

Report no.: 2000.080		ISSN 0800-3416	Grading: Open
Title: Gold resources on Ringvassøy, Western Troms-IV: Regional geochemistry of B- and C-horizon of till.			
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County: Troms		Commune: Tromsø, Karlsøy	
Map-sheet name (M=1:250.000) Helgøy and Tromsø		Map-sheet no. and -name (M=1:50.000) 1534-1 Reinøya, 1534-4 Ringvassøya, 1535-2 Helgøya, 1535-3 Rebbenøya	
Deposit name and grid-reference:		Number of pages: 78	Price (NOK): 450
		Map enclosures: 0	=20+(39*10)+1(79-39)
Fieldwork carried out: 01-16.09.1998	Date of report: 01.08.2001	Project no.: 274200	Person responsible:
<p>Summary:</p> <p>This report establishes a link between the various methods employed in geochemical prospecting for gold in the lithologic and topographic regimes present on Ringvassøy; these methods are also used elsewhere in Norway.</p> <p>Samples of the C-horizon from 203 locations in 5 transects across the Ringvassøy Greenstone Belt, and of the B-horizon from 70 of the same sites, were analyzed for Au and 34 other elements. Comparing the results of the B- and C-horizons shows that there is little difference in the geographical distribution between these horizons. The B- and C-samples have a good success rate locating known outcrops of Au ore and of base metal sulfides.</p> <p>The regional scale mapping conducted by NGU over the last decades succeeds in locating the large scale gold anomalies indicated by the sub-regional and detailed investigations carried out by prospecting companies. A sub-regional approach using B- and C-horizon samples at regular intervals along transects is less successful with reproducing the findings of the detailed study. But this approach unveils anomalies that the sub-regional stream sediment survey did not point out. This was partly because of the lack of streams, but there were also anomalies in the transect soil sampling that were not present in the nearby stream sediments.</p>			
Keywords: Geochemistry	C-horizon	B-horizon	
Gold	Till		

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## **APPENDIX**

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Appendix 2            2p  
Plot of analytical results for field duplicates.  
Listing of analytical results for field duplicates.

Appendix 3            9 p  
Bar diagrams depicting analytical result of B- and C-horizon samples along four transects for Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sr, Te, Th, Ti, Tl, U, V, W, and Zn.

Appendix 4            4 p  
Listing of analytical results for B- and C-horizon samples

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Listing of analytical results for all C-horizon samples

Appendix 6            36p  
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## 1. INTRODUCTION

The island of Ringvassøy has long caught the interest of prospectors and miners, for the last 30 years with the focus mainly on gold. The island covers around 650 km<sup>2</sup>, and is situated a short distance north of Tromsø, on the northern coast of Troms county, Northern Norway. It is also widely known for its rich grouse population, but from the soil geochemist's point of view, the hunting's contribution of lead to the soil over the years is more a "nugget" problem than anything else.

Following the more than 130 years of mining and prospecting, a large number of data sets are available for the island of Ringvassøy. The Geological Survey of Norway (NGU) has seen a need for compiling the most important data to aid the understanding of gold occurrence in this area. Partial financial support for this activity was provided by Troms County through the County Geologist.

Sandstad and Nilsson (1998) report in great detail the universities' and prospecting companies' activities since the 1970's, as well as bedrock and mineral resource mapping carried out by NGU in the period 1973 - 1994. Conclusions of the mentioned investigations are brought forward, and the report also contains observations from the authors' field visit in August 1997 and analytical results of 44 bedrock/ore samples collected at that time.

In addition, a regional geochemical survey covering Nordland and Troms counties in 1986 covered the island with 14 sampling sites (Ekremsæter, 1988, and Kjeldsen and Ottesen, 1988). Samples of stream sediments and of C-horizon of till were analysed for gold (and a score of other elements). The eight samples taken within the area of Ringvassøy that has been most intensively prospected, show the following enrichment:

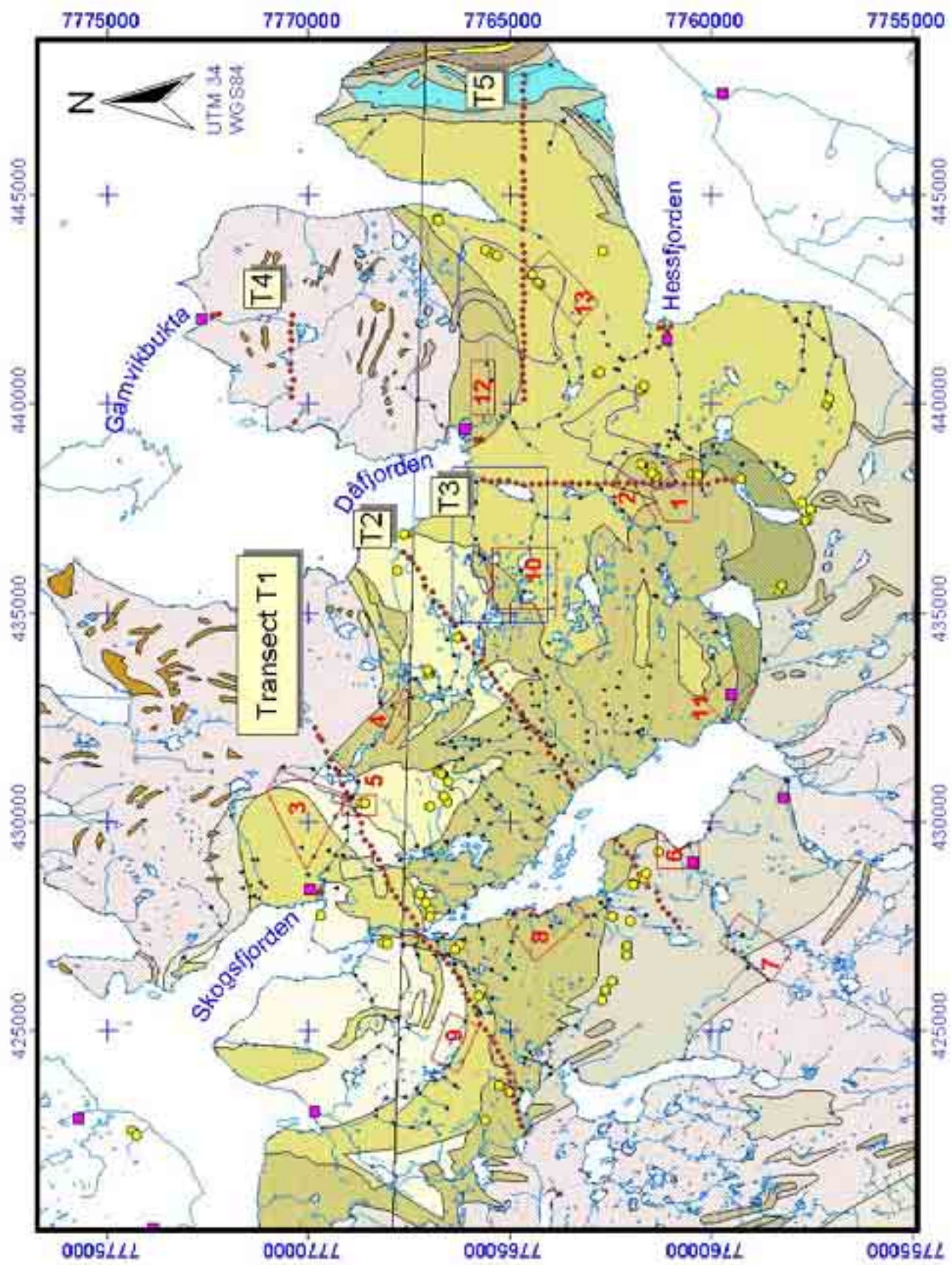
Sample medium	Till regional study		Stream sediment regional study		NGU Ore database
	Nordland/Troms	Ringvassøy	Nordland/Troms	Ringvassøy	Tromsø + Karlsøy
N	1047	8	1298	8	123
Max	163	54	187	10.4	37371
Min	1	1	0	2.6	-
Avg	4	21	3.97	4.61	584
Median	1	17	2.7	3.8	32

**Table 1.** Descriptive statistics of Au in till and stream sediments from Nordland/Troms regional study, the subset Ringvassøy, and of ore samples from Tromsø and Karlsøy municipalities.

Figure 1 shows Northern Ringvassøy, its lithology and location of various prospecting activities. The prospecting companies (ASPRO/Sulfidmalm and Follidal Verk AS/Amoco Norway) obtained a high number of anomalies in a 300 km<sup>2</sup> stream sediment survey, and from their detailed investigations by means of soil sampling and heavy mineral concentration of soil. NGU's regional mapping also shows an obvious enrichment of gold on the island. However, knowledge on how the results of the methods correlate was not available, and to improve interpretation of both the local data sets of Ringvassøy as well as the regional data sets, a geochemical mapping project was designed. Initially a sampling grid of 1x1 km was planned for most of the Northern part of Ringvassøy, covering approximately 350 km<sup>2</sup>. Due to financial limitations, the project had to reduce field and/or analytical cost. It was not

considered feasible to reduce on sampling density, and a reduction of the investigated area would not give results bringing together all the detailed prospectors' results. A compromise was denser sampling along transects crossing the Ringvassøy Greenstone Belt (RGB), in addition to some samples to verify the four highest gold values of the regional study. The transects were laid out roughly by Peter Ihlen, NGU, whereas the details were determined by the local conditions, the location of earlier prospecting areas, and by financial restrictions.

Figure 1. Overview map of northern Ringvassøy. *(next page)*



## 2. METHODS

### 2.1 Fieldwork

Sample sites were planned along five transects of varying length, crossing the RGB and passing some of the interesting anomalies found by the prospecting companies. Sampling interval was set to 200 m along the transects, and about 200 sites were planned. Chartering a local boat speeded up access to the sites on the SW side of Skogsfjordvatn. Obtaining evenly distributed locations, only 200 m apart, along (straight line) transects called for good quality real time navigation. A differential GPS signal radio (Garmin GBR 21) was employed together with an ordinary handheld GPS unit (Garmin 12CX). This set-up significantly decreased time spent on navigation, particularly during the 3-4 days when sea fog reduced visibility to 10 m. The radio beacon is located at the Torsvåg lighthouse, Vannøya, some 30 km north of Ringvassøy. Using a DGPS system greatly reduced positioning error compared to ordinary GPS, as the "noise" imposed by Pentagon (SA) was not lifted from the GPS satellite signals in 1998. The planned transects were plotted on maps prior to the fieldwork, and used to check progress in the field. Øystein Jæger and Tor Erik Finne, NGU, carried out fieldwork during the period 01-16.09.2001. Travelling by pick-up truck and on foot, the average number of sample sites visited per field day was 17.

Upon arrival at the sampling site, a hole was dug using a paint free steel spade, usually to a depth of about 35 cm, rarely deeper than 60 cm, where the C-horizon of the usually well-developed podzol soil was encountered. Picking out pebbles, a sample of about 4 dl was taken from the C-horizon and stored in white plastic containers. None of the field workers wore any jewellery during the field period. From a number of sites, a sample of the B-horizon was also collected. Furthermore, from every 10<sup>th</sup> site a duplicate sample was collected, some 20 m away from the regular sample. Upon storing coordinates in the GPS, they were also read from the GPS display and noted on the field observation card, together with observed thickness of humus, thickness of bleached layer and depth to the top of C-horizon.

### 2.2 Sample preparation and analysis.

At NGU, the samples were left to dry in the original sample container, only taking off the lid, and checking that sample numbering was legible. Drying temperature was below 40 °C. After drying, the samples were split and sieved on nylon sieves to obtain a minimum of 25 g sample <0.06 mm. Weight of split and fine fraction was recorded, thereby giving a rough indication of the samples' grain size. The fine fraction was wrapped in mini-grip plastic bags, whereas the coarse fraction of the split was discarded. Before shipping the samples to ACME Analytical Laboratories in Vancouver, they were put in random order together with small sample sets from other investigations. Sample numbering after randomisation was 10303 – 10603 inclusive; a total of 329 samples derived as follows:

Type	Number
C-horizon, regular samples	203
C-horizon, field duplicates	19
B-horizon regular samples	68
B-horizon, field duplicates	3

C-horizon from Reisa, 1998	9
Samples for reanalysis, sampled 1997	10
Overbank sediments from Ethiopia	17
SUM	329

ACME performed an Aqua Regia extraction on of 20 g of sample material, and analysed the samples for 33 elements by ICP-AES and *Ultrasonic ICP*, by graphite furnace AAS (Au only), and by cold vapor AAS (Hg only). Elements determined and their detection limits are given below in ppm unless otherwise stated:

Al	Ag	As	Au	B	Ba	Bi	Ca	Cd	Co	Cr	Cu
100	30ppb	0,5	0,2ppb	3	1	0,1	100	10ppb	1	1	0,2
0	25.8	0.3	5.4	55	0	82	0	10	0	0	0
Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb
100	0,5	10ppb	100	1	100	2	0,1	100	1	10	0,3
0	0	7.2	0.3	0.3	0	0	2	3.7	0	0	0
Sb	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn	Element
0,2	0,4	1	0,2	2	100	0,2	4	1	2	1	Det.Lim.
37.8	8.9	0	80.5	57.3	0	75.6	66.8	0	88.8	0	%age<DL

**Table 2.** Elements determined in the samples of B- and C-horizon from Ringvassøy, the detection limits, and proportion of samples reported below detection limit

A number of samples contained element concentrations that were reported below the determination limit (DL) for the analytical method. For a number of elements, all samples were above DL, but for Bi, Te, and Tl, more than 75% of the samples analyzed were reported below DL. Details are given in Table 2. In order to provide numbers for further processing, all results reported below DL were replaced by a value equal to 0.5\*DL for the element in question.

The analytical results were linked with sample information to yield data sets for evaluation of data quality, comparison of the two sampled horizons, as well as for producing maps. Data on 375 stream sediment samples collected in 1982 by Follidal Verk AS throughout the RGB (Krause, 1983) was compiled from paper maps of scale 1:50,000 into an electronic map with approximate coordinates (only for Au and Ag).



### 3. RESULTS

The transects are numbered T1 – T5, and have their defined starting point at the Southernmost or Westernmost end. Location of the transects, sample sites of the 1986 survey, location of samples from the ore database at NGU, stream sediment sites and detailed mapping areas of Follidal Verk are all shown in Figure 1 together with geographic place names.

#### 3.1 Data quality.

No standard sample was included with this analytical batch. However, the laboratory routinely analyses and reports its own standard, in this case named STANDARD DS2/C3/AU-S. The results 10 analyses of this standard, evenly distributed throughout the analytical batch are shown in Appendix 1. According to this, all elements determined have acceptable values for the standard sample throughout the batch, with the exception of K, Cd, and U, that all have one reading slightly out of bounds. The inclusion of this standard sample material is part of the quality control implemented by the laboratory, and results not meeting the quality criteria most likely would trigger a re-make in the lab, rather than being reported to the customer.

Field duplicates are considered the best measure of describing the reproducibility of a geochemical map. Field duplicates of the C-horizon were collected from 19 sample sites with approximately 20m between the two sample pits in a pair. The analytical results of these pairs are given in the listing of Appendix 2, as well as a matrix of scatterplots in the same Appendix. As there were only 3 duplicate pairs of the B-horizon samples, these were not given any special treatment.

The scatterplots of field duplicates for the 35 elements show that only a few of the elements have a very good reproducibility. With only 19 pairs of field duplicates, using a simple correlation coefficient ( $r$ ) (Table 3) as a measure of reproducibility in this case is not recommendable, as small variations in distribution pattern can bring up large differences in the calculated coefficient. To illustrate this; consider the scatterplots for Cr and Ti, and their corresponding  $r$ 's; .78 and .56. Judging from the plots, these two elements would score about the same on reproducibility, Ti perhaps even slightly better. But the calculated  $r$  says otherwise. The scatterplots show better than any other presentation form how the chances are that a high value really is high, and how often the detection limit of the laboratory has been set too low for this type of sample material (as when a number of sample pairs show values below detection limit and values way above, even extremely high values). The elements behaving like this are Ag, B, Bi, Te, (and W, that lacks variation along the duplicate axis). The plot for Au also has a couple of points on the detection limit, and for all these elements, one should keep this in mind when reading the maps and interpretations given later on.

Ag	Al	As	Au	B	Ba	Bi	Ca	Cd	Co	Cr	Cu
-0.24	0.65	0.63	0.00	-0.03	0.70	-0.07	0.82	-0.13	0.51	0.78	-0.06
Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb
0.66	0.72	0.14	0.61	-0.01	0.75	0.71	0.88	0.76	0.13	0.13	0.74
Sb	Se	Sr	Te	Th	Ti	Tl	U	V	W	Zn	
0.91	-0.13	0.91	-0.03	0.98	0.56	0.15	-0.32	0.63	-	0.76	

**Table 3.** Correlation coefficients ( $r$ ) of the 19 pairs of field duplicates.

### 3.2 B- horizon vs. C-horizon

Comparison of the results for the two soil horizons is presented primarily as an array of scatterplots in Figure 2, much like that for the field duplicates. Details on how the levels vary along the transects are also seen in the maps, but due to the scale, two variable plots are difficult to read clearly where the sampling intervals are so. As an aid, the bar diagrams of Appendix 3 give the concentrations for B- and C-horizon samples from the four transects where the B-horizon was also sampled. Results for the C-horizon are colored grey, and results for the B-horizon are colored brown. The transect positions are shown in Figure 1. From the bottom up, the diagrams show transect 1-4, and the direction along the X-axis is from SW to NE (transect 1 and 2), from S to N (transect 3) and from W to E (transect 4). Software limitations does not allow for positioning legible bars correctly according to sample sites' distance along the transect. Please recall that B-horizon samples were not collected from all sites along a transect, and that transect 2 is interrupted by the lake Skogsfjordvatnet. A listing of the B and C results is given in Appendix 4.

### 3.3 C-horizon

Twelve of the samples were collected close to four the sample sites of the regional study of 1986 as a follow-up. Results of these are plotted on the maps, but are also shown in Figure 5 together with the results of the old study. From left to right in the diagram, they are located at Gamvikbukta in the North; at Hessfjorden in the East; at Skogsfjorden in the West; and at Dåfjord in the center.

All results from the C-horizon samples are presented in table format in Appendix 5, and as proportional symbol maps in Appendix 6. However, the first page in Appendix 6 is a map of sample site numbers. The maps also show the features of the most up-to-date digital bedrock map based on the scale 1:250,000. As this information is gathered from the two map sheets Helgøy (Grogan and Zwaan, 1997) and Tromsø (Zwaan et al., 1998), a certain discrepancy is present along the map sheet border. No attempt is made here to join the rock units of the two adjacent maps, but to ensure better readability, the legend is somewhat changed in as much as the same raster is chosen for the rock units that continue across the map limits. The bedrock map is only used as a lithological backdrop, and to increase the readability of the point maps. The legend of the point maps are devised by the ArcView default method "natural breaks", that pays attention to the mapped variable's frequency distribution when assigning upper limits of the groups associated with the map symbols. The maps furthermore include the scatterplot of the field duplicates to assist in evaluating the map. The maps for silver (Ag) and for gold (Au) also show the results of the stream sediment survey conducted by Folldal Verk, and the gold map also shows the values for Au in the C-horizon from the regional study of 1986.

## 4. DISCUSSION

In the following, reference is made to geographic place names that can be found on the map in Figure 1. The transects are numbered T1 to T5, and have their defined starting point at the southernmost or westernmost end. Ihlen and Furuhaug (2001) comment on typical chemistry of bedrock present in the area, and no effort is made here to duplicate this. Surficial deposits in the area are mainly derived from the last glaciation period, and consist mostly of till of varying thickness. The transport distance and direction from the source rock vary, but the maps for Cu, Fe, and V suggest that there has been very little transport because these elements show a sharp and continuing change of concentration when entering into the tonalitic gneiss.

### 4.1 Data quality

The scatterplots of Appendix 2 give an impression that data have varying quality. Nevertheless, all elements analyzed have been included in the following, but particularly for Ag, B, Ni, Se, and Te the quality is either poor or not documented by the present set of duplicates.

### 4.2 C-horizon and stream sediments

It is important to point out that the absolute figures for gold concentrations in the B- and C-horizons of this study are not directly comparable to those for the stream sediments of Folldal Verk. The natural processes governing the dispersion and the grain sizes collected for analysis are different. Most likely are the extraction and analytical procedure different as well (not stated by Krause).

It is assumed that stream sediments reflect the chemistry of soils upstream; but only that of the active sediment sources as long as recent sediments are sampled. A high correlation between gold in soil samples and single point stream sediment anomalies is not to be expected due to the problem of nuggets. The Folldal Verk stream sediment data, however, exhibit a number of multi-point gold anomalies. Unfortunately, only few of these are in the vicinity of the transects sampled. The best correlation is seen at the start of Transect 1, T1, (its southwestern part), where moderate levels of Au in the streams are found close to the high(est) values of both the B- and C-horizons. Also at the follow-up by Skogsfjorden, both C-horizon and stream sediments have moderate to high levels, and the same goes for the follow-up at Dåfjorden. Also the stream sediment anomaly from the SE bay of Skogsfjordvatnet is matched by an anomalous sample of the 1986 survey, whereas this is not the case across the lake. The stream anomaly at Leirbogdalen is less than one km downstream of T1, but there is no elevation in gold of the B- or C-horizon. The moderate anomalies of T2's NE part are matched by moderate values for stream sediments. The soil C-horizon anomaly at the outlet of Skogsfjordvatnet has no stream sediment samples downstream.

All in all, there is a very good correlation between anomaly areas of these two methods. Krause (1983) states that four people carried out the fieldwork over a period of four weeks. Using stream sediment as a sampling medium is a widely used technique in prospecting. This

work shows that regular sampling of soil at a comparable sampling density yield comparable results, and is achieved at the approximate same input of man-hours. Soil sampling can also be employed where there are no streams available.

### **4.3 B-horizon vs. C-horizon**

Folldal Verk/Amoco used the precipitation layer of the soil profile as their sampling medium (Cuttle, 1983), and most of NGU's regional projects have used the C-horizon. A comparison of the two horizons' relative metal concentrations based on a large-scale survey is done through the Kola Ecogeochemistry project (Reimann et al, 1998). Median values for the Aqua Regia extracts for most of the elements of interest in gold prospecting, except for gold itself, are found in the Kola atlas. The concentration ratios of the B- and C-horizon samples from Ringvassøy agree well with the data from Kola; usually levels are higher in the C-horizon compared with the B-horizon, except for Fe, Mo, Pb, Se, Ti, and V (Figure 2). The Au concentrations are fairly similar in both soil horizons, but the gold values are usually somewhat higher in the C-horizon. Thus, the approach employed by most of NGU's regional geochemical mapping projects (emphasizing least possible influence by secondary dispersion in the samples of surficial deposits) yield results that are comparable with the results of the prospecting companies that emphasize reliable, but low-cost sampling procedures. The maps in Figure 3 and Figure 4 give a more precise indication of where the B-horizon has higher gold values than the C-horizon. Again, there is no evident clustering of the increased B/C ratio for gold, which leaves the two sampling medias quite comparable.

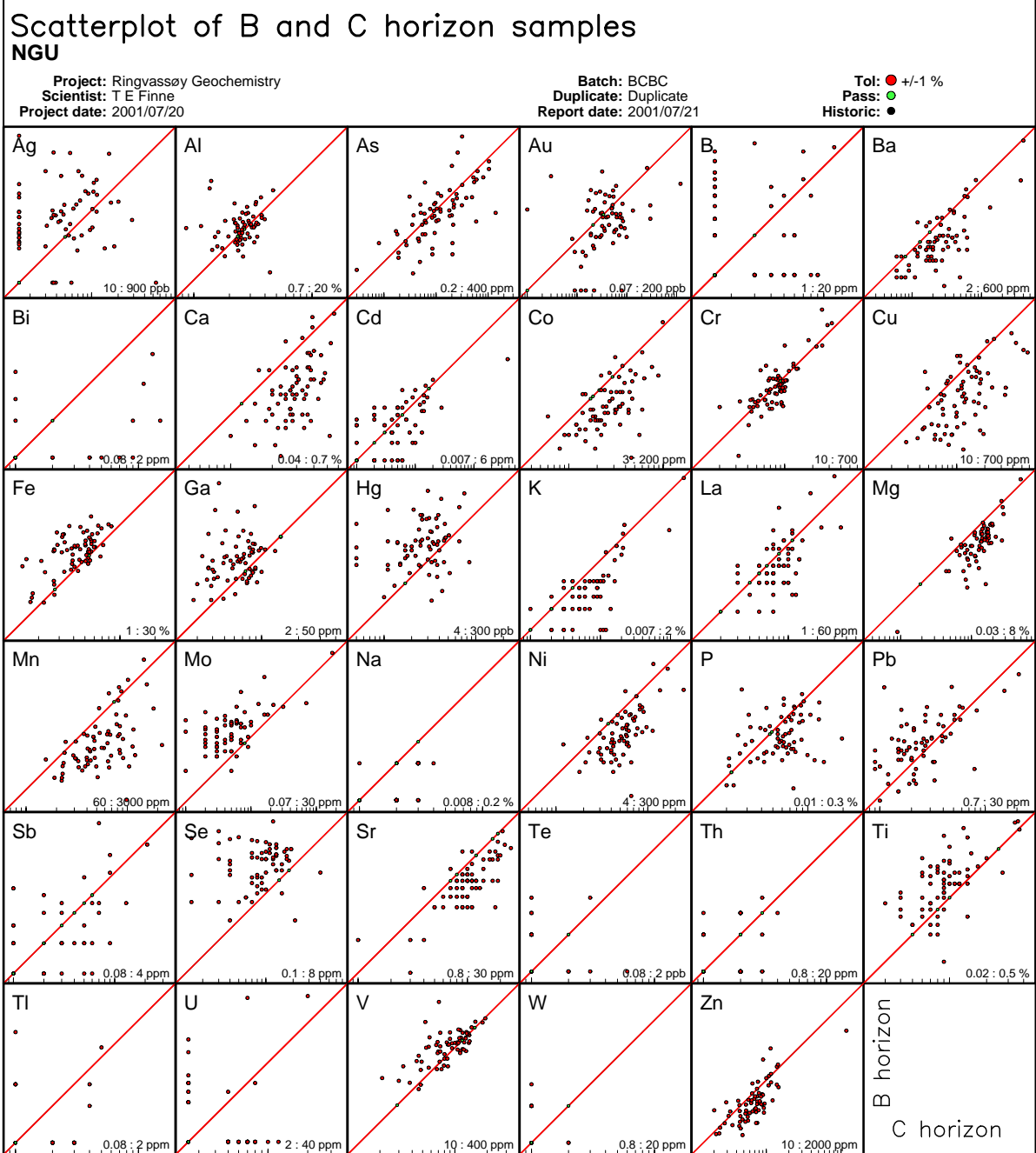


Figure 2. Scatterplot matrix of B- and C-horizon analyses for 35 elements.

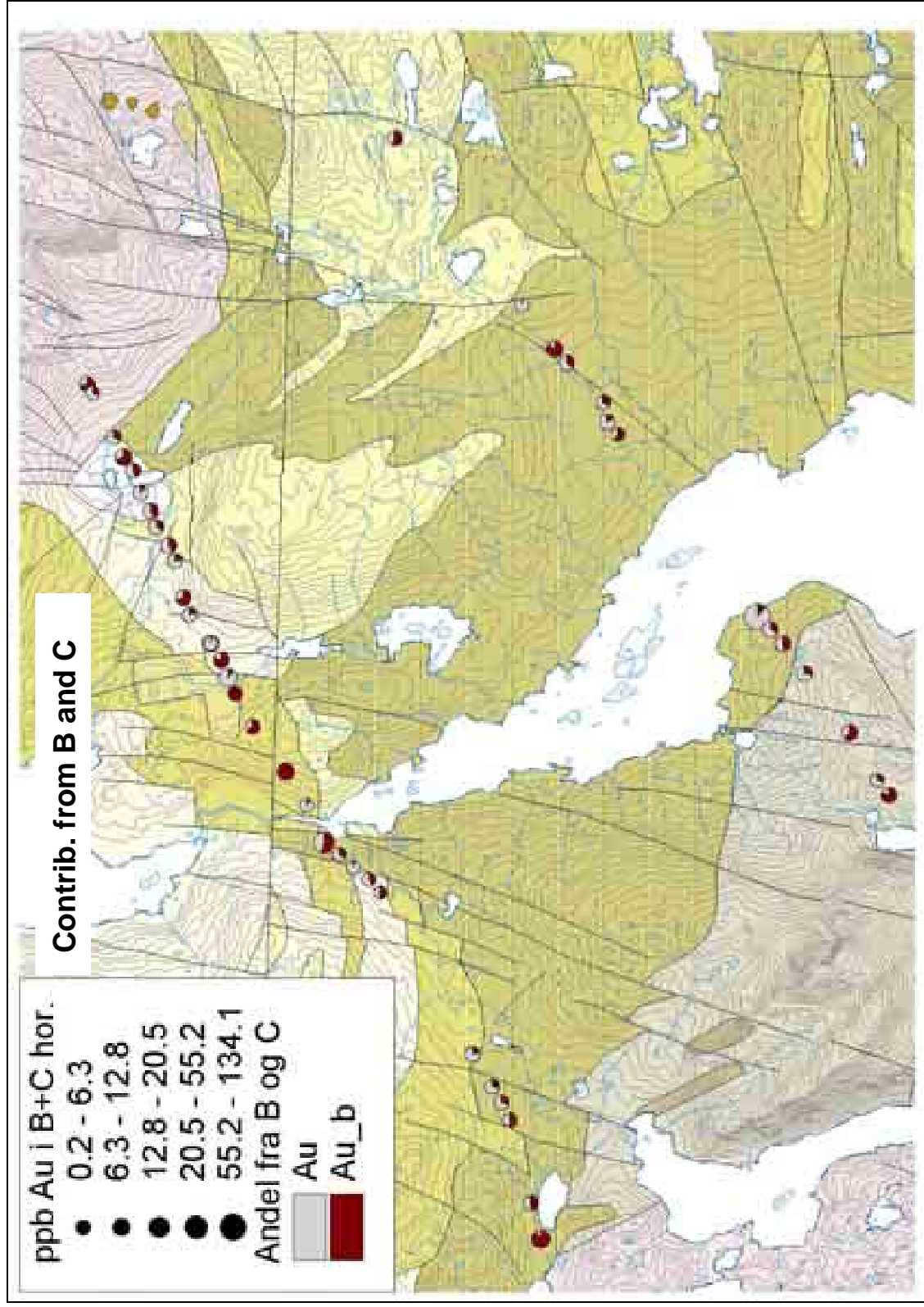


Figure 3. Relative proportion of Au in B- and C-horizon along transect T1 and T2.

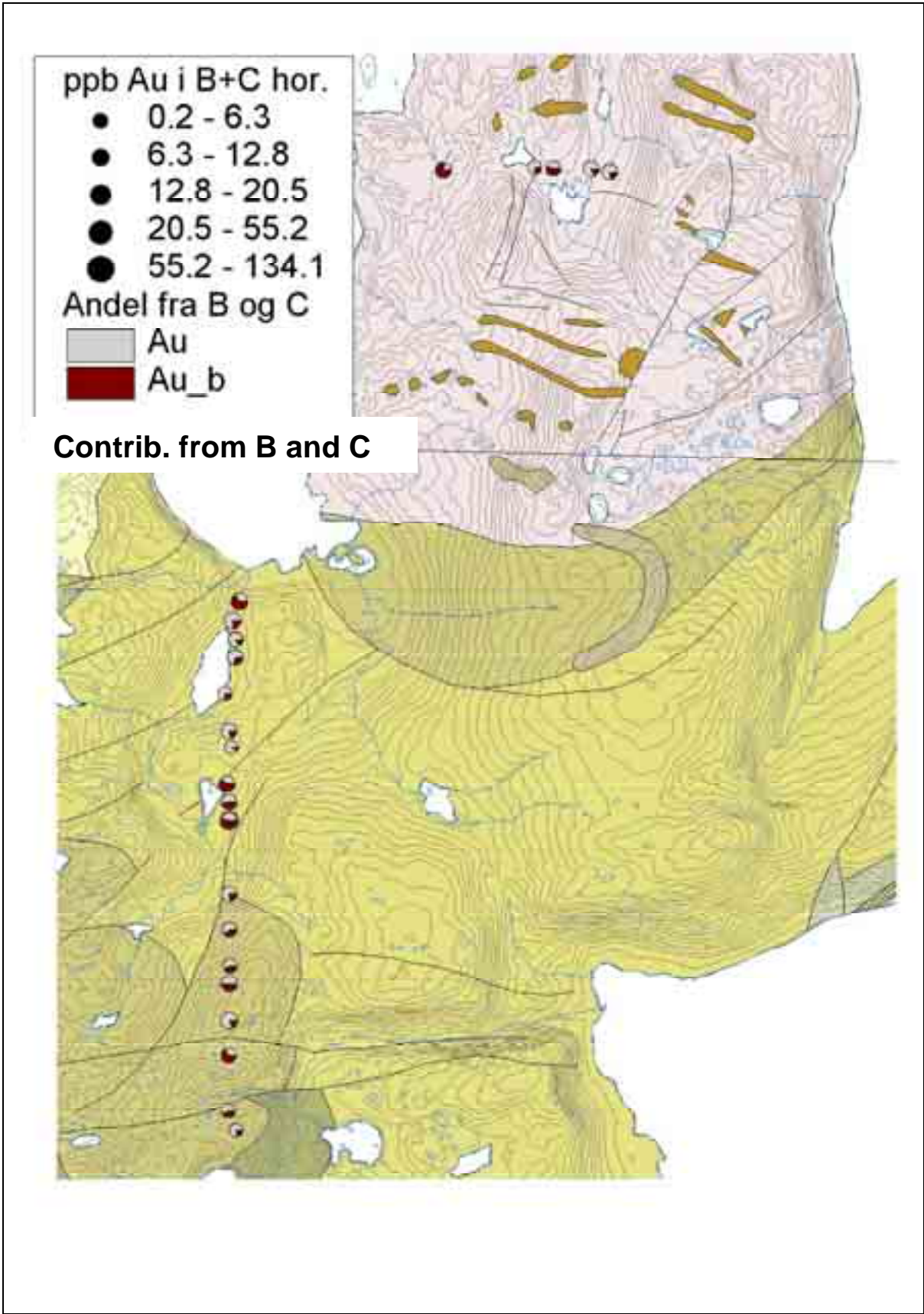


Figure 4. Relative proportion of Au in B- and C-horison along transect T3 and T4.

#### 4.4 C-horizon and old regional survey.

It was difficult to achieve precise positioning in the field for the four follow-up sites of the 1986 survey. The original locations of the old survey were transferred from maps with a scale 1:50,000 to maps with a scale 1:250,000, and the coordinates were obtained from digitizing these maps. The four-times-three samples that were collected close to the four sites of the old survey only show that the two old values above 10 ppb Au are verified by one of the three follow-up samples at each site. Of the to old samples of values below 10 ppb Au, one was verified to be low, whereas one of the follow-up samples at Skogsfjorden showed the highest Au value of the whole set of twelve.

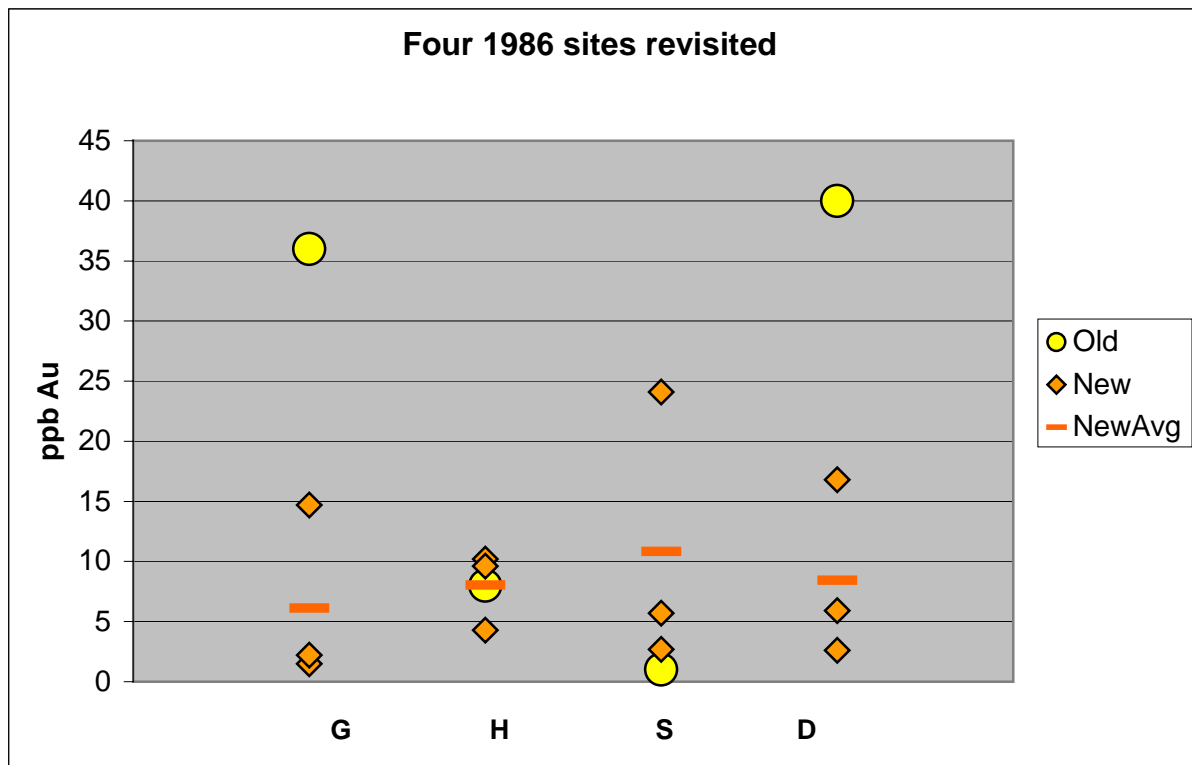


Figure 5. Concentrations of gold in 4 samples from the 1986 regional survey and corresponding values for samples from approximately same sites of this study.

#### 4.5 B- and C-horizon, anomalies of soil samples (Folldal Verk 1983-84), and soil samples of ASPRO.

Both B- and C-horizon results from this study are used for comparison with the anomalies identified by the Folldal Verk survey. The location numbering used by Sandstad and Nilsson (1998, p18-19 and p 29-31) is also used here, as shown in Figure 1.

1 Sjørdalshøgda S and 2 – Kable - Sjørdalshøgda N and ASPRO Sjørdalshøgda. T3 passes right through these areas. The highest gold value for the C-horizon in this area is 14.2 ppb Au (sample 1450D) and the highest B-sample contains 5.3 ppb Au. Sjørdalshøgda is barely visible as an anomaly in this data set.



3 Leirbogdalen and 5 Tverrfjellet.

Tverrfjellet is crossed by T1, but the elements Au, Pb or Zn show no anomalies in either of the two horizons. Ag and As also shows up in Folldal Verk's Leirbogdalen; this is not the case in the B- or C- samples of the present study.

Areas 4, 6, 7 and 8.

Neither of these areas are in the vicinity of any of the transects.

9 Nattmålstinden/-vatnet.

This area is not intersected by any of the transects, but lies closest to T1. Folldal Verk's soil samples were anomalous in Au (up to 200 ppb), and Cu, Zn and Pb. Highest Au value along T1 in the vicinity of area 9 is 29.1 ppb (sample 1520D).

10 Holmevasshøgda and 11 Saltindbukta.

Neither of these areas are in the vicinity of any of the transects. However, the 1986 survey has a Au-value of 26 ppb located in the center of area 11 Saltindbukta.

12 Høgda.

As for area 11, there is no transect in the immediate surrounding. The Au value of the 1986 survey is 40 ppb, and is located about 500 m downhill from Høgda. The Au values for the three follow-up samples from this study, contained between 2.6 and 16.8 ppb Au.

13 Blåfjell and ASPRO Hårskoltan.

T5 is adjacent to area 13, which is high in Au, As and Zn, and crosses Hårskoltan. The high As and Zn values are matched by the samples from T5, but not by the Au values.

14 Soltindaksla.

The southernmost samples from T3 lie closest to this area to within about one km. No values of interest are found in either horizons, only bedrock analyses are available from Folldal Verk.

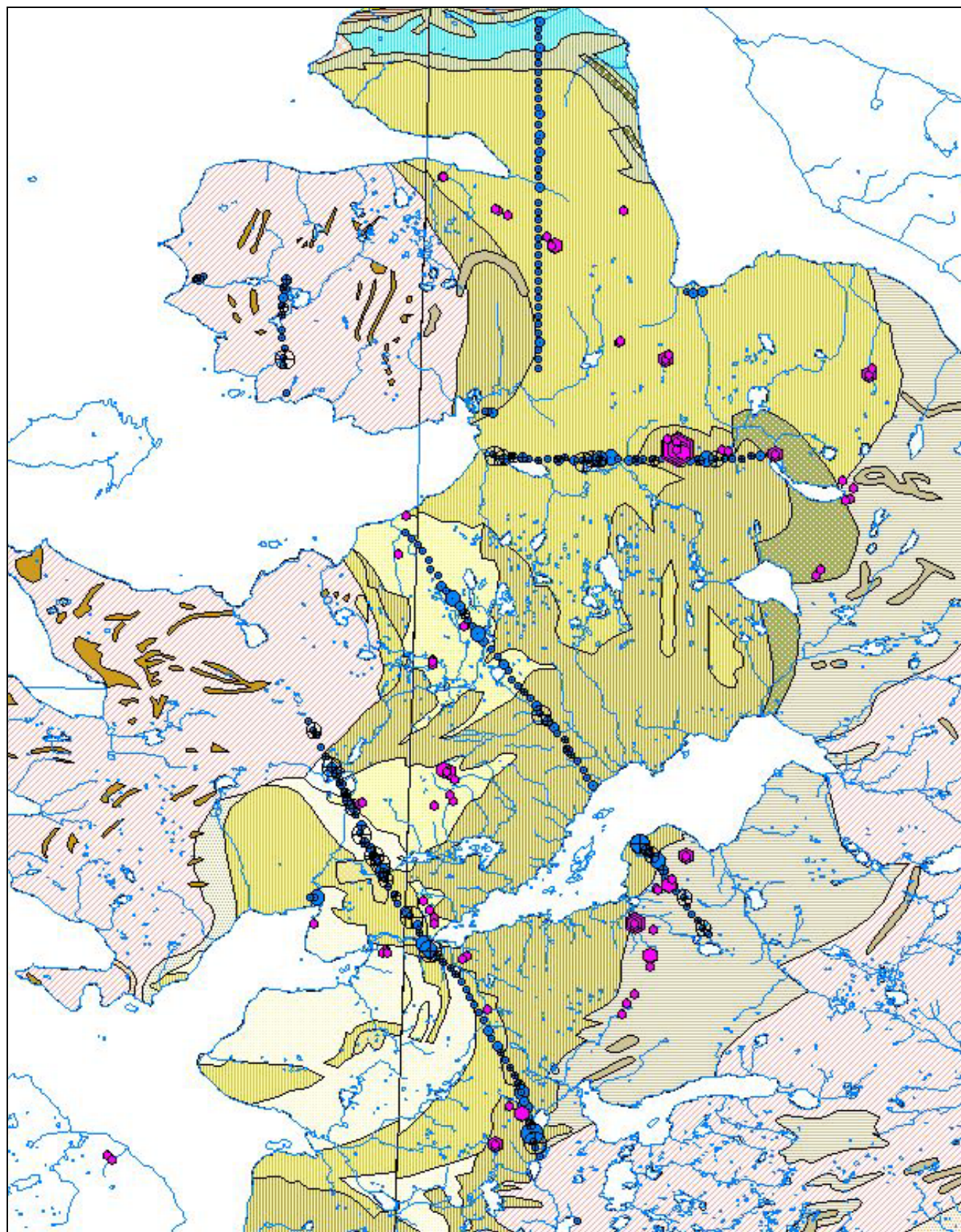
Out of four possible matches between results for the soil sample areas of Folldal Verk and for the transects of this study, only one is positive in gold, two if As is included. By including the 1986 survey and follow-ups, three out of six areas support the findings from Folldal Verk survey.

#### **4.6 C-horizon and known mineralizations.**

A number of analyses were retrieved from the ore database at NGU. A map showing the gold concentrations for these samples as proportional hexagons is presented in Figure 6. This map also shows the gold concentrations in the B- and C-horizon samples as circular symbols. Anomalous values for the analyzed ores/mineralizations are clearly picked up in two out of four cases; T1 SW and T2 SW of Skogsfjordvatnet. The ore samples from Sjørdalshøgda have a median concentration of 113 ppb Au, and also contain the extreme value of the entire data set. The ore sampled 1200 m S of Sjørdalshøgda's extreme Au ore values is reflected in a couple of B- and C-horizon samples some 300 m NW of this mineralization, whereas there is no indication in the samples of B- or C-horizons of the extreme Au ore values. Molybdenum (Mo) also occurs at anomalous levels in the ore samples from Sjørdalshøgda, and in the B- and

C-horizons as well. Samples along transect T5 do not reflect the moderate Au value for the ore sampled only 200 m south of the transect. However, the As and Sb values are highly elevated for most of this transect, similar to the elevated values for As and Sb in the ore. Another continuous As-Sb anomaly is found at the NE end of T2, where there are also a couple of weak Au anomalies in the C-horizon.

Figure 6. Gold concentrations in ore samples (hexagons) and the B- and C-horizon (circles). (*next page*).



## 5. CONCLUSIONS

The aim of this project was to establish a link between the various methods employed in geochemical prospecting for gold in the lithologic and topographic regimes present on Ringvassøy.

The regional scale mapping conducted by NGU over the last decades succeeds in locating the large-scale gold anomalies indicated by the sub-regional and detailed investigations carried out by exploration companies. A sub-regional approach, collecting the C-horizon at regular sampling intervals along transects, is less successful in reproducing the findings of the detailed study. But this approach unveils anomalies that the sub-regional stream sediment survey did not point out. This is partly due to the lack of streams, but there were also anomalies in the transect soil sampling that were not found in the nearby stream sediments.

Comparing the results for samples of the B- and C-horizon from 70 sites, there is little difference in the geographical distribution of the various elements.

## 6. REFERENCES

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# Standards Report

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**Scientist:**  
**Project date:**

**Batch:** Res98C  
**Standard:** DS2C3AU  
**Report date:** 2001/07/16

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**Pass:** ●  
**Historic:** ●

<p>FIN</p> <p>mean: * accept: ±0 (2 std.dev.)</p>	<p>AG</p> <p>mean: 247 accept: ±29.5 (2 std.dev.)</p>	<p>AL</p> <p>mean: 1.83 accept: ±0.0745 (2 std.dev.)</p>	<p>AS</p> <p>mean: 59.3 accept: ±3.46 (2 std.dev.)</p>
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<p>CA</p> <p>mean: 0.585 accept: ±0.0302 (2 std.dev.)</p>	<p>CD</p> <p>mean: 11 accept: ±0.85 (2 std.dev.)</p>	<p>CO</p> <p>mean: 11.8 accept: ±0.843 (2 std.dev.)</p>	<p>CR</p> <p>mean: 154 accept: ±7.38 (2 std.dev.)</p>
<p>CU</p> <p>mean: 123 accept: ±4.09 (2 std.dev.)</p>	<p>FE</p> <p>mean: 3.15 % accept: ±0.109 (2 std.dev.)</p>	<p>GA</p> <p>mean: 6.23 ppb accept: ±0.957 (2 std.dev.)</p>	<p>HG</p> <p>mean: 946 % accept: ±69.2 (2 std.dev.)</p>
<p>K</p> <p>mean: 0.151 ppm accept: ±0.00632 (2 std.dev.)</p>	<p>LA</p> <p>mean: 16.6 ppb accept: ±1.03 (2 std.dev.)</p>	<p>MG</p> <p>mean: 0.618 ppm accept: ±0.0363 (2 std.dev.)</p>	<p>MN</p> <p>mean: 866 ppm accept: ±58.4 (2 std.dev.)</p>
<p>MO</p> <p>mean: 12.8 ppm accept: ±1.53 (2 std.dev.)</p>	<p>NA</p> <p>mean: 0.04 ppm accept: ±0 (2 std.dev.)</p>	<p>NI</p> <p>mean: 33.5 ppm accept: ±1.41 (2 std.dev.)</p>	<p>P</p> <p>mean: 0.0754 ppm accept: ±0.00253 (2 std.dev.)</p>
<p>PB</p> <p>mean: 28.5 ppm accept: ±3.65 (2 std.dev.)</p>	<p>SB</p> <p>mean: 10.6 ppm accept: ±0.401 (2 std.dev.)</p>	<p>SE</p> <p>mean: 2.14 ppm accept: ±0.434 (2 std.dev.)</p>	<p>SR</p> <p>mean: 28.5 ppm accept: ±1.05 (2 std.dev.)</p>
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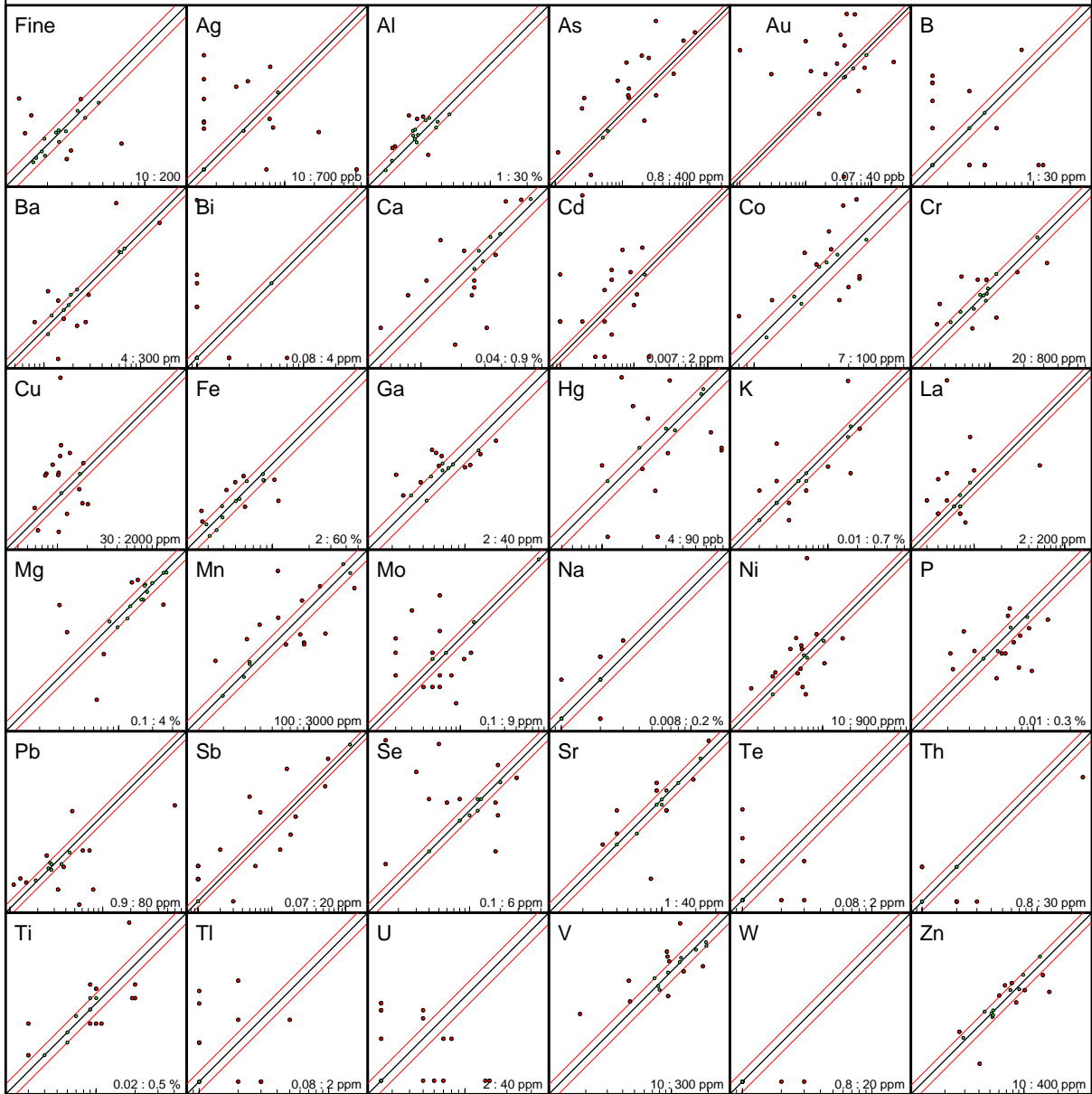
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NGU

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 Scientist: T E Finne  
 Project date: 2001/07/20

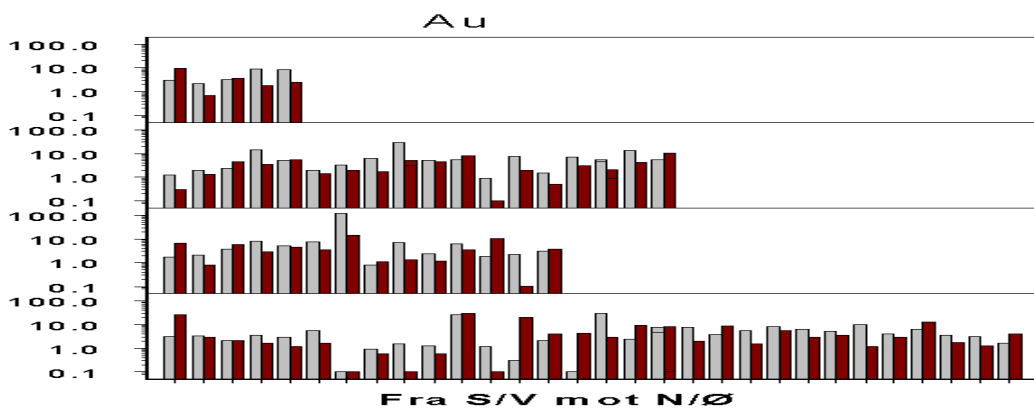
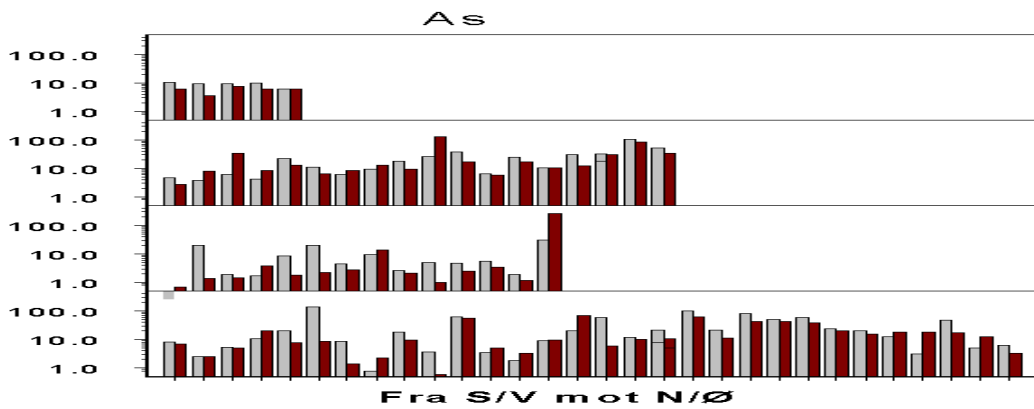
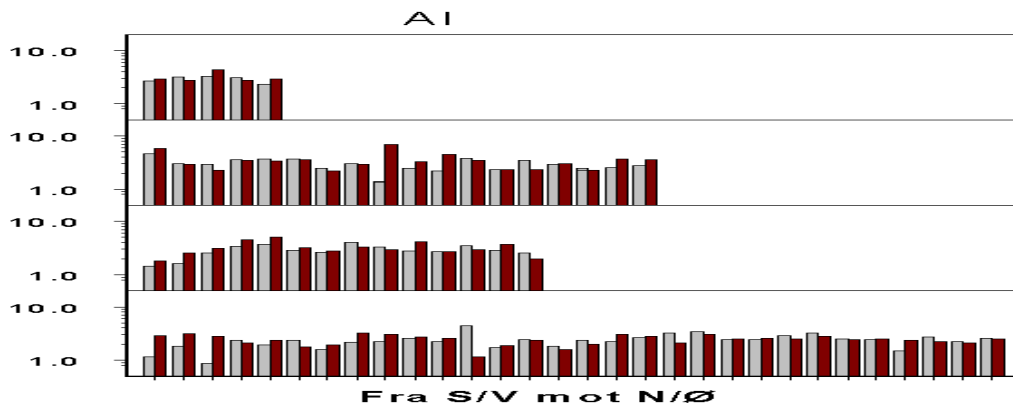
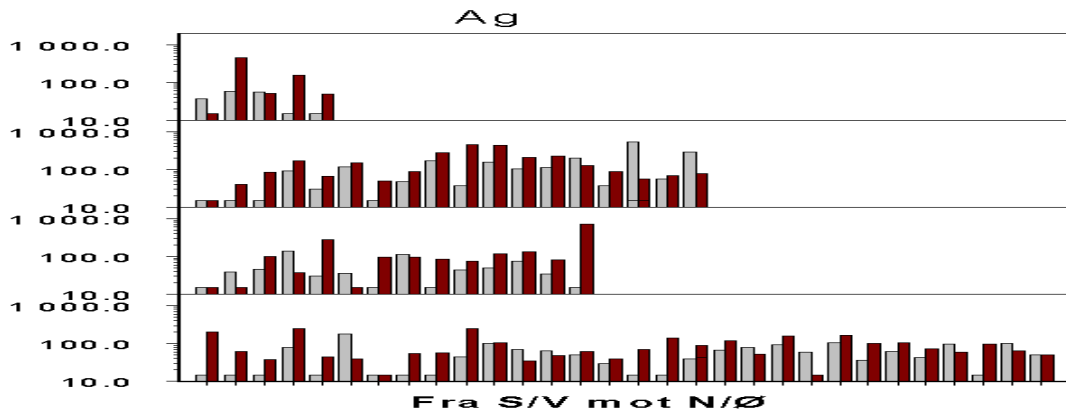
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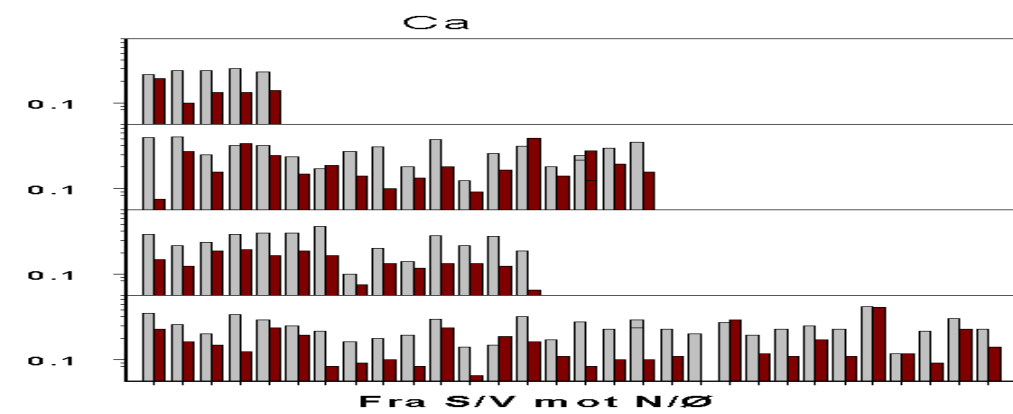
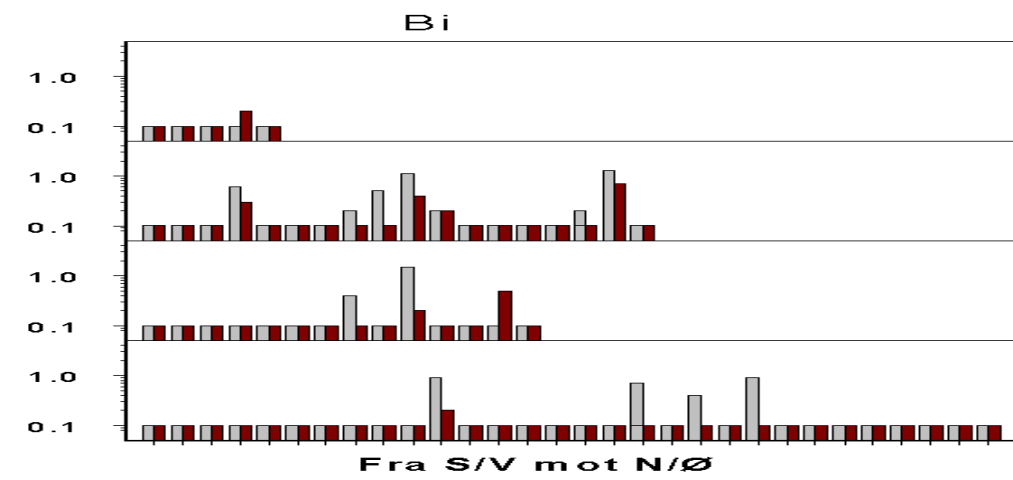
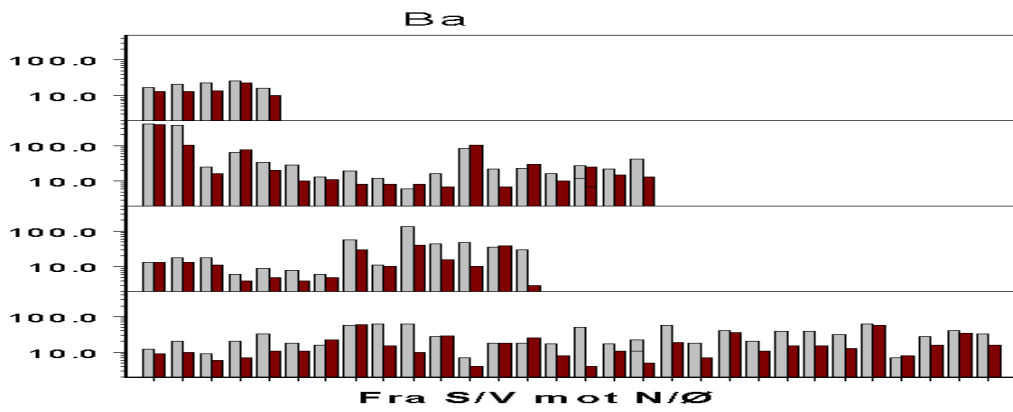
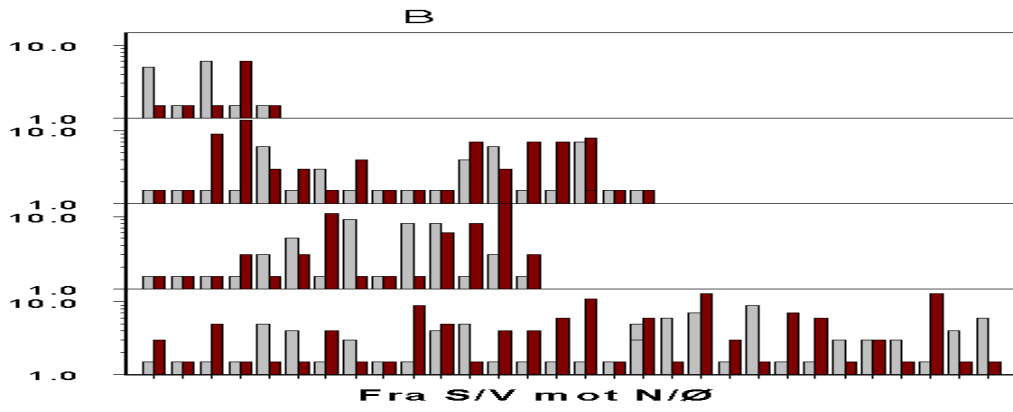
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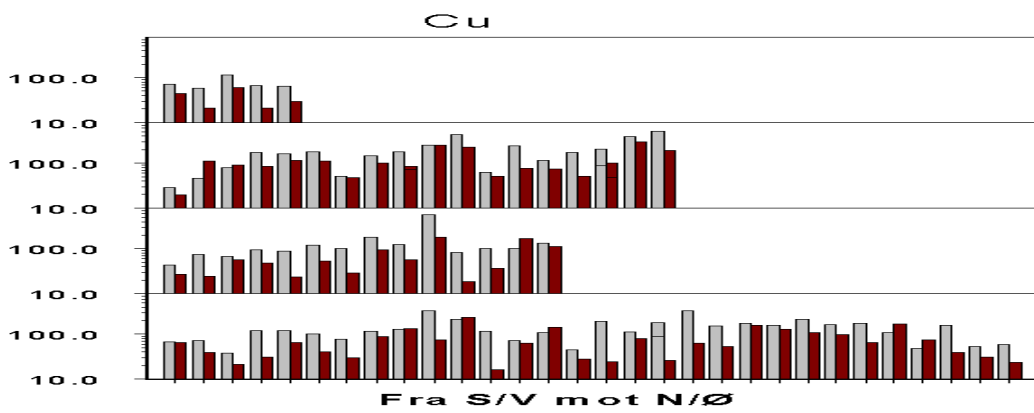
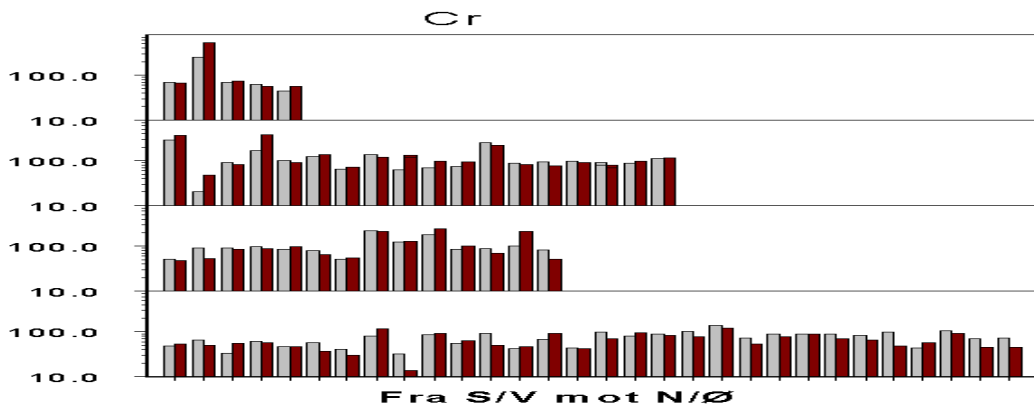
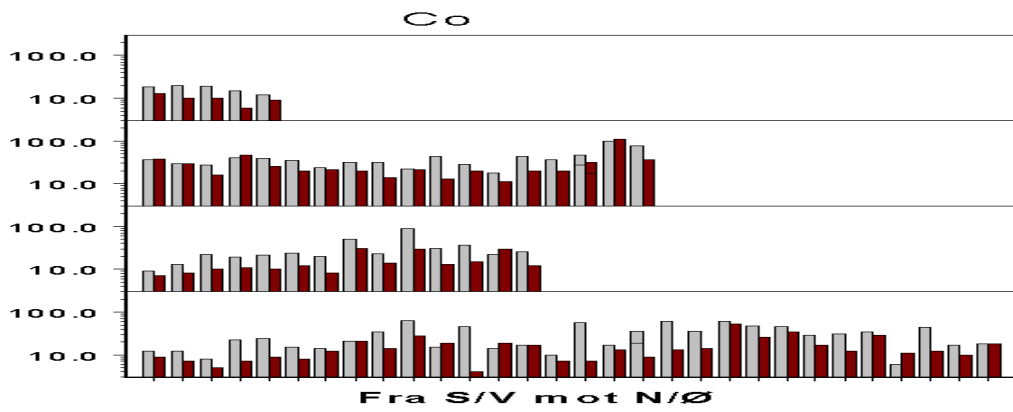
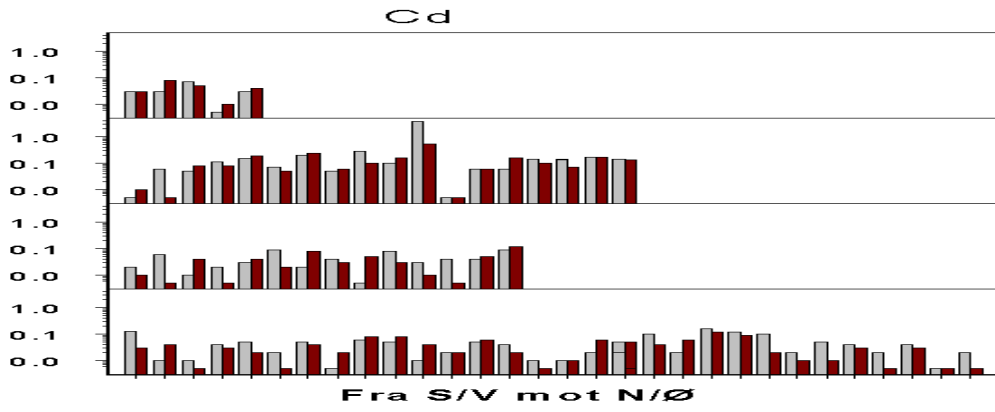


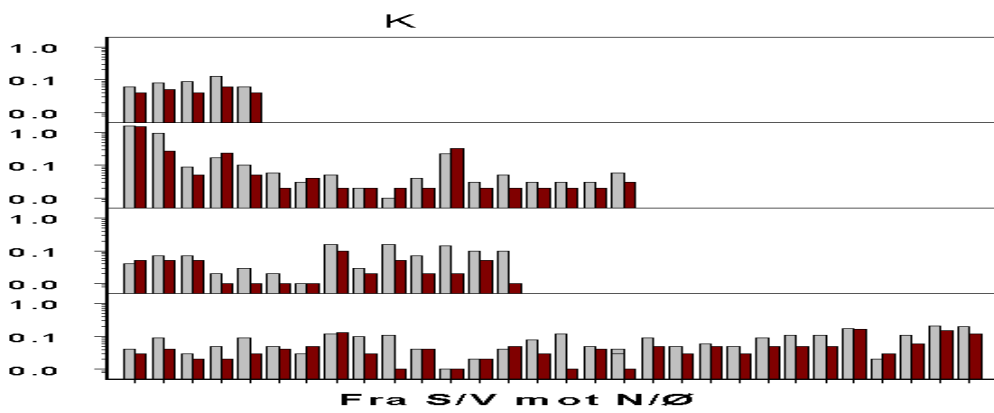
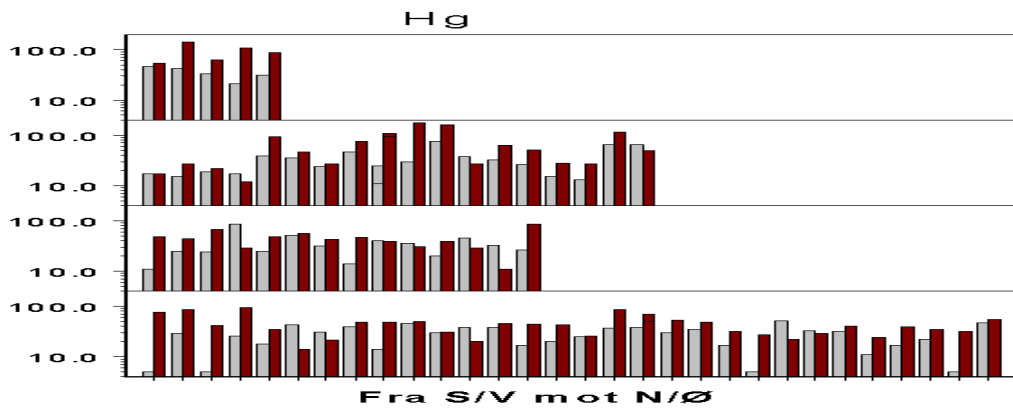
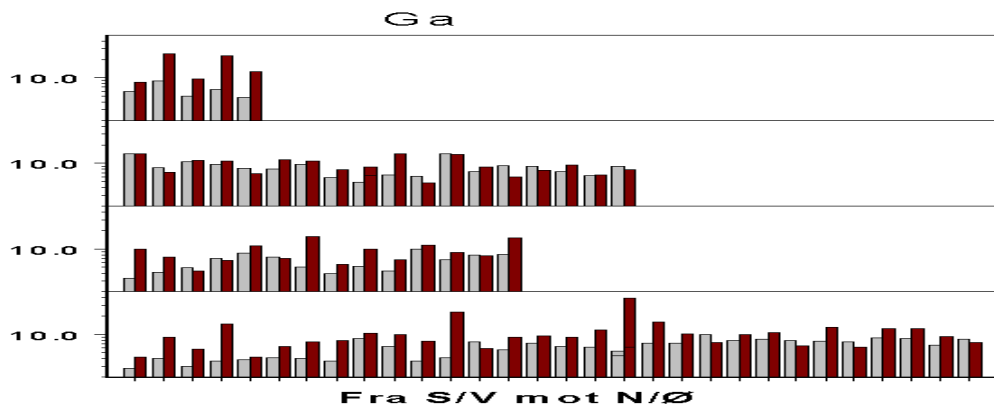
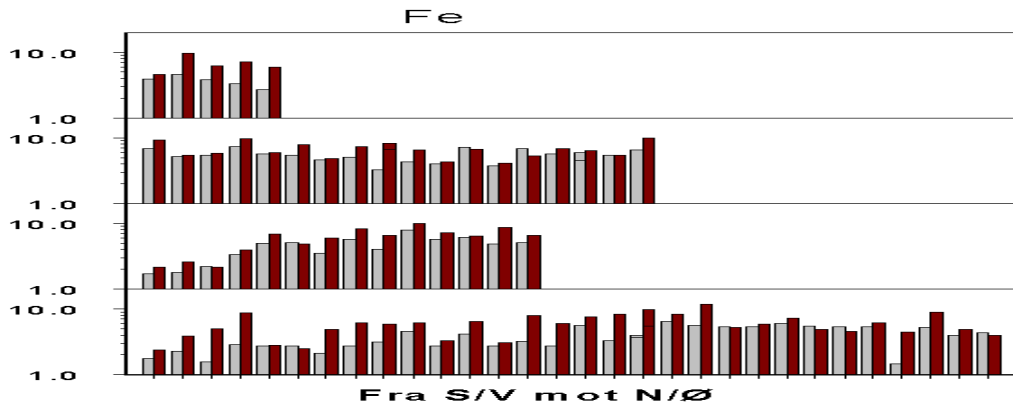


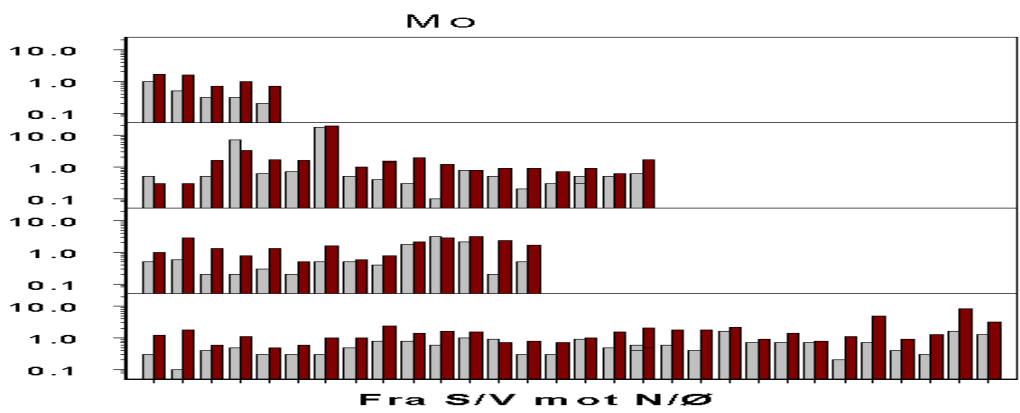
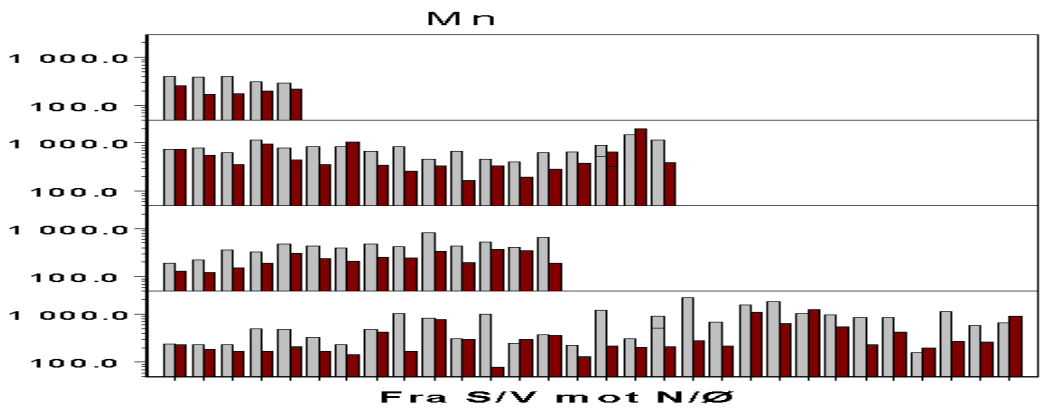
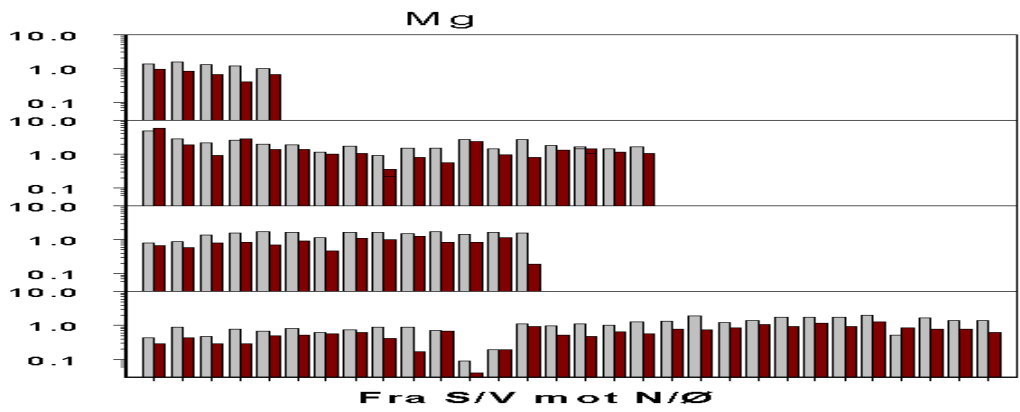
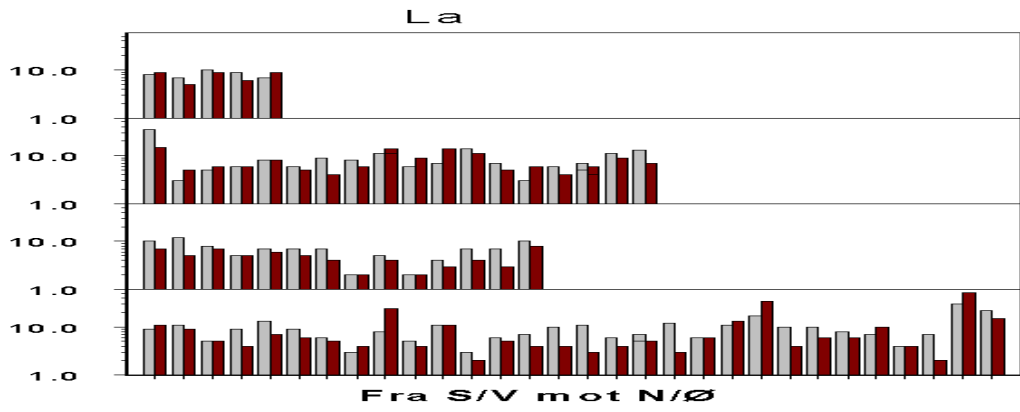


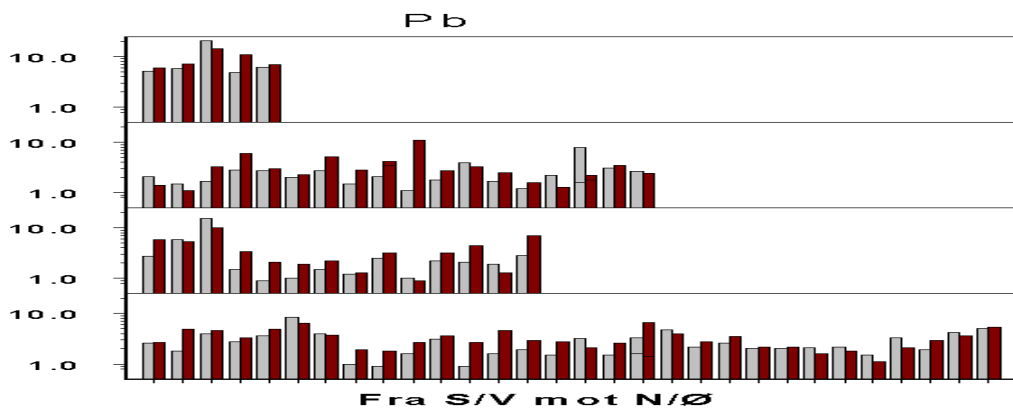
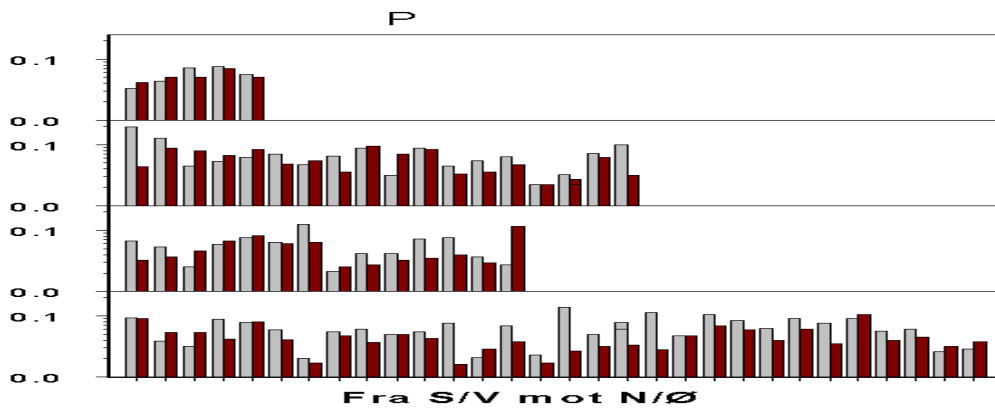
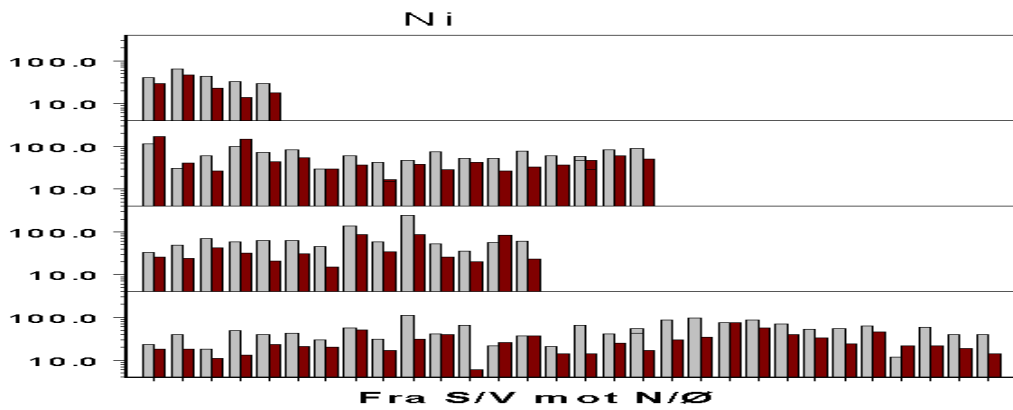
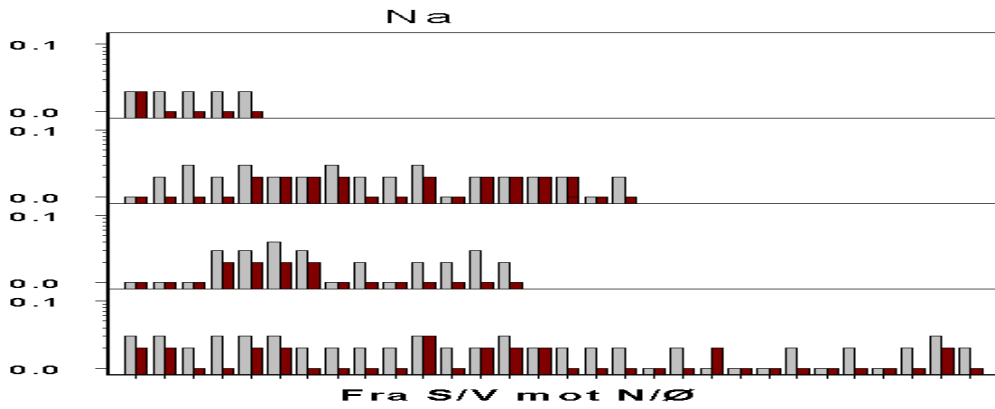


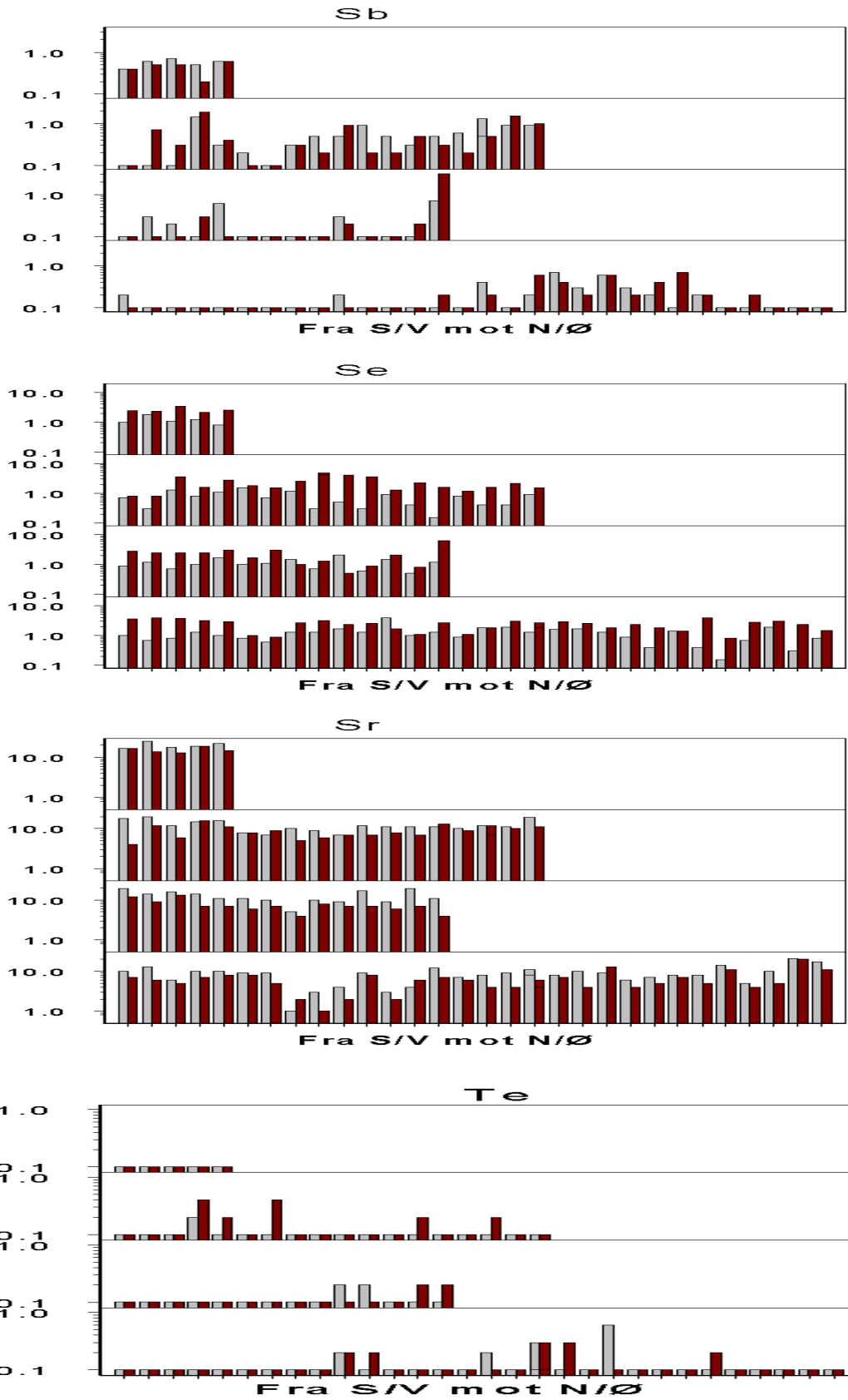


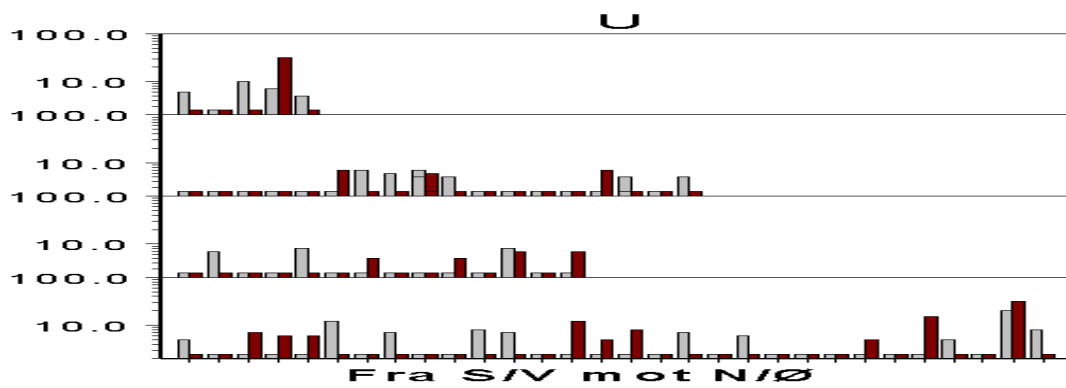
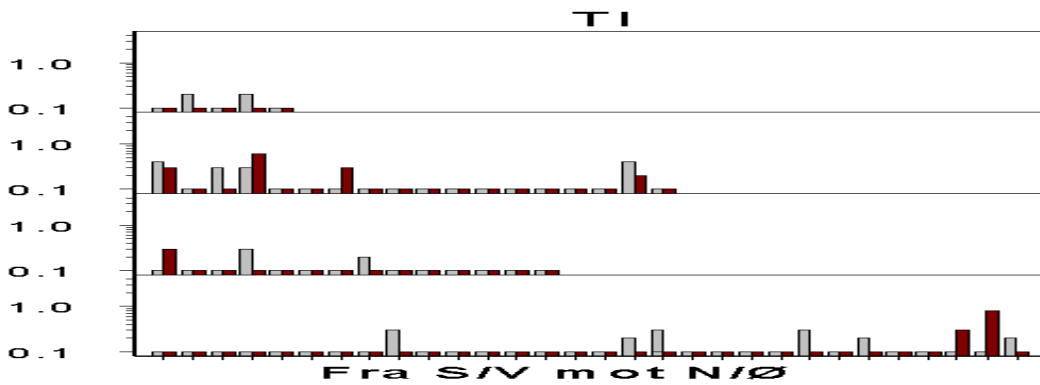
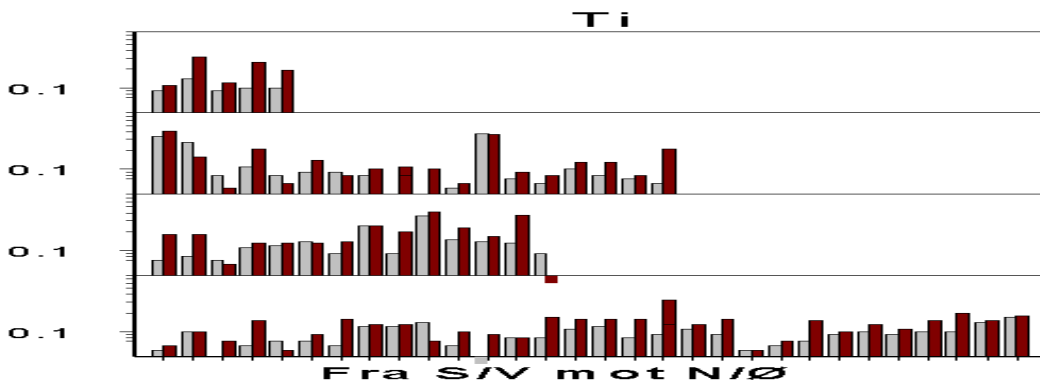
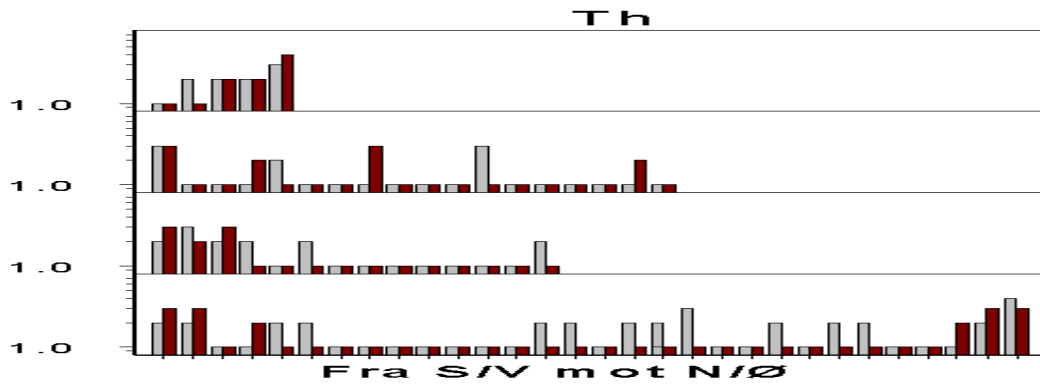




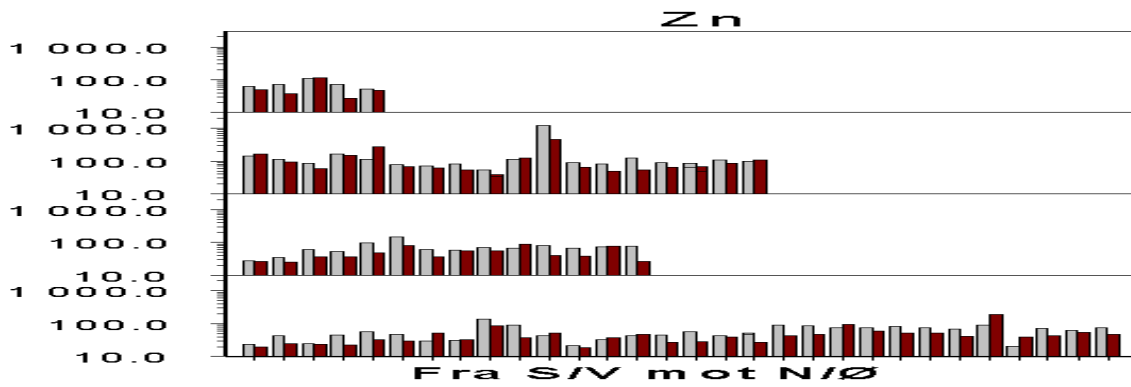
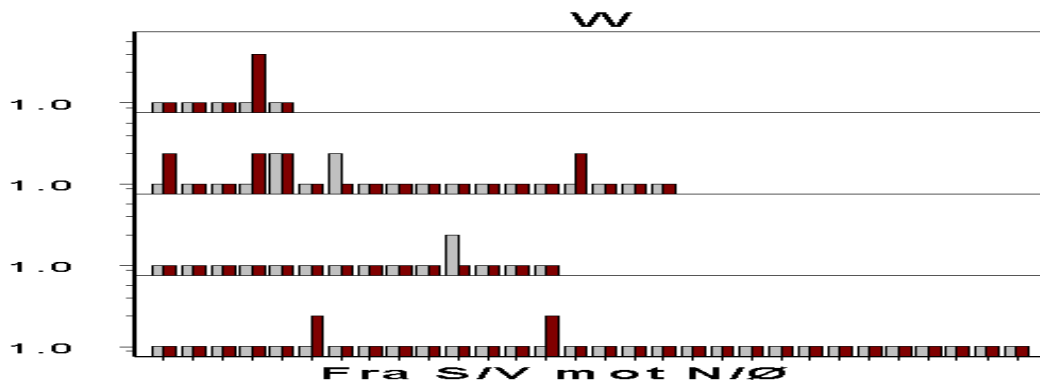
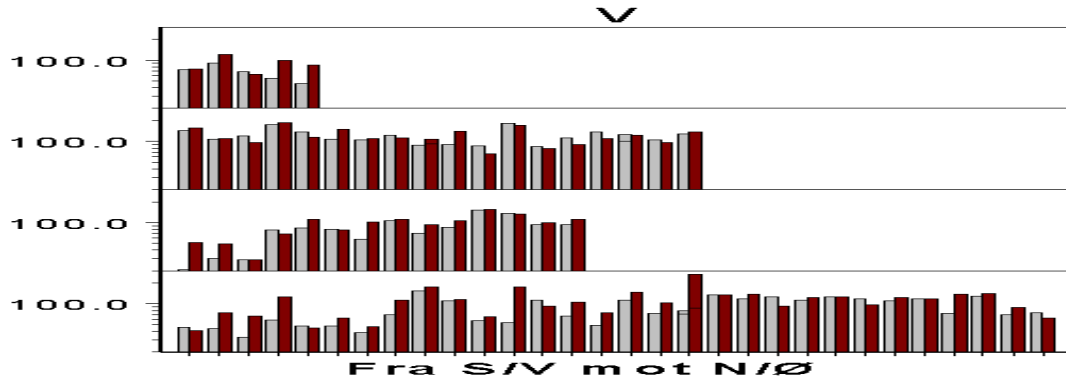














B- and C-horizon samples Ringvassøy 1998

Table with 44 columns: Sample, m, mN34eu89, Fine, Fine.B, Ag, Ag.B, Al, Al.B, As, As.B, Au, Au.B, B, B.B, Ba, Ba.B, Bi, Bi.B, Ca, Ca.B, Cd, Cd.B, Co, Co.B, Cr, Cr.B, Cu, Cu.B, Fe, Fe.B, Ga, Ga.B, Hg, Hg.B, K, K.B, La, ppm, %





Chorizon Ringveassøy 1998

Table with columns: Sample, FDrE34e89, mN34e489, m, m, m, and elements (As, Au, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sr, Te, Th, Ti, U, V, W, Zn). Each row represents a sample with its corresponding concentration values for various elements.







Chorizon Ringveassøy 1998

Table with columns for Sample ID, FDrE34e08, mN34e08, m, and various elements (Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Sr, Te, Th, Tl, U, V, W, Zn) with their respective values.

