GEOSCIENCE COOPERATION IN EUROPE: 40 YEARS OF ACHIEVEMENT

A success story told by Dr. Peadar McArdle, former Director of the Geological Survey of Ireland.

The blustery weather of September 2010 did not dampen the enthusiasm of the representatives of 30 geological surveys gathered in Copenhagen. In two days of presentations and discussions, they reviewed the key issues facing geological surveys at the European level, monitored progress among their internal thematic working groups, interacted with a variety of guests, and dealt with a wide range of organisational issues. They then set off to experience Denmark’s varied landscapes and appreciate examples of how geoscience contributes to Danish society - from the educational and tourism value of Mons Klint Geo Center to the use of chalk in the paper industry and the management of drinking and waste water in the city of Odense. This group of Eurogeosurveys Directors, National Delegates and partners were participating in a distinguished tradition based on a 40 year history of cooperation and achievement in European geoscience.

The first network of European geological surveys was established in Orleans in 1971 with the birth of WEGS (Western European Geological Surveys). This was an informal discussion group comprising the Directors of its member organisations: the cluster of national geological surveys of Western Europe and Scandinavia, as well as Cyprus, Greece and Turkey. West Germany, rather than Germany, was a member and it was joined by a representative of the geological surveys of the Lander. At the time Greenland had a geological survey which was separate from that of Denmark.

Many WEGS participants referred to their organisation as a Club: it had a stable membership with relatively few staff other than Directors attending. Its relaxed atmosphere belied the fact that it had well established but unwritten rules. Decisions were taken only by consensus and the position of Chairperson rotated among all members on an annual basis. The annual meeting in early September had a well-tried formula of social events, business meeting and excursion. A high proportion of partners attended, providing stability to the network and enhancing its social dimension. One couple was very important in establishing its culture and continuity: the Secretary, Alan Archer, and his wife, Jane, who served in an unpaid capacity from 1971 until about 1998. Fastidious and attentive, Alan ensured new Directors were swiftly absorbed into the group, he enforced a careful balance regarding hospitality (anything excessive was not appreciated) and he devoted much attention to drafting and revising the minutes of the business meetings.

WEGS Directors saw considerable value in maintaining this valuable network. Gradually they established a number of thematic working groups which encouraged staff to share experience and, on occasion, to develop joint projects.
However there is no doubt that WEGS would have had a limited impact on European institutions and national governments. This was about to change.

In 1992, after 20 years of networking, WEGS published its first coordinated and comprehensive statement (Lumsden 1992) on behalf of its 21 members. Entitled “Geology and the Environment in Western Europe”, it was intended to demonstrate the types of issues to which geological surveys might contribute at the national and European scales. It succeeded in showing how geological surveys interact with government, industry and academia.

Despite an admittedly technical treatment, the book did in practice reach an audience that extended beyond the limits of the Geoscience Community and, in so doing, can be regarded as the first noble step by geological surveys in demonstrating their relevance to society at large.

Even as WEGS took increasing notice of its political environment so that very environment itself began to change. The collapse of the Soviet system in the late 1980s had a major impact on the practice of geoscience across Europe. Geological surveys in western and central Europe took a greater interest in each other’s activities, wished to share experiences and aspired to cooperating with each other. Many far-sighted geologists and Directors helped this process. For example, Gabor Gaal, a Hungarian geochemist who worked in a senior position in the Geological Survey of Finland, returned as Director of his homeland’s survey for a time and his influence was very positive.

This effectively led to the transformation of WEGS into the Forum of European Geological Surveys (FOREGS), with the latter established by 1993. WEGS morphed into FOREGS without fanfare in the twelve months following the September 1992 meeting of Directors. While FOREGS reflected the geographic expansion of membership there is no doubt that it also characterised some changes in the way the organisation functioned. Now it had more members, they came from more diverse backgrounds (both scientifically and culturally) and their Directors tended to have shorter periods of tenure. The “Club” atmosphere of WEGS diminished and, in any event, many felt that a more business-like approach was appropriate. There were varied expectations of the benefits of membership - but undoubtedly Directors sought to derive tangible value. Part of the dividend was the richer diversity of experience and skill which became available in the larger FOREGS membership and this largely overshadowed any sense of regret at the passing of WEGS.

The membership of FOREGS increased to over 30 by the mid-1990s, this rapid growth reflecting the desire of surveys in central and Eastern Europe to affiliate. A survey of these new members in 1995 indicated that they were pre-occupied with providing a comprehensive and balanced service at a time of diminishing resources and reducing staff members. They looked to FOREGS networking to increase the exchange of experience and ideas, as well as to participate in collaborative projects that might attract European funding. Many looked to FOREGS to promote the value of geological surveys, thereby enhancing their reputation and influence, as well as staff morale. But above all, new members wanted to participate in specialist working groups, with their potential for establishing and maintaining international standards. Most urgent in this regard was the need to transit to digital databases. In addition to information management, FOREGS had active working groups in remote sensing, geochemical mapping, marine and industrial minerals.

However transitions are rarely painless and not all Directors were equally pleased with the progress of FOREGS. Already work had started on the formation of Eurogeosurveys which would focus on the need of European institutions and would effectively be limited to members of the European Union. Many felt that the evolving parallel bodies of FOREGS and Eurogeosurveys would lead to a “two-speed” Europe, the members of the latter being in the fast lane. So perhaps inevitably FOREGS would have a short life but it did provide a useful transitional vehicle.

FOREGS had a relatively simple structure. Its Board consisted of the present, past and future Chairmen (for they were all male!). It met annually in June to conduct the business of FOREGS, which principally consisted of preparing the agenda for the Annual Meeting of Directors in September. FOREGS had a number of thematic working groups and these would report annually to the meeting - often their presentations formed the major part of the agenda.

Photo of the FOREGS Family taken in Dublin Castle, September 1995
Eurogeosurveys, the Association of the Geological Surveys of the European Union, was established on 3 September 1995 in Dublin when its members signed its Statutes. This set out the objectives of the 16 constituent geological surveys as follows: to jointly address European issues of common interest; to promote the contribution of geoscientists to EU affairs and action programmes; to assist the EU to obtain technical advice from members; to provide a permanent network between members and a common, but not unique, gateway to each member and their national networks.

These have changed but little over the intervening years.

A national geological survey, or equivalent body, of an EU member state was entitled to full membership while those of EFTA (European Free Trade Area) were eligible for associate status without voting rights. Over time a number of regional and provincial geological surveys also became affiliated. Members committed themselves to work together in a cooperative, transparent and professional manner. In due course members would commit themselves to Internal Rules and a Code of Conduct in addition to Statutes. A schedule of membership fees was agreed, including detailed mechanisms for deciding the level for each member.

A General Meeting of Directors, the governing body of EGS, would be held at least once per year to approve the financial accounts and report of activities, as well as the budget and work programme for the following year. An Executive Committee would oversee the implementation of decisions made at General Meetings and represent EGS in dealings with third parties. The Executive Committee currently comprises the President, Vice-President, Treasurer and one additional member (the last mentioned belonging to an EFTA member state). They are elected for a term of three years by the General Meeting based on nominations submitted by a Selection Committee.

In a new departure, EGS appointed a full-time Secretary General with responsibility for managing its affairs under the supervision of the Executive Committee. The Secretary General is appointed for a term of four years and based in the Brussels Bureau of EGS. Secretaries General have been extremely influential in managing EGS affairs and guiding the organisation’s evolution. They have had a particular mandate to develop good relations with European institutions, especially the European Commission. In chronological sequence they comprise Richard Annels (1996-1999), Emile Elewaut (1999-2004), Patrice Christmann (2004-2009) and Luca Demicheli (2009 to date). The pace of European integration accelerated the EGS agenda after the Millennium, so that in practice the fears that new FOREGS members had of being excluded from the fast lane did not materialise. Eurogeosurveys membership rose gradually to over 30 members at one point and the FOREGS organisation, with its membership now served satisfactorily by the newer organisation, was allowed to lapse.

The new organisation quickly found its feet. With shorter meetings and quicker decision making, many saw improved benefits in participating. Once more thematic working groups were established and they were effective in bringing together the experts from the various surveys.

Groups tended to focus on the implementation of specific European Directives, such as the Water Framework Directive, the Mine Wastes Directive and the Directive on Geological Storage of Carbon. Others were established for the specific projects of undertaking projects funded from European funds (such as in geochemical and seabed mapping). All of this brought cooperation to a higher level with individual surveys gaining important benefits.

While European Geological surveys can take considerable pride in their joint achievements over the past four decades, there is little room for complacency. With budgetary difficulties widespread across Europe in 2010, there was an acknowledged need to sustain investment in Geoscience in order to reap its long term benefits. The Eurogeosurveys ambition is to become the recognised voice of European geoscience in matters of policy formulation, regulatory practice and problem solving. The organisation is currently preparing an application to ESFRI (European Scientific Framework for Research Infrastructure) for a funded Design Study on how best to achieve this objective. The mechanism would facilitate each survey to contribute based on its own strengths. Success, which would serve to strengthen and integrate European expertise, would be a fitting tribute to the cooperation since 1971.
The future could be very bright for geology... We need to keep the momentum.

Interview with Marko Komac

EuroGeoSurveys is 40 years old now and you are the youngest President in its history. Based on the progress made over the past decades, what is your vision for the future?

The future could be very bright for geology if we will be able to address it correctly and we're on a good way. EGS has made very important progress in the past several decades by bringing together European geoscientists and recently it started to gain visibility, partially due to societal needs and partially to more aggressive promotion of our science. The importance of geology and EGS has especially grown in the minds of politicians/decision makers in Brussels, while gaining visibility among general public is mainly the consequence of individual Geological Survey Organisations (GSO) activities. We need to keep the momentum, which I realise is not an easy task due to economic constrains.

EuroGeoSurveys works solely for the public interest: What are nowadays the most relevant needs of Europe that EGS is addressing or should address?

You're absolutely right! We, the national GSOs and thus also EGS, are organisations acting in the field of common goods. This is an important massage that needs to be constantly sent out to the public – you need us and we're there to help you. If I may abstractly compare contemporary society's needs related to non-living world to the classical ancient division of Nature (after Anaksimenes of Miletus) into water, fire, earth and air, geology or to be more precise our understanding of the environment through the eyes of geologists helps providing our society all four elements. How? By helping to provide with our knowledge sources of groundwater – potable, thermal, mineral or technical; by forming the basis for sustainable spatial planning and managing – mitigating geohazards impacts on society, deep-underground planning; with discovering new sources of natural resources – fossil and renewable energy resources, metals, rare elements and aggregates; and by helping to mitigate climate changes and “cleaning the air” with CCS, reducing GHG emissions by discovering new geothermal energy sources. One of the biggest challenges is, besides finding the right answers to questions or solutions to problems, how to efficiently and correctly communicate these to policy and decision makers so they can make the right decisions.

Communication seems to be the secret of a real success, and a way for growing in all sectors. Geology appears to have discovered only recently the importance of an effective communication (the IYPE is an example of its strategic role), and how important it is for a sustainable future: How do you value communication within EGS?

Communication nowadays is essential. Being informed and to effectively inform others of your activities is staying ahead and sometimes even alive in today's world... I've mentioned earlier that gaining recognition among general public is mainly the consequence of campaigns on national level. EGS has played a linking role for some campaigns and projects in the past, and its task in the future is to bring together, to liaise even more those individual activities of EGS members to make them internationally visible and thus more successful. But there's also other very important task of EGS, which we've nourished in the past and that is the pillar of our cooperation – an open and prompt communication between member organisations. If we would fail at any stage to put the latter into practice, it would mean a serious threat to the existence of EGS. Luckily geologists are not politicians to speculate and manipulate, but rather a community that is driven together by the common interest to serve the society.

EGS is engaged in a several of European projects. Many of them concern data sharing, which requires harmonised geological information: Is it the right mean for boosting the impact of geology on policy at European level? Can we consider it as a real opportunity or the effects are still too far away?

I see the current level of cooperation, namely related to data sharing, interoperability and one day even harmonised data, only as the first (the most obvious) step towards the policy-making level. By showing the policy-makers that we have rich archives and an excellent knowledge pool (in the form of our staff), which first have to be brought together on a basic, or if you want, on a data level, we are working towards their perception that there is a community out there, capable of helping to solve (or mitigate) contemporary problems and helping to create legal/policy frame for sustainable future. It's a thorny and long path, but I'm positive we can make it. RMI is a good example that with persistence the importance of GSO is recognised and that results can be effectively used at the common, European policy level.

Marko Komac
EuroGeoSurveys President
And now, what are we going to become?

40th Anniversary of EuroGeoSurveys celebrated in Brussels

After 40 years the deciding moment has come: either to keep on walking in the same direction or to become a more formal organisation within the EU system, a reference point for each national geological Survey on the continent, a European geoscientific data repository and a centre for geological intelligence integrating different policies.

That is what EGS wondered, on the stroke of its 40th anniversary, during the workshop organised for its celebration and hosted by the Royal Belgian Institute of Natural Sciences in the beautiful setting of the museum. Top level executives of the main European and international geoscientific organisations participated in a round table discussion expressing their views on the workshop topic: ‘Geoscience in Europe: the next 40 years’.

The question introduced by John Ludden - former President of EGS – and Executive Director of the British Geological Survey represents a crucial challenge not only for the future of an organisation which aims at increasing the number of its members (32 at present), but also for Europe as a whole. A lot has been done so far. Recent pan-European projects such as OneGeology-Europe or the Atlas of the geochemistry of European bottled water have given a start to the use of advanced technologies to draw Earth Sciences close to everyday culture. The exchange of experiences and the cooperation between Europe and other regions has been strengthened an agreement with the United States Geological Survey (USGS) was signed just on the celebration day.

Never collaborative frameworks with the Organisation of African Geological Surveys (OAGS) and with UNESCO might soon see EuroGeoSurveys involved in joint intercontinental scientific projects and in the improvement of Earth Sciences teaching programs in Africa.

Thanks to another agreement signed on the eve of the Anniversary celebration, EuroGeoSurveys will take over the Secretariat of the European Technology Platform on Sustainable Mineral Resources, consolidating its leading role in the field.

Now EGS must go on evolving and getting stronger; has it the capacity to make that change? Certainly a number of obstacles must be still overcome: “At the moment EGS works as an association - Zdenek Venera, Director General of the Czech Geological Survey, says - but in the future EuroGeoSurveys could be established as a Central Agency for the European Union by a board within the EU and approved by the European Parliament.

A NEW UNESCO’S EARTH SCIENCES EDUCATIONAL PROGRAMME FOR AFRICA

Interview with Robert Missotten, UNESCO’s Chief of the Global Earth Observation Section & Executive Secretary of the International Geoscience Programme (IGCP)

Mr. Missotten is this collaboration about?

“We are working together with the International Union of Geological Sciences on the analysis of the workforce as it is today, says Robert Missotten, UNESCO’s Chief of the Global Earth Observation Section & Executive Secretary of the International Geoscience Programme (IGCP). UNESCO, along with IUGS, concluded that this workforce is aging very quickly and therefore there is a need for training geologists now in order to have a gap of expertise in the near future.

The second point is that the minerals and prospecting methods that we need now are not the same of the past. In fact we have evolved from an age when we needed coal, iron, aluminium, to a more advanced technological situation where we need very much earth minerals and metals which are mined, at the moment, mainly in single country or a very small group of countries.

This situation might do some stress in the market, so there are export limitations that could disrupt industrial production of modern tools that we need for our knowledge based society. So there is a need to train more geoscientists to cope with this change and need in minerals and hydrocarbon resources in our society for modern development, as well as to develop new more environment friendly extraction processes for the natural resources of our planet. All that shows us that there is a need to start on working on education for a new generation of geoscientists.

Which are the main collaboration targets?

We, as UNESCO, follow the United Nations priority to ensure that the African nations can collaborate well with the rest of the world, especially in the fields of competence of UNESCO. It is important to note that UNESCO is the only UN Agency that is actively involved in capacity building and in research in geology and geophysics. This is why UNESCO has the aim to ensure that the African continent has a good number of well-trained geoscientists.
The real challenge, though, he adds, is the financing of EGS because the funding is based on membership fees which are not enough for a substantial further development. In my view this money should be supported by the European Union budget.”

“A lot Geological Surveys have different structures – Hans Joachim Kumpel, President of German Federal Institute for Geoscience claims – since some of them belong to distinct Ministries, (Research, Economy, Technology), so their background is quite different. These differences represent one of the main challenges, not so easy to be hampered, even if they could be good opportunities, because they bridge many gaps. Once overcome these difficulties, EuroGeoSurveys would be able to act as a real common institution, that is, as the European Geological Survey.

This is my view for the next years, but it also requires a change of the mandate clearly approved by each member country. There is, however, some evident reluctance by the countries, because our agreements imply some bureaucracy. In any case, the priority overriding of the network, which has to be looked in and finally decided - he concludes - is the individuation of a newer operating structure, more independent from individual countries contributions.”

In the meanwhile, the General Meeting gave the Secretary General the mandate to enter in negotiation for the establishment of a “European House of Geosciences” in Brussels. This new location might at the same time host the headquarters of EuroGeoSurveys and be home for other international geoscientific organisations. As a conclusion of the celebration day, EGS (which has changed its look promoting a new image) presented, almost as a gift for its anniversary, a fascinating video during the evening cocktail reception.

This video sums up history and activities in just one sentence:

“African countries informed UNESCO that their priority is, in the field of the geosciences, to have a better trained workforce and have more modern methods in teaching Earth science ensuring that this discipline is not taught as a mono-disciplinary science but as an interdisciplinary science involving different parts of the environment.

In this context there is a real need to change the teaching approach in Africa so what we did is to organize brainstorming seminars to see the needs of African geoscientific community, and how geologists interact with the academia how they make careers in industry, in government or in geological survey. On the basis of this analysis we are building an educational program to improve the geoscientific mapping and data collection, to strengthen the cooperation among earth science institutes focussing on the study of African geology and to develop an Earth science curriculum for secondary schools.

“EuroGeoSurveys, 40 years listening to the beat of the Earth”.

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A memorandum to make US and European geoscientists closer than ever

An agreement that gets two continents closer than ever before, at least from the geosciences point of view. It’s the Memorandum of understanding signed on the 28 of December 2010 between EEA and the USGS (United States Geological Survey) about the contributions of these two organisations to the “establishment of global monitoring networks including (but not limited to) hazards monitoring, energy and non-energy mineral resources, and climate change” besides the exchange of best practices between the experts.

The tasks of the two signing institutions fits very well together, since EEA promotes the contribution of geosciences to European Union affairs and provides a permanent network between the services across the continent, while USGS aims to provide reliable scientific information to describe and understand the Earth and to manage natural resources, developing predictive tools for scenario building and decision-making about natural systems. So, the agreement focuses on the establishment of global tools for the same purposes, created by identifying, defining and implementing mutually beneficial research projects and monitoring programs, also working together to develop and share expertise, data, information, tools, technology, and provide guidance and support for the data providers and users.

The Memorandum also aims to encourage the interaction among the appropriate offices of the two institutions, including also (but not only) the EGS Expert Groups on Earth Observation and on Mineral Resources, and the EGS Task Force on Fossil Fuels, with the idea of a total cooperation, well represented by the signatures on the MOU by John N. Ludden, EGS President, and Suzette M. Kimball, Deputy Director for USGS.

PanGeo, the European portal mapping the geological hazards in your town, is ready to start

On 1st March, the PanGeo project was launched, a new European initiative which aims to provide free, online information on geological hazards in EU urban areas. The information will be available online to all: decision makers, local authority planners, regulators and citizens. Financed by the EU under the FP7 Space Call, the project, which involves all 27 European Geological Surveys in a consortium composed of private companies and universities, will run for 3 years analysing the geological hazards in 52 European cities and towns with high population density.

The resulting information will be obtained by integrating terrain-movement data from a satellite technology called PSI (Persistent Scatterer InSAR) with existing, known information on geohazards already held by the National Geological Surveys, and the exposure data inherent within the EU’s Urban Atlas (landcover/use of European urban areas).

A Local Authority Feedback Group, appositely set up, will be tasked to test the European project activities and to verify the effectiveness of the results achieved and of the information disseminated.

EGS published a new book on Mapping the Chemical Environment of Urban Areas

This comprehensive text focuses on the increasingly important issues of urban geochemical mapping with key coverage of the distribution and behaviour of chemicals and compounds in the urban environment. The book include discussions on the potential impact on human health and description of the multi-disciplinary effort, usually supported by legislation, required to deal with the legacy of contamination found in many urban areas.
An extensive collaboration between US and Europe for geosciences

Interview with Suzette M. Kimball - Deputy Director of USGS - United States Geological Survey

Suzette Kimball recently signed a very important agreement between her organisation and EGS. We asked her about the contents of it and the role of the US Survey in the field of the geosciences at a global level.

The agreement that has been recently signed by your organisation and EGS is an innovative step forward for the cooperation between Europe and USA in the field of geosciences. Do you identify specific advantages from this new situation?

The U.S. Geological Survey (USGS) values broad, continent-wide collaboration with EuroGeoSurveys (EGS) as well as working with each European geological survey at a national level. The main objectives of our collaboration with EGS are, first, to establish an overall framework for cooperative programs that will facilitate and encourage exchange of data and information and, secondly, to perform collaborative regional assessments and research – for example, in the areas of unconventional energy, minerals, hazards, and climate change.

We hope that future collaborations will enhance existing monitoring networks and allow for exchange of best practices in many scientific fields. We look forward to participating in the EuroGeoSurveys’ Expert Groups on Earth Observation and Mineral Resources as well as the EuroGeoSurveys’ Task Force on Fossil Fuels.

What is the area with more room for improvement in the cooperation between USGS and European surveys?

While extensive collaborations have existed with individual geological surveys for some time, much work remains to be in the areas of enhancing the exchange of high quality, standardized data and information; expanding our knowledge and understanding of the earth; and improving the coordination of similar programs implemented in developing countries. Recently, the USGS and EGS have started to work more collaboratively on regional assessments pertaining to unconventional energy. We are also planning to exchange best practices on volcanic observations. These are just two examples where we find increased cooperation to be of value. Many cooperative endeavours could follow. We also have successfully collaborated on assessments, research, and capacity building in developing countries. We expect to continue building on these efforts.

From your point of view, what are the biggest differences in having a relationship with an international organisation rather than with national surveys?

Working with the EuroGeoSurveys allows us to easily enter a constructive dialog that concerns cooperation based on a regional perspective and approach. Research in earth sciences is almost always transboundary in nature; it can rarely be limited to national boundaries. Of course, some investigations are quite local in nature, e.g. landslide studies, but most scientific questions need to be answered using regional, if not global, data sets.

At USGS, we work from the very basic premise that when USGS scientists exchange ideas and learning from other scientists worldwide, we – and here I specifically include our international partners – together we contribute to the overall state of knowledge. EGS provides an excellent forum for exchange of these ideas and sharing of knowledge on a regional and, potentially, global scale.

Your geological survey is one of the biggest in the world. From this perspective, what are the major challenges for geosciences at a global level?

This is a sweeping question that defies a quick answer. I’ll be as brief as I possibly can.

With 6.9 billion people already living on Earth, and the world population increasing every day, human influence on our planet is more and more apparent. Changes to the natural world combined with increasing human demands threaten our health and safety, our national security, our economy, and our quality of life. As a planet, we face unprecedented challenges: loss of critical and unique ecosystems, the effects of climate change, increasing demand for limited energy and mineral resources, increasing vulnerability to natural hazards, the effects of emerging diseases on wildlife and human health, and growing needs for clean water. The time to respond to these challenges is now.

But policymakers and decisionmakers face difficult choices. With competing priorities to balance, and potentially serious - perhaps irreversible - consequences at stake, our leaders need reliable scientific information to guide their decisions. The science needed to better understand and deal with these challenges must reflect the complex interplay among natural and human systems. Moreover, our natural resources are limited and need to be exploited in a sustainable and environmentally friendly manner.
Due to globalization of the economy and pressing global issues that pertain to water, food, and energy security, exploitation of these natural resources should be evaluated using a global systems approach.

In the United States, the U.S. Geological Survey is the federal science agency responsible for providing our nation and its leaders with reliable and impartial information to describe and understand the earth including mineral, water, and biological resources and ecological factors affecting life. Holding this responsibility in the highest regard, the USGS has recently reorganized in order to better address the most challenging scientific questions by using an integrated systems approach.

At the same time, we have also raised the visibility of our international program in order to more effectively inform science policy globally. In recent years, USGS has agreements with and has carried out activities with more than 70 countries. We also continue to maintain leadership positions in a number of international organizations.

While USGS has long championed the provision of free and open access to globally significant scientific data, such as Landsat data, encouraging a similar transparent approach by all nations is an important continuing challenge.

Another challenge is the state of science education of the younger generation and interest in pursuing careers in the earth sciences. Accordingly, the U.S. Department of the Interior and the USGS, under the leadership of Interior Secretary Salazar and USGS Director Dr. McNutt, are strengthening the earth and biological science communities through educational outreach, internships, post-doctoral fellowships, scientist emeritus, and youth programs. In our nation, we are working closely with universities, nongovernment organizations, and other government agencies at federal, state, local, and tribal levels to expand and improve our educational and outreach materials that are available for free on the internet. Internationally, we look forward with great anticipation to working cooperatively with EGS and UNESCO to achieve our mutual goals for science education.

In summary, we warmly welcome a new level of regionally-based coordination with EuroGeoSurveys in order to more effectively face global challenges that affect us all.

SEG-2011 hosted a special session on Mapping the Geochemical Environment of Urban Areas, convened by the EuroGeoSurveys Geochemistry Expert Group.
GIS in mineral exploration: The European Geological Surveys approach

Geological Surveys across Europe frequently utilize GIS for efficient exploration targeting.

Background

With global economic growth and demand for mineral showing no signs of slowing down, exploration technology is now more important than ever. As the number of exploration projects in Europe accelerates, the use of advanced technologies is essential to conduct effective ground analysis. GIS offers multiple applications to Geological Surveys with tools to gather, compile, process, display, analyse and archive extensive volumes of exploration data. In addition to this European Commission concerns about the EU’s trade deficit in metal and mineral imports has provoked an investigation into how efficiency can be improved in this area.

GIS in Mining & Exploration

The first European event on strategies and technologies for innovative and cost-effective GIS use in Mining & Exploration was launched last January in Stockholm organized by International Exploration was launched last January in Quality and Productivity Center (IQPC) and sponsored by EuroGeoSurveys.

Nikolaos Arvanitidis, Dr. Economic Geologist of the Greek Institute of Geology and Mineral Exploration (IGME), National Delegate and member of the Mineral Resources Expert Group delivered on behalf of EuroGeoSurveys (EGS) a presentation entitled “An overview of mineral prospectivity analysis and mapping in GIS environments.” More specifically, the EGS presentation was focused on GIS use in mineral exploration looked from the application opportunities and perspectives of the European Geological Surveys including:

- a short description of EuroGeoSurveys mission, with respect to Mineral Resources Expert Group (MREG) and related initiatives
- some aspects of GIS applications in exploration using mainly examples from ProMine project and other case studies
- examples about the way GIS contributes to solve problems related to land use planning and mineral exploration/extraction conflicts.

MREG GIS based activities

The Mineral Resources Expert Group intends to establish a GIS based European Mineral Intelligence network, and to provide relevant information and coordination for EU projects related to minerals. In this respect two major initiatives of the MREG are in progress to make proposals for FP7/FP8 collaborative projects: the eMINEnt (European Minerals Network) concept, aiming to create GIS and spatially related data sources for EU-level mineral development, and the CriSys (Critical Minerals Deposits Information System) concept, which is about setting up an EU wide geological knowledge base to assist exploration for new mineral deposits in Europe.

The ProMine project

The ProMine (Nano-particle products from new mineral resources in Europe; http://promine.gtk.fi) is 4 years EU funded project going on, driven by the European mining industry, to deal with exploration, extraction and products development from new mineral resources in Europe with 27 partners from 11 countries participating. The Geological Survey of Finland is coordinating and another 5 European Geological Surveys participating.

The ProMine project will set up the first ever pan-European GIS-based database containing the known and predicted metalliferous and non-metalliferous resources, which together define the strategic reserves (including secondary resources) of the EU. It also plans to create an advanced modelling system for the extractive industry that will show known and predicted, metallic and non-metallic mineral occurrences across the EU. Detailed 3D/4D computer models will be produced for four metalliferous regions (Fennoscandian Shield, Iberian Belt, Polish Basins and Balkan-Hellenic Belt). Mineral, Anthropogenic and District data-bases will be developed on the basis of a homogeneous multi-layer information system covering the whole European Territory (Fig. 1).

This GIS based information system will allow the combination of the thematic layers to achieve predictive approach and prognostic evaluation of EU mineral resources, with respect to selected commodities, are deposits or mineral belts and geodynamic domains. Volumes of potentially strategic metals (e.g. cobalt, niobium, vanadium, antimony, platinum group elements and REE) and minerals that are currently not extracted in Europe will be calculated to enlarge the number of profitable potential targets in Europe.

From the data-bases it may be possible to extract and present any information requested, as for example was in the case of preparing the preliminary map of the 14 critical raw materials in Europe asked for by DG RTD (Fig. 3). Except from the GIS data-base work ProMine aims also develop and apply 3D/4D modeling tools in mineral exploration where GIS plays also a significant role. In the Olympias and Stratoni manto polymetallic deposits in Greece 3D modeling shows deeper extension of the orebodies (Fig. 4 & 5).
GIS in use planning of mineralized land

To an increasing extent, extraction of mineral resources must compete with other interests. Documentation and spatial databases of reserves/deposit areas is of importance for influencing on the future land use (Fig. 6). Austrian examples of using GIS to resolve conflicts between mineral resources extraction and other land uses were provided by country’s Geological Survey. From GIS geological maps the resource zones suitable for gravel and sand extraction are defined and evaluated with respect to conflict zones for other land uses to finally obtain the residual resource zones where extraction can really take place.

Concluding remarks

EuroGeoSurveys, through its mineral resources expert group and individual member organizations, is actively involved to develop:

- GIS mineral databases and relevant statistics
- 3D / 4D modeling exploration tools to locate deep seated ore deposits
- GIS tools to interpret multi-layer exploration data
- Best practices in land use planning for exploitation of mineral resources

Fig. 1: Mineral, Anthropogenic and District ProMine data-bases and detailed 3D/4D computer models will be produced for four metalliferous regions.

Fig. 2: The ProMine GIS based information system will allow the combination of the thematic layers to achieve predictive approach and prognostic evaluation of EU mineral resources.

Fig. 3: Preliminary map of the 14 critical raw materials in Europe based on ProMine databases.

Fig. 4: 3D modelling showing deeper extension of the Olympias orebody in Greece.

Fig. 5: 3D modelling showing the structural control of the Stratoni orebody.

Fig. 6: GIS may contribute to resolve conflicts between mineral resources extraction and other land uses (Arvanitidis and Heldal, 2006; OSNET EU project report).
The Geochemistry Expert Group has at present 53 official EGS members, and including associate members, from outside organisations, more than 70 scientists participate in the activities of the group. As such, it is an excellent vehicle for networking at the European scale. The group closely cooperates with colleagues from the USGS (David Smith) and Geoscience Australia (Patrice de Caritat), where comparable continental scale geochemical mapping programmes are presently carried out.

Mission
The mission of the EGS Geochemistry Expert Group is to provide high quality geochemical data of near-surface materials, to develop harmonised data bases for multi-purpose use, and to provide 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) medical geology, (g) determination of natural background values for environmental risk assessment, etc.

European dimension
The work of the group is directly relevant for and often used within many European initiatives, such as the Water Framework Directive (EC, 2000), the planned soil directive (van Camp et al., 2004; EC, 2006a), REACH (EC, 2006b), the Mining Wastes Directive (EC, 2006c), and INSPIRE (EC, 2007). However, it is also relevant to other directives requiring geochemical data, such as the Integrated Pollution Prevention and Control Directive (EC, 2008a), Sewage Sludge Directive (EC, 1986), Habitats Directive (EC, 1992), Landfill Directive (EC, 1999), and the Raw Materials initiative (EC, 2008b, c).

Further, the data of the Geochemical Atlas of Europe are used by the European Environmental Agency and the European Soil Bureau, as well as in medical geology, forensic sciences, and national studies, where geochemical background data are needed.

Activities from 1986 to 2010
The Geochemistry Expert Group is one of the oldest expert groups of EuroGeoSurveys. It was initiated during the WEGS (Western European Geological Surveys) time in 1985, and its first meeting was in Trondheim (Norway), one month after the Chernobyl accident in April 1986. At that time, it was realised that the widespread effects of Chernobyl could not be assessed, because of the non-existence of a pan-European harmonised geochemical database.

Hence, a geochemical mapping project was proposed, based upon the same types of sampling media, and the same field and laboratory methods.

The proposal was to sample five different media, i.e., (i) surface water, (ii) groundwater, (iii) surface soil, (iv) C-horizon soil, and (v) overbank sediment at a sampling density of 1 sample station/500 km² (Demetriades and Ottesen, 1990). The WEGS Directors, although approving the proposal in principle, were sceptical about using no less than five different sample materials.

In 1988, the Directors commissioned an orientation survey including (a) the preparation of an inventory of existing regional geochemical mapping projects in all European countries, and (b) an assessment of overbank sediments as sample material in different morpho-climatic terrains.

The results were presented in 1990 (Demetriades et al., 1990). The conclusion was a project proposal to map Europe at a sampling density of 1 station/500 km² using only three sample types (i) overbank sediment at a depth free from human influence, (ii) surface overbank sediment to assess anthropogenic impacts, and (iii) active stream sediment to facilitate linkage with the existing national geochemical databases (Bølviken et al., 1990, 1996).

The Directors decided that still more data were needed, and commissioned a new two-year research project. The Group submitted its final report in 1993, proposing again the geochemical mapping of Europe using the above mentioned sample types and sampling density (Bølviken et al., 1993).

Clemens Reimann
EuroGeoSurveys Geochemistry Expert Group Chairman

This book was largely based on the discussions, conclusions and recommendations of the WEGS/FOREGS geochemistry expert group.

By that time the Scandinavian Geological Surveys had already produced the multi-media ‘Geochemical Atlas of Northern Fennoscandia’ at a sample density of 1 site/34 km² (Bølviken et al., 1986), and the Finnish Geological Survey had published a Geochemical Atlas of Finland (Koljonen, 1992), based on only 1057 samples (ca. 1 site/300 km²). Still, the most controversial point in the discussions about a geochemical atlas of Europe was whether it is possible to produce a meaningful geochemical map at such a low sample density. These never-ending discussions, even among geochemists, led the directors to again commission a study compiling the many geochemical datasets that already existed in Europe, in order to use them to produce a geochemical atlas of Europe. Such a compilation had already been made in 1990 (see above). The conclusion at that time was that a geochemical atlas of Europe could not be produced by the compilation of available datasets, and the preparation of such an atlas required re-sampling and analysis based on completely standardised procedures (Plant and Ridgeway, 1990). The geochemistry group updated the 1990 inventory of existing datasets, and reported the results (Plant et al., 1996, 1997).

The conclusion was once more that the existing national datasets were too different to be merged for the purpose of producing a unified geochemical atlas of Europe. In 1995, Salminen published example maps from the high-density geochemical survey (1 site per 4 km²) of Finland (Figure 2), which could be directly compared with the low density maps (1 site/300 km²) published in Koljonen et al. (1992). These maps provided evidence that low-density mapping of large areas is possible and will provide useful information.

Finally, the FOREGS (Forum of European Geological Surveys) directors, after considering the recommendations of the ‘Blue book’ (Darnley et al., 1995), the inventory report (Plant et al., 1996), and the existing examples of low-density mapping, decided in 1996 to go ahead with a project towards the geochemical mapping of Europe.

The mandate of the directors was to follow the specifications in Darnley et al. (1995) for mapping the globe, which by and large are the suggestions of the original WEGS working group, but using a much lower sample density of 1 site/5000 km². The first product of the FOREGS Geochemistry Expert Group towards the geochemical atlas of Europe was the production of a field manual for mapping Europe (Salminen et al., 1998; Figure 3).

In 1998, yet another multi-element geochemical atlas using four different sample materials, based on low density sampling (1 site/300 km²), was published in Scandinavia, the Kola Atlas (Reimann et al., 1998), giving additional support to low sample density mapping.
The main problem for the project, through all these years, had always been financing. There is no European organisation that feels responsible for geochemical mapping of the continent. The Darnley report was printed by the UNESCO (Darnley et al., 1995), but again the UNESCO did not have the finances for a global (or continental) project.

The EU administration was of the opinion that geochemical mapping is a task for each country, and should thus be financed nationally.

Of course, no single country was willing to finance the mapping of Europe. What the EU bureaucrats neglected was the degree of harmonisation that successful geochemical mapping of a continent requires. Mapping in a piecemeal fashion, country by country, had resulted in the situation that although many high-resolution datasets existed at the national or a more local scale, it was impossible to produce a geochemical map of Europe (Plant and Ridgway, 1990; Plant et al., 1996, 1997).

The FOREGS directors finally found a solution to the “financing obstacle”; the geochemical atlas of Europe (Salminen et al., 2005; De Vos and Tarvainen, 2006; Figure 4) was produced in the form of national subprojects, where each country was responsible for the sampling of its territory, according to jointly agreed procedures, as outlined in Salminen et al. (1998), and to cover the analytical cost of its own samples.

The project as such, however, was run under the umbrella of FOREGS and with a central project management, which was provided by the chairman of the Geochemistry Expert Group (at that time Reijo Salminen of the Finnish Geological Survey).

This was an exemplary project, demonstrating how the network of the Geological Surveys of Europe can be utilised to provide a product that benefits the whole continent. These days, the data are used a lot in the European administration, and they have been recognised as the “best datasets that presently exist at the European scale on soil, sediment and surface water quality”. The geochemical maps (Figure 5), data and interpretation text can be downloaded from the internet (http://www.gtk.fi/publ/foregsatlas/), and are also freely available in the form of a CD ROM.

During 2003-2004, members of the Geochemistry Expert Group represented EGS in all technical working groups, established under the European Commission’s Thematic Strategy for Soil Protection that should have led to the soil directive (Van-Camp et al., 2004; EC, 2006a).

An important sample material missing from the geochemical atlas of Europe is groundwater (note that groundwater was part of the original 1986 recommendation of the WEGS working group). One of the first calls, the new chairman of the Geochemistry Expert Group received from a member of the European Commission in 2006, was an enquiry whether the Geological Surveys have a similar dataset for European groundwater.
To collect representative samples of groundwater at the European scale is not an easy task.

One of the members of the group suggested that it might be possible to use bottled water as a proxy for groundwater, and to produce an atlas of the geochemistry of groundwater by just buying the existing almost 2000 brands of bottled mineral water from European supermarkets and to analyse them in a central laboratory.

The suggestion was at first not taken seriously, but after due consideration, the group decided that it was worth giving it a try, since it was a cost-effective method to obtain a first picture of European groundwater geochemistry (Figure 6). The result is a new book, entitled “Geochemistry of European bottled water” (Reimann and Birke, 2010), which was published last year (and presented in the first issue of the EGS Newsletter). Several more detailed national interpretations were published in a special issue of the Journal of Geochemical Exploration (Birke et al., 2010).

Figure 6 shows the large variety of water types that are sold as bottled water in Europe (note that for plotting the Durov diagram only Na instead of the more usual “Na+K” was used) and proves the viability of using bottled water as a proxy for “European groundwater”.

The administration of REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals), the new European Chemical Regulation adopted in December 2006, demands additional knowledge about soil quality at the European scale (EC, 2006b). REACH requires that industry is able to prove that it can produce and handle its substances safely. In 2007, the FOREGS atlas was presented to Eurometaux, the association of the European metal producers. Their members were already using the data from the FOREGS atlas and the BSS atlas (Reimann et al., 2003) for their work.

They were, however, disappointed that the BSS atlas does not cover all of Europe, but just its northern part, and although the FOREGS atlas was useful for providing information about the geochemical background at the continental scale, none of the sample materials really fulfils the REACH requirements. In the end, this contact led to the Geochemical Mapping of Agricultural and Grazing land Soils project (GEMAS), where the European Geological Surveys collected samples of agricultural soil (0-20 cm) and grazing land soil (0-10 cm), according to the REACH requirements, and Eurometaux contributed more than 600,000 Euro towards the analytical programme.

The sample density is 1 site / 2500 km², double the density of the FOREGS atlas. Part of the analytical work is carried out in the form of a research contract between Eurometaux and CSIRO Land and Water in Adelaide.

The group also cooperates with the University of East Anglia to obtain Sr-isotope analyses on the grazing land soil samples. Today, practically all analytical results are in, and the group started to work on publications based on the data. Industry is using the data to produce their REACH dossiers. Due to industry sponsorship, the dataset will be kept confidential until 2013, when it will be released in the form of a new geochemical atlas of European agricultural and grazing land soils (Figure 7).
Many colleagues within the group work these days on urban geochemistry. Most of the results of this work are “hidden” in reports to the cities that were mapped, and results were rarely published. In 2007, the Geochemistry Expert Group decided to demonstrate the existence of this expertise to the outside world and to produce a book on Urban Geochemical Mapping, based on the many good examples from within the European Geological Surveys. Chris Johnson of BGS (British Geological Survey) volunteered as the lead editor, backed by an editorial team with colleagues from Hellas, Norway and Spain. The book will be published in April 2011 (Johnson et al., 2011).

Early on, while putting the first chapters for the book together, it was observed that the situation was the same as in the early days of the WEGS working group. Although a lot of urban geochemical data exist, they are not harmonised and are hardly comparable across national boundaries, and often not even within one and the same country. This observation gave the impetus for the URGE (Urban Geochemistry) project, led by Rolf Tore Ottesen of NGU (the Geological Survey of Norway). Again all procedures are harmonised and at the time of writing some cities are already sampled, while others are in the process of preparing for sampling during 2011 (Figure 8). The participating surveys do the sampling, and, if the city does not pay the analytical costs, they also bear these costs, and NGU is providing the expertise for sampling, quality control, and central project management. The aim is to obtain directly comparable datasets from at least 10 European cities.

Fig 8: A first product from the URGE project: zinc (Zn) in topsoil (0-10 cm) from Aschersleben in Germany. The map demonstrates the very local scale of serious soil contamination.
2010 was the first operational year of the EuroGeoSurveys’ expert group on CO₂ storage. It has been an exciting year in which the group named itself ‘EGS.CO₂’, announced itself to the outside world, and focussed on providing expertise during the review process of the Guidance Documents. The expert group on CO₂ storage got a head start on this technology in 2005. According to the International Panel on Climate Change (IPCC) issued an extensive special report on this technology in 2005. The importance and urgency of CCS to the European Commission was clear from the dedication and unprecedented speed by which this directive was drafted and agreed.

Nevertheless, for many authorities responsible for the transposition the topic of geological storage remains rather abstract. This not only hampers the timely transposition, but also could mean that the directive would not result in the anticipated uniform regulation across Europe. Moreover, the member states are expected to define a Competent Authority that will judge on storage proposals, follow-up on storage activities and assume responsibility of closed projects, but very little guidance to the specific tasks and level of competence was given in the CCS Directive. The possibility to draw up Guidance Documents and that the newest EuroGeoSurveys group would be rushing to action by assuming the role of technical reviewer. But let’s first trace back a few steps in order to sketch the Carbon Capture and Storage scenery.

The goal of Carbon Capture and geological Storage (CCS) is to avoid industrial emissions of CO₂, e.g. from power plants, by separating CO₂ from the flue gas (or fuel) and storing it quasi-permanently in geological reservoirs. The concept was developed between 1986 and 1988 in Norway, and started receiving EU support for research from 1992 onwards. The first industrial scale project, Sleipner, became operational already in 1996, or only 10 years after the initial concepts were discussed. The International Panel on Climate Change (IPCC) issued an extensive special report on this technology in 2005. According to the projections of the International Energy Agency, in 2050 CCS can be expected to make up nearly 20% of the total portfolio of emission reduction measures for CO₂. Without CCS, the cost of achieving the same reductions would go up by 70%. The current development of pilot, demonstration and industrial projects is fast and only living documents provide an up-to-date overview, such as the website of the Scottish Centre for Carbon Capture and Storage which is dedicated to CO₂ storage projects (www.geos.ed.ac.uk/ccsmap).

Europe not only quickly recognised CCS as an important technology, but also actively supported the deployment of demonstration projects through different funding mechanisms such as the EERP and NER300. These programs, together with national programs, are needed to lower the initial costs and uncertainties of especially the capture technologies to economic levels, a goal which should be reached well before 2020. Capture is, in short, considered as an issue of efficient engineering in order to overcome the economic hurdle.

Geological storage on the other hand is often perceived as the uncertain link of the CCS chain. It is obvious that the success of CCS projects relies on the guarantees for permanent storage of CO₂. Also scale is an important element: by 2050 an equivalent of at least 10000 Sleipner projects needs to be operational worldwide, each of those storing CO₂ in a reliable and safe way. The legal background for providing such guarantees was lacking in Europe, and therefore the CCS Directive (2009/31/EC), which in spite of its name deals mainly with storage aspects, was put in place in 2009.

The Information Exchange Group is traditionally made up of representatives from the different member states, who can co-invite technical experts if they feel they need that support. After expressing specific interest in the Guidance Documents, also EGS.CO₂ was made a member of the IEG group, and thus given the possibility to act as a first line reviewer during the drafting of these essential documents.

Kris Piessens
Carbon Capture and Storage Expert Group Chairman
It is no doubt clear where the explicit interest of the European Geological Surveys for the regulatory framework for CO₂ storage stems from. A national Geological Survey is an institute where huge amounts of geological information have been gathered and managed.

This information consists of cores, samples, measurements, seismic profiles etc., and is typically complemented by expertise on geo-energy and environmental issues. It is our understanding that this knowledge base of the Earth's subsurface should be valorised to come to maximal and safe deployment of CO₂ storage in Europe. The role that the different Surveys will play is in most countries not yet fixed: in some, the Survey may be identified with the Competent Authority. For those Surveys maintaining objectivity is of course a prime issue, posing limitations on the way they are entangled in demonstration projects financed by industry.

Depending on the national context, other Surveys may take up a more proactive role in such projects and offer their unbiased expertise to project consortia.

But also in these situations they should keep sufficient distance, because any Survey can expect to be called upon by their administrations for independent expert advice. Whatever role they will assume, Surveys will be confronted with the regulatory context of CO₂ storage, and therefore very much welcomed the opportunity to actively shape it through the Guidance Documents.

The importance and relevance of the topic is also evidenced by the larger than anticipated number of partners of this expert group. EGS.CO₂ counts sixteen different Surveys, of which 15 gathered in Brussels during the kick-off meeting the 5th of February last year. During this meeting, the group soon realised the need to efficiently organise itself to be able to cope with the workload that the review of the Guidance Documents would bring. This would prove to be far from unnecessary, since the Guidance Documents would grow to a bundle of over 120 well-stuffed, technical pages that needed to be reviewed several times against very tight deadlines.

The process put in place was based on assigning the main chapters to topic leaders. The role of topic leader was usually taken on by the larger Geological Surveys (TNO, BGR, BRGM, BGS) with GSB as back-up. These were expected to have the flexibility and man-power to do a quick, but thorough review of the chapters corresponding to their topic, which formed phase 1 of the review process. During phase 2, the other partners were invited to add their comments to the documents already reviewed by the topic leaders. Phase 3 would consist of summarizing and discussing the different comments. This three stage review process allowed performing in-depth revisions that combine the remarks of reviewers from 16 institutes in a time span of only 3 weeks.

The other members of the Information Exchange Group are mainly legislative experts, and it was only natural that EGS.CO₂ quickly profiled itself as (geo-) technical reviewer. Larger parts of the Guidance Documents were commented in detail, leading to sometimes quite fundamental discussions with the authors. As a whole EGS.CO₂ is confident that the quality of the documents was significantly improved through our involvement, even if some of the discussions had to be cut short in view of the very strict timeline against which the documents were prepared.

One of the more obvious improvements is the explicit and extensive reference that is made to the role and expertise of the national Competent Authorities.

This was lacking from the initial versions, but was adopted after EGS.CO₂ stated that a detailed discussion on the role of Competent Authorities was compulsory. EGS.CO₂ will remain member of the Information Exchange Group, but now that the Guidance documents are awaiting their publication, our role will be less conspicuous.

It was very satisfying to work in an ad-hoc way on a well defined task, but it is time to use the momentum of the successful kick-off year to embark on a new direction. In 2011 EGS.CO₂ will be given the foundations that reflect the different tasks, responsibilities and activities of the Geological Surveys regarding CO₂ Geological Storage, and use the existing connections with the European levels to act as the voice of the Geological Surveys in Europe.
Interview with John Ludden
Executive Director, British Geological Survey - BGS

Prof. Ludden, your outstanding career has allowed you to be a privileged observer of the international evolution of geosciences, particularly in Europe. Either as the Director of Earth Sciences Division at CNRS, and as the President of the European Geosciences Union, as well as the President of EuroGeoSurveys or, currently as the CEO of the world’s oldest Geological Survey, to mention a few. On the basis of this exceptional experience, which scientific areas would you define as more strategic for geology?

The recent events in Japan underline that we cannot ignore the need to live with the Earth and learn more about the fundamental driving forces of our planet. We did not expect a quake of that size on that particular segment of ocean crust, but then, when we look back at the record (after the event) we did realise that such an event was possible on a 800 year return period - we have a lot to learn still and need to add geological thought processes into engineering design.

Geologists also need to work increasingly with biologists and chemists at the interface of scientific processes that help understand feed-backs and potential new applications of our science. Some of the new ways of mining in environmentally controlled environments are examples. Data bases need to be able to mesh geological, environmental and social information to provide new responses to scientific questions that affect life-styles and health. Environmental questions will increasingly require social and economic solutions.

Is there any particular EGS experience or project that you value most? Why?

The EGS has the potential to bring the National surveys together and add European value. The OneGeology Europe project showed me that this is possible - but we have a long way to go still. In the past we have produced innovative trans-boundary data bases that remain unused and underdeveloped and if EGS is to move to the next level it must create the European digital base at the highest resolution possible.

How do you imagine EGS in 10 years? Which of its targets will be particularly difficult to achieve?

I think there will be a European Geological agency in 10 years that provides solutions for EU wide problems of resource sustainability and environmental quality. It will be difficult for National agencies to give up the perception that they do some things better on their own, but we must ask the question, if each survey needs its own facilities can we will share more facilities and also people.

The mission of ESFRI is to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe, and to facilitate multi lateral initiatives leading to the better use and development of research infrastructures, at EU and international level. At present, which are the main global research challenges related to the environment?

We need an European environmental modelling platform that includes key baselines and measurements that allow us to influence policy in Europe. The EGS should provide the sub-surface model and key information on environmental sustainability and resource development. Issues such as radioactive waste disposal, shale gas exploitation, coastal defenses, disaster response require a pan-European approach.

British Geological Survey

Founded in 1835, the British Geological Survey (BGS) is the world’s oldest national geological survey and the United Kingdom’s premier centre for earth science information and expertise. In 2010 we celebrated our 175th Anniversary. The BGS is the UK’s premier provider of objective and authoritative geoscientific data, information and knowledge for wealth creation, sustainable use of natural resources, reducing risk and living with the impacts of environmental change.

We are a world-leading geoscience centre for:
- survey and monitoring
- modelling and research
- data and knowledge

As a public sector organisation BGS is responsible for advising the UK government on all aspects of geoscience as well as providing impartial geological advice to industry, academia and the public. The BGS is part of the Natural Environment Research Council (NERC), which is the UK’s main agency for funding and managing research, training, and knowledge exchange in the environmental sciences. The NERC reports to the UK government’s Department for Business, Innovation and Skills (BIS). We also undertake an extensive programme of European & international research, surveying and monitoring, including major institutional strengthening programmes in the developing world.

The BGS advances understanding of the structure, properties and processes of the solid Earth system through interdisciplinary surveys, monitoring and research for the benefit of society. Our annual budget is in the region of £52m, about 50 per cent of which comes from NERC’s Science Budget, with the remainder coming from commissioned research from the public and private sectors. Our headquarters are at Keyworth, near Nottingham, and we have a regional offices at Edinburgh, Wallingford, London and Cardiff. The BGS also has a presence in Belfast through the Geological Survey of Northern Ireland.

www.bgs.ac.uk
On May 21, 1885, Emperor Alexander III decreed that an independent geological research institute be established in Finland. At this time the Geological Office of the Board of Mines that had been established in 1877 changed its name to the Geological Commission of Finland (the Geological survey of Finland). January 2011 marked the 125th anniversary of the beginning of the commission’s operation.

At present GTK is an internationally oriented governmental sector research institute that focuses on the research of natural resources of soil and producing geological information and added value for the business sector and authorities as defined in the GTK’s operating idea. GTK operates on a national level and has an important role in developing different regions. GTK’s strategy is based on the expectations and needs of society as well as the business sector.

“Prospecting for and making an inventory of geological natural resources have been central to GTK throughout its history,” says GTK’s Director General Elias Ekdahl. “In the future, geosciences will be even more important than today considering the inevitable competition for declining natural resources, accelerating urbanization and the aim to develop sustainable energy solutions. The importance of information and geological competence related to soil will increase significantly when we are looking for solutions to future challenges.”

Mega trends of the world change the focus areas of GTK’s research

“From the point of view of GTK’s operations,” Ekdahl states “the key factor initiating change is the growing concern about the sufficiency and availability of mineral resources. Securing mineral service is not the only challenge - the environmental perspective must also be considered more thoroughly than before.”

The importance of hi-tech metals will increase when new technological solutions such as super conductors, solutions related to energy, or nano and hybrid technologies are developed. GTK has a leading role in the EU in research programmes related to these future metals.

Another mega trend is related to rapid population growth, which causes strong immigration to growth centres. As a result of urbanisation, construction is focused more than before on dense city structures, traffic routes and energy and water infrastructure. The growth of cities challenges GTK to contribute to building of communities that are safe, attractive and based on sustainable energy solutions. The fast growth of communities increases the demand for geological information that is necessary when building traffic routes and underground facilities, as well as for rock material, energy and waste management.

The third crucial change factor for GTK is the growing significance of climate and energy policies. Evaluating energy solutions and options related to them is becoming the most important question in both industrial and environmental policy. For industries the most important questions, in addition to availability and price of energy, is the acceptability of production methods from the point of view of consumer values. On the other hand, the government is bound by obligations related to international climate treaties. The environmental sector emphasises reducing consumption and switching production to renewable energy sources.

GTK’s international influence grows

GTK is a renowned international actor that has active partnerships among both industrial and research organisations. Europe’s new raw materials initiative, enforcement of the INSPIRE directive and projects related to them offer a remarkable opportunity for GTK’s internationalisation and strengthening of GTK’s international role. Export projects funded by the EU’s framework programmes, international development banks and the Ministry for Foreign Affairs are important for GTK’s internationalisation, networking, and funding.
In light of the recent crises in Japan and North Africa, energy ministers on March 21st took stock of the state of play in the energy sectors and the possible impact on markets. At the end of the meeting, the Hungarian Presidency declared that the priority is to provide Japan and Libya with humanitarian as well as technical assistance. Regarding nuclear safety the main concern is to ensure that the highest standards are applied.
The member states are ready to launch a review of the safety of nuclear facilities through a comprehensive risk and safety assessment ("stress test") of the EU's reactors. The criteria should be defined learning from the lessons from the situation in Japan so as to allow for the tests to be carried out as soon as possible.

Various assessment criteria were discussed: seismic and flood risks, the technical design and arrangements of the backup systems, the age of the power plants, the type of reactor, emergency procedures and resistance to an air plane crash or terrorist attacks.

Water Scarcity & Droughts in the EU

The European Commission published the third report on the progress in addressing water scarcity and droughts in Europe on March 21st. The main overall objective of EU water policy is to ensure access to good quality water in sufficient quantity for all Europeans, and to ensure the good status of all water bodies across Europe. Therefore, policies and actions are set up in order to prevent and to mitigate water scarcity and drought situations, with the priority to move towards a water-efficient and water-saving economy.

A policy review for water scarcity and droughts is envisaged for 2012, which will be part of the “Blue Print for Safeguarding European Waters” announced by Environment Commissioner Potočnik at the hearings in the European Parliament in January 2010.

This review will be informed by specific assessments and studies on the state of the art and good practice of policies and measures to prevent and/or minimize water scarcity and drought situations, in the fields of water efficiency, better planning and other instruments.

The Commission calls for action on commodities and raw materials

The European Commission presents an overview of developments in financial and physical markets and outlines what has been done since the launch of the Raw Materials Initiative. This includes achievements such as identifying critical raw materials, actions in the area of trade and development, guidelines that clarify how extraction in the EU can be compatible with Natura 2000 requirements, new research opportunities under the 7th Research Framework Programme and development of end-of-waste criteria.

In the Communication (2 Feb 2011), the European Commission proposes a series of measures, based on its Raw Materials Initiative to ensure a fair and sustainable supply of raw materials from global markets, to foster sustainable supply within the EU and to boost resource efficiency and to promote recycling.

At the same time, recent developments on commodity markets show that the prices of derivative and physical markets may be linked in multiple ways. Clearly, the price of commodity derivatives is influenced by the price of the underlying commodity. It is also clear that investors increasingly use commodity derivatives as part of their strategic investments.

Financial market regulation is one important response to these developments. The regulatory initiatives already undertaken or planned for the coming months will ensure enhanced integrity, transparency and stability of commodity derivative markets. The Communication also notes that further work is necessary to understand fully the interlink between physical and financial markets. The European Commission intends to continue working on this matter, in the framework of the G20-debate taking place at the global level.

The key elements of the integrated strategic approach include:

• Improving the integrity, transparency and stability of commodity derivatives markets, inter alia through a review of the Directives on Market Abuse and Markets in Financial Instruments
• Undertaking additional research on developments in financial and physical commodities markets with the aim of identifying how the linkages work
• Regularly updating the list of 14 critical raw materials already identified by the European Commission
• Monitoring the development of access to critical raw materials with the view to identifying priority actions
• Strengthening the EU’s trade strategy in relation to raw materials and pursuing the “raw material diplomacy” to address raw materials priorities in bilateral and multilateral frameworks and dialogues
• Developing a bilateral co-operation with African countries in the area of raw materials, based on promoting governance, investment and geological knowledge and skills
• Working closely with Member States and other stakeholders to improve the regulatory framework for sustainable extraction within the EU
• Enhancing resource efficiency and promoting recycling by tackling the waste levels due to sub-standard treatment inside or outside the EU and obstacles to the development of the recycling industries through for example the strengthening of the enforcement of the directive on waste from electrical and electronic equipment
• Further promoting research and innovation efforts along the entire value chain of raw materials, from extraction, processing, recycling and resource efficiency to substitution.

For more information on the Commission’s raw material policy: http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm

⇒ Natural Hazards


The subsequent Council Conclusions invited the Member States, before the end of 2011 to further develop national approaches and procedures to risk management including risk analyses, covering the potential major natural and man-made disasters, taking into account the future impact of climate change. Member States are invited to make use of the guidelines on methods of risk assessments and mapping to be developed by the Commission.

⇒ EC consultations

Consultation on Maritime Spatial Planning and Integrated Coastal Zone Management:

The European Commission has launched a public consultation to explore options for future EU action on Maritime Spatial Planning and Integrated Coastal Zone Management.

The aim of the consultation is to gather stakeholder feedback about the status and future of Maritime Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM) in the EU, and to assess where further EU action would be most useful. The information gathered through this consultation will be used as part of an impact assessment and may be used to prepare draft proposals on Maritime Spatial Planning and/or Integrated Coastal Zone Management.

Open 23/03/2011 to 20/05/2011
Public consultation on the revision of Decision 280/2004/EC (Monitoring Mechanism Decision):
The EU’s system for reporting on greenhouse gas emissions and implementing the UN Kyoto Protocol is regulated by two pieces of legislation - the Monitoring Mechanism Decision - No 280/2004/EC and Implementing Decision 2005/166/EC. More precisely these Decisions cover:
• the mechanism for reporting on greenhouse gas emissions caused by human activity and on removal of greenhouse gases by sinks
• information on national programmes to reduce emissions, greenhouse gas emission projections, and policies and measures in accordance with the UN Framework Convention on Climate Change (UNFCCC).
However, they do not cover monitoring and reporting under the EU Emissions Trading System (EU ETS).
Analysis of the current monitoring mechanism suggests that it needs to be improved and aligned with recent EU legislation (adopted as part of the climate and energy package) and recent UNFCCC decisions.
Open 07 March 2011 to 29 April 2011

Consultation on a roadmap for a resource-efficient Europe:
The European Commission is preparing a Roadmap for a resource-efficient Europe as part of the resource–efficient Europe Flagship Initiative of the Europe 2020 Strategy.
The purpose of this consultation is to collect the views of businesses, other stakeholders and the public at large on policy options for the Roadmap. We are interested in informed opinions on the current situation (existing opportunities and main barriers to more efficient use of natural resources) and on the potential effectiveness of public policy tools in achieving a resource Efficient Europe.
Open 22.02.2011 to 22.04.2011

Consultation on the planned European Commission Communication for the 2012 United Nations Conference on Sustainable Development ("Rio+20"):
The Commission will publish towards the middle of 2011, a Communication setting out its views on objectives and possible concrete deliverables for UNCSO, as a basis for further dialogue with the EU institutions, civil society and other interested actors, including third countries.
This public consultation serves to provide the Commission with initial views for stakeholders.
Open 14.02.2011 to 10.04.2011

Upcoming Events

European Geosciences Union General Assembly
3rd – 8th April 2011 - Vienna, Austria
The EGU General Assembly 2011 will bring together geoscientists from all over the world into one meeting covering all disciplines of Earth, Planetary and Space Sciences. Especially for young scientists the EGU appeals to provide a forum to present their work and discuss their ideas with experts in all fields of geosciences.
http://meetings.copernicus.org/egu2011/

International Conference on Environment & Health incorporating the 28th SEGH European Conference and workshop
10th – 15th April 2011 - Lancashire, England
The conference provides an internationally recognized forum for interaction, discussions, and the exchange of research between academic scientists, practitioners and public servants who are engaged and active in the multi-disciplinary area of environment and health.
http://edgehill.ac.uk/segh2011/about

VII International Brown Coal Mining Congress
11th – 13th April 2011 - Belchatow, Poland
This will be the seventh edition of the Congress under the theme: “Role and position of brown coal in the world power industry of XXI century.”

Energy Efficiency & RES Congress for SE Europe
13th – 15th April 2011 - Sofia, Bulgaria
Innovative technologies and practices, strong international participation, a lot of new business contacts, many parallel initiatives and discussions – this is what

- **Waste Management & Recycling Conference** 13th – 15th April 2011 - Sofia, Bulgaria
  The International exhibition Save the Planet combines thematically the sectors of waste management, recycling, and environment. Climate changes and commitments of Bulgaria to the EU in environment sector issues require infrastructure reconstruction and market liberalization. The aim of the exhibition is to stimulate investments in the sector by presenting the most advanced concepts and technologies. http://viaexpo.com

- **Gi4DM (Geoinformation for Disaster Management) Conference** 3rd – 8th May 2011 – Antalya, Turkey
  Anticipating the obvious and growing importance of geoinformation for disaster and risk management a separate group of researchers, professionals and vendors have begun a worldwide discussion on collection, management, analysis, sharing and visualization of geo-information. The Gi4DM is coordinated by the ISPRS Ad hoc Committee on Risk and Disaster Management, Working Group 1 (Disaster) of ISPRS Commission VII (Remote Sensing and Policies) and Working Group 8 (3D Spatial Data Integration for Disaster Management and Environmental Monitoring) of the ISPRS Commission IV (Geodatabases and Digital Mapping). http://www.gi4dm2011.org/?page=program

- **2nd Annual Conference of the RHC-Platform** 5th – 6th May - Budapest, Hungary
  Building upon the success of it’s first edition, the RHC-Platform is organizing it’s second Annual Conference on the 5th and 6th of May 2011 in Budapest, Hungary. The event will provide the opportunity for industry executives and leading scientists to engage in an effective dialogue with the participation of high-level officers from the EU, national and local administrations. A first class panel of speakers presenting the very latest trends and developments for renewable heating and cooling technologies, will tackle a broad range of topics including EU funding priorities for research, development and innovation, market outlook, large scale integration of renewable heating and cooling in the European Smart Cities initiative. http://www.rhc-platform.org

- **CIM Conference and Exhibition 2011: Mines Without Borders** 22nd – 25th May - Montreal, Quebec, Canada
  It is an important time for the mining industry - economic issues, globalization, environmental stewardship and technology are at the forefront of discussions in boardrooms across the country, as well as around the world. Our 2011 technical program will address these key areas by drawing in over 6,000 participants who will network and exchange ideas with peers and business leaders alike. The technical program features sessions on Projects, Best Practices, People & Business Management, Environmental & Social Responsibility, Innovation & Technology, Earth Science, and the Iron Ore Symposium. http://www.cim.org

- **The 73rd EAGE Conference & Exhibition incorporating SPE EUROPEC** 23rd – 26th May – Vienna, Austria
  The 73rd EAGE Conference & Exhibition incorporating SPE EUROPEC 2011 is the largest and most comprehensive geosciences event in the world. The five-day programme consists in a large conference and technical exhibition presenting the latest developments in geophysics, geology, and reservoir/petroleum engineering. In 2010 almost 5,500 visitors from almost 100 different countries attended the event in Barcelona. Whether it is your goal to have a maximum exposure at this event, support a particular sponsor city or enhance your image, Vienna 2011 will provide a perfect opportunity to reach thousands of geoscientists and engineers. http://www.eage.org

- **The 2nd Annual Global Mining Technology Forum** 25th – 26th May – Stockholm, Sweden
  Changes in the mining industry are evolutionary not revolutionary. With an increasing number of projects in Scandinavia, Australia, Canada, South East Asia, India & China there certainly is a need for investing in cutting-edge technologies in order to improve their performance, reduce environmental pollution and improve the quality of life within their operational work areas. The current pace of technological advancements has driven companies to invest more and more in R&D efforts. The industry aims at adopting and implementing innovative technologies to create a better environment quality in mining industry areas, to reduce negative impact to human health and environment, reduce water and air pollution, and land degradation. http://www.fleminggulf.com
Upcoming Events

Geology, Tectonics, and Minerageny of Central Asia
6th – 8th June - St. Petersburg, Russia
The geological community will get acquainted with main results of work under the Central Asian international project for attraction of as much as possible project participants at future development stages, as well as for further widening of international cooperation between Russia, Kazakhstan, China, Mongolia, and Republic of Korea. Discuss topical problems and state of knowledge on geology, tectonics, lithosphere deep structure and minerageny of Central Asian mobile belt for the purpose of reliability increase of raw material potential estimation for solid minerals and hydrocarbon material.
http://www.vsegei.com

Mining in Americas Summit 2011
13th – 14th June - Denver, Colorado
Mining Americas 2011 is a key networking opportunity for mining executives involved in strategy, technology and investment to discuss the current challenges and latest resource projects to succeed in this exciting period of industry growth. This two stream event allows delegates the opportunity to focus on their main strategic or technological area of interest, whilst exchanging information with colleagues from key mining hotspots in the Americas region.
The fundamental issues include; Strategic mining investment – exploring the latest geographical hotspots and resource opportunities
Latest technology benchmarking – uncovering which technologies are being developed to help exploration and extraction processes
Operational best practices – developing efficient mining operations that also focus on stringent health and safety regulations
http://www.miningamericas.com

The 7th EUREGEO Congress on European Regional Geoscientific Cartography and Information Systems
12th - 15th June - Bologna, Italy
The importance of geosciences has increased steadily and rapidly over recent decades, with problems arising at local, regional, national, and international levels. Earthquakes, volcanic eruptions, floods and landslides threaten lives and infrastructure, the earth’s population is growing rapidly, we have to deal with challenges regarding raw materials, clean water is not available everywhere, soil protection is a key issue, ecosystems are at risk, and we are facing the consequences of a changing climate. For sustainable use of our natural resources, conservation of nature and the environmental protection from natural hazards, reliable data and easy to use information systems are crucial. In order to meet demands, we need a network with capability to deliver data, information and knowledge required for decisions in politics and public administration.
http://www.regione.emilia-romagna.it

The 11th International Geocconference SGEM
19th – 25th June - Varma City, Bulgaria
The new reality of global changes requires new knowledge concerning environmental, economics and social issues. In this regard the International Multidisciplinary Scientific GeoConference and Expo-SGEM (Surveying Geology & mining Ecology Management) considers the questions concerned to the geology and mining producing, oil and gas, geophysics, geodesy and mine surveying, photogrametry and remote sensing, cartography and GIS, informatics, geoinformatics, micro and nanotechnologies and innovations, hydrology and water resources, air and climate, water and forest ecosystems; soils resources, renewable energy, nuclear technologies, ecology and environmental protection; environmental economics and legislation accordance with the principles of sustainability. The overall objective of the SGEM GeoConference and Expo is to contribute to the integration of environmental consideration into the decision making process with the aim to ensure that present consumption will not compromise the ability of future generations to meet their own needs.
http://sgem.org

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Sustainable Geo-Management

Bologna | Italy | June 12th - 15th 2012

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November 2011 Second circular
January 31st 2012 Submittal of abstracts
February 2012 Information regarding accepted contributions
March 31st 2012 End of registration at reduced fee
April 2012 Third circular, short programme
June 12th-15th 2012 Congress

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