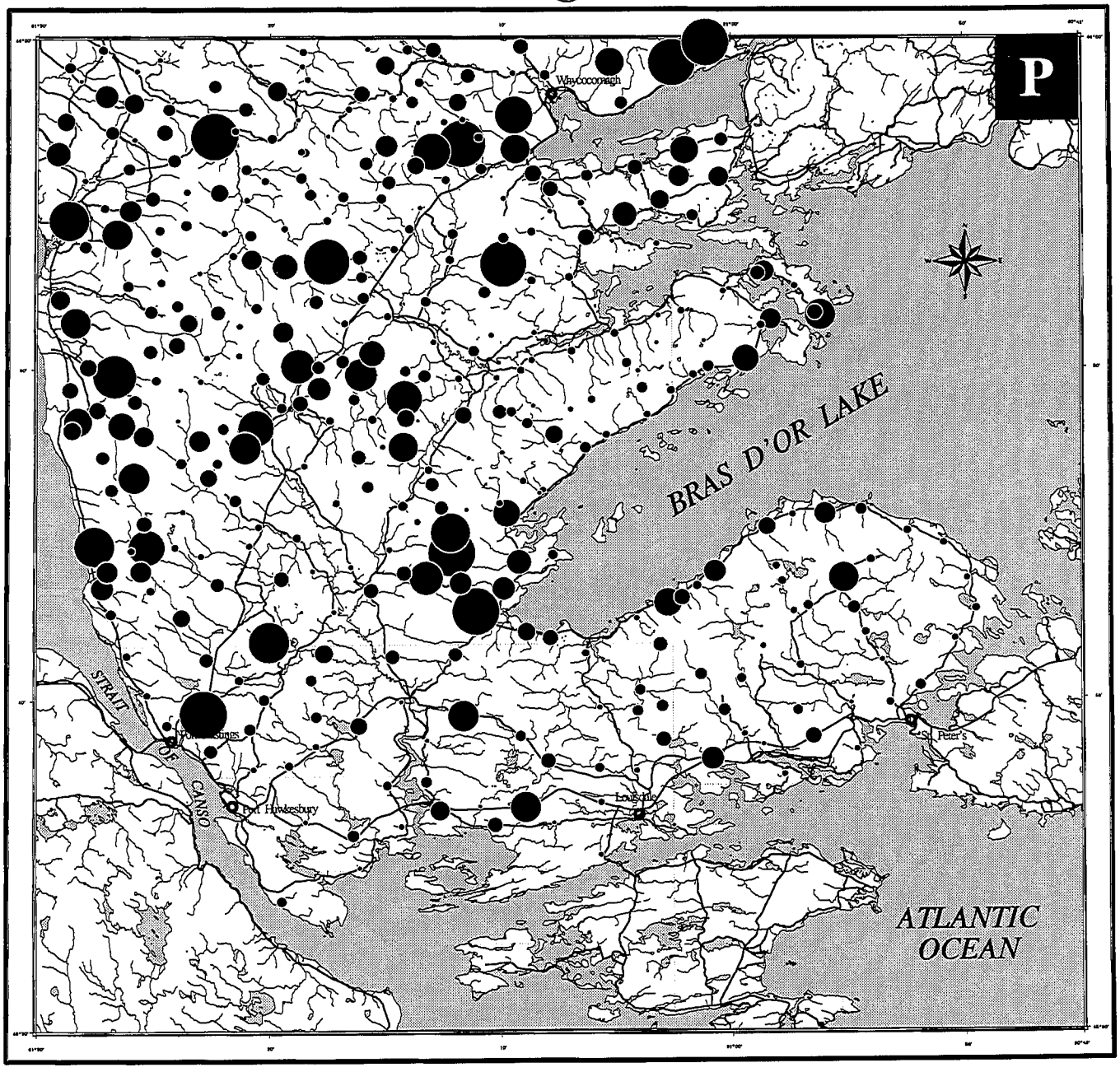


COOPERATION

COOPERATION AGREEMENT ON MINERAL DEVELOPMENT

ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE

Canada | Province of Nova Scotia

PHOSPHORUS

in

Balsam Fir Twigs

ICP-ES

pct	P	Percentile
4.55	●	Maximum
4.01	●	98
3.59	●	95
3.27	●	90
2.64	●	75
2.24	●	50
1.11	●	Minimum

358 Samples

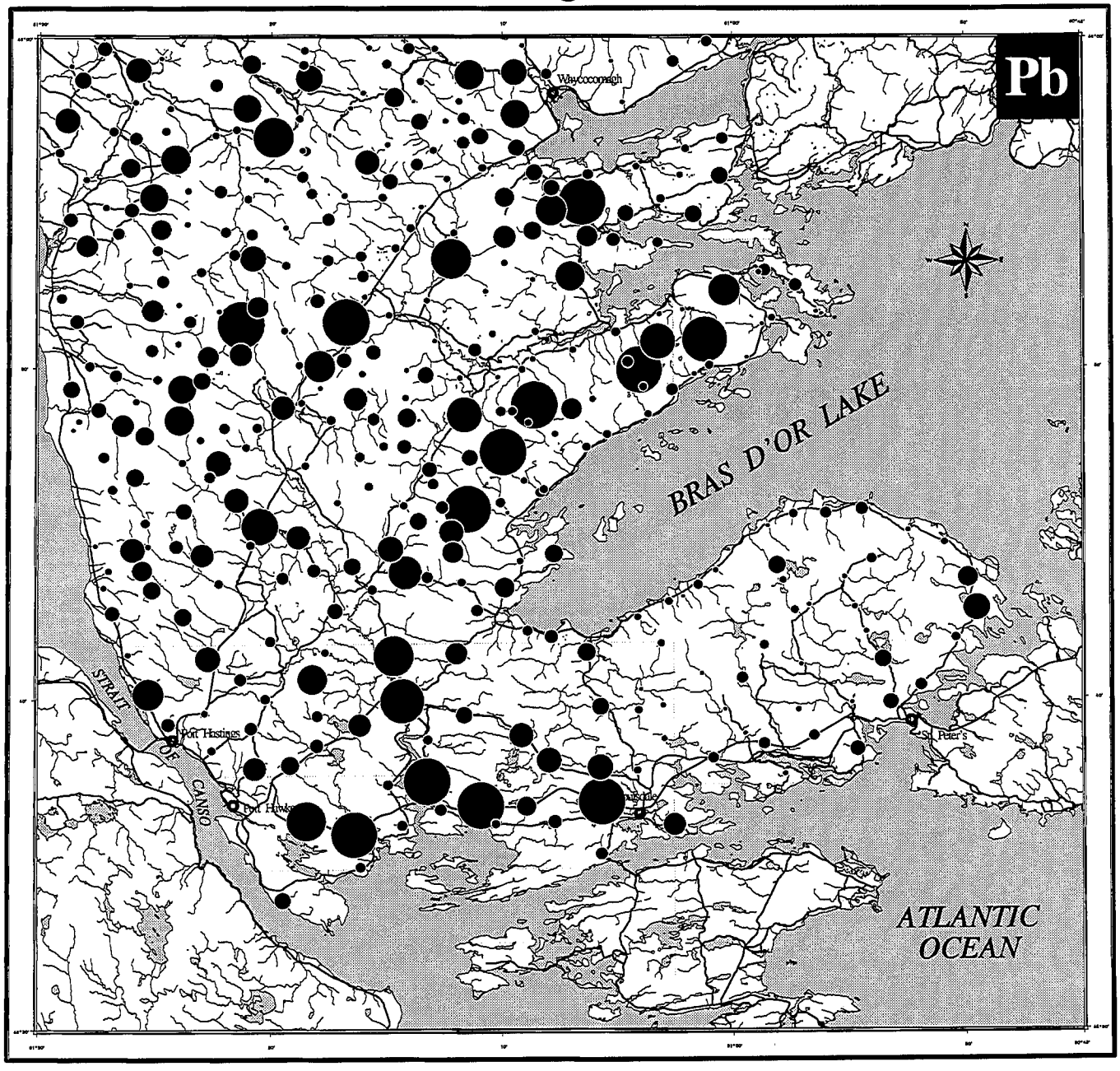
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada
Province of Nova Scotia

LEAD

in

Balsam Fir Twigs

ICP-ES

ppm Pb	Percentile
124	Maximum
101	98
90	95
77	90
62	75
48	50
14	Minimum

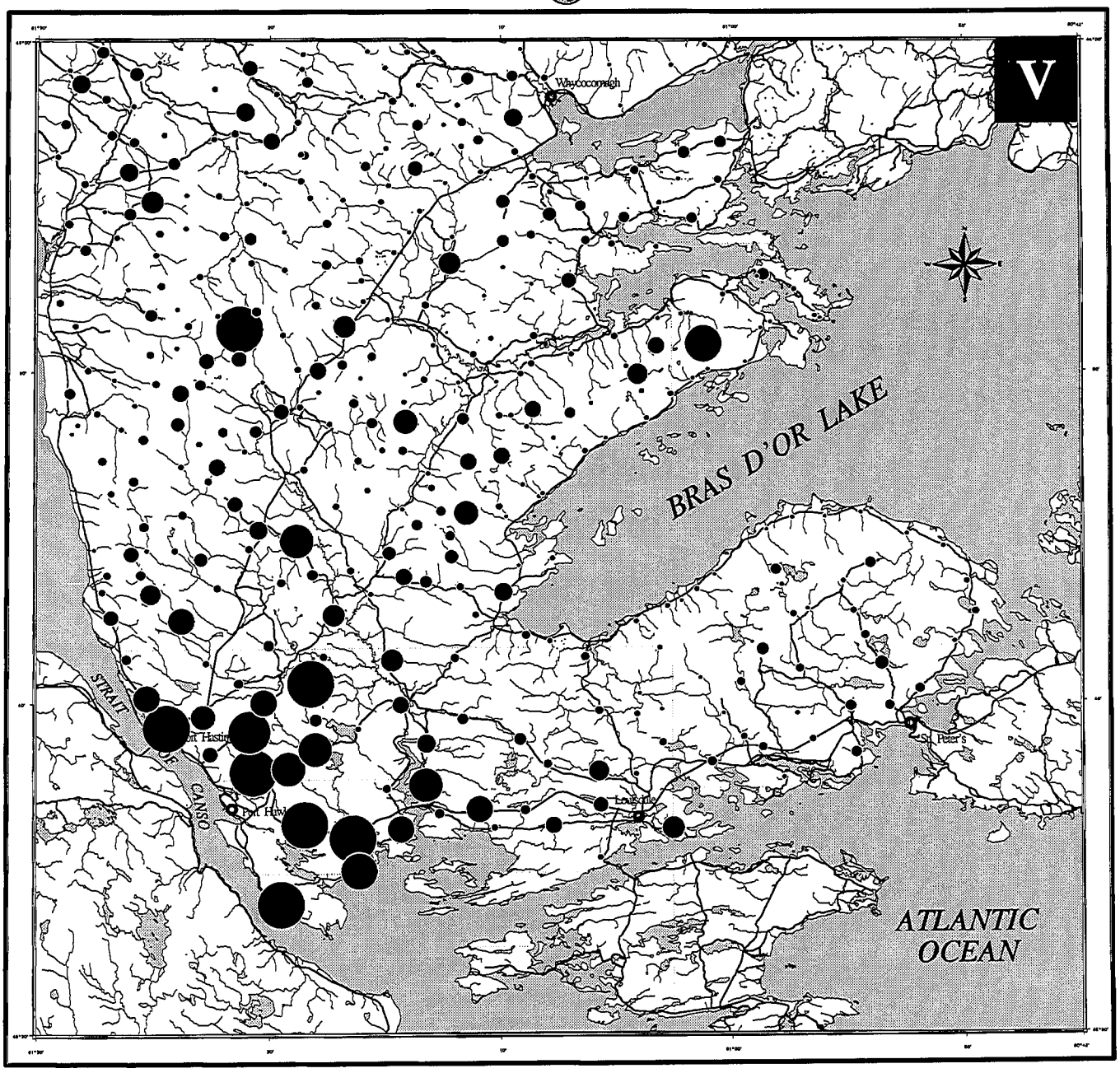
358 Samples
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20

Natural Resources Canada | Ressources naturelles Canada
GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA
Canada



VANADIUM

in

Balsam Fir Twigs

COOPERATION
COOPERATION AGREEMENT ON MINERAL DEVELOPMENT
ENTENTE DE COOPÉRATION SUR L'EXPLOITATION MINÉRALE
Canada | Province of Nova Scotia

ICP-ES

ppm	V	Percentile
125	●	Maximum
29	●	98
21	●	95
17	●	90
12	•	75
8	•	50
1	·	Minimum

358 Samples
Exponent = 2

Scale 1:350 000 - Échelle 1/350 000

Kilometres 5 0 5 10 15 20 25 30 Kilomètres

UTM Zone 20