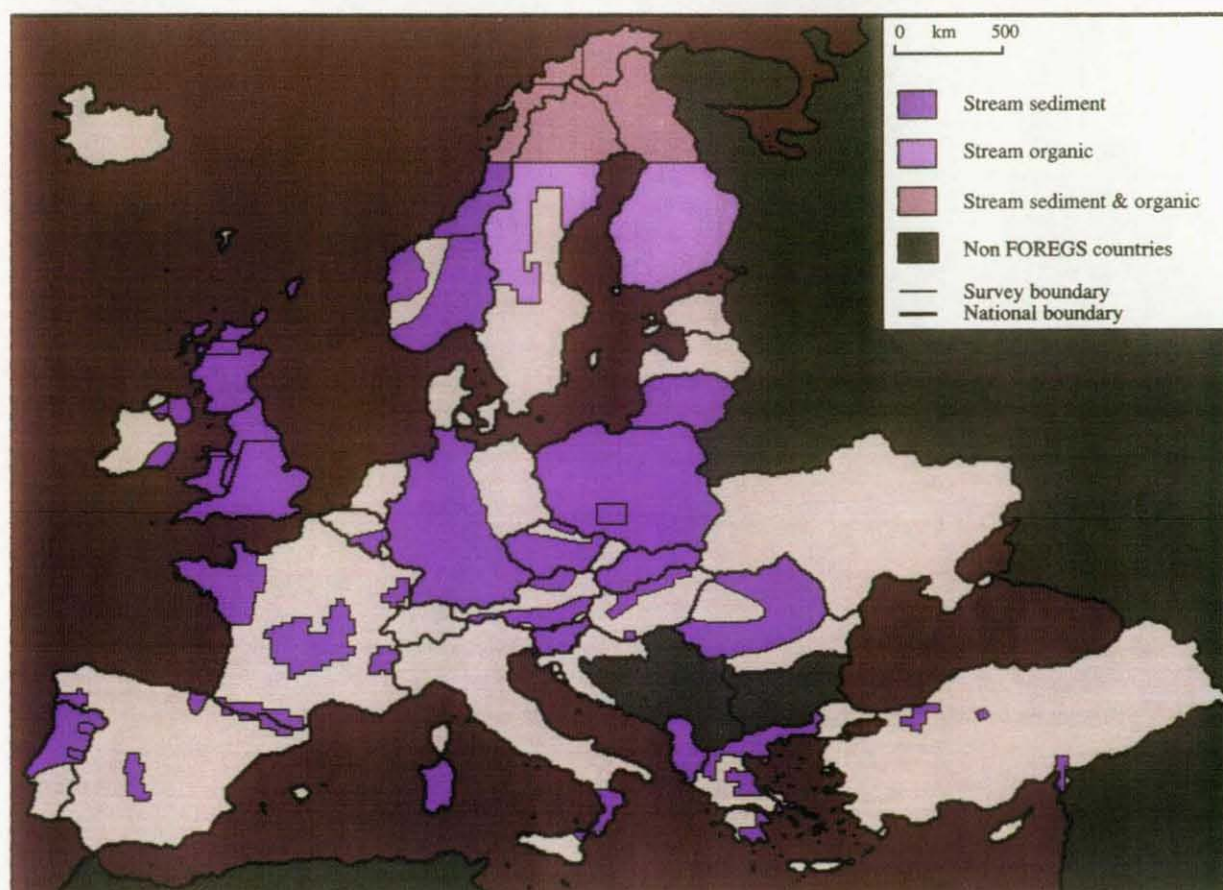


# Forum of European Geological Surveys FOREGS

Geochemistry Task Group  
1994–1996

Report

A contribution to IUGS Continental Geochemical Baselines



BGS Technical Report WP/95/14  
British Geological Survey

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Technical Report WP/95/14

Forum of European Geological  
Surveys (FOREGS)  
Geochemistry Task Group 1994–1996  
Report

J A Plant, G Klaver, J Locutura, R Salminen,  
K Vrana and F M Fordyce

BRITISH GEOLOGICAL SURVEY

TECHNICAL REPORT WP/95/14

Applied Geochemistry Series

# Forum of European Geological Surveys (FOREGS) Geochemistry Task Group 1994–1996 Report

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*Cover illustration*

Coverage of stream sediment and stream organic surveys in FOREGS countries.

This report was prepared by the FOREGS Geochemistry Task Group for the annual general meeting of FOREGS Directors September 1996. The report, which details the current status of geochemical mapping in FOREGS countries was also prepared as a contribution to the International Union of Geological Sciences Working Group on Continental Geochemical Baselines.

*Bibliographic reference*

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Geological Surveys Geochemistry  
Task Group 1994–1996 Report.  
*British Geological Survey  
Technical Report WP/95/14.* British  
Geological Survey, Keyworth, UK.

## BRITISH GEOLOGICAL SURVEY

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## List of abbreviations

AEG	Association of Exploration Geochemists
BGS	British Geological Survey
EEA	European Environment Agency
EU	European Union
FOREGS	Forum of European Geological Surveys
FSU	Former Soviet Union
GIS	Geographic Information System
GRN	Global Reference Network
GSF	Geological Survey of Finland
GSSR	Geological Survey of the Slovak Republic
IGCP	International Geological Correlation Programme
IUGS	International Union of Geological Sciences
NERC	Natural Environment Research Council
PHES	Potentially Harmful Elements and Species
RGD	Rijks Geologische Dienst
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTM	Universal Trans Mercator

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# 1 Introduction

## 1.1 The Problem

1. Europe has a long history of mining, industrialisation, intensive agriculture/forestry and urbanisation. It remains one of the most densely populated and utilised land areas on earth.
2. These factors have led to interrelated problems of land degradation and contamination which affect both the land and the coastal zone.
3. Deficiency conditions in crops, agricultural animals and possibly man are increasing, partly as a result of land degradation.
4. Redevelopment of contaminated land is becoming increasingly difficult because of legislative and fiscal controls. This is despite the need to reutilise 'brown field' sites rather than extend development into 'green field' areas.
5. Throughout Europe public concern about the environment is growing. In response, national governments and the European Union (EU) are attempting to develop policies, legislation and infrastructure, such as the European Environment Agency (EEA). Attempts are also being made to establish 'Safe Levels' of Potentially Harmful Elements and Species (PHES), but these are often based on limited and/or inadequate information.
6. The available data on environmental geochemical baselines and radioactivity are not systematic in coverage or quality and, therefore, are not of the standard required to quantify the distribution of PHES at the European scale as a basis for policy-making and monitoring future change to the environment.

## 1.2 Current Status

1. At the present time, knowledge of the geochemistry of the surface environment of Europe is based on different surveys of variable standards carried out by different organisations in the public and private sectors. Whilst there are exceptions, Geological Surveys have, in the past, provided data on rocks and stream sediments; Soil Surveys on soils; Hydrological Surveys on ground and surface water and biologists/agriculturists on plant and animal tissue samples.
2. In general, there is a failure to recognise that the natural geochemical background is highly variable and that natural levels of PHES (such as As, Cd, Pb, NO<sub>3</sub>, the radioelements and organic pollutants) can be as high or higher than those caused by man-made sources of pollution. Even where synthetic pollutants are concerned, it is the natural geology and geochemistry which frequently exert the fundamental controls on the distribution of the PHES and consequently determine their potential to create hazards.

## 1.3 Requirements

Systematic baseline environmental geochemical data are necessary to inform policy-makers and provide a sound basis for legislation. For this purpose such data are required to be:

1. Standardised across national boundaries.
2. Available in digital form for use on GIS so that they can be viewed interactively with other datasets, such as those for land-use and for animal and human morbidity and mortality data.
3. Comprehensive, to include the majority of PHES and ideally as many harmful chemical species as possible, including synthetic compounds.
4. Based on a full suite of sample types including soil, stream sediment, surface water, groundwater and off-shore marine and estuarine sediment in the coastal zone.

## 1.4 Why Geological Surveys?

1. The lithosphere is the fundamental base on which soils and crops develop and through which water and fluid pollutants migrate.
2. Geological Surveys are uniquely well equipped to prepare the systematic environmental geochemical baseline databases required for Europe, since:
  - a. They have the knowledge and experience of optimum methods of sampling and analysing surface environmental materials and are familiar with the preparation, analysis and interpretation of geochemical maps.
  - b. Many are already concerned with the preparation of multi-element geochemical maps of rocks, soils, surface waters, groundwaters and stream sediments.
  - c. Many are centres of excellence for the study of water and silicate mineral chemistry. The aim is to standardise all surveys at a high level of analytical capability.
  - d. Geochemical baseline data in digital form produced by FOREGS countries at the national scale already enable contaminated land to be viewed in the context of naturally occurring high levels of PHES and the natural environment generally.
  - e. The FOREGS countries generally have programmes concerned with site-specific pollution such as land-fill and nuclear waste repositories, hence have considerable knowledge of the interaction of natural and synthetic pollutants with the natural environment.

- f. Geological Surveys have experts on ore deposits, which provide natural analogues for understanding the distribution and migration of heavy metals, radioelements and other pollutants in different geological environments.
- g. The European Geological Surveys have the quality control procedures in place and the expertise in databases and GIS to develop and apply environmental baseline geochemistry effectively.

### **1.5 Geochemical Information in FOREGS Countries**

The inventory described in this report has been prepared on behalf of the FOREGS Directors to identify the similarities and differences among different national datasets and to delineate areas where data are currently unavailable.

This information forms a fundamental basis for compiling a series of geochemical maps of Europe with the primary aim of informing environmental policy-makers. Such maps would also be of value for geological and metallogenic studies, agriculture, forestry, veterinary studies, epidemiology, and, in the coastal zone, fisheries.

The inventory was also carried out as a contribution to the IUGS Working Group on Continental Geochemical Baselines.

## 2 The Survey

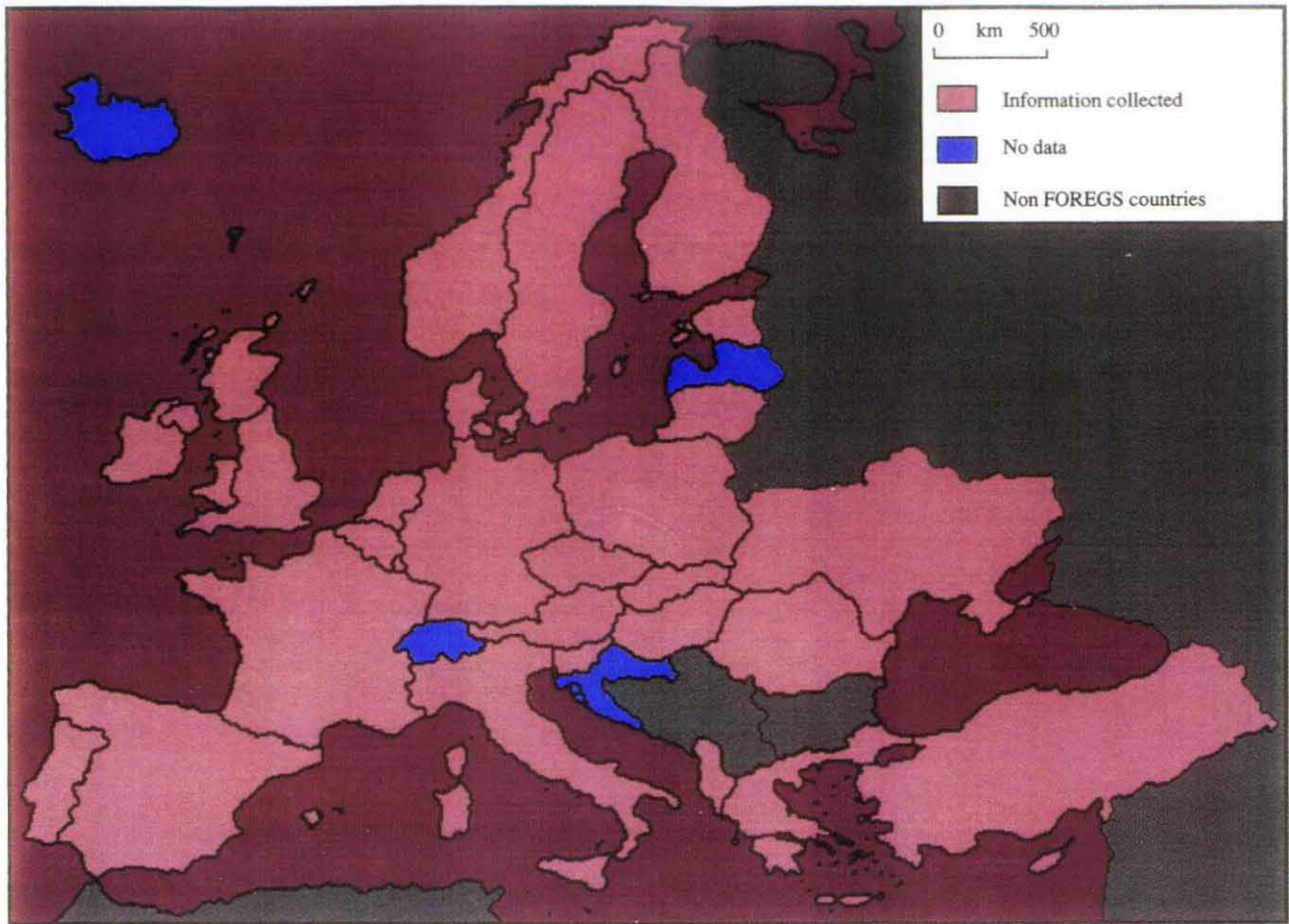
Information was collected using a standard form designed by the FOREGS Geochemistry Task Group. The form comprised 9 sections, each for a particular sample type (Table 1). An example of the drainage sediment survey section is shown in Appendix 1. Detailed information on collection, preparation, analysis and data availability were requested for all sample types with the exception of rock and biological surveys where information on availability only was required. The form was distributed to the organisations detailed in Appendix 2. Mining and exploration companies and universities were generally not included because the surveys which they carry out tend to cover relatively small areas of less than 5000 km<sup>2</sup>, the lower limit considered relevant for the purpose of the inventory. Completed forms were received from 29 of 33 countries (Figure 1). Croatia, Iceland, Latvia and Switzerland have not conducted regional geochemical surveys over the minimum area required for the survey. Results for Sardinia and

for Scottish soils were received too late to be included in the calculations presented in this report. Bulgaria has recently joined the FOREGS group and information from Bulgaria will be included in the digital version of the inventory. Unfortunately it was not possible to represent Greenland on the map projections presented in this report. Maps indicating survey areas in Greenland are included separately in Appendix 3. In general, the form was completed successfully although the recording of UTM coordinates for the boundaries of survey areas presented some difficulties. The coordinates held in the inventory are, therefore, a mixture of UTM coordinates, latitude and longitude and local coordinates.

Summary information is presented here in tables, maps and statistical diagrams. Copies of the inventory are available to participating organisations in digital format in Microsoft Excel (IBM or Macintosh) from the BGS.

**Table 1** Sample types included in the FOREGS geochemical inventory.

Form Section	Sample Type	Information Required
A	Drainage Sediment	Full survey procedure
B	Lake Sediment	Full survey procedure
C	Overbank Sediment	Full survey procedure
D	Soil and Regolith	Full survey procedure
E	Heavy Mineral	Full survey procedure
F	Surface Water	Full survey procedure
G	Rock Sample	Information available Yes/No
H	Biological Sample	Information available Yes/No
I	Radiometric	Full survey procedure



**Figure 1** Countries included in the FOREGS geochemical inventory 1996.

**Table 2** Sample types collected in FOREGS countries.

Stream Sediment	Surface Water	Soil	Stream Orgainc	Till	Lake Sediment	Overbank Sediment	Heavy Minerals	Rock	Radio metric	Biological
Albania	Albania	Albania	Finland	Denmark	Czech	Belgium	Czech	Cyprus	Albania	Finland
Austria	Czech	Belgium	Norway	Finland	Finland	Denmark	Denmark	Czech	Belgium	Lithuania
Belgian	Finland	Cyprus	Sweden	Norway	Lithuania	Greece	Finland	Estonia	Czech	Norway
Czech	Germany	Czech		Sweden		Hungary	Germany	Finland	Greece	Slovakia
Finland	Greenland	Estonia				Luxembourg	Greenland	Germany	Greenland	Sweden
France	Norway	France				Netherlands	Norway	Lithuania	Luxembourg	
Germany	Poland	Germany				Norway	Spain	Netherlands	Poland	
Greece	Romania	Lithuania				Slovenia	Sweden	Slovakia	Portugal	
Greenland	Slovakia	Netherlands					UK		Slovakia	
Hungary	Slovenia	Norway							Slovenia	
Ireland	UK	Poland							Spain	
Lithuania		Portugal							Sweden	
Norway		Slovakia							UK	
Poland		Solvenia								
Portugal		Ukraine								
Romania		UK								
Slovakia										
Slovenia										
Spain										
Sweden										
Turkey										
UK										

tions, although surveys carried out in France, Greenland and Spain were primarily for mineral exploration (Appendix 4).

Surface water surveys covering nearly one fifth of the FOREGS region have generally involved the collection of stream water, although spring and lake water have also been sampled, particularly in Central Europe (Table 2; Figures 2 and 7 and Appendix 4). Multi-element analysis is available for surveys covering most of the Czech Republic, former West Germany, Poland, Slovakia and Slovenia and for extensive areas of Finland, Norway, Romania and the UK. In addition, data for U, are available for Albania, Greenland and northern UK (Appendix 4).

Soils have been collected in 16 of the 33 countries, covering 11% of the FOREGS region (Table 2 and Figures 2 and 3). Belgian, German, Slovenian and Ukrainian surveys have sampled A, B and C horizon soils whereas, Slovakian surveys are based on the collection of A and C horizon soils only. Surveys in the Czech Republic, Estonia, Lithuania, The Netherlands, Norway, Portugal and the UK are based on the collection of A horizon soils although some surveys in the Czech Republic and the UK also sample B horizon soils. Surveys in Albania and France are based on the collection of B horizon soils only.

### 3.2 Sampling Density

A wide range of sampling densities have been employed across the FOREGS region, reflecting different survey objectives. Stream sediment survey densities range from 1 sample per <math>0.5 \text{ km}^2</math> in France, Greece, Italy, Portugal and Spain for mineral exploration to 1 sample per 200  $\text{km}^2$  in Fennoscandia for geological and metallogenic province mapping, to 1 sample per 2000  $\text{km}^2$  in Romania for rapid reconnaissance mapping (Table 3 and Appendix 4). Most surveys, however, have been carried out in the range of 1 sample per 1  $\text{km}^2$  to 1 sample per 5  $\text{km}^2$  (Table 3 and Appendix 4).

Surface water surveys range from relatively high densities (<math>1</math> sample per 2.5  $\text{km}^2$  in Albania, Germany and the

UK) to very low densities in Finland and Romania (1 sample per 290  $\text{km}^2$  and 1 sample per 2000  $\text{km}^2$  respectively).

In general, soil survey sampling densities follow similar trends to those of stream sediments ranging from 1 sample per <math>1 \text{ km}^2</math> in France and Portugal to 1 sample per 3500  $\text{km}^2$  in Estonia. Most soil surveys have been conducted in the range 1 sample per 5  $\text{km}^2$  to 1 sample per 25  $\text{km}^2$ .

### 3.3 Size Fractions

The size fractions analysed for the different stream sediment surveys range from <math>63 \mu\text{m}</math> (BSI 240 mesh) in the Czech Republic, Romania and Slovenia to <math>1000 \mu\text{m}</math> (BSI 16 mesh) in Lithuania (Table 4 and Appendix 4). Most stream sediment surveys have, however, been based on the collection and analysis of <math>177</math> to <math>200 \mu\text{m}</math> (BSI 80 to 76 mesh) fractions (Figure 8 and Appendix 4).

All the filtered surface water analyses carried out in the FOREGS region have been based on a filter size of 0.45  $\mu\text{m}$  with the exception of Poland where a hard filter was used (Figure 9, Table 4 and Appendix 4).

The range of grain-size fractions collected for soil surveys is bimodal. Some countries collect <math>100</math> to <math>180 \mu\text{m}</math> (BSI 150 to 85 mesh) fractions to integrate with stream sediment surveys, while others follow traditional soil survey practice and use <math>1000</math> or <math>2000 \mu\text{m}</math> (BSI 16 or 8 mesh) fractions (Table 4, Figure 9 and Appendix 3).

### 3.4 Sieving Techniques

Several countries had difficulty completing the section of the inventory on sieving methods. In some cases it is not clear whether samples were sieved in the field, in the laboratory or both (Table 5). The majority of stream sediment surveys employ sieving techniques in the laboratory after the samples have been dried, but in a significant number of countries sediment is wet sieved in the field. Surveys in Norway and a small area in the north of the UK are based on wet sieving sediment to a relatively coarse size fraction

### 3 Results

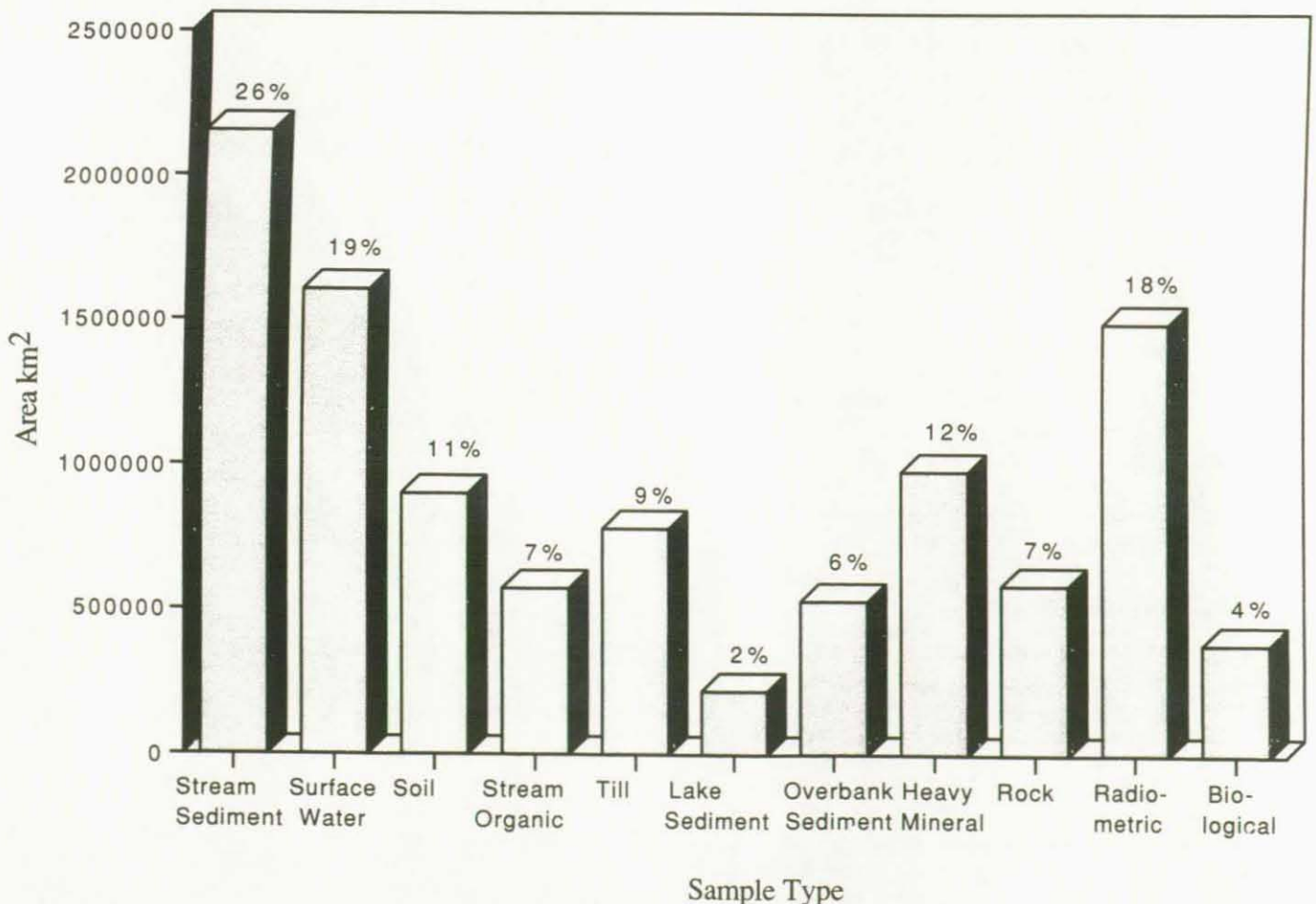
#### 3.1 Regional Coverage

The extent of coverage of FOREGS countries by each sample type is listed in Appendix 4 and is shown in Figures 2 to 7 and Appendix 3. Results for percentage of coverage are based on the total area of the 33 FOREGS countries which extend to 8 306 516 km<sup>2</sup>. Table 2 lists the range of sample types collected by each country.

The coverage of regional geochemical till, organic drainage, rock, lake sediment and biological surveys is largely restricted to Scandinavian, Baltic and some central European countries (Table 2 and Figures 2-6). These surveys do not, therefore, provide a suitable basis for the preparation of European geochemical maps. The use of overbank sediment is also somewhat restricted (Table 2 and Figures 2 and 4). Although the coverage of heavy mineral surveys is more extensive (12%) (Table 2 and Figures 2 and 4), in several cases these samples have undergone qualitative rather than quantitative analysis and are consequently not suitable for the preparation of geochemical maps. Despite increased concern about radioactivity in the environment, only 18% (Table 2 and Figures 2 and 5) of

the FOREGS region is covered by radiometric surveys. This contrasts with the situation in North America and Australia where complete coverage of systematic radiometric data is available. There is clearly a need for survey organisations to increase radiometric survey activity if they are to make a significant contribution to environmental radiometric policy.

Many FOREGS countries have surveys based on either stream sediments, surface waters or soils and these materials are considered in more detail in this report as they appear to offer the most valuable basis for the preparation of European geochemical maps. Stream sediment surveys are by far the most extensive and have been carried out in 22 of the 33 countries covering 26% of the FOREGS region (Table 2 and Figures 2 and 6). Complete systematic coverage is available for Albania, Northern Fennoscandia, former West Germany, Lithuania, Poland, Slovakia and Slovenia. Large areas of Austria, the Czech Republic, France, Greece, Greenland, Portugal, Romania and the UK are also covered. Most of these surveys have been carried out for a range of environmental and economic applica-



**Figure 2** Area of FOREGS countries covered by each sample type. (Percentage cover of the total area of FOREGS countries is indicated at the top of each column)

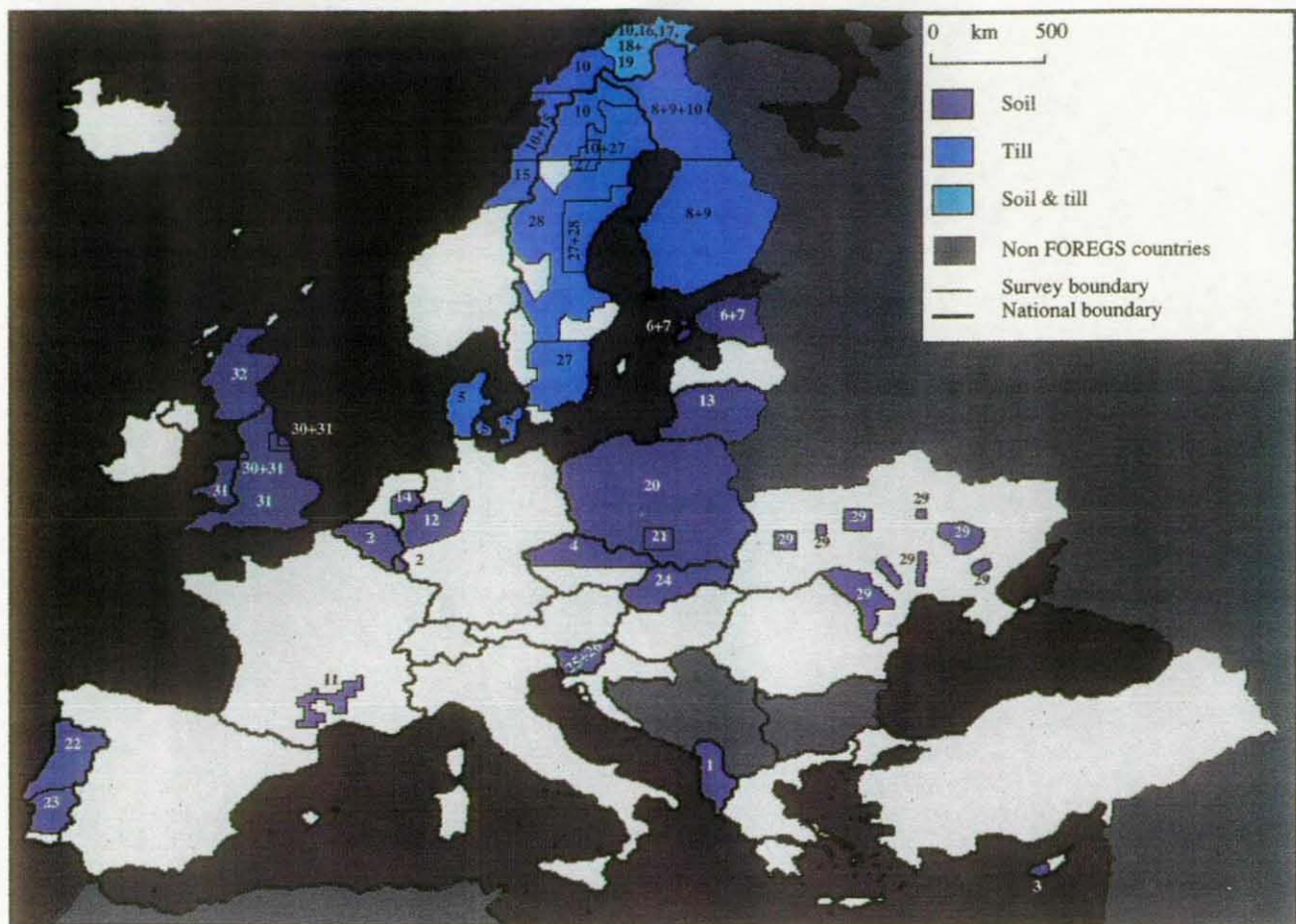


Figure 3 Coverage of soil and till surveys in FOREGS countries.

KEY:

Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density (Samples/ km <sup>2</sup> )	Size Fraction (µm)	Determinants, Total	Determinants, Extractable
1	GGCT(2)	Albania	Soil	Whole country	1 per 2.5	180	39 elements	
2	FSCC	Most of Europe	Soil	Belgium	1 per 76	2000	C, N	14 elements
3	GS Dept(1)	Cyprus	Soil	Troodos Ophiolite	Not applicable	100	Co, Cu, Ni, Zn	
4	Soil Survey	Czech Republic	Soil	Whole country	1 per 1	2000		13 elements
5	DIPSS	Denmark	Till	Whole country	1 per 2	20	C, Ca, N, NO <sub>3</sub>	Al, Fe
6	EG(1)	Estonia	Soil	Whole country	1 per 16 Total	2000	30 elements	
7	EG(2)	Estonia	Soil	Whole country	1 per 450 Extract 1 per 1800/2400 Tot	2000	28 elements	8 elements
8	GSF(3)	Finland	Till	Whole country	1 per 320	60	38 elements	8 elements
9	GSF(4)	Finland	Till	Whole country	1 per 4	60	Au	25 elements
10	GSF/NGU/SGU	Fin/Nor/Swe	Till	N Fennoscandia	1 per 200	62	27 elements	
11	BRGM(2)	France	Soil	Cevennes-Montagne Noire	1 per 0.5	125	22 elements	
12	GLNRW(1)	Germany	Soil	Northrhine-Westfalia	1 per 2		C, Cd, Cu, N, Ni, Pb, Zn	15 elements
13	IG/LGT(1)	Lithuania	Soil	Whole country	1 per 50	1000	35 elements, pH	
14	RGD(1)	Netherlands	Soil	The Netherlands	1 per 10	2000	27 elements	
15	NGU(6)	Norway	Till	Nordland and Troms	1 per 40	63	19 elements	25 elements
16	NGU(11)	Norway	Soil	Finnmark	1 per 40	1000		24 elements
17	NGU(12)	Norway	Till	Finnmark	1 per 40	60		27 elements
18	NGU(13)	Norway	Till	Finnmark	1 per 40	63	Au, Pt	27 elements
19	NGU(14)	Norway	Till	Finnmark	1 per 200	60	16 elements	
20	PIG(3)	Poland	Soil	Whole country	1 per 25-30	1000		21 elements
21	PIG(4)	Poland	Soil	Upper Silesia	1 per 5	1000		21 elements
22	Aveiro Uni(2)	Portugal	Soil	N Portugal	1 per 225	180		32 elements
23	IGM(3)	Portugal	Soil	S Portugal	1 per 0.01	180	No information	
24	Soil Survey	Slovakia	Soil	Whole country	1 per 5	125	34 elements	
25	ULIG(2)	Slovenia	Soil	Whole country	1 per 180	2000	36 elements	
26	GZL(2)	Slovenia	Soil	Whole country	1 per 25	2000	36 elements	
27	SGU(2)	Sweden	Till	S + Mid Sweden	1 per 7	63	30 elements, pH	22 elements
28	NSG	Sweden	Till	N-Mid Sweden	1 per 15	63		18 elements
29	INGMOF	Ukraine	Soil	Kiev, Poltava etc.	1 per 1	500-1000	34 elements, pH, Eh	
30	BGS(1)	UK	Soil	Tyne Tees/Welsh Borders	1 per 2	150	29 elements	
31	Soil Survey	UK	Soil	England and Wales	1 per 25	2000	18 elements, pH	11 elements
32	MLURI	UK	Soil	Scotland	1 per 100	2000	19 elements	Ca, K, Mg, Na



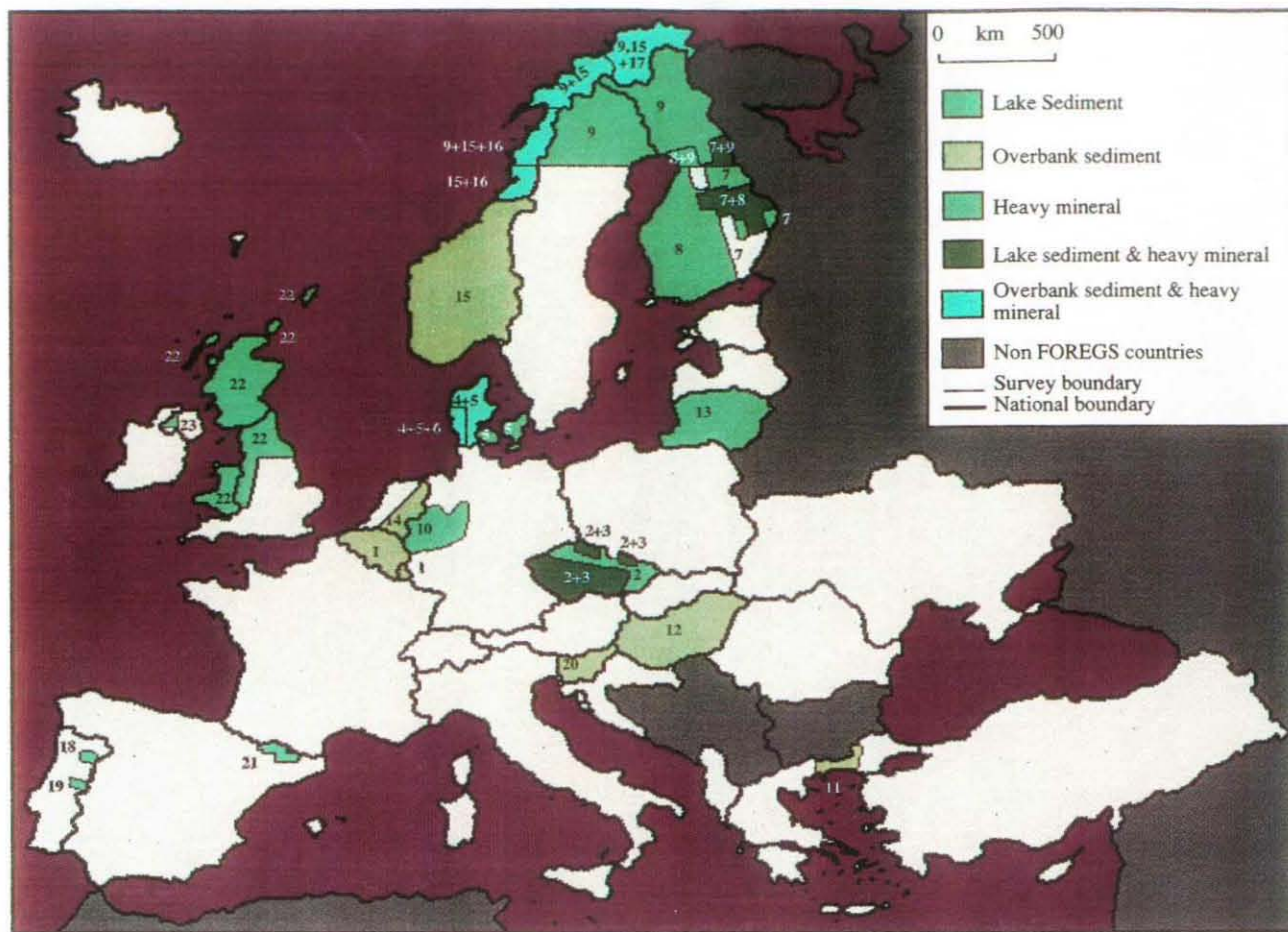


Figure 4 Coverage of lake sediment, overbank sediment and heavy mineral surveys in FOREGS countries.

KEY

Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density (Samples/km <sup>2</sup> )	Size Fraction (µm)	Determinants, Total	Determinants, Extractable
1	GSB/UL	Belgium/Luxembourg	Overbank sediment	Belgium + Luxembourg	1 per 523	125	24 elements	
2	CGS(2)	Czech Republic	Lake/river sediment	Whole country	1 per 350		51 elements	10 elements
3	Geomin	Czech Republic	Heavy mineral	Whole country	1 per 1	150	36 elements	
4	MAF	Denmark	Overbank sediment	Jutland	1 per 2		Ca, Mg, FeS <sub>2</sub> , CaCO <sub>3</sub> , FeCO <sub>3</sub> , pH	
5	GDU(1)	Denmark	Heavy mineral	W Jutland	1 per 100	45		
6	GDU(2)	Denmark	Heavy mineral	Whole country	1 per 205	45		
7	GSF(1)	Finland	Lake sediment	E Finland	1 per 5		U	Ag, Co, Cu, Fe, Mn, Ni, Pb, Zn
8	GSF(2)	Finland	Heavy mineral	SE Finland	1 per 14	2000	12 elements	
9	GSF/NGU/SGU	Fin/Nor/Swe	Heavy mineral	N Fennoscandia	1 per 200	62	25 elements	
10	GLNRW(2)	Germany	Heavy mineral	Northrhine-Westfalia	1 per 4	32		
11	IGME(2)	Greece	Overbank sediment	E Macedonia and Thrace	1 per 300	63	46 elements	28 elements
12	GIH(2)	Hungary	Overbank sediment	Whole country	1 per 225	100		26 elements
13	IG(2)	Lithuania	Lake sediment	Whole country	1 per 40	1000	33 elements	
14	RGD(2)	Netherlands	Overbank sediment	Netherlands	1 per 500	125	27 elements	
15	NGU(7)	Norway	Overbank sediment	Whole country	1 per 500	60	31 elements	
16	NGU(9)	Norway	Heavy mineral	Nordland and Troms	1 per 40	180	23 elements	
17	NGU(15)	Norway	Heavy mineral	Finnmark	1 per 180	180	22 elements	
18	IGM(4)	Portugal	Heavy mineral	Regiao do Rio Douro	1 per 1.5	4000		
19	IGM(5)	Portugal	Heavy mineral	Faixa de Gois-Segura	1 per 1	4000		
20	GZL(1)	Slovenia	Overbank sediment	Whole country	1 per 150	125	36 elements	
21	ITGE(3)	Spain	Heavy mineral	Central Pyrenees	1 per 5	5000	Mineralogy	
22	BGS(5)	UK	Heavy mineral	N-Mid Britain	1 per 1.5	2000	Mineralogy	
23	BGS/GSNI(2)	UK	Heavy Mineral	N Ireland	1 per 2	2000	Mineralogy	

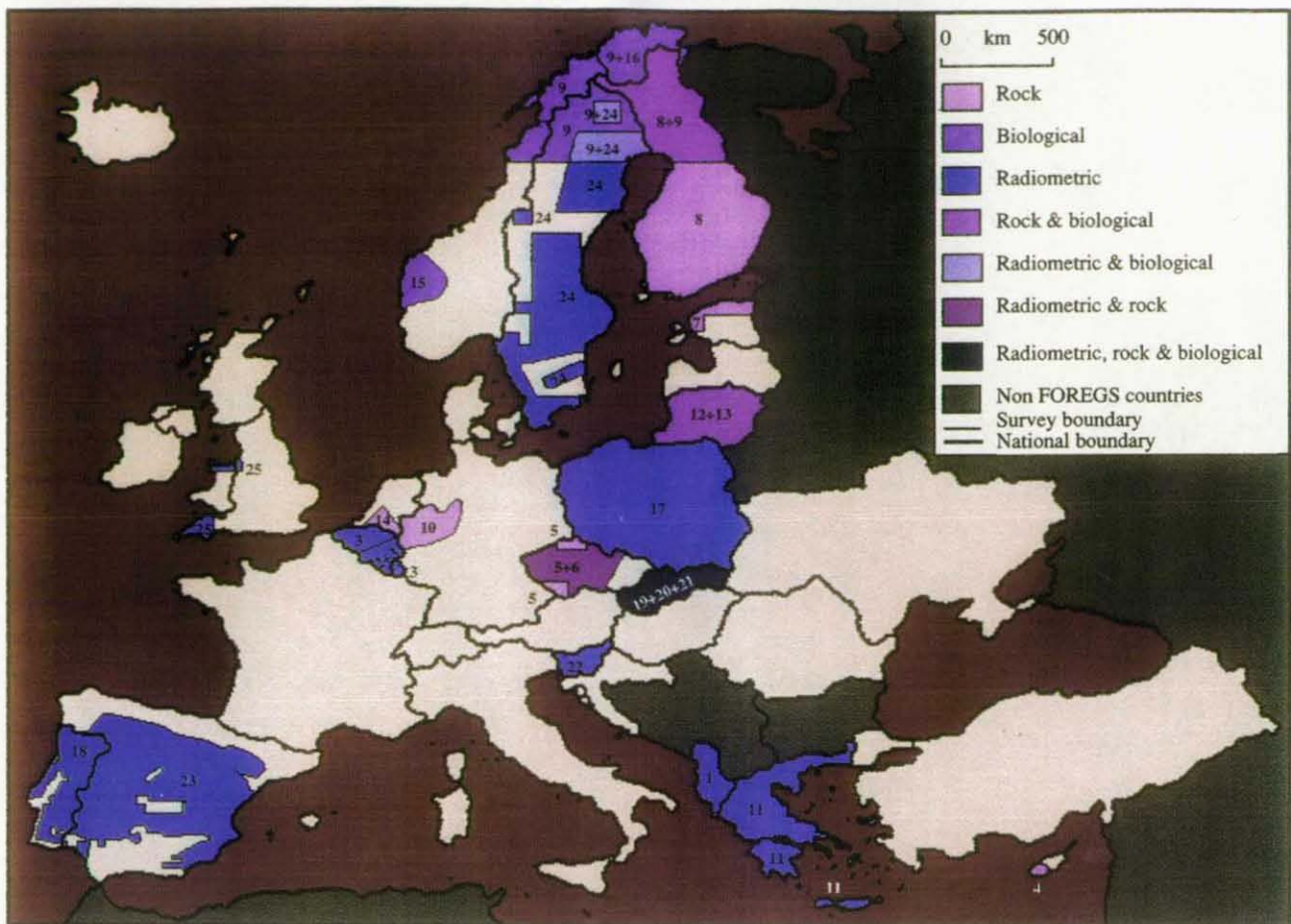


Figure 5 Coverage of rock, radiometric and biological surveys in FOREGS countries.

KEY

Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density Samples/ km <sup>2</sup>	Size Fraction (µm)	Determinants
1	GGCT(4)	Albania	Radiometric	Whole country	1 per 0.8		Total gamma, U, K, Th
2	GSB/PFM	Belgium	Radiometric	Walloon Region	100 m		Total gamma, eU, K, Th
3	GSB	Belgium/ Luxembourg	Radiometric	Belgium+Luxembourg	1 km spacing		Total gamma, eU, K, Th
4	GS Dept(2)	Cyprus	Rock	Troodos Ophiolite	Not applicable		Total Co, Cu, Ni, Zn
5	CGS(4)	Czech Republic	Rock	Whole country	1 per 20		
6	Geofyzika	Czech Republic	Radiometric	Whole country	250 m spacing		Total gamma, eU, K, Th, Cs
7	EG(3)	Estonia	Rock	N Estonia	1 per 0.5		
8	GSF(5)	Finland	Rock	Whole country	1 per 48		
9	GSF/NGU/SGU	Fin/Nor/Swe	Biological	N Fennoscandia	1 per 200		
10	GLNRW(4)	Germany	Rock	Northrhine-Westfalia	Variable		
11	IGME(3)	Greece	Radiometric	Whole country	1 per 1		Total gamma
12	IG/LGT(2)	Lithuania	Rock	Whole country	1 per 25		
13	Forest Inst.	Lithuania	Biological	Whole country	1 per 16		
14	RGD(3)	Netherlands	Rock/soil	Netherlands	1 per 100	2000	Total 27 elements
15	NGU(5)	Norway	Biological	Sogn and Fjordane	1 per 30		
16	NGU(16)	Norway	Biological	Finnmark	1 per 200		
17	PIG(7)	Poland	Radiometric	Whole country	17 km spacing		Total gamma, eU, K, Th
18	IGM(6)	Portugal	Radiometric	Portugal	1 per 1		Total gamma, eU, K, Th
19	GSSR(3)	Slovakia	Rock	Whole country	1 per 12		
20	Forest Res Inst	Slovakia	Biological	Whole country	1 per 15		Total 38 elements
21	Uranpress	Slovakia	Radiometric	Whole country	1 per 10		Total gamma, eU, K, Th
22	GZL(3)	Slovenia	Radiometric	Whole country	1 per 25		Total gamma, eU, K, Th
23	ENUSA	Spain	Radiometric	Spain	1 km spacing		Total gamma, eU, K, Th
24	SGU(3)	Sweden	Radiometric	Sweden	1 per 40/200 m		Total gamma, eU, K, Th, Cs-137
25	BGS(10)	UK	Radiometric	UK	Variable		Total gamma, eU, K, Th, Rn, Tn

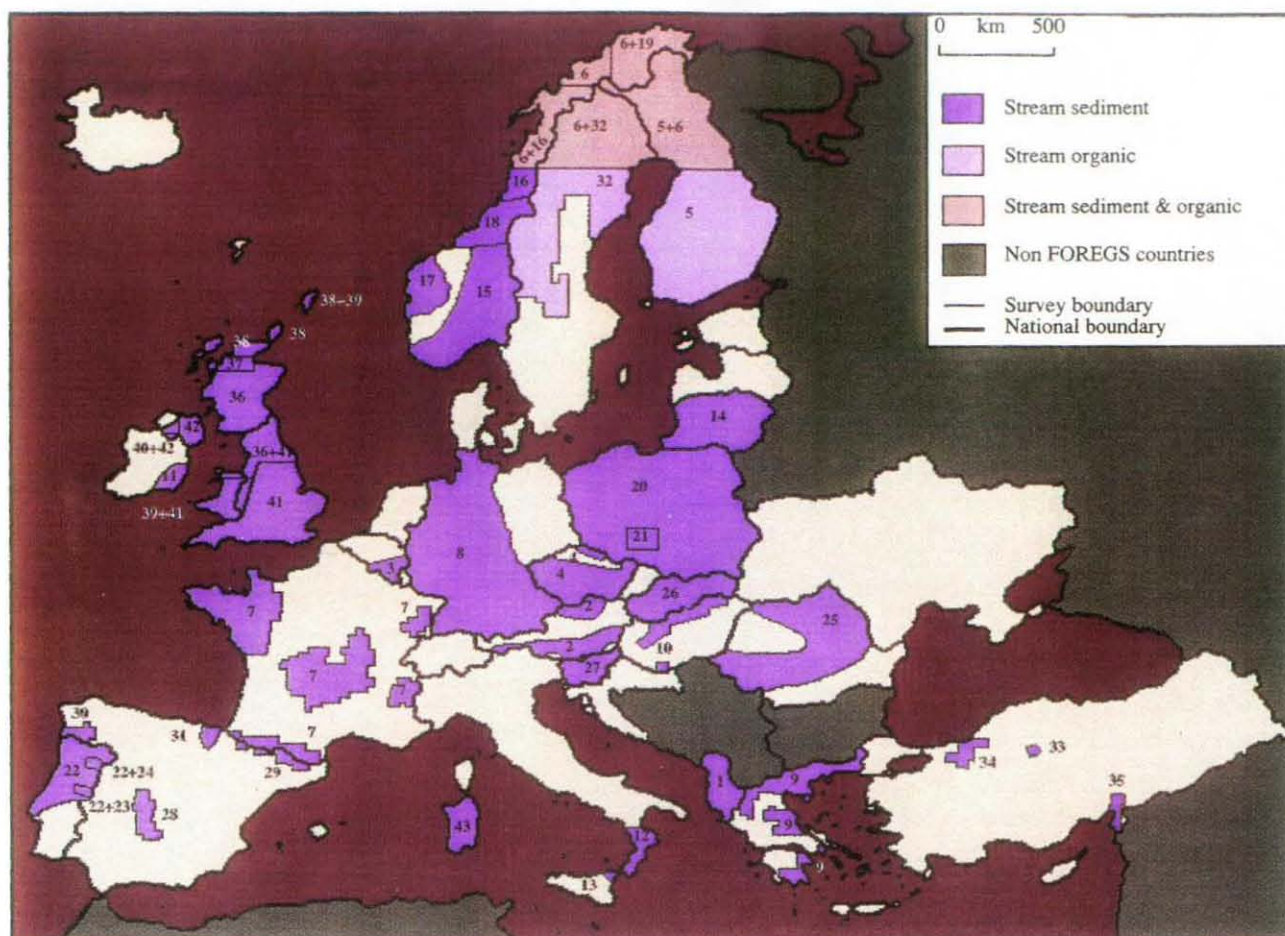


Figure 6 Coverage of stream sediment and stream organic surveys in FOREGS countries.

Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density (Samples/km <sup>2</sup> )	Size Fraction (µm)	Determinants, Total	Determinants, Extractable
1	GGCT(1)	Albania	Stream sediment	Whole country	1 per 2.5	180	34 elements	
2	GB	Austria	Stream sediment	Alps + Bohemian Massif	1 per 1.5	177	34 elements	
3	GSB/UCL	Belgium	Stream sediment	Walloon Region	1 per 1	180	Cu, Fe, Mn, U, V	
4	CGS(1)	Czech Republic	Stream sediment	Bohemian Massif	1 per 1.5	63	15 elements	Cu, Mn, Ni, Pb, Zn
5	GSF(6)	Finland	Stream organic	Whole country	1 per 290		28 elements	
6	GSF/NGU/SGU	Fin/Nor/Swe	Stream sediment	N Fennoscandia	1 per 200	180	22 elements	
			Stream organic		1 per 200	100	25 elements	
7	BRGM(1)	France	Stream sediment	Massif Central Alpes Vosges Pyrenees Massif Armonicaian	1 per 0.5	125	22 elements	
8	BGR(1)	Germany	Stream sediment	Former FRG	1 per 4	200	Ba, Cr, Sr, V	11 elements
9	IGME(1)	Greece	Stream sediment	Greece	1 per 0.5	177	Hg, U	14 elements
10	GIH(1)	Hungary	Stream sediment	Hilly regions	1 per 4	100		18 elements
11	GSI	Ireland	Stream sediment	SE Ireland	1 per 4	150	39 elements	
12	MICA(1)	Italy	Stream sediment	Calabria	1 per 3		11 elements	
13	MICA(2)	Italy	Stream sediment	Peloritani	1 per 0.5		35 elements	
14	IG(1)	Lithuania	Stream sediment	Whole country	1 per 60	1000	33 elements	
15	NGU(1)	Norway	Stream sediment	SE Norway	1 per 4-25	180	23 elements	18 elements
16	NGU(2)	Norway	Stream sediment	Nordland and Troms	1 per 40	180	23 elements	25 elements
17	NGU(3)	Norway	Stream sediment	Sogn and Fjordane	1 per 30	180	19 elements	26 elements
18	NGU(8)	Norway	Stream sediment	Nord-Trondelag	1 per 3	180	38 elements	19 elements
19	NGU(10)	Norway	Stream sediment	Finnmark	1 per 30	180	23 elements	23 elements
20	PIG(5)	Poland	Stream sediment	Whole country	1 per 25	200	20 elements	20 elements
21	PIG(6)	Poland	Stream sediment	Upper Silesia	1 per 5	200	20 elements	32 elements
22	Aveiro Uni(1)	Portugal	Stream sediment	N Portugal	1 per 225	180		
23	IGM(1)	Portugal	Stream sediment	Faixa de Gois-Segura	1 per 0.3	180	22 elements	
24	IGM(2)	Portugal	Stream sediment	Regiao do Rio Duoro	1 per 0.25	180	32 elements	
25	GIR(1)	Romania	Stream sediment	E + S Carpathians	1 per 2000	63	36 elements	
26	GSSR(1)	Slovakia	Stream sediment	Whole country	1 per 2	125	36 elements	
27	ULIG(1)	Slovenia	Stream sediment	Whole country	1 per 200	63	37 elements	
28	ITGE(1)	Spain	Stream sediment	S Central Meseta	1 per 0.25	177	27 elements	
29	ITGE(2)	Spain	Stream sediment	Central Pyrenees	1 per 0.4	177	23 elements	
30	ITGE(4)	Spain	Stream sediment	S Galicia	1 per 0.4	177	23 elements	
31	ITGE(5)	Spain	Stream sediment	Basque Country	1 per 7	177	35 elements	
32	SGU(1)	Sweden	Stream organic	S Sweden	1 per 7/ ex. 1 per 40		29 elements	Cd, Hg, Se

Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density (Samples/km <sup>2</sup> )	Size Fraction (µm)	Determinants, Total	Determinants, Extractable
33	MTA(1)	Turkey	Stream sediment	Central Anatolian Region	1 per 1	177	Cu, Pb, Zn, Hg, W	
34	MTA(2)	Turkey	Stream sediment	Marmara	1 per 1	177	Pb, Zn	
35	MTA(3)	Turkey	Stream sediment	Antakya-Kirkhan	1 per 2	177	Co, Cu, Ni, Pb, Zn	
36	BGS(6)	UK	Stream sediment	Mid Britain	1 per 1.5	150	33 elements	
37	BGS(7)	UK	Stream sediment	NW Scotland	1 per 1.5	150	26 elements	
38	BGS(8)	UK	Stream sediment	N Scotland	1 per 1.5	150	14 elements	
39	BGS(9)	UK	Stream sediment	Mid-S Wales and Shetland	1 per 1.5	150	35 elements	
40	BGS/GSNI(1)	UK	Stream sediment	N Ireland	1 per 2	150	35 elements	
41	EGRC,ICL(1)	UK	Stream sediment	England and Wales	1 per 3	200	21 elements	
42	EGRC,ICL(2)	UK	Stream sediment	N Ireland	1 per 3	200	19 elements	
43	MICA (3)	Italy	Stream sediment	Sardinia	1 per 2		47 elements	

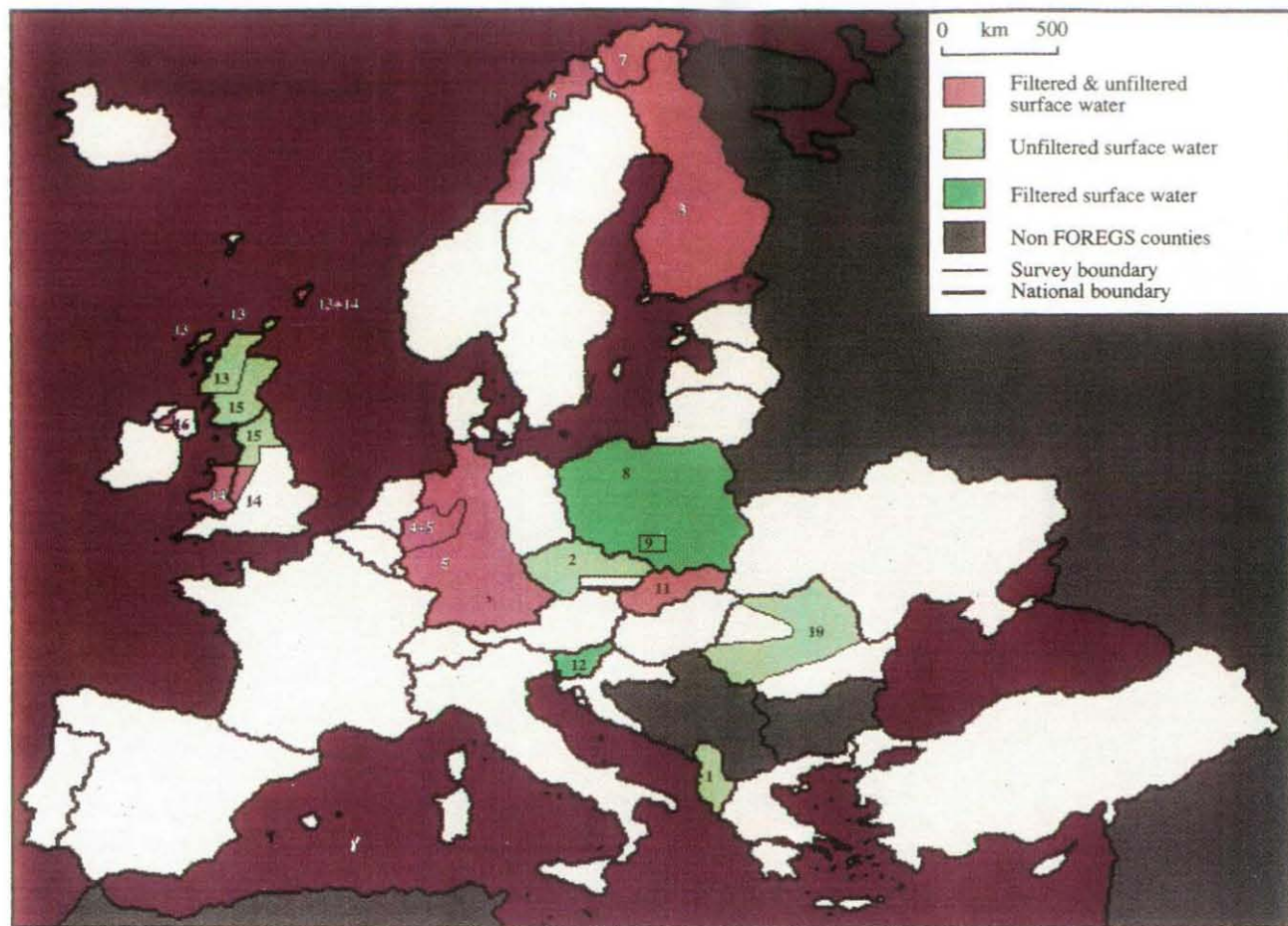


Figure 7 Coverage of surface water surveys in FOREGS countries.

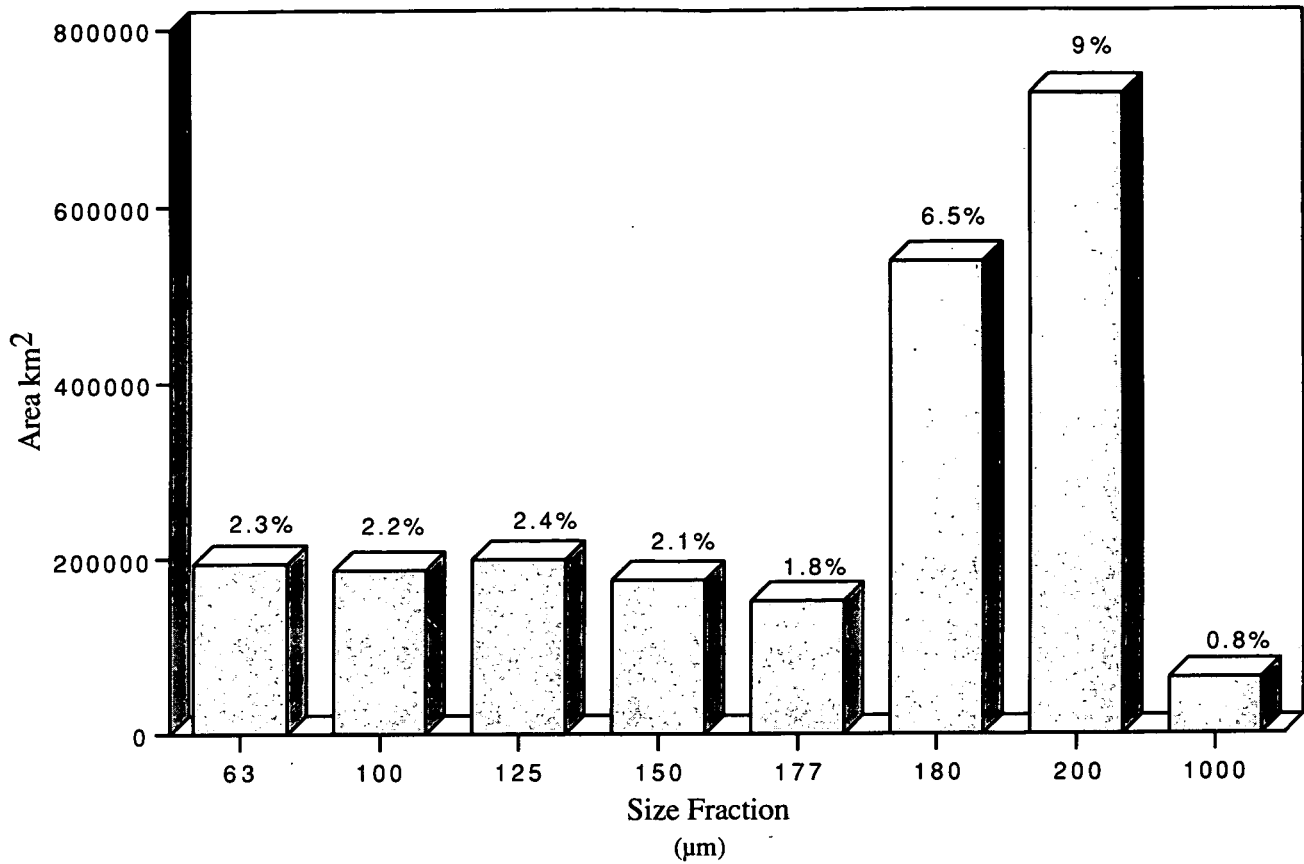
Survey No.	Organisation	Country	Survey Type	Area Name	Sample Density (Samples/km <sup>2</sup> )	Size Fraction (µm)	Determinants, Unfiltered water	Determinants, Filtered water
1	GGCT(3)	Albania	Stream/spring water	Whole country	1 per 2.5	None	U, HCO <sub>3</sub> , SO <sub>4</sub> , Cl, Fe <sup>2+</sup> , Fe <sup>3+</sup> , tot heavy metals	
2	CGS(3)	Czech Republic	Lake/stream/spring water	Whole country	1 per 6	None	20 elements, pH, cond	
3	GSF(7)	Finland	Stream water	Whole country	1 per 290	None and 0.45	SO <sub>4</sub> , NO <sub>3</sub> , 12 determinants	27 elements
4	GLNRW(3)	Germany	Spring water	Northrhine-Westfalia	1 per 2	None and 0.45	HCO <sub>3</sub> , CO <sub>2</sub> , C	24 elements
5	BGR(2)	Germany	Stream water	Former FRG	1 per 3	None	8 elements, pH, cond, temp	
6	NGU(4)	Norway	Stream water	Nordland and Troms	1 per 50	None and 0.45		8 elements, pH, cond
7	NGU(17)	Norway	Stream water	Finnmark	1 per 30	None and 0.45		21 elements
8	PIG(1)	Poland	Stream/lake water	Whole country	1 per 25	Hard filter	24 elements	
9	PIG(2)	Poland	Stream/lake water	Upper Silesia	1 per 5	Hard filter	24 elements	
10	GIR(2)	Romania	Stream water	E + S Carpathians	1 per 2000	None	40 elements	
11	GSSR(2)	Slovakia	Spring/well/bore water	Whole country	1 per 3	None and 0.45	11 elements, pH, cond, temp, alk	20 elements
12	ULIG(3)	Slovenia	Stream/seepage water	Whole country	1 per 200	0.45		74 elements, pH, cond, temp, tot hard
13	BGS(2)	UK	Stream water	NW Scotland	1 per 1.5	None	U, pH, cond	
14	BGS(3)	UK	Stream water	Wales and Shetland	1 per 1.5	None and 0.45	pH, cond, HCO <sub>3</sub>	20 elements
15	BGS(4)	UK	Stream water	Mid Britain	1 per 2	None	U, F, pH, cond, HCO <sub>3</sub>	
16	BGS/GSNI(3)	UK	Stream water	N Ireland	1 per 2	None and 0.45	pH, cond, HCO <sub>3</sub>	41 elements

**Table 3** Sampling densities employed for stream sediment, surface water and soil surveys in FOREGS countries.

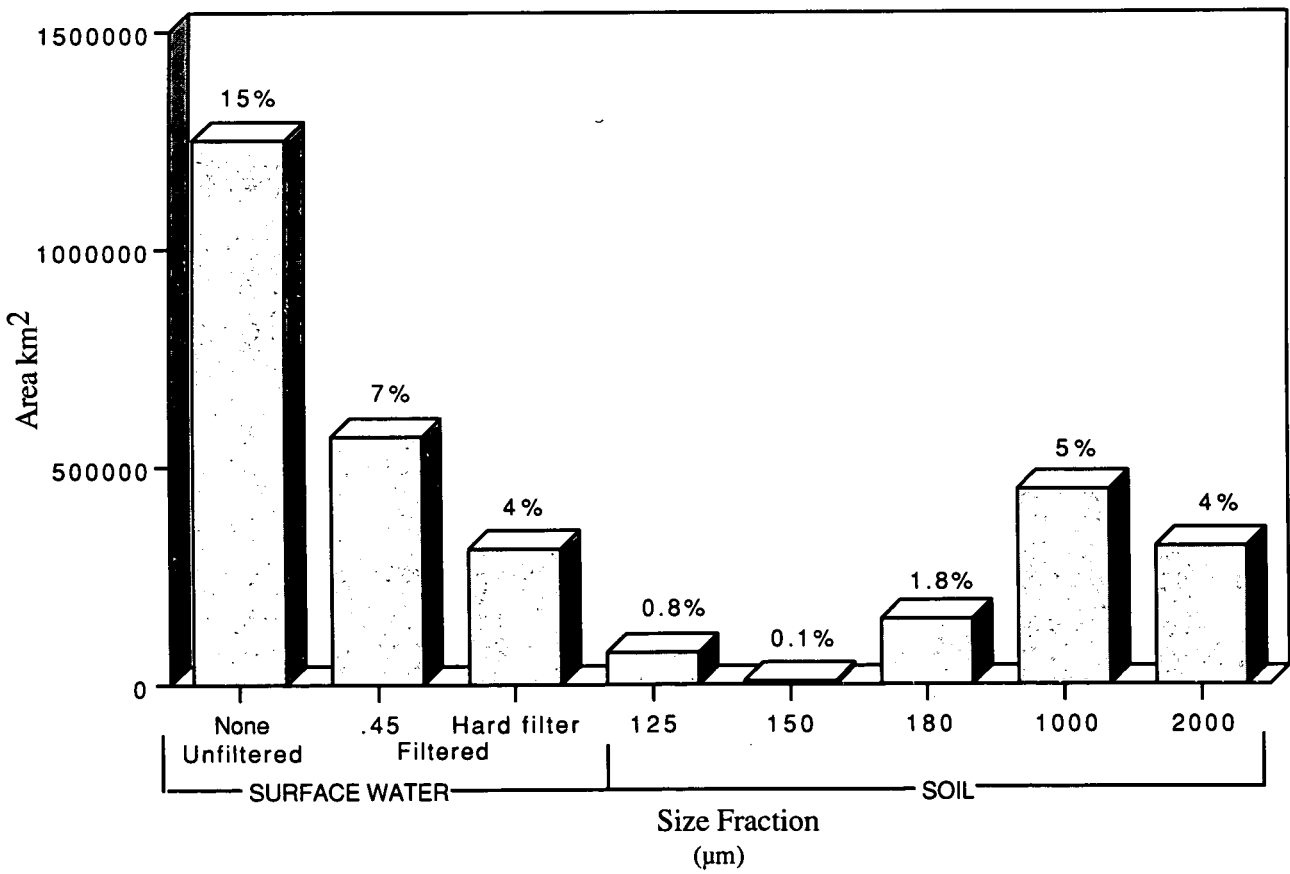
	Sampling Density (1 sample per x km <sup>2</sup> )								
	0.01-0.30	0.4	0.5	1	1.5	2	2.5	3	4
<b>Stream Sediments</b>	Portugal Spain	Spain	France Greece Italy	Belgium Turkey	Austria Czech UK	Slovakia Turkey UK	Albania	Italy Norway UK	Germany Hungary Ireland Norway
<b>Surface Water</b>					UK	Germany UK	Albania	Germany Slovakia	
<b>Soil</b>	Portugal		France	Czech Ukraine		Germany UK	Albania		
	<b>5</b>	<b>6</b>	<b>7</b>	<b>10-16</b>	<b>25</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>
<b>Stream Sediments</b>	Greenland Poland		Spain		Norway Poland	Greenland Norway	Norway	Greenland	Lithuania
<b>Surface Water</b>	Poland	Czech			Poland	Greenland Norway		Greenland Norway	
<b>Soil</b>	Poland Slovakia			Estonia Netherlands	Poland Slovenia UK	Estonia	Norway	Lithuania	
	<b>76-100</b>	<b>180</b>	<b>200</b>	<b>225-290</b>	<b>450</b>	<b>1800</b>	<b>2000</b>	<b>2400</b>	<b>3500</b>
<b>Stream Sediments</b>			Finland Norway Slovenia Sweden	Portugal			Romania		
<b>Surface Water</b>			Slovenia	Finland			Romania		
<b>Soil</b>	Belgium UK	Slovenia		Portugal	Estonia	Estonia		Estonia	Estonia

**Table 4** Size fractions collected for stream sediment, surface water and soil samples in FOREGS countries.

	Water		Size Fraction								
	Unfiltered None	Filtered 0.45	63	100	125	<µm 150	177	180	200	1000	2000
<b>Stream Sediment</b>			Czech Romania Slovenia	Greenland Hungary	France Slovakia	Greenland Ireland UK	Austria Greece Spain Turkey	Albania Belgium Finland Norway Portugal Sweden	Germany Poland UK	Lithuania	
<b>Surface Water</b>	Albania Czech Finland Germany Greenland Norway Romania Slovakia Slovenia UK	Finland Germany Norway Slovakia Slovenia UK									
<b>Soil</b>				Cyprus	France Slovakia	UK		Albania Portugal		Lithuania Norway Poland Ukraine	Belgium Czech Estonia Germany Nethlnds Slovenia UK



**Figure 8** Area of FOREGS countries covered by stream sediment grain-size fractions. (Percentage cover of the total area of FOREGS countries is indicated at the top of each column)



**Figure 9** Area of FOREGS countries covered by surface water and soil size fractions. (Percentage cover of the total area of FOREGS countries is indicated at the top of each column)

**Table 5** Sample sieving methods employed in FOREGS countries.

	Field Sieving		Laboratory Sieving		Field Wet then	Field Dry then
	Wet	Dry	Wet	Dry	Lab Dry Sieving	Lab Dry Sieving
<b>Stream Sediments</b>	Finland Ireland Norway Sweden Romania Spain UK	Greece Turkey Italy		Albania Austria Belgium Czech France Germany Greenland Hungary Lithuania Poland Portugal Slovakia Slovenia Spain UK	Norway UK (minor area)	
<b>Soils</b>		Estonia	Belgium Ukraine	Albania Czech France Germany Lithuania Netherlands Poland Portugal Slovakia Slovenia Ukraine UK		Cyprus

in the field followed by dry sieving to a finer mesh size in the laboratory. With the exception of Belgium and the Ukraine, all soil surveys are based on dry sieving methods. Estonia and Cyprus are the only countries to dry sieve soils in the field.

### 3.5 Analytical Techniques

A range of techniques have been employed to analyse geochemical samples in FOREGS countries, largely reflecting the years during which the survey was conducted. The abbreviations used to describe each technique are listed in Table 6. The main analytical methods available in FOREGS countries include XRF, ICP-AES, ICP-MS, DC-Arc ES, Flame AAS and NAA (Table 7 and Appendix 4). Surveys in Ireland, Italy and Luxembourg do not have the facilities to analyse regional geochemical samples, and geochemical analyses were carried out in

commercial and survey laboratories in other countries in these cases.

The range of elements determined appears to reflect the type of analytical method available rather than the economic or environmental aims of the survey (Figures 10–12 and Appendix 4). Elements such as Sr and Zr which are readily determined by rapid, high-productivity, cost-effective methods have been included in more surveys than elements such as Au and U which are potentially of greater economic significance. There are few data for elements of environmental importance which are difficult to determine by automated analytical methods. Iodine has been determined in only one water survey, for example, and only Greenland, Norway, Slovakia and the UK have data for Se in stream sediments, surface waters or soils. Both total and extractable analytical methods have been employed. The definitions listed in the inventory are those described by each survey organisation.



**Table 6** Abbreviations of analytical techniques employed by FOREGS countries.

Analytical Technique	Abbreviation
DC Arc Emission Spectrometry	DC-Arc ES
Flame Atomic Absorption Spectrometry	Flame AAS
Electro-thermal Vaporisation Atomic Absorption Spectrometry	ETV-AAS
Cold Vapour Atomic Absorption Spectrometry	Cold vapour AAS
Atomic Absorption Spectrometry (unspecified)	AAS
Inductively Coupled Plasma Atomic Emission Spectrometry	ICP-AES
Direct Current Plasma Atomic Emission Spectrometry	DCP-AES
Inductively Coupled Plasma Mass Spectrometry	ICP-MS
Optical Emission Spectrometry	OES
Spectrophotometry	Spectrophotometry
Flame Photometry	Flame Phot
Semi-quantitative Spectral Analysis	Semi quant. Spectral
Instrumental Neutron Activation Analysis	INAA
Delayed Neutron Activation Analysis	DNAA
Neutron Activation Analysis (unspecified)	NAA
Delayed Neutron Counting	DNC
Flow Injection Analysis	FIA
Ion Selective Electrode	ISE
Ion Chromatography	IC
High Precision Liquid Chromatography	HPLC
Gas Chromatography	GC
GSM (Albania)	GSM
X-ray Fluorescence	XRF
Energy Dispersive X-ray Fluorescence	ED-XRF
Fluorimetric	Fluorimetric
X-ray Diffraction	XRD
Colorimetric	Colorimetric
Gravimetric	Gravimetric
LECO	LECO
Kjeldahl	Kjeldahl
Gutzeit Test	Gutzeit
Catalytic	Catalytic

**Table 7** Main analytical techniques employed by FOREGS countries.

XRF	DC-Arc ES	ICP-AES	ICP-MS	Flame AAS	NAA
Albania	Albania	Albania	Finland	Austria	Czech
Austria	Austria	Austria	Romania	Belgium	Finland
Belgium	Germany	Belgium	Slovenia	Cyprus	Greece
Czech	Greenland	Czech	UK	Czech	Greenland
Estonia	Lithuania	Finland		Denmark	Ireland
Finland	Ukraine	Germany		Estonia	Norway
Germany	UK	Greece		Finland	Sweden
Greece		Hungary		Germany	UK
Greenland		Norway		Greece	
Lithuania		Poland		Greenland	
Luxembourg		Portugal		Hungary	
Italy		Slovakia		Ireland	
Netherlands		Slovenia		Italy	
Norway		Spain		Luxembourg	
Romania		Sweden		Norway	
Sweden		UK		Spain	
UK				Sweden	
				Turkey	
				UK	

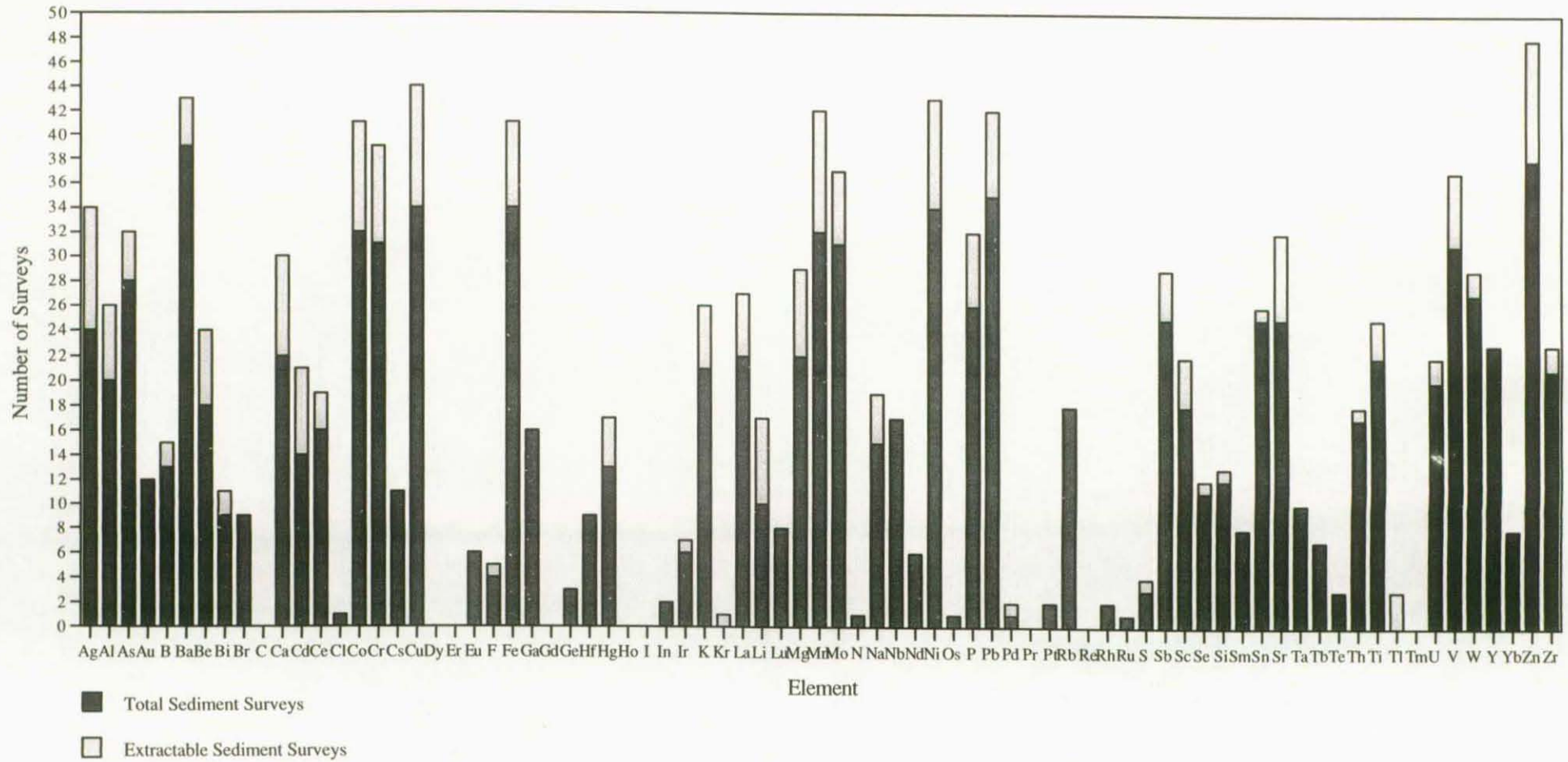
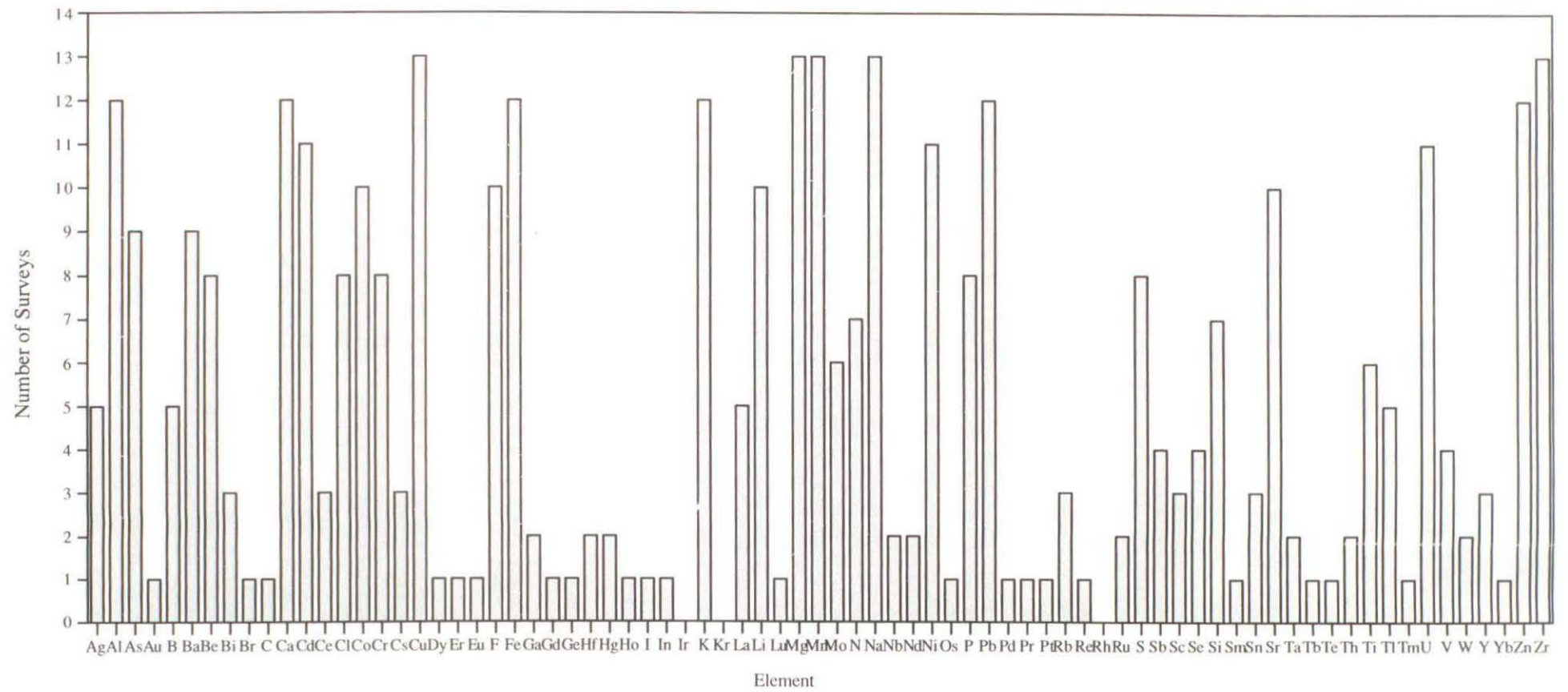


Figure 10 Availability of total and extractable analyses of elements in stream sediments in FOREGS countries.



**Figure 11** Availability of analyses for elements in surface waters in FOREGS countries.

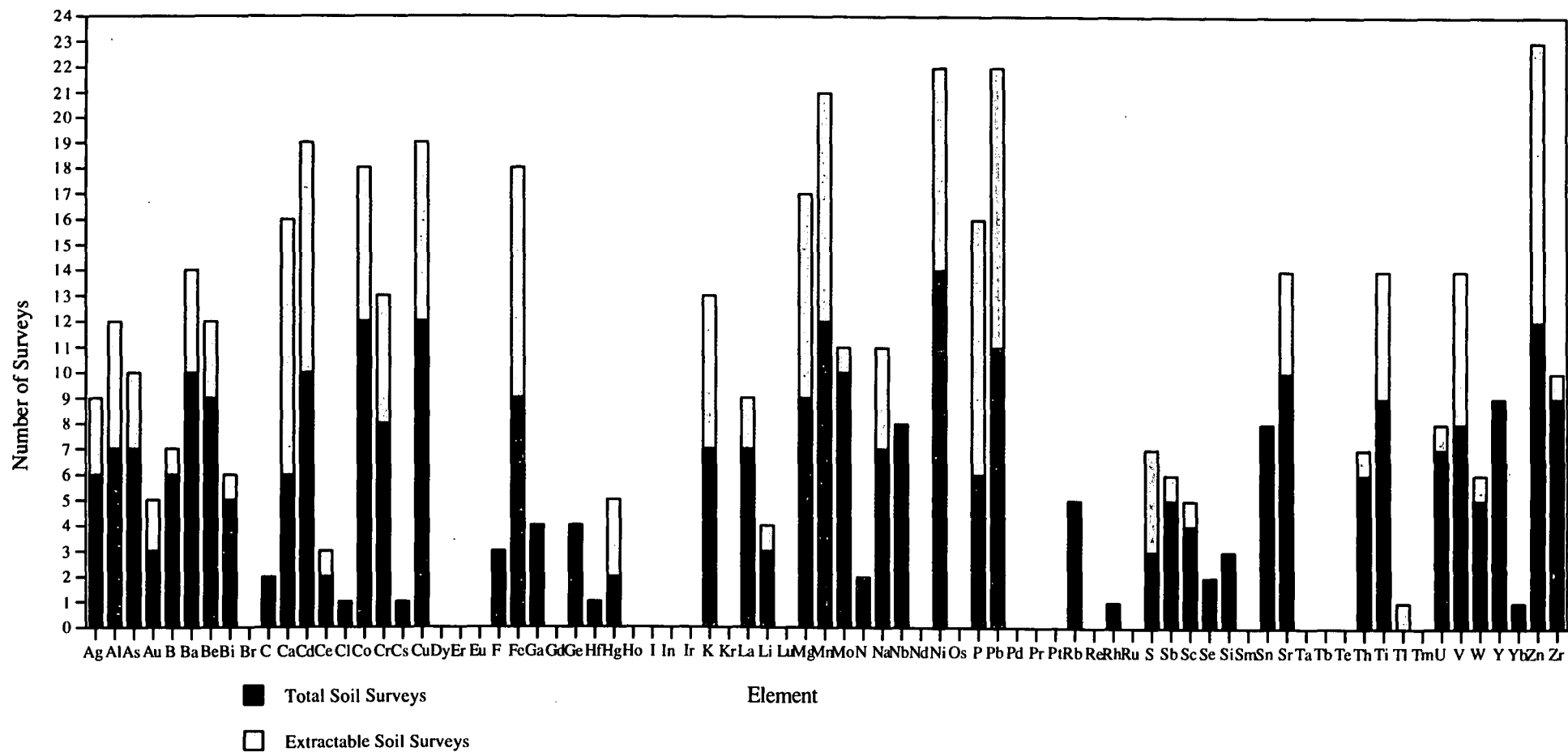


Figure 12 Availability of total and extractable analyses of elements in soils in FOREGS countries.

### 3.6 Quality Control Procedures

All FOREGS countries employ some form of quality control procedure involving inclusion of field and/ or analytical duplicates in analysis, repeat analysis and analysis of internal and/or international reference materials (Appendix 4 and Table 8 ). There are, however, no systematic quality control procedures among countries, highlighting the need for the EU-funded laboratory standardisation project proposed at the FOREGS Geochemistry Task Group meeting in January 1995. The UK is the only country where national water standards are included in analysis.

### 3.7 Archive Sample Material and Digital Data

Most FOREGS countries retain sample archives for stream sediment and soil samples, although Albania is the only country to report storage of surface water samples (Table 9 and Appendix 4). Stream sediment sample archives are available for 14% of the area of FOREGS countries and soil archive material extends to 6% (Figure 13).

Digital data are available for 21% of the FOREGS region for stream sediments, 6% for surface waters and 8% for soils (Figure 13).

**Table 8** Analysis of international standards in FOREGS countries.

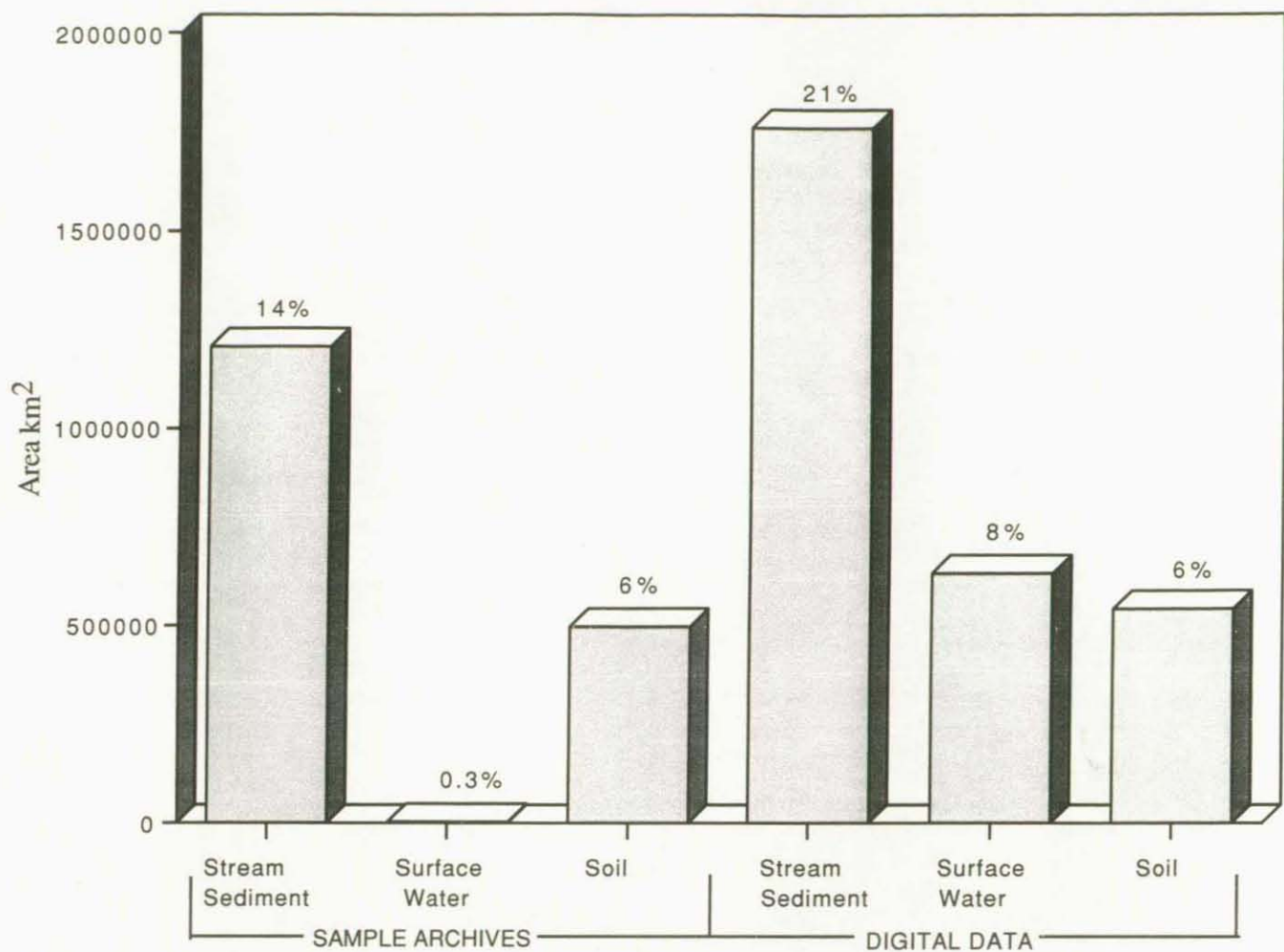
International Standards Analysed		No Response to Inventory Question
Yes	No	
Austria	Albania	Belgium
Cyprus	Germany (seds)	Denmark
Czech	Greece	Italy
Estonia	Poland	Portugal (some surveys)
Finland	Spain (some surveys)	Romania
France	Ukraine	Turkey
Germany (soil)	UK (some surveys)	
Greenland		
Hungary		
Ireland		
Lithuania		
Netherlands		
Norway		
Portugal		
Slovakia		
Slovenia		
Spain		
Sweden		
UK		

**Table 9** Availability of sample archives and digital data in FOREGS countries.

	Sample Archives		Digital Data		No Response to question
	Yes	No	Yes	No	
<b>Stream Sediments</b>	Albania France Greece Ireland Italy Lithuania Norway Poland Portugal (some) Slovakia Spain UK	Austria Belgium Germany Greenland Hungary Portugal (some) Turkey	Albania Austria Germany Greece Greenland Hungary Ireland Italy Lithuania Norway Poland Portugal (some) Slovakia Slovenia Spain Turkey UK	Belgium Portugal (some surveys) Romania	Czech France (digital) Norway (some surveys) Romania (archive) Slovenia (archive)
<b>Surface Water</b>	Albania	Czech Finland Germany Greenland Norway Poland Slovakia Slovenia UK	Albania Czech Germany Norway Slovakia Slovenia UK	Finland Poland Romania	Greenland (digital) Romania (archive)
<b>Soil</b>	Albania Czech Estonia France Germany Lithuania Norway Portugal (some) Slovakia Slovenia UK	Belgium Netherlands Poland Portugal (some) UK (some)	Albania Czech Estonia France Germany Lithuania Netherlands Norway Portugal (some) Slovakia Slovenia Ukraine UK	Belgium Poland Portugal (some surveys) UK (some surveys)	Ukraine (archive)

## 4 Conclusions

1. Many FOREGS countries have high-quality multi-element, geochemical data available in digital form at the national level which can be interacted with other geoscience and environmental datasets using GIS.
2. The data have been collected for various purposes including exploration and environmental studies. In several countries multi-purpose surveys are now in progress.
3. This is reflected by the range of sample types collected. Stream sediment, stream water and soil data are available from most surveys. These sample types therefore provide the most appropriate basis for the preparation of environmental geochemical baseline maps of the FOREGS countries.
4. Across the FOREGS countries, stream sediments have been collected using a narrow range of mesh sizes (<150 to <200  $\mu\text{m}$ ), close to those recommended in the UNESCO report of IGCP 259.
5. In the case of soil surveys conducted for geochemical purposes, however, the range of mesh sizes is bimodal. Some surveys collect fine mesh sizes (close to those recommended in the UNESCO report of IGCP 259) to integrate with stream sediment data while others follow traditional soil survey methods and use <1000 or <2000  $\mu\text{m}$  fractions.
6. Various analytical methods have been used, partly reflecting the years in which the survey was performed. Most data have been calibrated using international reference materials.
7. Different suites of chemical elements have been determined in different surveys but data for the PHES are generally available.
8. Sample densities range from 1 sample per 0.5  $\text{km}^2$  to 1 sample per 3500  $\text{km}^2$ .
9. Sample archives are available for re-analysis for up to 14% of the land area of the FOREGS countries.
10. Systematic radiometric data are available for only a small proportion of the land area of the FOREGS countries, despite the Chernobyl accident and increasing concern about natural radioactivity, especially radon gas. This compares very unfavourably with North America, the FSU and many developing countries.



**Figure 13** Area of FOREGS countries for which sample archives and digital data are available for stream sediments, surface waters and soils. (Percentage cover of the total areas of FOREGS countries is indicated at the top of each column)

## 5 Recommendations

1. Modern high-resolution, multi-element geochemical databases prepared to the standards agreed by IGCP 259/360 should be given high priority by FOREGS Directors. These databases have a range of applications comparable to those of other geoscience maps including environmental studies, mineral exploration and geological studies. Such databases are essential if Geological Surveys wish to play the central role in environmental issues concerned with the geochemistry of the surface environment, a subject which is of increasing interest and concern to the public and national governments.
2. The continuing support of FOREGS Directors is requested for:
  - a. The proposal led by GSF to examine the impact of climate change on the mobilisation of PHES based on available environmental geochemical baseline data (Chemical Time-Bomb Concept)
  - b. Initiatives in organising international conferences such as that of GSSR Baseline Geochemical Mapping in Europe (May 1996) and the BGS-AEG Environmental and Legislative Uses of Geochemical Data for Sustainable Development (March 1996)
3. It is recommended that FOREGS organisations prepare or modify their existing geochemical programmes to ensure that their data conform to IGCP 259/360 standards and are suitable for environmental baseline studies as well as other purposes.
4. In terms of national mapping programmes, it is recommended that FOREGS organisations collect a stream sediment and/or soil and one surface water sample if possible at each sample site, in addition to samples such as till, rock or biological material which they may require for their national purposes. A minimum density of 1 site per 100 km<sup>2</sup> is recommended (where higher density surveys are available these can be sub-sampled using computer methods).\*

\* Standard soil survey methods based on <1000 and <2000 µm size fractions are NOT RECOMMENDED since they involve the preparation and analysis of a large proportion of quartz and other coarse-grained dilutants and are particularly wasteful of effort for developing countries who may wish to follow the European lead.
5. The preparation of European Geochemical Maps should incorporate existing geochemical data. The integration of existing datasets will be greatly aided by collection and analysis of the Global Reference Network (GRN) of samples recommended by IGCP 259.
6. Integration of existing data may require some re-analysis and re-sampling. Additional analysis for environmentally important trace elements such as Se and I is recommended.
7. The collection of the GRN samples is the next priority for FOREGS countries. Samples should be collected according to IGCP 259 recommendations. Stream sediment, surface water, soil, floodplain soil and humus samples are required to maintain global compatibility.
8. Implementation of a GRN of samples in Europe also provides a basis for monitoring changes in environmental geochemical baselines through time. In the UK, for example, it is proposed to combine geochemical monitoring with the operation of the seismic network. The UK is served by 70 seismic monitoring stations and the range of remotely-gathered data from selected monitoring sites will be extended to include surface or atmospheric gamma radiation and radon in soil gas. In addition, it is proposed that routine geochemical sampling of stream sediment, surface water and soil should be carried out during maintenance visits to the seismic network sites. The proposed programme will provide information on both short/medium-term radiometric variation and long-term geochemical change.
9. Analytical methods used for geochemical baselines across Europe urgently require calibration and standardisation among laboratories, and two EU proposals, involving 16 EU countries and 9 non-EU countries led by RGD, have been submitted to the EU Standards Measurement and Testing programme (DG12) and the INCO-Copernicus Programme (DG12). The continuing support of the FOREGS Directors is sought for these proposals and for the collection by each national survey of the Global Reference Network samples that they will require.
10. It is recommended that FOREGS should produce a newsletter detailing the activities of all FOREGS groups and any proposals submitted to the EU. This would raise the profile of proposals ensuring that all FOREGS countries wishing to collaborate are aware of potential projects.
11. The FOREGS Directors' support is sought for the preparation of an exhibit for presentation at environmental and geochemistry meetings run by learned societies and trade and professional associations.
12. FOREGS Directors are requested to press the case, especially with the EU and the EEA, for additional funding for baseline geochemical and radiometric surveys across Europe.
13. Following this final report of the task group (1996) consideration should be given to establishing a standing group involving all FOREGS countries to oversee the preparation of a geochemical database for Europe to IGCP 360 standards with the chairmanship rotating once every two years. The standing group should also act as the European Regional Committee for the IUGS Working Group on Continental Geochemical Baselines.



## 6 Bibliographic references

Organisation	Country	Bibliographic References
GGCT(1)	Albania	Stream Survey in Scale 1:25 000. Geoalba Archive.
GGCT(2&3)	Albania	Geochemical Survey in Scale 1:200 000. Geoalba Archive.
GGCT(4)	Albania	Results of Radiometric Surveys in Korabi Zone, Alp and Mirdita Zone and Jonian Zone.
GB	Austria	THALMANN, F, SCHERMANN, O, SCHROLL, E, and HAUSBERGER, G. 1989. Geochemical Atlas of the Republic of Austria. 1:1 000 000. Geol. Bundesanstalt, Wien.
GSB/UCL	Belgium	THORLET et al., 1983. Reconnaissance Survey for Uranium in the Belgian Palaeozoic. Geological Survey of Belgium Professional Paper 196.
GSB/UL	Belgium/Luxem	Atlas in press.
GSB/PFM	Belgium	CHARLET, J M, DEJONGHE, L, DEWITTE, S M, DRUMEL, B, HENRY, J, HERBOSCH, A, LEFIN, J P, and MARTIN, H. 1993. Reconnaissance Survey for Uranium in the Belgian Palaeozoic. Geological Survey of Belgium Professional Paper 196.
CGS(1)	Czech Republic	BARNET, I, DURIS, M, and MRNA, F. 1986. Geochemická Prospekce Recistnich Sedimentu v Ceskem Masivu. Academia, Praha. (In Czech).
CGS(2)	Czech Republic	In Czech only.
Soil Survey	Czech Republic	Annual reports for GEMS — PoTT — ROMA. Publications in Czech only.
CGS(3)	Czech Republic	VESELY, J, and MAJER, V. 1993. Environmental Survey of Fresh Waters in the Czech Republic. Proc Biogeomon, CGS.
Geofyzika	Czech Republic	In Czech only.
MAF	Denmark	MADSEN, H B, JENSEN, N H, JACOBSEN, B H, and PLAUTOU, S W. 1985. A method for identification and mapping potentially acid sulphate soils in Jutland, Denmark. Catuna 12. 363–371.
DIPSS	Denmark	MADSEN, H B. 1991. Soil mapping in Denmark. The Danish Soil Database. In: CEC, Soil and Groundwater Research. Report 1. Soil Survey — A Basis for European Soil Protection.
GDU(1&2)	Denmark	Heavy Mineral Sands in Denmark. 1993. DGU Service Report No. 4.
EG(1&2)	Estonia	In prep, will be published 1996.
GSF(1)	Finland	TENHOLA, M. 1988. Alueellinen geokemiallinen järvisedimenttikartoitus Itä-Suomessa — Regional Geochemical Mapping based on Lake Sediments in Eastern Finland. GSF, Report of Investigation 78. 42 pp.
GSF(2)	Finland	NIKKARINEN, M, MÄKINEN, J, and SALMINEN, R. 1991. Statistical Interpretation of the Regional Geochemical Mapping Data based on the Heavy Fraction of Till in Southern Finland. GSF, Spec. Paper 12, 181–186.
GSF(3)	Finland	KOLJONEN, T. 1992. Geochemical Atlas of Finland, Part 2, Till. GSF.
GSF(4)	Finland	SALMINEN, R. 1995. Alueellinen geokemiallinen kartoitus Suomessa vuosina 1982–1994. — Regional Geochemical Mapping in Finland 1982–1994 GSF, Report of Investigation.
GSF(6&7)	Finland	LAHERMO et al. In prep. Geochemical Atlas of Finland, Part 3: Environment. GSF. SALMINEN, R, and TARVAINEN, T. In press. Geochemical mapping and databases in Finland, J. Geochem Explor.
GSF/NGU/SGU	Fin/Nor/Swe	BOLVIKEN, B et al. 1986. Geochemical Atlas of Northern Fennoscandia. GSU/GNU/GSF
GLNRW(2)	Germany	Geological maps of North Rhine Westfalia
BGR(1&2))	Germany	FAUTH, H, HINDEL, R, SIEVERS, U, and FINNA, I. 1985. Geochemische Atlas der Bundesrepublik Deutschland.
IGME(2)	Greece	DEMETRIADES, A, OTTESEN, R T, and LOCUTURA, J. 1990. Geochemical Mapping of Western Europe Towards the Year 2000. Pilot Project Report NGU Open File Report 90–105.
GGU(1)	Greenland	THORNING, L, TUKIAINEN, T, and STEENFELT, A (eds). 1994. Compilations of Regional Geoscience Data from the Kap Farvel-luvittuut Area, South Greenland. Thematic Map Series Gronlands Geol Unders. 94/1.
GGU(2)	Greenland	ADY, B, and TUKIAINEN, T. (eds) 1995. Compilations of Regional Geoscience Data from the Paaminut–Buksefjorden Area, Southern West and South-west Greenland. Thematic Map Series. Gronlands Geol Unders. 95/1.
GGU(3)	Greenland	STEENFELT, A. 1987. Geochemical mapping and prospecting in Greenland — a review of results and experience. J Geochem. Explor. Vol. 29. 183–203

Organisation	Country	Bibliographic References
GGU(4)	Greenland	GHISLER, M, HENRIKSEN, N, STEENFELT, A, and STENDAL, H. 1979. A Reconnaissance Geochemical Survey in the Proterozoic-Phanerozoic Platform Succession of the Peary Land Region, North Greenland. Rapp. Gronlands Geol Unders. No. 88. 85-91.
GGU(5)	Greenland	JENSEN, S M, STEENFELT, A, and DAM, E. 1994. Reconnaissance Geochemical Mapping of Lambert Land and Southern Kronprins Cristina Land, Eastern North Greenland. Open File Series. Gronlands Geol Unders. 94/19. 19 pp. 41 maps.
GGU(6)	Greenland	STEENFELT, A, and KUNZENDORF, H. 1979. Geochemical methods in uranium exploration in Northern East Greenland. In: WATTERSON, J R, and THEOBALD, P K (eds). 1979. Geochemical Exploration. Association of Exploration Geochemists Spec Vol. 7. Ontario. 429-442.
GGU(7)	Greenland	STEENFELT, A, DAM, E, and ERFURT, P. 1992. Reconnaissance Geochemical Mapping of Eastern South Greenland (60°30' to 62°30'N). Open File Series. Gronlands Geol Unders. 92/10. 12 pp.
GGU(8)	Greenland	STEENFELT, A, and DAM, E. 1982. Reconnaissance Study of Uranium and Fluorine contents of Stream and Lake Surface Waters, West Greenland. Rapp. Gronlands Geol Unders. 110. 26-32.
GGU(11)	Greenland	STEENFELT, A, THORNING, L, and TUKIAINEN, T. 1990. Regional Compilations of Geoscience Data from the Nuuk-Maniitsog Area, Southern West Greenland. Thematic Map Series Gronlands Geol Unders. 90/1. 9 pp. 57 maps with legends.
GGU(12)	Greenland	GRISLER, M. 1994. Ore Minerals in Stream Sediments from North Greenland. GGU Open File Series. 94/17.
GGU(13)	Greenland	ADY, B, and TUKIAINE, T. 1995. Regional Compilations of Geoscience Data from the Paamiut-Buksefjorden Area, Southern West and South-west Greenland. Thematic Map Series Gronlands Geol Unders. 94/2. 27 pp. 63 maps with legends.
GGU(14)	Greenland	HARPOTH, O, PEDERSEN, J L, SCHONWANDT, H K, and THOMASSEN, B. 1986. The Mineral Occurrences of Central East Greenland. Meddr Gronland Geosci 17. 139 pp.
GGU(15)	Greenland	THORNING, L, TUKIAINEN, T, and STEENFELT, A. 1994. Regional Compilations of Geoscience Data from the Kap Farvel-Ivittuut Area, South Greenland. Thematic Map Series Gronlands Geol. Unders. 94/1. 27 pp. 4 figs, 5 tables, 71 maps with legends.
GIH(1)	Hungary	Regional Geochemical Survey of the Tokaj Mts, NE Hungary. 1993. GSF. Helsinki.
GSi	Ireland	O'CONNOR, P J, and GALLAGHER, V. 1994. Gold prospectivity in the caledonides of southeast Ireland: application of the upper crustal reservoir model. Trans IMM. 103. B175-187. O'CONNOR, P J, and REMAN, C. 1993. Multi-element regional geochemical reconnaissance as an aid to target selection in Irish Caledonian terrains. J Geochem Explor. 47. 63-87.
MICA(1)	Italy	DE VIVO, B, CLOSS, L G, LIMA, A, MARMOLINO, R, and PERRONE, V. 1984. Regional geochemical prospecting in Calabria, Southern Italy. J Geochem Explor. 21. 291-310.
MICA(2)	Italy	DE VIVO, B, LIMA, A, CATALANO, G, and CHERSICLA, A. 1993. (North-eastern Sicily, Italy): Evidence of fold anomalies. J of Geochem Explor. 46. 309-324.
IG(1)	Lithuania	RADZEVICIUS, A, and ZINKUTÉ, R. 1993. The Geochemical Peculiarities of Silt Formation in Lithuanian Rivers. Geologija. 15. Vilnius. 43-50
NGU(1)	Norway	OTTESEN, R T. 1976. Sammenstilling av data over metallinnhold i norsk jord med henblikk på sykdomsfrekvens. Rapport No. 1494/A
NGU(2)	Norway	FINNE, T E, GLATTRE, E, and LANGMARK, F. 1984. A Norwegian Cancer Atlas.
NGU(10-17)	Norway	FINNE, T E. In prep. Geokjemisk Atlas Finnmark. In Norwegian with English figure captions.
PIG(1, 3, 5)	Poland	LIS, J, and PASIECZNA, A. 1995. Geochemical Atlas of Poland 1:2 500 000. Warsaw.
PIG(2, 4, 6)	Poland	LIS, J, and PASIECZNA, A. 1995. Geochemical Atlas of Upper Silesia 1:200 000. Warsaw.
PIG(7)	Poland	IGME and Faculty of Science, Charles University, Prague. 1994. Study of Regional Gamma-Ray Data in Central and Eastern Europe. Final Report. Community Action for Cooperation in Science and Technology with Central and Eastern European Countries.
IGM(6)	Portugal	TORRES, L, GRAITY, R, and TAUCHID, M. 1993. The Radioactive Map of Portugal. In: Proceedings of the Technical Committee Meeting on the Use of Uranium Exploration Data and Techniques in Environmental Studies. IAEA. Vienna.
GZL(1)	Slovenia	BIDOVEC, M. 1994. Overbank sediment in Slovenia as a reflection of geogenic and anthropogenic activities. In: 3rd Int Symp on Environ Geochem. Krakow.
GZL(2)	Slovenia	ANDJELOV, M. 1994. Results of radiometric and geochemical measurements for the natural radioactivity map of Slovenia. Geologija. 36. 223-248.
ITGE(1)	Spain	Investigation de la Reserva Hesparica. Internal Report.
ITGE(2-4)	Spain	Internal reports. 1:50 000 map sheets
ENUSA	Spain	Proyecto MARNA XIX Reunion Anual SNE Caceres (Octubre 1993) Use of uranium airborne survey data in the preparation of radiometric map of Spain. 1993. In: Proceedings of the Technical Committee Meeting. IAEA October 1993. Vienna

Organisation	Country	Bibliographic References
		The Radiometric Map of Spain. 1994. In: IX Congreso Internacional de Minería y Metalurgia. 1994. Leon, Spain.
		El Mapa de Radiación Natural y Dosimétrico de España. 1994. Radioprotección No. 7. Vol. II.
SGU(1)	Sweden	SGU. 1985–1995. Biogeokemiska Kartor Rapporter och meddelanden Nos 42, 48, 49, 51, 60, 63, 68, 75 and 78. No. 75 and 78 with English summary.
SGU(2)	Sweden	SGU. 1988-. Markgeokemiska Kartor Rapporter och meddelanden Nos 53, 59, 62 and 73. No. 73 with English summary.
		National Atlas of Sweden. Geology. SNA Publishing. Stockholm.
NSG	Sweden	Data and Data Analysis, Digital Exploration Data in Sweden. Catalogue 1, NSG No. 92043, GeoVista, GVRAP 92005.
IGMOF	Ukraine	Atlas of Soils of Ukraine. 1979.
BGS(1)	UK	Regional Geochemistry Atlas Series: Tyne Tees. In press. BGS, Keyworth.
BGS(2)	UK	Regional Geochemistry Atlas Series: Shetland 1978; Orkney 1978; South Orkney and Caithness 1979; Hebrides 1983; Great Glen 1987; Sutherland 1982; Argyll 1990. BGS, Keyworth.
BGS(3&9)	UK	Regional Geochemistry Series: North Wales and North-west England. In prep; Hydrogeochemical Atlas of Wales. In prep. BGS, Keyworth.
BGS(3&9)		BUCHANAN, D L, and DUNTON, S N (eds). 1992. Results of a Geochemical Survey of Shetland and Identification of Exploration Targets. Shetland Islands Council
BGS(4)	UK	Regional Geochemistry Series: East Grampians 1991; Lake District 1992; Southern Scotland 1993. BGS, Keyworth.
BGS(5)	UK	Regional Geochemistry Series. BGS, Keyworth.
BGS(6)	UK	Regional Geochemistry Series: East Grampians 1991; Lake District 1992; Southern Scotland 1993. BGS, Keyworth.
BGS(7)	UK	Regional Geochemistry Series: Hebrides 1983; Great Glen 1987. BGS, Keyworth.
BGS(8)	UK	Regional Geochemistry Series: Shetland 1978; Orkney 1978; South Orkney and Caithness 1979; Sutherland 1982. BGS, Keyworth.
BGS/GSNI(1–3)	UK	FLIGHT, D M A, CHRISTIE, J L, LISTER, T R, SIMPSON, P R, and SMITH, B. 1995. Results of a Pilot Geochemical Survey, Northern Ireland. Technical Report No. GSNI/95/6.
Soil Survey	UK	MCGRATH, S P, and LOVELAND, P J. 1992. The Soil Geochemical Atlas of England and Wales. Blackie, London.
EGRC, ICL(1)	UK	The Wolfson Geochemical Atlas of England and Wales. 1978. Clarendon Press. Oxford.
EGRC, ICL(2)	UK	Provisional Geochemical Atlas of Northern Ireland. 1973. Applied Geochemical Research Group, Imperial College of Science and Technology, London.

# Appendix 1 Example of the Inventory Questionnaire Form

Forum of European Geological Surveys (FOREGS) Geochemistry Task Group 1995  
Inventory of Regional Geochemical Data in FOREGS Countries

Name of person to whom form has been sent: \_\_\_\_\_

Position: \_\_\_\_\_

Name of survey organisation: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name of person completing form: (if different from above) \_\_\_\_\_

Position: \_\_\_\_\_

Name of survey organisation: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Other Survey Organisations:**

*Please list below the names and addresses of any other national organisations responsible for collection of regional geochemical data e.g. Soil Survey Institute.*

**A. DRAINAGE SEDIMENT SURVEYS**

**A1. General Information**

*Organisation responsible* \_\_\_\_\_

*Year(s) of collection* \_\_\_\_\_

*Contact person responsible (name)* \_\_\_\_\_

Survey complete       Ongoing survey

**A2. Objective of Survey**

*Exploration*       *Environment*       *Multipurpose*

*Other*  \_\_\_\_\_  
(please specify)

**A3. Locational Information** (please also show on accompanying map)

*Country* \_\_\_\_\_

*Survey Area Name* \_\_\_\_\_

*Minimum and maximum UTM co-ordinates  
of survey area boundaries and UTM zone* \_\_\_\_\_

*Approximate  
area in km<sup>2</sup>*  
(minimum area 5000 km<sup>2</sup>, except in Cyprus  
Luxembourg, Liechtenstein, Monaco)

*Number of samples* \_\_\_\_\_

*Approximate sample density* \_\_\_\_\_  
(samples per km<sup>2</sup>)

**Comments:**

**A4. Sample Information**

Sample type

'Active'  Active  Other   
**Bank**  **channel**  (please specify) \_\_\_\_\_

*Typical catchment area of stream* (km<sup>2</sup>) \_\_\_\_\_

*Typical stream order* \_\_\_\_\_

*Type of material*  Clastic  Particulate  Organic   
 Other \_\_\_\_\_  
(please specify)

*Bulk sample weight before sieving* (kg) \_\_\_\_\_

*Sample weight after sieving* (g) \_\_\_\_\_

*Depth in sediment* (cm) \_\_\_\_\_

*Field treatment* Wet sieving  Mesh size \_\_\_\_\_  
(in microns)  
Other   
(please specify) \_\_\_\_\_

*Composite sample*  **Length of stream section** (m) \_\_\_\_\_  
**Number of individual samples forming composite** \_\_\_\_\_  
**Please specify method of homogenising samples in the field**  
\_\_\_\_\_

*Field duplicate samples collected*  **Percentage of samples** \_\_\_\_\_  
(e.g. 1 duplicate per 100 samples = 1%)

**A5. Sample Preparation**

**Drying**

Freeze drying       Deep freezing       Oven drying       Air drying   
Other  \_\_\_\_\_  
(please specify)  
Maximum temperature during drying (°C) \_\_\_\_\_

**Ashing**

Wet       Dry

**Sieving**

Wet       Dry   
Sieve type: Brass       Stainless steel       Nylon   
Other  \_\_\_\_\_  
(please specify)  
Maximum mesh size (in microns) \_\_\_\_\_  
Minimum mesh size (in microns) \_\_\_\_\_  
Sample weight after sieving (g) \_\_\_\_\_

**Disaggregation procedures**

Agate pestle and mortar       Ceramic pestle and mortar       Other  \_\_\_\_\_  
(please specify)

**Separation procedures**

Magnetic separation       Heavy liquids       Other  \_\_\_\_\_  
Density separation      Jigging      (please specify)

**Grinding**

Agate       Cr steel       Tungsten carbide   
Ceramic       Mn steel       Other  \_\_\_\_\_  
(please specify)

Final mesh size (in microns) \_\_\_\_\_

Homogenisation  \_\_\_\_\_  
(please specify composites)

**Subsampling procedures**

Cone & quarter       Random grab       Other  \_\_\_\_\_  
Riffle       Rotary       (please specify)

**A6. Chemical Analysis** (use attached list of techniques only)

**Analytical information**

Element	Total	Extractable	Solution and Molar Strength State whether hot or cold	Size (g) of Subsample	Pre-concentration Method	Analytical Method
Ag						
Al						
Ar						
As						
Au						
B						
Ba						
Be						
Bi						
Br						
C						
Ca						
Cd						
Ce						
Cl						
Co						
Cr						
Cs						
Cu						
Dy						
Er						
Eu						
F						
Fe						
Ga						
Gd						
Ge						
H						
He						
Hf						
Hg						
Ho						
I						
In						
Ir						
K						
Kr						
La						
Li						
Lu						
Mg						
Mn						
Mo						
N						
Na						
Nb						
Nd						
Ne						
Ni						



O						
Os						
P						
Pb						
Pd						
Pr						
Pt						
Rb						
Re						
Rh						
Rn						
Ru						
S						
Sb						
Sc						
Se						
Si						
Sm						
Sn						
Sr						
Ta						
Tb						
Te						
Th						
Ti						
Tl						
Tm						
U						
V						
W						
Xe						
Y						
Yb						
Zn						
Zr						

(A6 cont.)

Loss on ignition determined  yes  no

Total organic carbon determined  yes  no

International reference materials used \_\_\_\_\_  
(please specify)

Internal standards used \_\_\_\_\_  
(please specify)

Analytical duplicates  Percentage of samples  
(e.g. 1 duplicate per 100 samples = 1%)

Precision and limit of detection information available?  yes  no

Brief description of quality control procedures:

**A7. Data Availability**

**Bibliographical references** Supply list of main publications (e.g. atlases) giving titles, authors and publication details

**Availability of digital data/information**

Yes  No   
Free  Charge  \_\_\_\_\_  
(Please specify in ECUs [European Currency Units])

**Contact person** Name:  
Address:

Phone:  
Fax:  
E-mail:

**Availability of sample archives**

Yes  No   
Free  Charge  \_\_\_\_\_  
(Please specify in ECUs [European Currency Units])

**Contact person** Name:  
Address:

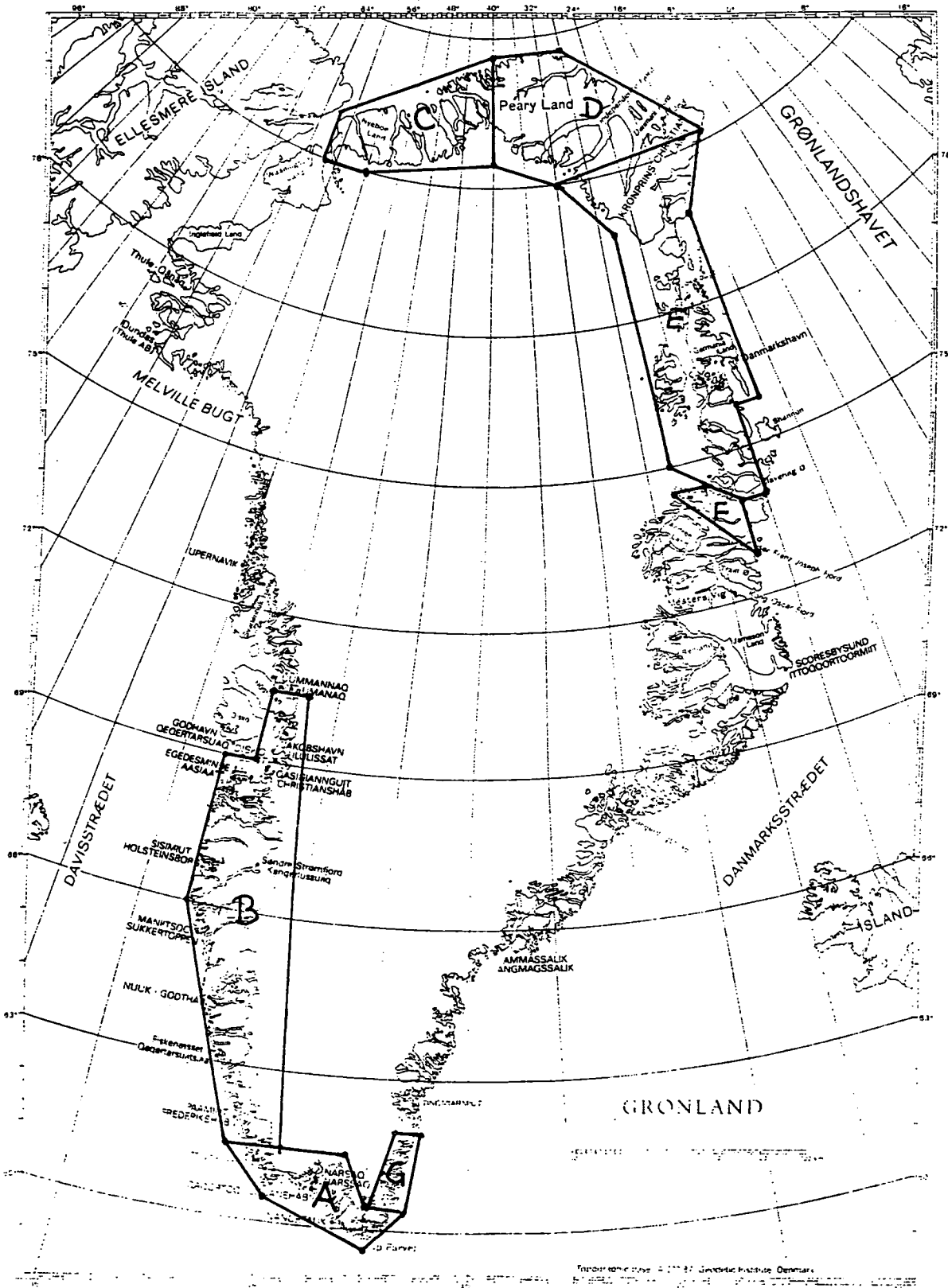
Phone:  
Fax:  
E-mail:

## Appendix 2 Organisations included in the FOREGS geochemical inventory

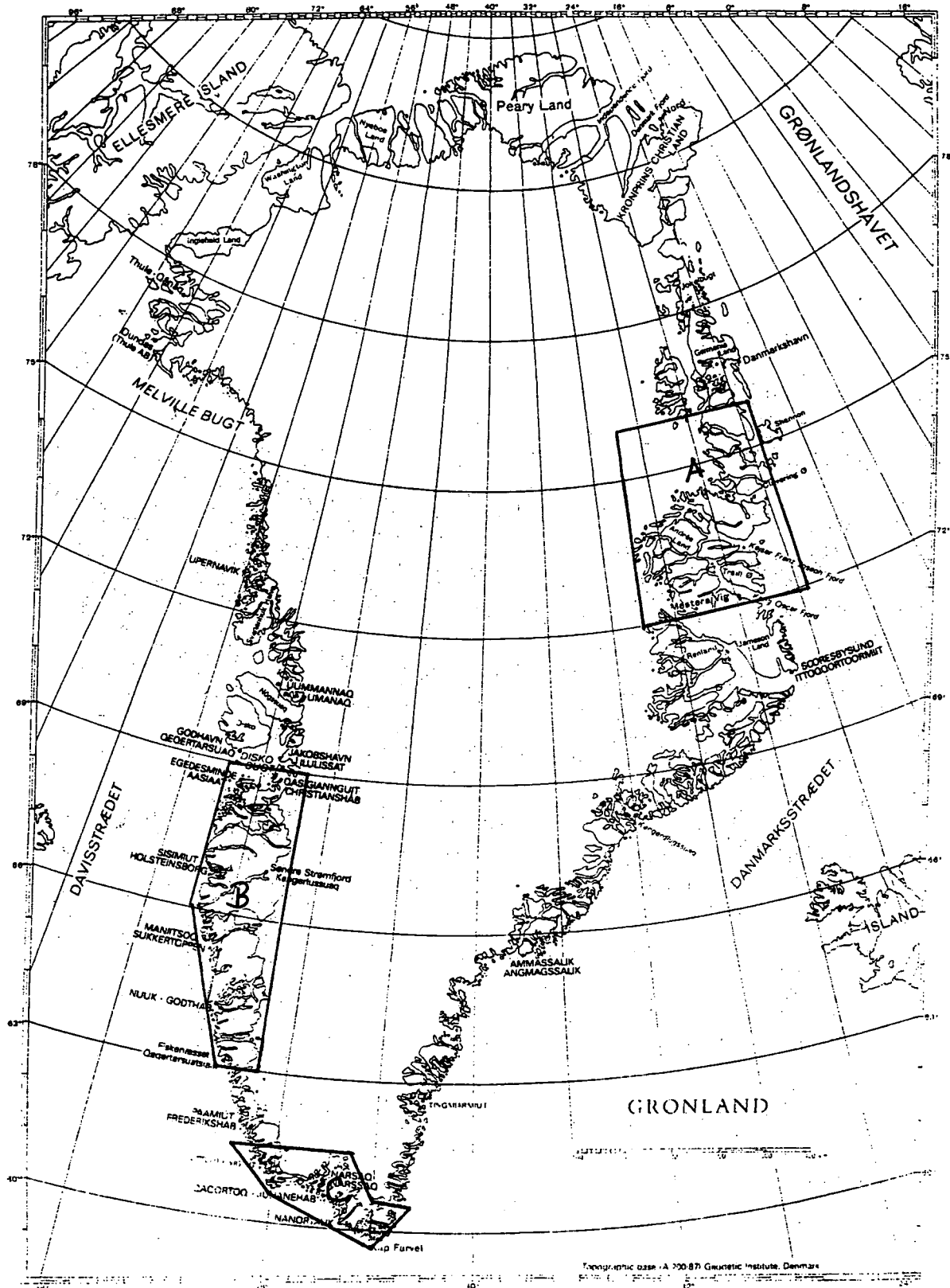
Geophysical and Geochemical Centre of Tirana (GGCT)	<b>Albania</b>
Geologische Bundesanstalt (GB)	<b>Austria</b>
Geological Survey of Belgium (GSB)	<b>Belgium</b>
University of Louvain-La-Neuve (UCL)	
University of Leuven (UL)	
Forest Soil Co-ordinating Centre (FSCC)	
Polytechnic Facility of Mors (PFM)	
Institut za Geoloska Istrazivanja (IGI)	<b>Croatia</b>
Geological Survey Department (GS Dept)	<b>Cyprus</b>
Czech Geological Survey (CGS)	<b>Czech Republic</b>
Ministry of Agriculture (Soil Survey)	
Geomineral Coop (Geomin)	
Geofyzika A S (Geofyzika)	
Danmarks Geologiske Undersøgelse (GDU)	<b>Denmark</b>
Ministry of Agriculture and Fisheries (MAF)	
Department of Plant and Soil Science (DPSS)	
Eesti Geoloogiakeskus (EG)	<b>Estonia</b>
Geological Survey of Finland (GSF)	<b>Finland</b>
Bureau de Recherches Géologiques et Minières (BRGM)	<b>France</b>
Geologisches Landesmat North-Rhine-Westphalia (GLNRW)	<b>Germany</b>
Bundesanstalt für Geowissenschaften und Rohstoffe (BGR)	
Institute of Geology and Mineral Exploration (IGME)	<b>Greece</b>
Grønlands Geologiske Undersøgelse (GGU)	<b>Greenland</b>
Geological Institute of Hungary (GIH)	<b>Hungary</b>
Orkustofnun (Ork)	<b>Iceland</b>
Geological Survey of Ireland (GSI)	<b>Irish Republic</b>
Ministry of Industry (MCA)	<b>Italy</b>
University di Napoli (Uni di Napoli)	
Geological Survey of Latvia (GSL)	<b>Latvia</b>
Lietuvos Geologijos Tarnyba (LGT)	<b>Lithuania</b>
Institute of Geology (IG)	
Institute of Forestry (Forest Inst)	
Service Géologique du Luxembourg (See Belgium)	<b>Luxembourg</b>
Rijks Geologische Dienst (RGD)	<b>The Netherlands</b>
Norges Geologiske Undersøkelse (NGU)	<b>Norway</b>
Panstwowy Instytut Geologiczny (PIG)	<b>Poland</b>
Aveiro University (Aveiro Uni)	<b>Portugal</b>
Instituto Geológico e Mineiro (IGM)	
Geological Institute of Romania (GIR)	<b>Romania</b>
Geological Survey of the Slovak Republic (GSSR)	<b>Slovakia</b>
Soil Survey of Slovakia (Soil Survey)	
Forestry Research Institute (Forest Res Inst)	
Uranpress (Uranpress)	
Institute for Geology, Geotechnics and Geophysics (GZL)	<b>Slovenia</b>
Instituto Tecnológico GeoMinero de España (ITGE)	<b>Spain</b>
Empresa Nacional del Uranio SA (ENUSA)	
Sveriges Geologiska Undersökning (SGU)	<b>Sweden</b>
Department of Mineral Resources (NSG)	
Schweizer Landeshydrologie und Geologie (SLG)	<b>Switzerland</b>
Maden Tektik ve Arama (MTA)	<b>Turkey</b>
Inst. of Geochemistry, Mineralogy and Ore Formation (IGMOF)	<b>Ukraine</b>
British Geological Survey (BGS)	<b>UK</b>
Soil Survey of England and Wales (Soil Survey)	
Environmental Geochemistry Research Group, (EGRC,ICL)	
Imperial College London	
Macaulay Land Use Research Institute (MLURI)	

# Appendix 3 Regional Geochemical Surveys in Greenland

Geochemical stream sediment and stream water surveys: A-G  
 Radiometric ground-scintillometry surveys: B, C, E, F, G



Air-borne gamma-spectrometry surveys



## Appendix 4 Summary table of information in the inventory database

Organisation	Country	Survey Type	Country Size km <sup>2</sup>	Years of Collection	Survey Status	Object of Survey
GGCT(1)	Albania	Stream sediment	28000	1993-1996	Ongoing	Multi-purpose
GGCT(2)	Albania	Soil	28000	1993-1996	Ongoing	Multi-purpose
GGCT(3)	Albania	Stream/spring water	28000	1993-1996	Ongoing	Multi-purpose
GGCT(4)	Albania	Radiometric	28000	1993-1996	Ongoing	Multi-purpose
GB	Austria	Stream sediment	83848	1978-1981	Complete	Multi-purpose
GSB/UCL	Belgium	Stream sediment	30512	1979-1980	Complete	Exploration
GSB/UL	Belgium/Luxembourg	Overbank sediment	34000	1992-1995	Complete	Multi-purpose
FSCC	Most of Europe	Soil	570000	1991-	Ongoing	Environment
GSB/PFM	Belgium	Radiometric	30512	1979-1981	Complete	Exploration
GSB	Belgium/Luxembourg	Radiometric	34000	1994-	Ongoing	Multi-purpose
IGI	Croatia	No data	56538			
GS Dept(1)	Cyprus	Soil	9251	1957-1963	Complete	Exploration
GS Dept(2)	Cyprus	Rock	9251	1967-1980	Complete	Exploration
CGS(1)	Czech Republic	Stream sediment	78000	1975-1980	Complete	Multi-purpose
CGS(2)	Czech Republic	Lake/river sediment	78000	1990-1991	Complete	Environment
Soil Survey	Czech Republic	Soil	78000	1991-1995	Ongoing	Multi-purpose
Geomin	Czech Republic	Heavy mineral	78000	1966-1987	Complete	Exploration
CGS(3)	Czech Republic	Lake/stream/spring water	78000	1984-1996	Ongoing	Multi-purpose
CGS(4)	Czech Republic	Rock	78000	1975-1984	Complete	Multi-purpose
Geofyzika	Czech Republic	Radiometric	78000	1990-	Ongoing	Multi-purpose
MAF	Denmark	Overbank sediment	43000	1981-1983	Complete	Environment
DIPSS	Denmark	Till	43000	1981-1984	Complete	Environment
				1986-1990		
GDU(1)	Denmark	Heavy mineral	43000	1991-1995	Complete	Exploration
GDU(2)	Denmark	Heavy mineral	43000	1991-1995	Ongoing	Exploration
EG(1)	Estonia	Soil	45000	1983-1996	Complete	Exploration
EG(2)	Estonia	Soil	45000	1991-1995	Complete	Environment
EG(3)	Estonia	Rock	45000	1968-1991	Ongoing	Multi-purpose
GSF(1)	Finland	Lake sediment	337000	1973-1984	Complete	Multi-purpose
GSF(2)	Finland	Heavy mineral	337000	1982-1992	Complete	Exploration
GSF(3)	Finland	Till	337000	1982	Complete	Multi-purpose
GSF(4)	Finland	Till	337000	1982-1994	Complete	Multi-purpose
GSF(5)	Finland	Rock	337000	1990-1995	Ongoing	Multi-purpose
GSF(6)	Finland	Stream organic	337 000	1990	Complete	Environment
GSF(7)	Finland	Stream water	337000	1990	Complete	Environment
GSF/NGU/SGU	Fin/Nor/Swe	Till	N/A	1980-1983	Complete	Exploration
		Stream sediment				
		Stream organic				
		Biological				
		Heavy mineral				
BRGM(1)	France	Stream sediment	551000	1977-1988	Complete	Exploration
BRGM(2)	France	Soil	551000	1977-1987	Complete	Exploration
GLNRW(1)	Germany	Soil	356388	1957-	Ongoing	Environment
GLNRW(2)	Germany	Heavy mineral	356388		Ongoing	Multi-purpose
GLNRW(3)	Germany	Spring water	356388	1957-	Ongoing	Hydrogeol map
GLNRW(4)	Germany	Rock	356388	1957-	Ongoing	Multi-purpose
BGR(1)	Germany	Stream sediment	356388	1977-1983	Complete	Multi-purpose
BGR(2)	Germany	Stream water	356388	1977-1983	Complete	Multi-purpose
IGME(1)	Greece	Stream sediment	131944	1971-	Ongoing	Multi-purpose
IGME(2)	Greece	Overbank sediment	131944	1989-1991	Ongoing	Multi-purpose
IGME(3)	Greece	Radiometric	131944	1971-1979	Complete	Exploration
GGU(1) Area A	Greenland	Stream sediment	2175600	1979	Complete	Multi-purpose
GGU(2) Area B	Greenland	Stream sediment	2175600	1981-1993	Complete	Multi-purpose
GGU(3) Area C	Greenland	Stream sediment	2175600	1984-1985	Complete	Multi-purpose
GGU(4) Area D	Greenland	Stream sediment	2175600	1978-1980	Complete	Multi-purpose
GGU(5) Area E	Greenland	Stream sediment	2175600	1988-1994	Complete	Multi-purpose
GGU(6) Area F	Greenland	Stream sediment	2175600	1975-1976	Complete	Multi-purpose
GGU(7) Area G	Greenland	Stream sediment	2175600	1992	Complete	Multi-purpose
GGU(8) A-G	Greenland	Stream water	2175600	1974-	Ongoing	Multi-purpose
GGU(9) A-C	Greenland	Radiometric	2175600	1973-1979	Complete	Exploration
GGU(10) B-F	Greenland	Radiometric	2175600	1981-1994	Ongoing	Multi-purpose

Organisation	Country	Survey Type	Country Size km <sup>2</sup>	Years of Collection	Survey Status	Object of Survey
GGU(11)	Greenland	Heavy mineral	2175600	1982-1988	Complete	Exploration
GGU(12)	Greenland	Heavy mineral	2175600	1978-1980	Complete	Exploration
GGU(13)	Greenland	Heavy mineral	2175600	1982-1992	Complete	Exploration
GGU(14)	Greenland	Heavy mineral	2175600	1967-1083	Complete	Exploration
GGU(15)	Greenland	Heavy mineral	2175600	1990	Complete	Exploration
GIH(1)	Hungary	Stream sediment	90000	1989-	Ongoing	Multi-purpose
GIH(2)	Hungary	Overbank sediment	90000	1992-	Ongoing	Multi-purpose
Ork	Iceland	No data	102828			
GSI	Ireland	Stream sediment	70 282	1986-1991	Complete	Multi-purpose
MICA(1)	Italy	Stream sediment	301245	1974-1975	Complete	Exploration
MICA(2)	Italy	Stream sediment	301245	1988-1991	Complete	Exploration
GSL	Latvia	No data	64100			
IG(1)	Lithuania	Stream sediment	64000	1980-1990	Complete	Environment
IG(2)	Lithuania	Lake sediment	64000	1980-1990	Complete	Environment
IG/LGT(1)	Lithuania	Soil	64000	1987-1994	Ongoing	Environment
IG/LGT(2)	Lithuania	Rock	64000	1965-1975	Complete	Multi-purpose
Forest Inst.	Lithuania	Biological	64000	1991	Ongoing	Environment
RGD(1)	Netherlands	Soil	33940	1994-	Ongoing	Environment
RGD(2)	Netherlands	Overbank	33940	1992-	Ongoing	Environment
RGD(3)	Netherlands	Rock/soil	33940	1992-	Ongoing	Environment
NGU(1)	Norway	Stream sediment	324000	1976-1979	Complete	Multi-purpose
NGU(2)	Norway	Stream sediment	324000	1986-1988	Complete	Multi-purpose
NGU(3)	Norway	Stream sediment	324000	1984-1985	Complete	Multi-purpose
NGU(4)	Norway	Stream water	324000	1986-1988	Complete	Environment
NGU(5)	Norway	Biological	324000	1984-1985	Complete	Multi-purpose
NGU(6)	Norway	Till	324000	1986		Multi-purpose
NGU(7)	Norway	Overbank sediment	324000	1986	Complete	Multi-purpose
NGU(8)	Norway	Stream sediment	324000	1984-1985	Complete	Exploration
NGU(9)	Norway	Heavy mineral	324000	1986-1988		Multi-purpose
NGU(10)	Norway	Stream sediment	324000	1980-1985	Complete	Multi-purpose
NGU(11)	Norway	Soil	324000	1980-1985	Complete	Multi-purpose
NGU(12)	Norway	Till	324000	1980-1985	Complete	Multi-purpose
NGU(13)	Norway	Till	324000	1980-1983	Complete	Exploration
NGU(14)	Norway	Till	324000	1980-1985	Complete	Multi-purpose
NGU(15)	Norway	Heavy mineral	324000	1980-1985	Complete	Multi-purpose
NGU(16)	Norway	Biological	324000	1980-1985	Complete	Multi-purpose
NGU(17)	Norway	Stream water	324000	1980-1985	Complete	Multi-purpose
PIG(1)	Poland	Stream/lake water	312000	1991-1992	Complete	Multi-purpose
PIG(2)	Poland	Stream/lake water	312000	1991-1992	Complete	Multi-purpose
PIG(3)	Poland	Soil	312000	1991-1992	Complete	Multi-purpose
PIG(4)	Poland	Soil	312000	1991-1992	Complete	Multi-purpose
PIG(5)	Poland	Stream sediment	312000	1991-1992	Complete	Multi-purpose
PIG(6)	Poland	Stream sediment	312000	1991-1992	Complete	Multi-purpose
PIG(7)	Poland	Radiometric	312000	1991-1992	Complete	Multi-purpose
Aveiro Uni(1)	Portugal	Stream sediment	91671	1993-	Ongoing	Multi-purpose
Aveiro Uni(2)	Portugal	Soil	91671	1993-	Ongoing	Multi-purpose
IGM(1)	Portugal	Stream sediment	91671	1980-	Ongoing	Exploration
IGM(2)	Portugal	Stream sediment	91671	1979-1984	Complete	Exploration
IGM(3)	Portugal	Soil	91671	1965-	Ongoing	Multi-purpose
IGM(4)	Portugal	Heavy mineral	91671	1979-1984	Complete	Exploration
IGM(5)	Portugal	Heavy mineral	91671	1980-	Ongoing	Exploration
IGM(6)	Portugal	Radiometric	91671	1955-	Ongoing	Multi-purpose
GIR(1)	Romania	Stream sediment	237500	1994-	Ongoing	Multi-purpose
GIR(2)	Romania	Stream water	237500	1994-	Ongoing	Multi-purpose
GSSR(1)	Slovakia	Stream sediment	49014	1991-1995	Ongoing	Multi-purpose
GSSR(2)	Slovakia	Spring/well/bore water	49014	1991-1994	Complete	Multi-purpose
GSSR(3)	Slovakia	Rock	49014	1991-1994	Complete	Multi-purpose
Soil Survey	Slovakia	Soil	49014	1991-1995	Ongoing	Multi-purpose
Forest Res Inst	Slovakia	Biological	49014	1991-1994	Complete	Multi-purpose
Uranpress	Slovakia	Radiometric	49014	1991-1994	Complete	Multi-purpose
ULIG(1)	Slovenia	Stream sediment	20251	1993	Complete	Multi-purpose
GZL(1)	Slovenia	Overbank sediment	20251	1990-1993	Complete	Multi-purpose
ULIG(2)	Slovenia	Soil	20251	1992	Complete	Multi-purpose
GZL(2)	Slovenia	Soil	20251	1990-1993	Complete	Multi-purpose
ULIG(3)	Slovenia	Stream/seepage water	20251	1994	Complete	Multi-purpose
GZL(3)	Slovenia	Radiometric	20251	1990-1993	Complete	Multi-purpose
ITGE(1)	Spain	Stream sediment	504782	1984-1986	Complete	Exploration
ITGE(2)	Spain	Stream sediment	504782	1981-1982	Ongoing	Exploration
ITGE(3)	Spain	Heavy mineral	504782	1981-1982	Ongoing	Exploration
ITGE(4)	Spain	Stream sediment	504782	1981-1990	Ongoing	Exploration

Organisation	Country	Survey Type	Country Size km <sup>2</sup>	Years of Collection	Survey Status	Object of Survey
ITGE(5)	Spain	Stream sediment	504782	1991-1992	Ongoing	Multi-purpose
ENUSA	Spain	Radiometric	504782	1958-	Ongoing	Multi-purpose
SGU(1)	Sweden	Stream organic	449791	1983-	Ongoing	Multi-purpose
SGU(2)	Sweden	Till	449741	1983-	Ongoing	Multi-purpose
NSG	Sweden	Till	449741	1983-	Complete	Exploration
SGU(3)	Sweden	Radiometric	449741	1970-	Ongoing	Multi-purpose
SLG	Switzerland	No data	41287			
MTA(1)	Turkey	Stream sediment	780576	1979-1981	Complete	Exploration
MTA(2)	Turkey	Stream sediment	780576	1987-1989	Complete	Exploration
MTA(3)	Turkey	Stream sediment	780576	1991	Complete	Exploration
IGMOF	Ukraine	Soil	597219	1970-1995		Multi-purpose
BGS(1)	UK	Soil	242461	1987-1991	Ongoing	Multi-purpose
BGS(2)	UK	Stream water	242461	1968-1977	Ongoing	Multi-purpose
BGS(3)	UK	Stream water	242461	1990-1992	Ongoing	Multi-purpose
BGS(4)	UK	Stream water	242461	1977-1990	Ongoing	Multi-purpose
BGS(5)	UK	Heavy mineral	242461	1968-1990	Ongoing	Exploration
BGS(6)	UK	Stream sediment	242461	1976-1989	Ongoing	Multi-purpose
BGS(7)	UK	Stream sediment	242461	1974-1975	Ongoing	Multi-purpose
BGS(8)	UK	Stream sediment	242461	1968-1972	Ongoing	Multi-purpose
BGS(9)	UK	Stream sediment	242461	1990-1994	Ongoing	Multi-purpose
BGS(10)	UK	Radiometric	242461	1946-	Ongoing	Multi-purpose
BGS/GSNI(1)	UK	Stream sediment	242461	1994-	Ongoing	Multi-purpose
BGS/GSNI(2)	UK	Heavy Mineral	242461	1994-	Ongoing	Exploration
BGS/GSNI(3)	UK	Stream water	242461	1994-	Ongoing	Multi-purpose
Soil Survey	UK	Soil	242461	1978-1982	Complete	Environment
EGRC,ICL(1)	UK	Stream sediment	242461	1969	Complete	Multi-purpose
EGRC,ICL(2)	UK	Stream sediment	242461	1968	Complete	Multi-purpose
MLURI	UK	Soil	242461	1978-1982	Complete	Environment



Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
GGCT(1)	Albania	Stream sediment	Total	XRF	Al, As, Ba, Ca, Ce, Co, Cr, Cu, Fe, Ga, Ge, Hg, K, La, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sb, Sc, Si, Sr, Ti, V, W, Y, Zn, Zr
			Total	DC-Arc ES, ICP-AES GSM	Be, Bi, Sn, Cs U
GGCT(2)	Albania	Soil	Total	XRF	Al, As, Ba, Ca, Ce, Co, Cr, Cu, Fe, Ga, Ge, Hg, K, La, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Sb, Sc, Si, Sr, Ti, V, W, Y, Zn, Zr
			Total	DC-Arc ES, ICP-AES GSM	Be, Bi, Sn, Cs U
GGCT(3)	Albania	Stream/spring water	Speciation	Colorimetric	U Ph, temp, HCO <sub>3</sub> , SO <sub>4</sub> , Cl, Fe <sup>2+</sup> , Fe <sup>3+</sup> , tot heavy metals
GGCT(4)	Albania	Radiometric	Total		U, K, Th in rock
GB	Austria	Stream sediment	Total	Carborne, handheld DC-Arc ES	Total gamma Ag, Mo, Pb, Sn
			Total	XRF	Al, K, Na, Rb, Th, U, W, Y, Zr
			Total	ICP-AES	Ba, Be, Ca, Ce, Co, Cr, Cu, Fe, Ga, La, Mg, Mn, N, Ni, P, Sc, Sr, Ti, V, Zn
GSB/UCL	Belgium	Stream sediment	Total	Flame AAS	Sb
GSB/UL	Belgium/Luxembourg	Overbank sediment	Total	Flame AAS XRF	Cu, Fe, Mn, U, V Al, Ba, Ca, Ce, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Nb, P, Rb, S, Si, Sn, Sr, Ta, Th, Ti, Y, Zr
				ICP-AES	Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cs, Cu, Fe, Ga, Hg, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sc, Sr, Ti, Tl, U, V, W, Zn
FSCC	Most of Europe	Soil	Total Extractable	AAS Variable Variable	As, Cd C, N Al, Ca, Cd, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Zn
GSB/PFM	Belgium	Radiometric		Carborne	Total gamma, eU, Th, K
GSB	Belgium/Luxembourg	Radiometric		Airborne	Total gamma, eU, Th, K
IGI	Croatia	No data			
GS Dept(1)	Cyprus	Soil	Total	Chromatography	Co, Ni
			Total	Colorimetric	Cu, Zn
GS Dept(2)	Cyprus	Rock	Total	Flame AAS	Co, Cu, Ni, Zn
CGS(1)	Czech Republic	Stream sediment	Total	OES	Ag, B, Be, Bi, Co, Cu, Li, Mo, Ni, Pb, Sb, Sn, V, W, Zn
			Extractable	Flame AAS	Cu, Mn, Ni, Pb, Zn
CGS(2)	Czech Republic	Lake/river sediment	Total	Flame AAS, INAA, XRF, ICP-AES	Ag, Al, As, Au, Ba, Be, C, Ca, Ce, Co, Cr, Cs, Cu, Er, Eu, Fe, Hf, Hg, K, La, Li, Lu, Mg, Mn, Na, Nb, Nd, Ni, P, Pb, Rb, S, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Th, Ti, Tm, U, V, W, Y, Yb, Zn, Zr
			Extractable	Flame AAS, INAA, XRF	Ag, Bi, Cd, Co, Cu, Fe, Mn, Ni, Pb, Zn
Soil Survey	Czech Republic	Soil	Extractable	ICP-AES	Al, Co, Cr, Cu, Mn, Mo, Ni, Pb, V, Zn
Geomin	Czech Republic	Heavy mineral	Extractable Total	ICP-AES OES	Ca, K, Mg Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, In, Li, Mn, Mo, Nb, Ni, Pb, Rb, Sb, Sn, Sr, Ta, Th, Ti, V, W, Y, Yb, Zn, Zr
CGS(3)	Czech Republic	Lake/stream/spring water	Total	Flame AAS ETV-AAS "ISE, HPLC"	Al, Ca, Cl, F, Fe, K, Li, Mg, Mn, N, Na, S, Si, Sr, Zn As, Be, Cd, Cu, Pb F, Cl, N, S pH, conductivity
CGS(4) Geofyzika	Czech Republic Czech Republic	Rock Radiometric		Air + carborne, handheld	Total gamma, eU, Th, K, Cs
MAF	Denmark	Overbank sediment	Total	Flame AAS XRD	Ca, Mg Fe <sub>2</sub> S <sub>2</sub> , CaCO <sub>3</sub> , FeCO <sub>3</sub>

Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
DIPSS	Denmark	Till	Extractable Total	Flame AAS LECO Flame AAS (Ca)	pH Al, Fe C Ca, N, NO <sub>3</sub>
GDU(1) GDU(2) EG(1)	Denmark Denmark Estonia	Heavy mineral Heavy mineral Soil	Total Total Total Total Extractable Extractable Extractable	Semi-quant Spectral Flame Photometry Volumetric Gas Analyser AAS XRF Colorimetric ISE Ashing at 450°C AAS Colorimetric ISE	B, Ba, Be, Co, Cr, La, Mo, Ni, Sn, Ti, Zr K, Na Ca, Mg Hg Cd, Cu, Fe, Fe, Mn, Zn Mo, Nb, Pb, Rb, Sr, Th, U, Y, Zr P F Organic Matter Cd, Cu, Fe, Mn, Pb, Zn P F
EG(2)	Estonia	Soil	Total Total Total Total Extractable Extractable Extractable	Semi-quant Spectral Gas Analyser XRF ISE Flame Photometry Volumetric AAS Colorimetry AAS Volumetric Colorimetric	B, Ba, Be, Co, Cr, La, Mo, Ni, Sn, Ti, Zr Hg Mo, Pb, Rb, Sr, Th, U, Y F K Ca, Fe, Mg Cd, Cu, Fe, Mn, Zn P Cd, Cu, Fe, Mn, Pb, Zn Fe P
EG(3)	Estonia	Rock	Total	INAA	U
GSF(1)	Finland	Lake sediment	Extractable	Flame AAS	Ag, Co, Cu, Fe, Mn, Ni, Pb, Zn
GSF(2)	Finland	Heavy mineral	Total	ED-XRF	Ba, Ce, Cr, Fe, La, Nb, Rb, Sr, Ti, W, Y, Zr
GSF(3)	Finland	Till	Total Total Total Extractable	ICP-AES INAA LECO ICP-AES	Al, Ba, Ca, Co, Cr, Cu, Fe, K, La, Li, Lu, Mg, Mn, Mo, Na, Ni, P, Pd, Sc, Si, Sr, Th, Ti, V, W, Y, Yb, Zn, Zr As, Au, Br, Cs, Rb, Sb, Ta, Th, U, W S Al, Ba, Ca, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sc, Si, Sr, Th, Ti, V, W, Y, Yb, Zn, Zr
GSF(4)	Finland	Till	Total Extractable	ETV-AAS ICP-AES	Au Al, Ba, Ca, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Na, Ni, P, Pb, Pd, Sc, Sr, Te, Th, V, Y, Zn, Zr
GSF(5)	Finland	Rock	Total	ICP-MS	Ag, Al, As, B, Ba, Be, Bi, Ca, Ce, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Ni, Pb, Sb, Se, Sr, Ti, Tl, U, V, Zn
GSF(6)	Finland	Stream organic	Total	ICP-MS	Ag, Al, As, B, Ba, Be, Bi, Ca, Co, Cu, Fe, K, La, Li, Mg, Mn, Na, Ni, P, Pb, Sb, Sc, Se, Ti, Tl, U, Zn
GSF(7)	Finland	Stream water	Total Speciation Total	ICP-MS ISE	Ag, Al, As, B, Ba, Be, Bi, Ca, Co, Cu, Fe, K, La, Li, Mg, Mn, Na, Ni, P, Pb, Sb, Sc, Se, Ti, Tl, U, Zn SO <sub>4</sub> , NO <sub>3</sub> , KMnO <sub>4</sub> Cl, F
GSF/NGU/ SGU	Fin/Nor/Swe	Till	Total	OES NAA	pH, cond, temp, Eh, HCO <sub>3</sub> , tot hard, tot alk, strm discharge Co, Cr, Cu, K, Mg, Mn, Ni, Pb, Ti, V, Zn As, Au, Ba, Br, Cs, Fe, La, Na, Rb, Sb, Sc, Sm, Ta, Th, U, W

Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
		Stream sediment	Total	ICP-AES	Ag, Al, Ba, Ca, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Ni, P, Sc, Sr, V, Zn, Zr
		Stream organic	Total	XRF	Al, Ba, Ca, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Rb, S, Si, Sr, Th, Ti, U, V, Y, Zn
		Biological Heavy mineral	Total	XRF	Al, Ba, Ca, Cl, Bo, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Nb, Ni, P, Rb, Si, Sr, Th, Ti, V, T, Zn, Zr
BRGM(1)	France	Stream sediment	Total	DCP-AES	Ag, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ni, P, Pb, Sb, Sn, V, W, Y, Zn
BRGM(2)	France	Soil	Total	DCP-AES	Ag, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ni, P, Pb, Sb, Sn, V, W, Y, Zn
GLNRW(1)	Germany	Soil	Total	Colorimetric	C
			Total	XRF	Cd, Cu, Ni, Pb, Zn
			Total	Kjeldahl	N
			Extractable	ICP-AES	Al, Ca, Fe, K, Mg, Mn, Na, P, S, Zn
			Extractable	ETV-AAS	Cd, Cr, Cu, Ni, Pb
GLNRW(2)	Germany	Heavy mineral	Total	ICP-AES	Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Zn
GLNRW(3)	Germany	Spring water	Total	ICP-AES	HCO <sub>3</sub> , CO <sub>2</sub> , C
			Speciation	Titration	Cl, F, N, S
			Total	IC	Spring discharge, pH, cond, temp, tot alk
GLNRW(4)	Germany	Rock	Total	DC-Arc ES	Ba, Cr, Sr, V
BGR(1)	Germany	Stream sediment	Extractable	Flame AAS	Cd, Co, Cu, Li, Ni, Pb, Sn, Zn
			Extractable	ISE	F
			Extractable	Fluorimetric	U
			Extractable	Colorimetric	W
BGR(2)	Germany	Stream water	Total	Flame AAS	Cd, Co, Cu, Ni, Pb, Zn
			Total	ISE	F
			Total	Fluorimetric	U
					pH, conductivity, temp
IGME(1)	Greece	Stream sediment	Extractable	Flame AAS	Ag, B, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Sr, V, Zn
			Total	ETV-AAS	Hg
			Total	Fluorimetric	U
IGME(2)	Greece	Overbank sediment	Extractable	ICP-AES	Ag, Al, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sc, Si, Sr, Ti, V, Zn, Zr
			Total	ICP-AES	Al, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Li, Mn, Mo, Ni, Pb, Sc, Sr, Ti, V, Y, Zn
			Total	INAA	Ag, As, Au, Ba, Br, Ca, Ce, Co, Cr, Cs, Eu, Fe, Hf, Ir, La, Lu, Mo, Nd, Ni, Rb, Sb, Sc, Se, Sm, Sn, Sr, Ta, Th, Ti, U, V, Yb, Zn
			Total	XRF	Al, As, Ba, Bi, Ca, Ce, Co, Cr, Cu, Fe, Ga, Hf, K, Mg, Mn, Mo, Na, Nb, Ne, Ni, P, Pb, Rb, S, Si, Sn, Sr, Ta, Th, Ti, U, V, W, Y, Zn, Zr
			Total	Flame AAS	Au
			Total	ETV-AAS	Hg
			Total	Carborne	Total gamma
IGME(3)	Greece	Radiometric	Total	INAA	Ag, As, Au, Ba, Br, Ce, Co, Cr, Cs, Eu, Ga, Hf, Hg, Ir, La, Lu, Mo, Nd, Sb, Sc, Se, Sm, Sn, Ta, Tb, Th, W, Yb
GGU(1)	Greenland	Stream sediment	Total	INAA	Al, Ca, Fe, K, Mg, Mn, Ni, P, Rb, Si, Sr, Ti, Zr
Area A			Total	XRF	Al, Ca, Fe, K, Mg, Mn, Ni, P, Rb, Si, Sr, Ti, Zr
			Total	EDX	Cu, Nb, Pb, Y, Zn

Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
GGU(2) Area B	Greenland	Stream sediment	Total	INAA	Ag, As, Au, Ba, Br, Ce, Co, Cr, Cs, Eu, Ga, Hf, Hg, Ir, La, Lu, Mo, Nd, Sb, Sc, Se, Sm, Sn, Ta, Tb, Th, U, W, Yb
			Total	XRF	Al, Ca, Fe, K, Mg, Mn, Ni, P, Rb, Si, Sr, Ti, Zn
GGU(3) Area C	Greenland	Stream sediment	Total	Flame AAS	Cu, Na
			Total	XRF	Al, As, Ba, Ca, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Rb, S, Si, Sr, Th, Ti, V, Y, Zn, Zr
GGU(4) Area D	Greenland	Stream sediment	Total	EDX	Ca, Cr, Cu, Fe, Ga, K, Mn, Ni, Pb, Ti, Zn
GGU(5) Area E	Greenland	Stream sediment	Total	DNAA	U
			Total	INAA	Ag, As, Au, Ba, Br, Ce, Co, Cr, Cs, Eu, Hf, Hg, Ir, La, Lu, Mo, Nd, Sb, Sc, Se, Sm, Sn, Ta, Tb, Th, U, W, Yb
GGU(6) Area F	Greenland	Stream sediment	Total	XRF	Al, Ca, Fe, K, Mg, Mn, Ni, P, Rb, Si, Sr, Ti, V, Zn
			Total	Flame AAS	Cu, Na
GGU(7) Area G	Greenland	Stream sediment	Total	INAA	Ag, As, Au, Ba, Br, Ce, Co, Cr, Eu, Hf, Hg, Ir, La, Lu, Mo, Nd, Sb, Sc, Se, Sm, Ta, Tb, Te, Th, W, Yb
			Total	EDX	Ca, Fe, Ga, K, Mn, Ni, Pb, Zn
GGU(8) A-G GGU(9) A-C GGU(10) B-G GGU(11)	Greenland	Stream water Radiometric Radiometric Heavy mineral	Total	INAA	U
			Total	Fluorimetric Airborne Handheld scintillometer	U6+ Total gamma, eU, Th, K Total gamma
GGU(12) GGU(13)	Greenland Greenland	Heavy mineral Heavy mineral	None		
			Total	DC-Arc ES	Ba, Co, Cr, Cu, Ga, La, Li, Mn, Ni, Rb, Sc, Sr, V, Y, Zr
GGU(14) GGU(15)	Greenland Greenland	Heavy mineral Heavy mineral	Total	INAA	Ag, As, Au, Ba, Br, Ca, Ce, Co, Cr, Cs, Eu, Fe, Hf, Hg, Ir, La, Lu, Mo, Na, Nd, Ni, Rb, Sb, Sc, Se, Sm, Sn, Sr, Ta, Tb, Th, U, W, Yb, Zn
			Total	DC-Arc ES	Ag, As, Au, Ba, Bi, Ce, Cu, Mo, Nb, Ni, Pd, Sn, W, Zn
GIH(1)	Hungary	Stream sediment	Extractable	Flame AAS	Cu, Pb
			Extractable	"Flame,ETV, cold vapour AAS" ICP-AES	Ag, As, Sb, Au, Hg
GIH(2)	Hungary	Overbank sediment	Extractable	Flame, ETV, cold vapour AAS	Ba, Cd, Co, Cr, Cu, K, Li, Mn, Mo, Ni, Pb, Sr, Zn
				ICP-AES	Ag,As,Sb,Au,Hg
Ork GSI	Iceland Ireland	No data Stream sediment	Total	INAA	Al, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sr, Ti, Zn
					Ag, As, Au, Ba, Br, Cd, Ce, Cs, Eu, Hf, Ir, La, Lu, Mo, Na, Rb, Sb, Sc, Se, Sm, Sn, Ta, Tb, Te, Th, U, W, Yb, Zr

Organisation	Country	Survey Type	Total/ Extractable	Analytical Speciation Water Method	Determinants
			Total	Flame AAS	Co, Cr, Cu, Fe, Li, Mn, Ni, Pb, V, Zn
MICA(1)	Italy	Stream sediment	Total	AAS XRF	As, Ba, Be, Fe, Mn, Mo, Sn, W Cu, Hg, Zn
MICA(2)	Italy	Stream sediment	Total	AAS	Ag, Al, As, Au, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Fe, Hg, K, La, Mg, Mn, Mo, Nb, Ni, P, Pb, Sb, Si, Sn, Sr, Ti, V, W, Y, Zn, Zr
GSL IG(1)	Latvia Lithuania	No data Stream sediment	Total	DC-Arc ES	Ag, As, B, Ba, Be, Bi, Cd, Ce, Co, Cr, Cu, Ga, Ge, Hf, La, Li, Mn, Mo, Nb, Ni, P, Pb, Sb, Sc, Sn, Sr, Ti, V, W, Y, Yb, Zn, Zr
IG(2)	Lithuania	Lake sediment	Total	DC-Arc ES	Ag, As, B, Ba, Be, Bi, Cd, Ce, Co, Cr, Cu, Ga, Ge, Hf, La, Li, Mn, Mo, Nb, Ni, P, Pb, Sb, Sc, Sn, Sr, Ti, V, W, Y, Yb, Zn, Zr
IG/LGT(1)	Lithuania	Soil	Total	DC-Arc ES	Ag, As, B, Ba, Be, Bi, Cd, Ce, Co, Cr, Cu, Ga, Ge, Hf, La, Li, Mn, Mo, Nb, Ni, P, Pb, Sb, Sc, Sn, Ti, V, W, Y, Yb, Zn, Zr
			Total	XRF	Sr, Th, U pH
IG/LGT(2) Forest Inst. RGD(1)	Lithuania Lithuania Netherlands	Rock Biological Soil	Total	XRF	Al, As, Ba, Ca, Cr, Cu, Fe, Ga, K, Mg, Mn, Na, Nb, Ni, P, Pb, Rb, S, Si, Sr, Th, Ti, U, V, Y, Zn, Zr
RGD(2)	Netherlands	Overbank	Total	XRF	Al, As, Ba, Ca, Cr, Cu, Fe, Ga, K, Mg, Mn, Na, Nb, Ni, P, Pb, Rb, S, Si, Sr, Th, Ti, U, V, Y, Zn, Zr
RGD(3)	Netherlands	Rock/soil	Total	XRF	Al, As, Ba, Ca, Cr, Cu, Fe, Ga, K, Mg, Mn, Na, Nb, Ni, P, Pb, Rb, S, Si, Sr, Th, Ti, U, V, Y, Zn, Zr
NGU(1)	Norway	Stream sediment	Total	XRF	Al, Ba, Co, Cr, Fe, Ga, K, Mg, Mn, Na, Nd, Ni, P, Pb, Rb, S, Si, Sr, Ti, V, Y, Zn, Zr
			Extractable	ICP-AES	Al, Ag, Be, Bi, Ca, Fe, K, La, Li, Mg, Mn, Na, P, Sb, Sc, Se, Tl, Zn
NGU(2)	Norway	Stream sediment	Total	NAA	Ag, As, Au, Ba, Br, Co, Cr, Cs, Fe, La, Lu, Mo, Na, Ni, Pb, Sb, Sc, Sm, Ta, Th, U, W, Zn
			Extractable	ICP-AES	Ag, Al, Ba, Ca, Ce, Co, Cr, Cu, Fe, Ir, La, Li, Mg, Mn, Mo, Na, Ni, P, Pd, Sc, Sr, Tl, V, Zn, Zr
NGU(3)	Norway	Stream sediment	Total	XRF	Au, Ba, Br, Cl, F, In, Nb, Os, Pb, Pt, Rb, Rh, Ru, Sn, Sr, Th, U, Y, Zr
			Extractable	ICP-AES	Ag, Al, Ba, Be, Ca, Cd, Ce, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sc, Si, Sr, Ti, V, Zn
NGU(4)	Norway	Stream water	Total	ICP-AES	Al, Ca, Fe, Mg, Mn, Na, Si, Sr pH, conductivity
NGU(5) NGU(6)	Norway Norway	Biological Till	Total	NAA	As, Ba, Br, Co, Cr, Cs, Fe, La, Lu, Mo, Na, Pb, Sb, Sm, Ta, Th, U, W, Zn
			Extractable	ICP-AES	Ag, Al, Ba, Ca, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sc, Sr, Ti, V, Zn, Zr
NGU(7)	Norway	Overbank sediment	Total	XRF	Al, As, Au, Ba, Ca, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Si, Sn, Sr, Th, U, V, W, Y, Zn, Zr
			Extractable	ICP-AES, Flame AAS	Ag, Al, B, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg,

Organisation	Country	Survey Type	Total/ Extractable	Analytical Speciation Water Method	Determinants
NGU(8)	Norway	Stream sediment	Total	XRF	Mn, Mo, Na, Ni, P, Pb, Sc, Se, Si, Sr, Ti, V, Zn, Zr
			Extractable	ICP-AES	Ag, As, Au, Ba, Br, Ca, Ce, Co, Cr, Cs, Fe, Hf, In, La, Lu, Na, Ni, P, Pb, Pd, Pt, Rb, Rh, Sb, Sc, Se, Si, Sm, Sr, Ta, Tb, Th, Ti, U, V, W, Yb, Zn
NGU(9)	Norway	Heavy mineral	Total	XRF	Ag, Ba, Ca, Cl, Co, Cr, Fe, Mg, Mn, Na, Nb, Nd, P, Pd, S, Si, Sr, Th, Ti, V, Y, Zn, Zr
NGU(10)	Norway	Stream sediment	Extractable	ICP-AES	Ag, Al, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Ni, P, Sc, Sr, V, Zn, Zr
NGU(11)	Norway	Soil	Extractable	ICP-AES	Al, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Na, Ni, P, Pb, Sc, Ti, V, Zn, Zr
NGU(12)	Norway	Till	Extractable	ICP-AES	Ag, Al, B, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sc, Ti, V, Zn, Zr
NGU(13)	Norway	Till	Extractable	ICP-AES	Ag, Al, As, B, Ba, Bi, Ca, Co, Cr, Cu, Fe, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, U, V, W, Zn
NGU(14)	Norway	Till	Total	Flame AAS	Au, Pt
NGU(15)	Norway	Heavy mineral	Total	INAA	As, Au, Ba, Br, Cs, Fe, La, Na, Rb, Sb, Sc, Sm, Ta, Th, U, W
NGU(16)	Norway	Biological	Total	ICP-AES	Al, Ba, Be, Ca, Cd, Co, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Si, Sr, Ti, V, Zn
NGU(17)	Norway	Stream water			
PIG(1)	Poland	Stream/lake water	Total	ICP-AES	Al, As, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, S, Si, Sr, Ti, V, Zn
PIG(2)	Poland	Stream/lake water	Total	ICP-AES	Al, As, B, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Na, Ni, P, Pb, S, Si, Sr, Ti, V, Zn
PIG(3)	Poland	Soil	Extractable	ICP-AES	Ag, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, P, Pb, S, Sr, Ti, V, Zn
PIG(4)	Poland	Soil	Extractable	ICP-AES	Ag, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, P, Pb, S, Sr, Ti, V, Zn
PIG(5)	Poland	Stream sediment	Extractable	ICP-AES	Ag, As, Ba, Be, Ca, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, P, Pb, S, Sr, Ti, V, Zn
PIG(6)	Poland	Stream sediment	Extractable	ICP-AES	Ag, As, Ba, Be, Ca, Co, Cr, Cu, Fe, Hg, Mg, Mn, Ni, P, Pb, S, Sr, Ti, V, Zn
PIG(7)	Poland	Radiometric	Total	Carbone	Total gamma, eU, Th, K
Aveiro Uni(1)	Portugal	Stream sediment	Extractable	ICP-AES	Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, Ti, Tl, U
Aveiro Uni(2)	Portugal	Soil	Extractable	AA	Hg
			Extractable	ICP-AES	Ag, Al, As, Au, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, Ti, Tl, U
IGM(1)	Portugal	Stream sediment	Extractable	AAS	Hg
			Total	Plasma	Ag, As, B, Ba, Be, Co, Cr, Cu, Fe, Mn, Mo, Nb, P, Pb, Sb, Ta, V, Y,

Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
IGM(2)	Portugal	Stream sediment	Total	Colorimetric Fluorimetric OES	Zn Sn, W U Ag, Al, As, B, Ba, Be, Bi, Ca, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Sb, Sn, Sr, Ti, V, W, Y, Zn, Zr
IGM(3)	Portugal	Soil			
IGM(4)	Portugal	Heavy mineral			
IGM(5)	Portugal	Heavy mineral			
IGM(6)	Portugal	Radiometric	Total	Air + carborne, handheld XRF	Total gamma, eU, Th, K
GIR(1)	Romania	Stream sediment	Total		Al, As, Ba, Ca, Ce, Co, Cr, Cs, Cu, Fe, Ga, Hf, K, La, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Sc, Si, Sn, Sr, Ta, Th, Ti, U, V, W, Y, Zn, Zr
GIR(2)	Romania	Stream water	Total	ICP-MS	Al, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Hf, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, Pb, Rb, Sb, Sc, Sn, Sr, Ta, Th, Ti, Tl, U, W, Y, Zn, Zr pH, conductivity, temp
GSSR(1)	Slovakia	Stream sediment	Total	ICP-OES	Al, As, Be, Ca, Cd, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, Rb, Se, Sn, Th, Ti, U, V, W, Y, Zn, Zr
GSSR(2)	Slovakia	Spring/well/bore water	Total Total Speciation	AAS XRF ICP-OES	Ce, Hg Ba, Ga, Sr Al, As, Ba, Ca, Cd, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Na, Pb, Sb, Se, Sr, Tl, Zn Cl, CO <sub>2</sub> , F, HCO <sub>3</sub> , HPO <sub>4</sub> , NH <sub>4</sub> , NO <sub>3</sub> , SO <sub>4</sub> , SiO <sub>2</sub> pH, cond, temp, diss O <sub>2</sub> , free CO <sub>2</sub> , alk
GSSR(3)	Slovakia	Rock			
Soil Survey	Slovakia	Soil		ICP-OES	Al, As, Ba, Be, Ca, Cd, Ce, Co, Cr, Cu, F, Fe, Ga, Hg, K, La, Li, Mg, Mn, Na, Ni, Pb, Rb, S, Sb, Se, Sr, Th, Tl, U, V, Y, Zn, Zr
Forest Res Inst	Slovakia	Biological		ICP-OES	Al, As, Ba, Be, Ca, Cd, Ce, Cl, Co, Cr, Cs, Cu, F, Fe, Ga, Hg, K, La, Li, Mg, Mn, N, Na, Ni, P, Pb, Rb, S, Se, Sr, Th, Tl, U, V, W, Y, Zn, Zr
Uranpress ULIG(1)	Slovakia Slovenia	Radiometric Stream sediment	Total	ICP-AES	Total gamma, eU, Th, K Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ge, Hg, K, La, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Sb, Sc, Se, Sn, Sr, Th, Ti, V, W, Y, Zn, Zr
GZL(1)	Slovenia	Overbank sediment	Total	ICP-AES	Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ge, K, La, Mg, Mn, Mo, Na, Nb, Ni, Pb, Sb, Sc, Se, Sn, Sr, Th, Ti, V, W, Y, Zn, Zr
ULIG(2)	Slovenia	Soil	Total Total	Cold vapour AAS ICP-AES	Hg Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ge, K, La, Mg, Mn, Mo, Na, Nb, Ni, Pb, Sb, Sc, Se, Sn, Sr, Th, Ti, V, W, Y, Zn, Zr
GZL(2)	Slovenia	Soil	Total Total	Cold vapour AAS ICP-AES	Hg Ag, Al, As, Au, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ge, K, La, Mg, Mn, Mo, Na, Nb, Ni, Pb, Sb, Sc, Se, Sn, Sr, Th, Ti, V, W, Y, Zn, Zr
			Total	DNC	U

Organisation	Country	Survey Type	Total/ Extractable	Analytical Speciation Water Method	Determinants
ULIG(3)	Slovenia	Stream/seepage water	Total	ICP-MS	Ag, Al, As, Au, Ba, Be, Bi, Br, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Hg, Ho, I, In, K, La, Li, Lu, Mg, Mn, Mo, Na, Nb, Nd, Ni, Os, Pb, Pd, Pr, Pt, Rb, Re, Ru, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr
			Speciation	IC	Cl <sup>-</sup> , NO <sup>2-</sup> , NO <sup>3-</sup> , PO <sup>4-</sup> , SO <sup>4-</sup>
GZL(3)	Slovenia	Radiometric		Handheld	pH, cond, temp, tot hard
ITGE(1)	Spain	Stream sediment	Total	ICP-AES	Total gamma, eU, Th, K
					Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Hg, Mg, Mn, Mo, Nb, Ni, P, Pb, Sb, Sc, Sn, Ti, V, W, Y, Zn
ITGE(2)	Spain	Stream sediment	Total	DCP-AES	Ag, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ni, P, Pb, Sb, Sn, V, W, Y, Zn
ITGE(3)	Spain	Heavy mineral		Colorimetric	F
ITGE(4)	Spain	Stream sediment	Total	Binocular lens DCP-AES	Mineralogy Ag, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Nb, Ni, P, Pb, Sb, Sn, V, W, Y, Zn
ITGE(5)	Spain	Stream sediment	Total	Colorimetric ICP-AES	F Ag, Al, As, B, Ba, Be, CaO, Cd, Co, Cr, Cu, Fe, K <sub>2</sub> O, La, MgO, Mn, Mo, Na <sub>2</sub> O, Nb, Ni, P, Pb, Sb, Sc, Ti, V, W, Y, Zn, Zr
				ICP-AES	F
				Colorimetric	F
				Flame AAS	Li, Rb, Sr
				Flame AAS	Au
ENUSA	Spain	Radiometric		Air	Total gamma, eU, Th, K
SGU(1)	Sweden	Stream organic	Total	XRF	Al, As, Ba, Ca, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Si, Sr, Ti, U, V, W, Y, Zn, Zr
			Extractable	Flame AAS	Cd
			Extractable	Cold Vapour AAS	Hg
			Extractable		Se
SGU(2)	Sweden	Till	Total	XRF	Al, As, Ba, Ca, Cl, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, S, Si, Sr, Ti, U, V, W, Y, Zn, Zr
			Total	Flame AAS	Au
			Extractable	ICP-AES	Al, Ba, Be, Ca, Co, Cr, Cu, Fe, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Si, Ti, V, Zn"
NSG	Sweden	Till	Extractable	ICP-AES	pH Al, As, Ba, Bi, Ca, Co, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sb, Ti, Zn
SGU(3)	Sweden	Radiometric		Airborne, handheld	Total gamma, eU, Th, K, Cs-137
SLG	Switzerland	No data			
MTA(1)	Turkey	Stream sediment	Total	Flame AAS	Cu, Pb, Zn
				Colorimetric	Hg
				Colorimetric	W
MTA(2)	Turkey	Stream sediment	Total	Flame AAS	Pb, Zn
MTA(3)	Turkey	Stream sediment	Total	Flame AAS	Co, Cu, Ni, Pb, Zn
IGMOF	Ukraine	Soil	Total	Flame AAS	Ag, Cd, Cu, Pb
				Flame AAS	Be
				Flame AAS	Ca, Gd, Mg, Ni
				Flame AAS	Co, Cr
				Flame AAS	Zn
				Flame AAS	Hg, Mo
				DC-Arc ES	Al
				DC-Arc ES	Au, V
				DC-Arc ES	B, Nb, Rb, Rh, Sr
				ISE	Cl, F
				Colorimetric	Fe



Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
				Colorimetric Colorimetric Colorimetric Flame photo Gravimetric	Mn Ti P K, Li, Na S, Si pH, Eh, F, Cl
BGS(1)	UK	Soil	Total	DC-Arc ES	Ag, Al, B, Ba, Be, Bi, CaO, Cd, Co, Cr, Cu, Fe, Ga, K, La, Li, MgO, Mn, Mo, Ni, Pb, Sn, Sr, Ti, U, V, Y, Zn, Zr
BGS(2)	UK	Stream water	Total	DNAA	U pH, conductivity
BGS(3)	UK	Stream water	Total Total Total Total	ISE Fluorimetric Colorimetric ICP-AES/MS	F U Cl, NO <sub>3</sub> Al, As, B, Ba, Be, Ca, Cd, Co, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sr, Zn pH, conductivity, HCO <sub>3</sub>
BGS(4)	UK	Stream water	Total Total	ISE DNAA/Fluor	F U pH, conductivity, HCO <sub>3</sub>
BGS(5)	UK	Heavy mineral	None	Hand lens	Mineralogy
BGS(6)	UK	Stream sediment	Total	DC-Arc ES	Ag, Al, B, Ba, Be, Bi, CaO, Cd, Co, Cr, Cu, Fe, Ga, K, La, Li, MgO, Mn, Mo, Ni, P <sub>2</sub> O <sub>5</sub> , Pb, Rb, Sn, Sr, Ti, U, V, Y, Zn, Zr
BGS(7)	UK	Stream sediment	Total Total	Flame AAS DC-Arc ES	As, Sb Al, B, Ba, Be, CaO, Co, Cr, Cu, Fe, La, Li, MgO, Mn, Mo, Ni, P <sub>2</sub> O <sub>5</sub> , Rb, Sn, Sr, Ti, V, Y, Zr Pb, Zn
BGS(8)	UK	Stream sediment	Total Total Total	Flame AAS DNAA OES	U B, Ba, Be, Cr, Fe, Mn, Mo, Ni, V, Zr Cu, Pb, Zn
BGS(9)	UK	Stream sediment	Total Total Total	Flame AAS DNAA XRF	U Ag, As, Ba, Bi, CaO, Cd, Ce, Co, Cr, Cs, Cu, Fe <sub>2</sub> O <sub>3</sub> , Ga, K <sub>2</sub> O, La, MgO, MnO, Mo, Nb, Ni, P <sub>2</sub> O <sub>5</sub> , Pb, Rb, Sb, Se, Sn, Sr, Th, TiO <sub>2</sub> , U, V, W, Y, Zn, Zr
BGS(10)	UK	Radiometric		Various	Total gamma, eU, Th, K, Rn, Tn
BGS/GSNI(1)	UK	Stream sediment	Total	XRF	Ag, As, Ba, Bi, CaO, Cd, Ce, Co, Cr, Cs, Cu, Fe <sub>2</sub> O <sub>3</sub> , Ga, K <sub>2</sub> O, La, Mg, Mn, Mo, Mb, Ni, P <sub>2</sub> O <sub>5</sub> , Pb, Rb, Sb, Se, Sn, Sr, Th, TiO <sub>2</sub> , U, V, W, Y, Zn, Zr
BGS/GSNI(2)	UK	Heavy Mineral		Hand lens	Mineralogy
BGS/GSNI(3)	UK	Stream water	Total Total	ISE ICP-MS	F Ag, As, Be, Cd, Ce, Co, Cr, Cs, Cu, La, Li, Mo, Nd, Ni, Pb, Rb, Sb, Se, Sn, Ti, U, V, Y, Zr
			Total	ICP-AES	Al, B, Ba, Ca, Fe, K, Mg, Mn, Na, P, Si, SO <sub>4</sub> , Sr, Zn
			Total	Colorimetric	Cl, NO <sub>3</sub> pH, conductivity, HCO <sub>3</sub>
Soil Survey	UK	Soil	Total	ICP-AES	Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, P, Pb, Sr, Zn
			Extractable Extractable Extractable	ICP-AES Flame AAS Colorimetric	Cd, Co, Cu, Fe, Mn, Ni, Pb, Zn K, Mg P
EGRC, ICL(1)	UK	Stream sediment	Total Total Total Total	DC-Arc ES Flame AAS Gutzeit Spectrophotometry	pH Al, Ba, Co, Cr, Cu, Fe, Ga, Li, Mg, Mn, Ni, Pb, Sc, Si, Sr, Ti, V Zn, Cd As Mo
EGRC,	UK	Stream sediment	Total	DC-Arc ES	

Organisation	Country	Survey Type	Total/ Extractable Speciation Water	Analytical Method	Determinants
ICL(2)			Total		Al, Ba, Ca, Co, Cr, Cu, Fe, Ga, K, Mg, Ni, Pb, Sc, Si, Sr, V, Zn
MLURI	UK	Soil	Total	Gutzeit Spectrophotometry	As
			Total	ICP-AES	Mo
			Total		Al, Ba, Ca, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, P, Pb, Sr, Ti, Zn
			Extractable	Catalytic Flame AAS	C
					Ca, K, Mg, Na

Organisation	Country	Digital Data	Sample Archives	Contact Name	Position	Address	Telephone	Fax
GGCT(1)	Albania	Yes	Yes	A Zajmi	Director	GGCT, L.9, Blloku, Vasil Shanto, Tirana	355 42 27360	
GGCT(2)	Albania	Yes	Yes	A Zajmi	Director	GGCT, L.9, Blloku, Vasil Shanto, Tirana	355 42 27360	
GGCT(3)	Albania	Yes	Yes	A Zajmi	Director	GGCT, L.9, Blloku, Vasil Shanto, Tirana	355 42 27360	
GGCT(4)	Albania			A Zajmi	Director	GGCT, L.9, Blloku, Vasil Shanto, Tirana	355 42 27360	
GB	Austria	Yes	No	Dr O Schermann		GB, Rasumofskygasse 23, A-1031, Vienna		43 1 712 567456
GSB/UCL	Belgium	No	No	J Van der Sluys	Geologist	GSB, 13 Jenner Street, B-1040, Brussels	32 2 6270350	32 2 6477359
GSB/UJL	Belgium/Luxem	Yes	Yes	J Van der Sluys	Geologist	GSB, 13 Jenner Street, B-1040, Brussels	32 2 6270350	32 2 6477359
FSCC	Most of Europe	Not yet	Not yet	J Van der Sluys	Geologist	GSB, 13 Jenner Street, B-1040, Brussels	32 2 6270350	32 2 6477359
GSB/PFM	Belgium	No		J Van der Sluys	Geologist	GSB, 13 Jenner Street, B-1040, Brussels	32 2 6270350	32 2 6477359
GSB	Belgium/Luxem	Yes		J Van der Sluys	Geologist	GSB, 13 Jenner Street, B-1040, Brussels	32 2 6270350	32 2 6477359
IGI	Croatia							
GS Dept(1)	Cyprus	No	Yes	Dr G Constantinou	Director	GS Dept, Nicosia	357 2 302338	357 2 367911
GS Dept(2)	Cyprus	No	Yes	Dr G Constantinou	Director	GS Dept, Nicosia	357 2 302338	357 2 367911
CGS(1)	Czech Republic	Yes	No	Ing M Duris	Geochemist	CGS, Klarov 3, 118 21 Praha 1	42 2 5818740	42 2 5818748
CGS(2)	Czech Republic	Yes	Yes	Ing M Duris	Geochemist	CGS, Klarov 3, 118 21 Praha 1	42 2 5816995	42 2 5818748
Soil Survey	Czech Republic	Yes	Yes	Ing E Cerna		Min of Agric, DPT 320, Tesnov 17, 110 00 Praha 1	42 2 2181	42 2 2314117
Geomin	Czech Republic			Z Miroslav				
CGS(3)	Czech Republic	Yes	No	Ing M Duris	Geochemist	CGS, Klarov 3, 118 21 Praha 1	42 2 5818740	42 2 5818748
CGS(4)	Czech Republic			Ing M Duris	Geochemist	CGS, Klarov 3, 118 21 Praha 1	42 2 5818740	42 2 5818748
Geofyzika	Czech Republic	Yes		Dr C Dedacek		Geofyzika, Vecna 29a, 602 00, BRNO	42 5 7264 281	42 5 41225089
MAF	Denmark	Yes	Yes	J Freclericia	Head Quat Dept	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 89991900	45 89991919
DIPSS	Denmark	Yes	Yes	J Freclericia	Head Quat Dept	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 89991900	45 89991919
GDU(1)	Denmark	No	Request	J Freclericia	Head Quat Dept	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31106600	45 31196868
GDU(2)	Denmark	No	Request	J Freclericia	Head Quat Dept	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31106600	45 31196868
EG(1)	Estonia	Yes	Yes	Dr R Raudsep	Research Director	GE, Kadaka tee 80/82, EE0026, Tallinn	372 2 537 331	372 2 446 501
EG(2)	Estonia	Yes	Yes	Dr R Raudsep	Research Director	GE, Kadaka tee 80/82, EE0026, Tallinn	372 2 537 331	372 2 446 501
EG(3)	Estonia			Dr R Raudsep	Research Director	GSE, Kadaka tee 80/82, EE0026, Tallinn	372 2 537 331	372 2 446 501
GSF(1)	Finland	Yes	Yes	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(2)	Finland	No	Yes	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(3)	Finland	Yes	No	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(4)	Finland	Yes	Yes	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(5)	Finland			Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(6)	Finland	No	Yes	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF(7)	Finland	No	No	Prof R Salminen	Head of Geochem	GSF, Betonimiehenkuja 4, SF-02150 Espoo 15	358 0 46931	358 0 462205
GSF/NGU/SGU	Fin/Nor/Swe	Yes	Yes	GSF/NGU/SGU				
BRGM(1)	France	Yes	Yes	Dr H Zeegers	Deputy Manager	BRGM, SMN/DEX, BP 6009, Orleans, Cedex 2	33 38 643434	33 38 643518
BRGM(2)	France	Yes	Yes	Dr H Zeegers	Deputy Director	BRGM, SMN/DEX, BP 6009, Orleans, Cedex 2	33 38 643434	33 38 643518
GLNRW(1)	Germany	Yes	Yes	Dr B Luer	Geochemist	GLNRW, De-Greiff-Str 195, 47803 Krefeld	49 2151 8971	49 2151 897505
GLNRW(2)	Germany	Yes	Yes	Dr B Luer	Geochemist	GLNRW, De-Greiff-Str 195, 47803 Krefeld	49 2151 8971	49 2151 897505
GLNRW(3)	Germany	Yes	No	Dr B Luer	Geochemist	GLNRW, De-Greiff-Str 195, 47803 Krefeld	49 2151 8971	49 2151 897505
GLNRW(4)	Germany			Dr B Luer	Geochemist	GLNRW, De-Greiff-Str 195, 47803 Krefeld	49 2151 8971	49 2151 897505
BGR(1)	Germany	Yes	No	Dr R Hindel	Head of Geochem	BGR, Postfeld 510153, D-30631 Hannover	49 511643 2813	49 511 643 2304
BGR(2)	Germany	Yes	No	Dr R Hindel	Head of Geochem	BGR, Postfeld 510153, D-30631 Hannover	49 511643 2813	49 511 643 2304
IGME(1)	Greece	Yes	Yes	Mr A Demetriades	Geochemist	IGME, 70 Messoghion Street, GR-11527, Athens	30 1 7771438	30 1 7752211
IGME(2)	Greece	Yes	Yes	Mr A Demetriades	Geochemist	IGME, 70 Messoghion Street, GR-11527, Athens	30 1 7771438	30 1 7752211
IGME(3)	Greece			Mr A Demetriades	Geochemist	IGME, 70 Messoghion Street, GR-11527, Athens	30 1 7771438	30 1 7752211
GGU(1) Area A	Greenland	Yes	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU (2) Area B	Greenland	Yes	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(3) Area C	Greenland	Not yet	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(4) Area D	Greenland	No	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(5) Area E	Greenland	No	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(6) Area F	Greenland	No	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(7) Area G	Greenland	Yes	No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(8) A-G	Greenland		No	Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(9) A-C	Greenland			Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(10) B-F	Greenland			Dr A Steenfelt	Senior Researcher	GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(11)	Greenland	Yes	No	Dr P Appel		GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(12)	Greenland	No	Yes	Dr P Appel		GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868

Organisation	Country	Digital Data	Sample Archives	Contact Name	Position	Address	Telephone	Fax
GGU(13)	Greenland	Yes	No	Dr P Appel		GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(14)	Greenland	Yes	Yes	Dr P Appel		GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GGU(15)	Greenland	Yes	No	Dr P Appel		GEUS, Thoravej 8, DK 2400, Copenhagen K	45 31 106600	45 31 196868
GIH(1)	Hungary	Yes	No	L Odor	Project Manager	GIH, POB 106, Stefania ut 14, H-1442, Budapest	36 1 2514678	36 1 2510703
GIH(2)	Hungary	Yes	Yes	L Odor	Project Manager	GIH, POB 106, Stefania ut 14, H-1442, Budapest	36 1 2514678	36 1 2510703
Ork	Iceland							
GSI	Ireland	Yes	Research only	Dr P O'Connor	Geologist	GSI, Begars Bush, Haddington Road, Dublin 4	353 1 671 5233	353 1 668 1782
MICA(1)	Italy	No		Dr B de Vivo	Assoc Prof	Uni di Napoli, Via Messocannone 8, 80134 Napoli	39 81 5803318	39 81 5525739
MICA(2)	Italy	Yes	Yes	Ing Ingravalle	Director General	MICA, Via Molise 2, 00187 Roma	39 6 4705 2582	
GSL	Latvia							
IG(1)	Lithuania	Yes	Yes	Dr A Radzevicius		GI, T Sevcenkosy Str 13, 2009 Vilnius	370 2 661 409	370 2 662 710
IG(2)	Lithuania	Yes	Yes	Dr V Kadunas		GI, T Sevcenkosy Str 13, 2009 Vilnius	370 2 661 814	370 2 662 710
IG/LGT(1)	Lithuania	Yes	Yes	V Gregorauskiene	Head of Geochem	GSL, Konavskio 35, 2600 Vilnius	370 2 635323	370 2 6706376
IG/LGT(2)	Lithuania			Dr V Kadunas		GI, T Sevcenkosy Str 13, 2009 Vilnius	370 2 661 814	370 2 662 710
Forest Inst.	Lithuania			R Ozolincius				
RGD(1)	Netherlands	Yes	No	Dr G Klaver	Head of Geochem	RGD, Postbus 157, 2000 AD Haarlem	31 23 300300	31 23 401754
RGD(2)	Netherlands	Yes	Yes	Dr G Klaver	Head of Geochem	RGD, Postbus 157, 2000 AD Haarlem	31 23 300300	31 23 401754
RGD(3)	Netherlands	Yes	Yes	Dr G Klaver	Head of Geochem	RGD, Postbus 157, 2000 AD Haarlem	31 23 300300	31 23 401754
NGU(1)	Norway			T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 72 921620
NGU(2)	Norway	Yes		T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(3)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(4)	Norway	Yes	No	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(5)	Norway			T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(6)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(7)	Norway	Yes	No	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(8)	Norway			T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(9)	Norway	Yes		T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(10)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(11)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(12)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(13)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(14)	Norway	Yes	Yes	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(15)	Norway	Yes	1.3.97	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(16)	Norway			T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
NGU(17)	Norway	Yes	No	T Finne	Geochemist	NGU, PO Box 3006 Lade, N7002 Trondheim	47 73 904011	47 73 924020
PIG(1)	Poland	No	No	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(2)	Poland	No	No	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(3)	Poland	No	No	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(4)	Poland	No	No	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(5)	Poland	Yes	Yes	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(6)	Poland	Yes	Yes	Dr F Lis	Head of Geochem	PIG, Rakowiecka 4,00-975 Warszawa	48 22 495096	48 22 495342
PIG(7)	Poland			Prof K Jaworowski	Director General			48 22 495342
Aveiro Uni(1)	Portugal	No	No	Prof M Pinto	Professor	Dept de Geociencias, Aveiro Uni, 3800 Aveiro	351 34 370806	351 34 370605
Aveiro Uni(2)	Portugal	No	No	Prof M Pinto	Professor	Dept de Geociencias, Aveiro Uni, 3800 Aveiro	351 34 370806	351 34 370605
IGM(1)	Portugal	No	No	J Lencastre		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
IGM(2)	Portugal			J Lencastre		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
IGM(3)	Portugal			J Lencastre		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
IGM(4)	Portugal	No	No	J Lencastre		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
IGM(5)	Portugal	No	No	J Lencastre		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
IGM(6)	Portugal	Yes		Dr L Torres		IGM, Zambujal, 2720 Alfragide, Apartado 7586	351 4718922	351 4718940
GIR(1)	Romania	No		Dr P Andar	Head of Geochem	GIR, I Caransebes Str, 78344 Bucuresti		
GIR(2)	Romania	No		Dr P Andar	Head of Geochem	GIR, I Caransebes Str, 78344 Bucuresti		
GSSR(1)	Slovakia	Yes	Yes	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
GSSR(2)	Slovakia	Yes	No	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
GSSR(3)	Slovakia	Yes	Yes	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
Soil Survey	Slovakia	Yes	Yes	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
Forest Res Inst	Slovakia	Yes	Yes	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
Uranpress	Slovakia	Yes	Yes	Dr K Marsina	Head Appl Geol	GSSR, Mlynska dolina 1, 81704 Bratislava	42 7 3705111	42 7 371940
ULIG(1)	Slovenia	Yes		Prof S Pirc	Professor	ULIG, Askerceva 12, 61000 Ljubljana	386 61 1254121	386 61 1258114
GZL(1)	Slovenia	Yes	Yes	M Bidovec	Geochemist	GZL, Dimiceva 14, 61000 Ljubljana	386 61 1682461	386 61 1682557
ULIG(2)	Slovenia	Yes	Yes	Prof S Pirc	Professor	ULIG, Askerceva 12, 61000 Ljubljana	386 61 1254121	386 61 1258114
GZL(2)	Slovenia	Yes	Yes	M Bidovec	Geochemist	GZL, Dimiceva 14, 61000 Ljubljana	386 61 1682461	386 61 1682557
ULIG(3)	Slovenia	Yes	No	Prof S Pirc	Professor	ULIG, Askerceva 12, 61000 Ljubljana	386 61 1254121	386 61 1258114
GZL(3)	Slovenia	Yes	Yes	M Bidovec	Geochemist	GZL, Dimiceva 14, 61000 Ljubljana	386 61 1682461	386 61 1682557
ITGE(1)	Spain	Yes	Yes	Mr J Locutura	Head of Geochem	ITGE, Rios Rosas 23, Madrid 28042	34 1 3495971	34 1 3495834

Organisation	Country	Digital Data	Sample Archives	Contact Name	Position	Address	Telephone	Fax
ITGE(2)	Spain	Yes	Yes	Mr J Locutura	Head of Geochem	ITGE, Rios Rosas 23, Madrid 28042	34 1 3495971	34 1 3495834
ITGE(3)	Spain		Yes	Mr J Locutura	Head of Geochem	ITGE, Rios Rosas 23, Madrid 28042	34 1 3495971	34 1 3495834
ITGE(4)	Spain	Yes	Yes	Mr J Locutura	Head of Geochem	ITGE, Rios Rosas 23, Madrid 28042	34 1 3495971	34 1 3495834
ITGE(5)	Spain	Yes	Yes	Mr J Locutura	Head of Geochem	ITGE, Rios Rosas 23, Madrid 28042	34 1 3495971	34 1 3495834
ENUSA	Spain	No		J Martinez	Director U Div	ENUSA,Santiago Rusinol 12,Madrid 28040	34 1 337 4475	34 1 347 4215
SGU(1)	Sweden	Yes	Yes	Dr H Ressar		SGU, B ox 670, S-75128 Uppsala	46 18 179000	46 18 179210
SGU(2)	Sweden	Yes	Yes	Dr M Andersson		SGU, Box 670, S-75128 Uppsala	46 18 179000	46 18 179210
NSG	Sweden	Yes	Yes	Dr M Andersson		SGU, Box 670, S-75128 Uppsala	46 18 179000	46 18 179210
SGU(3)	Sweden	Yes		A Lindén		SGU, Box 670, S-75128 Uppsala	46 18 179 338	46 18 179 304
SLG	Switzerland							
MTA(1)	Turkey	Yes	No	M Z Gozler	Director General	MTA, Genel Mudurlugu, 06520 Ankara	90 313 2879150	90 312 2879188
MTA(2)	Turkey	Yes	No	M Z Gozler	Director General	MTA, Genel Mudurlugu, 06520 Ankara	90 313 2879150	90 312 2879188
MTA(3)	Turkey	Yes	No	M Z Gozler	Director General	MTA, Genel Mudurlugu, 06520 Ankara	90 313 2879150	90 312 2879188
IGMOF	Ukraine	Yes		Dr E Zhovinsky	Deputy Director	IGMOF, NAS, 34 Palladin Prosp, Kiev-142,252680	38 44 4440305	38 44 4441270
BGS(1)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(2)	UK	Yes	No	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(3)	UK	Yes	No	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(4)	UK	Yes	No	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(5)	UK	No	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(6)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(7)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(8)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(9)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS(10)	UK			Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS/GSNI(1)	UK	Yes	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS/GSNI(2)	UK	No	Yes	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
BGS/GSNI(3)	UK	Yes	No	Prof J Plant	Assist Director	BGS, Keyworth, Nottingham NG12 5GG	44 115 9363100	44 115 9363200
Soil Survey	UK	Yes	Yes	Dr P Bullock	Director	SSLRC, Cranfield Uni, Silsoe, Bedford MK45 4DT	44 1525 863000	44 1525 863253
EGRC.ICL(1)	UK	Yes	Yes	Dr M Ramsay	Director	EGRC, ICSTM, Prince Consort Road, London SW7 2BP	44 171 589 5111	44 171 594 6408
EGRC.ICL(2)	UK	Yes	Yes	Dr M Ramsay	Director	EGRC, ICSTM, Prince Consort Road, London SW7 2BP	44 171 589 5111	44 171 594 6408
MLURI	UK	No	No	Dr E Paterson	Manager	MLURI, Cragiebuckler, Aberdeen AB15 8QH	44 1224 318611	44 1224 311556