EXECUTIVE SUMMARY

The EuroGeoSurveys Geochemistry Expert Group was very active during 2011 with (a) the final editing and publication of the book “Mapping the Chemical Environment of Urban Areas”, (b) assessing the quality of new GEMAS analytical results [total C and S, total organic carbon (TOC), cation exchange capacity (CEC), XRF, pH, and particle size distribution (PSD) analysis] and the writing of the relevant report, (c) the release of GEMAS national data sets for processing and interpretation, and whole data sets to people responsible for the interpretation of European wide geochemical patterns on specific elements, (d) presentation of project results at conferences, symposia, seminars and workshops, (e) writing of papers for publication in journals and books, (g) writing of articles for the EuroGeoSurveys newsletter and annual report, and (h) production of PowerPoint material for the GEO (Group on Earth Observations) Ministerial Summit. The annual meeting of the Group was held in October 2011, and was hosted by the Geological Survey of Finland. Apart from discussions on ongoing projects (GEMAS and URGE), there were many interesting presentations on both projects, but also food for thought with respect to the interpretation of new FOREGS Geochemical Atlas of Europe data on fluoride, chloride and bromide.

1. INTRODUCTION

The Geochemistry Expert Group has at present 56 official members. In addition, there are 43 associate members from geological survey and non-survey organizations that participate in the GEMAS and URGE projects, which are scheduled to be completed in 2013 and 2015, respectively, and another 65 contributors to the Urban Geochemistry Book project, which was completed in April 2011 with the publication of the book “Mapping the Chemical Environment of Urban Areas” (Johnson et al., 2010).

2. MISSION AND VISION

2.1 Mission

The mission of the EuroGeoSurveys Geochemistry Expert Group is to provide high quality geochemical data of near-surface materials, to develop harmonised databases for multi-purpose use, and to offer independent expert advice to the European Commission.

To achieve this mission, systematic geochemical data for the whole of Europe are generated by harmonised methods of sampling of near-surface materials (soil, stream or floodplain sediment, water), sample preparation, chemical analysis, quality control, data processing, and presentation.
The systematic geochemical information is published in the form of geochemical atlases, which are
freely available, and can be used for (a) state of the environment reports, (b) mineral exploration,
(c) agriculture, (d) forestry, (e) animal husbandry, (f) geomedicine or medical geology, (g)
determination of natural background values for environmental risk assessment, etc.

Why are Geochemical Atlases important? The answer is given by Darnley et al. (1995, p.X;
and on the earth - mineral, animal and vegetable - is made from one, or generally some
combination of, the 86 naturally occurring chemical elements. Everything that is grown, or made,
depends upon the availability of the appropriate elements. The existence, quality, and survival of
life depend upon the availability of elements in the correct proportions and combinations. Because
natural processes and human activities are continuously modifying the chemical composition of our
environment, it is important to determine the present abundance and spatial distribution of the
elements across the Earth’s surface in a much more systematic manner than has been attempted
hitherto’. Systematic geochemical mapping is considered, therefore, as the best available method to
document changes in the levels of chemical elements in materials occurring at or below the Earth’s
surface.

2.1. Vision
The EuroGeoSurveys Geochemistry Expert Group’s aim is to be regarded as the body that provides
high quality harmonised geochemical data of near-surface materials to support European policy and
decision makers, but also to supply sound background data to scientists for their research, and to the
public, in general, for education and other purposes.

3. FOCUS AND SCOPE
The focus of the EuroGeoSurveys Geochemistry Expert Group is to produce high quality
harmonised geochemical data sets of near-surface materials for multipurpose use. The scope is to
bring under the same umbrella applied geochemists from all EGS member institutions, and to act as
a forum for the exchange of expertise and to work together in order to deliver good quality
professional products and services to European Union countries.

Innovation can include, but is not limited to, the following:

- To develop creative collaboration between EGS member surveys in the field of applied
  geochemistry.
- To incorporate new innovative technologies in applied geochemical investigations, e.g.,
stable isotopes, Mid-InfraRed spectroscopy (MIR), Mobile Metal Ion analysis (MMI), etc.
in order to improve and expand data interpretation and, thus, improve the service to end-
users.

- To introduce new outreach services for the benefit of end-users.
- To test new ideas in order to improve products and services.
- To continuous redefine the role of the Expert Group to meet new challenges.
- To develop processes that encourage effective organisational innovation.
- To find new ways of making geochemical data sets more useful to end-users.
- To discover unmet end-user needs.

The EuroGeoSurveys Geochemistry Expert Group publishes original research, reports on
innovative practices and case studies, and publishes books and atlases. It also disseminates its work
findings and experience through participation in conferences, seminars and workshops.

4. THE EUROPEAN DIMENSION

Table 1 summarises European Commission (EC) Directives that require European wide harmonised
geochemical data. In the sections of the different on-going projects during 2011, the relevant EC
Directives are given. It is noted that all projects are INSPIRE compliant (EC, 2007).

Table 1. Summary of some European Commission (EC) Directives driving the demand for
harmonised geochemical background data across political borders (modified from Johnson and
Demetriades, 2011, Table 2.3, p.22)

<table>
<thead>
<tr>
<th>Directive</th>
<th>Summary</th>
<th>Application geochemical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC Water Framework Directive (WFD) (2000/60/EC)</td>
<td>This requires Member States to meet a good ecological status for water quality objectives (except where deviations from the standard are justified); and to identify basic and supplementary measures to deal with point source and diffuse pollution. The directive will be managed on the basis of River Basin Districts (one or more drainage catchments).</td>
<td>Geochemical background data for low order streams produced by the European Geochemical Atlas project can provide information about surface water quality for farmers and those who manage land. In addition, the data produced by the project on Ground water Geochemistry using bottled water as 'proxy' can be used to assess the quality of ground water, but also bottled water with respect to inorganic constituents. Regulatory bodies and administrators can use these data to determine guideline levels for elemental concentrations.</td>
</tr>
<tr>
<td>EC Integrated Pollution Prevention and Control Directive (IPPC) (2008/1/EC), it replaces Directive 96/61/EC</td>
<td>It has been formulated to implement the EC Integrated Pollution Prevention and Control Directive (96/61/EC). Its objective is to control pollution from industry.</td>
<td>Geochemical background data can be used by both industry and regulators to assess the impact of polluting industries on the environment. The geochemical background data provide a reference point against which changes can be measured.</td>
</tr>
<tr>
<td>EC Sewage Sludge Directive (86/278/EEC)</td>
<td>This directive seeks to encourage the use of sewage sludge in agriculture, but regulates its use in</td>
<td>Geochemical background data can be used to monitor and model the impact on the environment of sewage sludge.</td>
</tr>
<tr>
<td>Directive</td>
<td>Summary</td>
<td>Application geochemical data</td>
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<td>Proposed EC Soil Directive</td>
<td>Directive under consideration. The European Union included in the 6th Environmental Action Programme the ‘Thematic Strategy on Soil Protection’ that will lead in the future to an EU soil protection Directive.</td>
<td>Geological Surveys are the only organisations systematically sampling soil from urban areas, and can establish the urban geochemical background in order to assess the impact of human induced pollution. Geological Surveys are, in fact, the only organisations in Europe that have the necessary experience for carrying out continental scale geochemical mapping and monitoring projects.</td>
</tr>
<tr>
<td>EC Mine Waste Directive (2006/21/EC)</td>
<td>This proposed directive is seen as a supplementary measure to the WFD to minimise the adverse effects on the environment, caused by waste from the extractive industries.</td>
<td>Geochemical background data can be used to monitor and model the impact on the environment of mine waste.</td>
</tr>
<tr>
<td>EC Habitats Directive (92/43/EEC)</td>
<td>This directive is concerned with the conservation of natural habitats and of wild fauna and flora.</td>
<td>Climatic or anthropogenic changes to the geochemistry of the surface environment that may impact on fauna and flora can be monitored using geochemical background data of the surface environment.</td>
</tr>
<tr>
<td>EC Landfill Directive (1999/31/EC)</td>
<td>The Landfill (England and Wales) Regulations of 2002, implement the EC Landfill Directive, which aims to prevent or reduce the negative environmental effects of landfill.</td>
<td>Geochemical data can be used to monitor and model the impact on the environment of landfills.</td>
</tr>
<tr>
<td>INSPIRE Directive (2007/2/EC)</td>
<td>Establishing an Infrastructure for Spatial Information in the European Union for making available relevant, harmonised, and quality geographic information to support formulation, implementation, monitoring, and evaluation of policies and activities that have a direct or indirect impact on the environment.</td>
<td>Harmonised geochemical background data for the whole of Europe are needed in order to assess impacts on the environment.</td>
</tr>
<tr>
<td>REACH Directive (EC 1907/2006)</td>
<td>The aim of REACH is to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. There is a need to fill information gaps to ensure that industry is able to assess hazards and risks of the substances, and to identify and implement the risk management measures to protect humans and the environment.</td>
<td>Geochemical background data are needed to establish the variable geochemical background across Europe, and the local maximum threshold values, against which any future changes can be monitored.</td>
</tr>
</tbody>
</table>

4.1. Agricultural and Grazing land soil geochemistry

The Agricultural and Grazing land soil geochemistry project (GEMAS) fulfils requirements of the following EU Directives, regulations, and communications:


(2) Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (EC, 2004);

(3) European Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation), adopting in the EU the Globally Harmonised System (GHS) (EC, 2008a), and


The administration of REACH (Registration, Evaluation and Authorisation of Chemicals), the new European Chemicals Regulation adopted in December 2006 (EC, 2006a, 2009), and the pending EU Soil Protection Directive (Van Camp et al., 2004; EC, 2006b), require additional knowledge about “soil quality” at the European scale. REACH specifies that industry must prove that it can produce and use its substances safely. Risks, due to the exposure to a substance during production and use at the local, regional, and European scale, all need to be assessed. In contrast, to human-made organic substances that do not occur naturally in the environment, all industries dealing with natural resources will face in the near future a number of specific questions:

Most of their “products” occur also naturally – the natural background variation needs to be established, in addition to a methodology to differentiate the industrial impact from the natural geogenic background.

What is the “bioavailability” of metals and other chemical elements in soil?

What is the long-term fate of metals and other chemical elements added to soil?

Besides fulfilling the conditions of EC policy documents, it satisfies other EU international commitments, such as (i) the United Nations Strategic Approach to International Chemicals Management (SAICM) (UNEP, 2006), and (ii) the OECD Work on Investigation of High Production Volume Chemicals (OECD, 2009).

4.2. European Ground water Geochemistry (EGG-Project)

The ground water geochemistry project, using bottled water as “proxy”, fulfils conditions of the EC Directive 2000/60/EC (EC, 2000), and its results should assist the European Commission in its
legislative work on bottled waters with respect to inorganic constituents, e.g.,


Further, the information produced can also be used in the national legislative procedure of European Union member countries.

4.3. Urban geochemistry


5. ACTIVITY REPORT

5.1. Continued work with the FOREGS data

- Alecos Demetriades (Hellas) is involved with interpretation of new Au data. He will prepare a publication that incorporates FOREGS and GEMAS Au data and the GEMAS Pd, Pt data.
- Reijo Salminen (Finland) is working on the fluoride, chloride and bromide data, and some interpretation problems were discussed during the October 2011 Annual Group meeting in
Espoo.

- Benedetto De Vivo (Italy) and the Italian Universities team have been working on the new data to model the effects of lower density sampling and cost-benefit in geochemical surveys. A manuscript has been submitted for publication in the Journal of Geochemical Exploration.
- Maria João Batista (Portugal) is preparing a manuscript on Sn data.
- Ignace Salpeteur (France) has published one paper in French:
  
- Clemens Reimann (Norway) and Manfred Birke (Germany) will determine a way forward with the perchlorate analyses performed on the topsoil samples that had been received from the USGS. It is noted that due to problems at the USGS laboratories, not all samples were analysed. However, enough results are available to plot a map.
- Clemens Reimann reported that there is no progress with MIR analysis on FOREGS samples, but that all GEMAS samples were measured. It is quite apparent that the FOREGS samples will not be analysed, and arrangements should be made for the return of the samples to the BGS sample storage facilities.
- The Chinese have published an article about the comparison of FOREGS results as analysed in European and Chinese laboratories (Wensheng Yao et al., 2011, Geoscience Frontiers 2).

5.2. European Ground water Geochemistry project (EGG)

A geochemical atlas presenting the results was published in August 2010:


Until the end of 2011, 910 copies of the “Geochemistry of European Bottled Water” were sold, and the generated royalties reached an amount in excess of €1,600. Up to now €1,588.66 of royalties have been paid into the EuroGeoSurveys bank account. The next payment will be in April 2012.
The EGG project results were presented at different occasions:


- Workshop “The Geochemistry of European Groundwater” for postgraduate students of the Faculty of Geology and Geo-Environment (National and Kapodistrian University of Athens): presentation by Alecos Demetriades.

- NATO Advanced Research Workshop (The NATO Science and Peace and Security Programme): Drinking water protection by integrated management of contaminated land. Belgrade, Serbia, 21-23 March 2011, Meeting venue: Hotel “M”, Bulevard Oslobodenja 56a. Two oral presentations were delivered:


- ENSAA: Young Europeans Discuss Sustainable Development, 9-14 of May 2011, Ionic Centre, Athens, Hellas [http://www.ensaa.eu/]:


One paper was also published:
The EGG atlas received an unusually high number (10 to date) of positive independent external reviews in international and national journals, i.e., (i) 1 page in the Slovenian journal Geologija by Mateja Gosar and Mihael Brenčič (2010), (ii) 2 pages in Elements by Prof. Kurt Bucher (2011), (iii) 3 pages in Environmental Earth Sciences by Prof. Jörg Matschullat (2011), (iv) 1.5 pages in Explore by Matthew Leybourne (2011), (v) 4 pages in the Journal of Water Chemistry and Technology by V.V. Goncharuk (2011), (vi) 2 pages in the Austrian journal Beiträge zur Hydrogeologie by R. Benischke (2011), (vii) 1 page in the German Journal für Kulturpflanzen by F. Knolle and E. Schnug (2011a), (viii) 1 page in the German journal Grundwasser by W. Käss (2011), (ix) 1 page in the German journal Der Aufschluss by F. Knolle and E. Schnug (2011b), and (x) 2 pages in the German journal Wasserwirtschaft by F. Knolle and E. Schnug (2011c).

5.3. Geochemistry of Agricultural and Grazing land soil (GEMAS)

The GEMAS project is running according to plan. All analytical results have been received, and passed quality control. The following quality control report was written and is freely available from NGU’s website:


National data sets were made available to each country for processing and interpretation, and whole data sets to Group members that are responsible for writing papers or book chapters on specific elements for all Europe. SGS, a Toronto, Canada, based commercial laboratory has promised free mobile metal ion analysis (MMI) for the Ap samples.

A number of papers have been written, but not yet published (details shall be reported in the 2012 annual report). The GEMAS project results were presented at different occasions:-

Geological Survey of Norway, Laboratory lunchtime presentation, Trondheim, 7 February 2011:

**SEGH 2011**: International Conference on Environment and Health and 28th European Conference on Environmental Geochemistry & Health, Edge Hill University, Edge Hill, United Kingdom, 11-14 April 2011 [http://www.edgehill.ac.uk/segh2011]:


EuroGeoSurveys Geochemistry Expert Group Meeting – Geological Survey of Finland, Espoo, Finland, 5-7 October, 2011. The following oral presentations were delivered:


Birke, M., Reimann, C., Rauch, U. and The Eurogeosurveys GEMAS Project Team, 2011. *Geochemical mapping of agricultural and grazing land soils (GEMAS-
project) - Selected results at German and European scales.


Dinelli, E. et al., 2011. *A comparison between XRF and Aqua Regia data from the GEMAS database.*


Oorts, K., Schoeters, I., Reimann, C. and Dohrmann, R., 2011. *Experiences with the grain size analyses of the GEMAS samples: How to measure the clay content?*


Gosar, M., 2011. *GEMAS results from Slovenia.*


EuroGeoSurveys Geochemistry Expert Group Meeting – Geological Survey of Finland, Espoo, Finland, 5-7 October, 2011. The following poster presentations were displayed:


5.3.1. *GEMAS project Website and Google Earth photo database*

Paolo Valera (Italy) is working on GEMAS project website, and. Edith Haslinger (Austria) on a “GEMAS Google Earth photograph database”, where it will be possible to click on the sample sites and be able to download the field photographs (Figure 1). The website will be hosted on the server of the Geological Survey of Austria.

(a) (b)

Figure 1. (a) Agricultural soil, Norway, and (b) Grazing land soil (Cyprus).

5.3.2. *GEMAS project calendar*

Following the success of the interactive pdf 2011 calender, Peter Hayoz (Switzerland) has produced a very attractive “GEMAS Project Calendar for the year 2012”, based on field photographs from the project. The 2012 GEMAS project calendar was printed, and the printing costs paid from the
royalties earned from the sales of the EGG Atlas. Peter has also prepared an interactive pdf version. Copies of the calendar were sent to all GEMAS participants and the EuroGeoSurveys Brussels office.

5.4. **Urban Geochemistry**

5.4.1. **Urban Geochemistry Book project**

Chris Johnson, Alecos Demetriades, Juan Locutura and Rolf Tore Ottesen have edited a book on “Urban Geochemistry”, which was published by Wiley-Blackwell, and first released in April 2011. The full reference is: Johnson, C.C., Demetriades, A., Locutura, J. & Ottesen, R.T. (Editors), 2011. *Mapping the Chemical Environment of Urban Areas*. Wiley-Blackwell, Oxford, UK, 618 pp. (Figure 2) [http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0470747242.html]. A total of 359 copies of the book have been sold until the end of 2011, generating combined royalties from all editors and authors of UK £1,347.30, which will be paid into the EuroGeoSurveys bank account in April 2012 for use by the Geochemistry Expert Group. The book is divided into two parts, *i.e.*, Part 1: General aspects and methodologies (12 Chapters), and Part 2: Case studies (21 Chapters).


The following chapters were written by European Geological Survey scientists:
Foreword: Luca Demicheli


5.4.2. Specialist session on Urban Geochemistry

EuroGeoSurveys sponsored with 200 Euro a specialist session on “Mapping the Geochemical Environment of Urban Areas” at the SEGH 2011 International Conference on Environment and Health and 28th European Conference on Environmental Geochemistry & Health, which was held at Edge Hill University (Edge Hill, United Kingdom) from the 11th to 14th April 2011 [http://www.edgehill.ac.uk/segh2011/specialistsessions/mapping]. The conveners of the session were Chris C. Johnson (United Kingdom) and Alecos Demetriades (Hellas). The following oral presentations were delivered:


Arrangements were also made with the conference organisers for EuroGeoSurveys to have a desk in the main hall on which EGS promotional material was displayed and disseminated to participants (*e.g.*, leaflets, bag, *etc.* – see Figure 3). As part of the promotion of EGS publications, special arrangements were made with the publishers of both books “Mapping the Chemical Environment of Urban Areas” (Wiley-Blackwell) and “Geochemistry of European Bottled Water” (Borntraeger Science Publishers) to send leaflets for inclusion in the participant conference bags, and to offer the books at reduced price.

Finally, since the SEGH conferences award prizes to the best student oral and poster presentations on urban geochemistry, Wiley-Blackwell provided two copies of the Urban Geochemistry book for this purpose. The profile of EuroGeoSurveys was promoted well during the conference, and many people learnt of its existence and published material.
5.4.3. Urban Geochemistry project (URGE)

The URGE project’s objective is to compare the urban geochemistry of several European cities using the same sampling protocol and analytical procedures. It has already started, and is led by Rolf Tore Ottesen of NGU. More than 25 members of the group volunteered to sample a city for the project. The main problem, however, is financing sample analyses. It was agreed to use a commercial laboratory for the analytical work and that each participating city/survey must cover the analytical costs. Up to date the following cities have been sampled: Acerra-Marigliano (Napoli), Aschersleben, Dublin, Hämeeulinna, Idrija, Karlstad, Kristiansand, London (transect), Napoli and Sisak; Ajka (Hungary) Athens, Lisbon and a Croatian city may follow in 2012.

This is an important project, because it is dealing with the chemical environment of urban areas, where most of us live and work. Geological Surveys are the only institutions that can map systematically urban areas, and in a harmonised manner to produce comparable data sets across Europe, and have the know-how to distinguish between the natural and urban (anthropogenically modified) geochemical background. Furthermore, legislatively driven demand for geochemical data from the urban environment is now an important requirement in the challenge to produce
healthier and cleaner towns and cities. It is, therefore, important that in 2012 further cities are added to the project.

The following presentations on Urban Geochemistry were delivered at the annual Geochemistry Expert Group’s meeting, which was held at the premises of the Geological Survey of Finland in Espoo from the 5th to the 6th October 2011:

*Urban Geochemistry Book project:*

*URGE project:*

*One Geological Survey publication:*

### 5.5. Material for EuroGeoSurveys publications and presentations
An overview of the EGS Geochemistry Expert Group activities was written and published in the 2nd Issue of EuroGeoSurveys News (April 2011) – see pages 10-16. Another report was written and published in the EuroGeoSurveys 2010 Annual Report (see pages 40-48). Finally, PowerPoint material was produced for the GEO (Group on Earth Observations) Ministerial Summit, which has
held in Beijing, China, from 3-5 November 2011.

5.6. 2011 Annual meeting
The annual meeting of the Geochemistry Expert Group was held from the 5th-6th October 2011 at the amphitheatre of Geological Survey of Finland (GTK) in Espoo, Helsinki, and on the 7th October at Radisson Blu Hotel, Espoo. The GEMAS Executive Committee held a meeting on the 4th October 2011 at GTK. Twenty-seven people attended the meeting. The group received a very warm welcome to Espoo by Dr. Keijo Nenonen, Director of Southern Finland Office. The first two days were devoted to group activities, including the URGE project. The third day was totally devoted to national presentations of GEMAS project results.

5.7. Participation in International projects
Members of the working group are collaborating in a number of EU-funded research projects: Maria Joao Batista (Portugal), Alecos Demetriades (Hellas) and Juan Locutura (Spain) are participating in the ProMine project (Nano-particle products from new mineral resources in Europe - http://promine.gtk.fi/), which is financed by the 7th Framework programme (2009-2013). Alecos Demetriades (Hellas) is participating in the GS Soil project (Assessment and strategic development of INSPIRE compliant Geodata-Services for European Soil Data - http://www.gssoil.eu/), which is a financed by the eContentplus programme (2009-2012). Clemens Reimann (Norway) has a “Norwegian Financial Mechanism” project (Biogeochemistry of the Czech Republic) with the Institute for Landscape and Ornamental Gardening in Pruhonice.

5.8. 2012 Annual meeting
The next meeting of the geochemistry group is scheduled for early October 2012 in Lisbon. This is an important meeting for the GEMAS project will be finalised and the publication of the atlas planned. The URGE project should also be in a stage to plan its final reporting.

6. RESULTS AND IMPACTS
The EuroGeoSurveys Geochemistry Expert Group, since its first mandate in 1985 by the Western European Geological Survey Directors (WEGS), and its subsequent by the Forum of European Geological Surveys Directors (FOREGS), and EuroGeoSurveys has produced an enormous amount of results that have been published in reports and publications. A list of products from 1989 to 2008 can be viewed at: http://www.globalgeochemicalbaselines.eu/publications.html.

Significant milestones are:

- 1998: Salminen, R., Tarvainen, T., Demetriades, A., Duris, M., Fordyce, F.M.,


**2005:** The establishment of the **Geochemical Atlas of Europe Interactive Website** ([http://weppi.gtk.fi/publ/foregsatlas/](http://weppi.gtk.fi/publ/foregsatlas/)) by the Geological Survey of Finland, which was an innovative venture at the time, and continues to be for the dissemination of the data sets, maps, text, photographs, etc.


**2006:** Production of the **Geochemical Atlas of Europe CD,** which includes the text of the two parts of the Geochemical Atlas, all the geochemical maps, field manual, and all the data sets. Up to now more than 2500 original copies have been disseminated world wide. In 2008, the Executive Committee of the IUGS/IAGC Global Geochemical Baselines Task Group decided to produce a DVD to honour its first chairperson, Dr. Arthur G. Darnley. The DVD includes all the material of the Geochemical Atlas of Europe CD, the book by
Darnley et al. (1995), and all publications concerned with continental scale mapping from 1989 to 2008. The DVD was first distributed at the 1st Symposium in honour of Arthur Darnley, which was held during the 33rd International Geological Congress in Oslo (Norway) as a special session on the 9 August 2008 with the title “Geochemical Mapping from the Global to the Local Scale: The Arthur Darnley Symposium”. Since, then more than 1000 copies of the DVD have been distributed world wide.


The material produced by the EGS Geochemistry Expert Group had considerable impact not only in Europe, but globally, because the results of the geochemical atlases were produced for the first time in a harmonised manner, beginning from sampling, sample preparation, analysis, quality control and map production. The most significant innovation is the harmonisation of all procedures, and, most importantly, the analysis of the same suite of samples in the same laboratory, because this is the only way to produce continent wide harmonised results for decision makers, researchers and the general public.

7. FUTURE PERSPECTIVES

Future perspectives include (i) the publication of the GEMAS atlas results in a book form by mid-2013, (ii) publication of a number of papers on GEMAS results during 2012 and 2013, (iv) publication of second book on urban geochemistry using URGE project results, (v) updating of Geochemical Atlas of Europe and GEMAS websites, and (vi) development of new projects, such as lithogeochemistry of Europe, and update of the FOREGS stream water geochemistry etc.

REFERENCES


Available online at: http://www.appliedgeochemists.org/ (click on Explore Newsletter).


## LIST OF OFFICIAL GEOLOGICAL SURVEY GEOCHEMISTRY EXPERT GROUP MEMBERS

(most official members participate in the GEMAS project)

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>SURVEY</th>
<th>NAME</th>
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<tbody>
<tr>
<td>NORWAY</td>
<td>NGU</td>
<td>Clemens Reimann (Chairperson)</td>
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<tr>
<td>ALBANIA</td>
<td>AGS</td>
<td>Agim Mazreku</td>
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<td>AUSTRIA</td>
<td>GBA</td>
<td>Sebastian Pfleiderer</td>
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**LIST OF ADDITIONAL SURVEY AND NON-SURVEY GEMAS PARTICIPANTS**

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The Annual Report for 2011 was compiled and edited by Alecos Demetriades with the assistance of all EGS Geochemistry Expert Group and associate members. The final version for submission to the EGS office was approved by Clemens Reimann.

Trondheim, 3rd February, 2012
Dr. Clemens Reimann
Chairman, EuroGeoSurveys Geochemistry Expert Group
E-mail: Clemens.Reimann@ngu.no
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The appendix includes an additional list of presentations and publications of EGS Geochemistry Expert Group and associate members.
APPENDIX 1

Additional list of 2011 presentations and publications by EGS Geochemistry Expert Group and associate members

Note: Names of EGS Group and associated members are in bold letters.

1. NEW GEOCHEMICAL ATLASES


2. ORAL PRESENTATIONS

June 2011


July 2011


August 2011


**September 2011**


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**10th International Symposium and Summer School on Bioanalysis**, 18-28 September 2011, Graz, Austria


**November 2011**

National soil symposium, The Netherlands


**Symposium of Slovenian Geologists**, 25 November 2011, Ljubljana, Slovenia


**3. POSTER PRESENTATIONS**

**August 2011**

25th International Applied Geochemistry Symposium 2011, 22-26 August 2011 Rovaniemi, Finland


**September 2011**


2nd CEFSER Workshop “Persistent Organic Pollutants in Food and Environment”, 26th Symposium on Recent Developments in Dairy Technology, BIOXEN Seminar “Novel Approaches for Environmental Protection”, Novi Sad, Serbia, 8-10 September 2011


October 2011

IX Congress of Pure and Applied Chemistry for the Students of F.Y.R.O.M. (with international participation), Skopje, 6-8 October 2011


4. PUBLICATIONS IN JOURNALS


6. PUBLICATIONS IN CONFERENCE PROCEEDINGS


