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## GEMAS Atlas - A flagship event of World Soil Day

**On 5th December 2013 the World Soil Day was celebrated at the FAO headquarters in Rome, with the aim to raise awareness among stakeholders and decision makers on the importance of soil as a critical component of the natural system and as a vital contributor to human wellbeing.**

The event was attended by more than 300 participants from all over the world, the majority of which were from public authorities, from ministries, diplomats and scientists. The celebration developed under the form of a round table among high level personalities such as the FAO Deputy Director-General, Ms. M.H. Semedo, the Minister of Agriculture and Livestock of Zambia, Mr R. Sichinga, the Permanent Representative of Thailand to FAO, Mr. R. Chandarasivongs, the EGS President, Mr M. van Bracht, the EGS Geochemistry Expert Group Chair, Mr. C. Reimann, and the Chair of the Intergovernmental Technical Panel on Soil, Mr. L. Montanarella.

The focus of the round table was the need to update global databases related to soil health condition. In this framework the launch of the GEMAS Atlas was a highlight of the day.

FAO Deputy Director-General Maria Helena Semedo, in her opening address, stressed that «The importance of soil for food security should be obvious. From the origins of civilisation in early farming communities up through today, we can see how societies have prospered, thanks to healthy soils, and declined when their lands became degraded or infertile». She continued by stating that "there is a change in the state of affairs as 'World Soil Day' has been recognised by the United Nations and a new international 'Global Soil Partnership' initiative ties us now all together".

EGS President Mart van Bracht introduced the GEMAS project by saying "I am proud to present to you today the success story just concluded,

the launch officially today of the Geochemical Atlas of Agricultural and Grazing Land Soil of Europe, the two-volume atlas entitled 'Chemistry of Europe's Agricultural Soils', in short GEMAS. [...] The main achievement of the GEMAS project involving 33 European countries is the development of a comprehensive database about the composition and quality parameters of European agricultural and grazing land soils for multipurpose uses. GEMAS represents an excellent example of cooperation between public institutions and industry; Eurometaux, the European Association of the Metals Industries, has been a key partner in this initiative. GEMAS has proved that geology, or more precisely the distribution of parent materials for soil formation, plays a key role in determining the spatial distribution of chemical elements in soils. This type of contribution was currently missing at the European level, and we are proud to put it now at the disposal of institutions, scientific bodies, and society in general".

Clemens Reimann began his keynote presentation of the GEMAS project by first thanking the 65 organisations from around the world that participated in this unique international collaboration. He shortly presented the main achievements of the GEMAS project: a fully harmonised, freely available and interoperable geochemical map of the natural distribution of chemical elements and of soil parameters at the continental scale.

The GEMAS project, another success story of the collaborations borne through EuroGeoSurveys, is unique in its focus on soil quality and contamination. This is a new territory for soils science and one which will figure prominently in the work of the FAO's Global Soil Partnership, of which EGS is a member.

Following the round table, over 60 participants attended the GEMAS technical workshop organized to present in more details the results achieved by the Atlas. The workshop was opened



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by Mr. M. Achouri, Director of the FAO's Land and Water Division, who acknowledged the importance of the GEMAS results for the European community. The first session was chaired by Morten Smelror (Director, Geological Survey of Norway) and several presentations were given by well known scientists in this field: Ilse Schoeters, Koen Oorts, José Martin Soriano-Disla, Rainer Baritz, Timo Tarvainen, Ray Scanlon, Benedetto De Vivo, Laurel G. Woodruff and Dee Flight.

The main results of the workshop, which are crucial for the production of high quality geochemical bases, can be summarised as following:

## EXPERIENCE

Applied geochemists have more than 60 years experience with geochemical mapping using bedrock, sediment, soil, water and vegetation as sample materials; the first countrywide maps were produced in the 1950's. This experience is recognised by pan-European policy makers, and UN agencies, e.g. UNESCO recently approved the establishment of an International Centre on Global-scale Geochemistry in Langfang, China.

## INDEPENDENT QUALITY CONTROL

This is the cornerstone to the success of any geochemical mapping project, using accredited laboratories is not sufficient.

All analytical data must be validated by strict external quality control procedures.

## MAPPING SCALE

Geochemical maps at all scales are produced by the Geological Surveys, from continental to local. Different processes are highlighted at different scales, and different scales highlight different geochemical processes.

## COOPERATION

Geological Surveys cooperate within and between the continents – three projects at the continental scale were completed recently: Australia - Europe - USA, and the project standards were exchanged to ensure comparability.

A side meeting between the FAO Deputy Director-General, Ms. M.H. Semedo, and the EGS Directors present at the event also took place in the afternoon.

Reporters: [Alec Demetriades](#), [Manfred Birke](#) and [Anna Ladenberger](#)

FAO World Soil Day event speakers



Clemens Reimann's opening presentation slide showing the logos of the 65 organisations that participated in the GEMAS project.



From left to right: Luca Demicheli (EGS Secretary General), Clemens Reimann (Chairperson, EGS Geochemistry Expert Group) and Mart van Bracht (EGS President) holding the two volumes of the GEMAS Atlas "Chemistry of Europe's Agricultural Soils".



GEMAS Workshop chaired by Morten Smelror (Director, Geological Survey of Norway). Anna Ladenberger, SGU, delivering her presentation on "GEMAS - soil, geology and health implications".

## United Nations declared 2015 the International Year of Soils

On 20th December 2013 the 68th United Nations General Assembly has designated 5th of December as World Soil Day and declared 2015 as the International Year of Soils.

The Global Soils Partnership (GSP) Secretariat will serve as the Secretariat of the International Year of Soils and thus, will immediately establish an organizing committee composed by willing partners

in order to prepare a joint plan of activities for the year.

EuroGeoSurveys is a GSP member organisation.

## Shale Gas Summit in Warsaw

The EGS Conference 'S-Bridge: Shale Gas as a Bridge Energy Carrier – from Fossil Fuels to Green Energy' (12-13 November 2013, Warsaw and Wojcieszow, Poland) turned to be a real European shale gas summit. The event, hosted and organised by the Polish Geological Institute - National Research Institute (PGI-NRI), was a satellite event of the UN Framework Convention on Climate Change conference (COP19) and was supported by patronage of the International Union of Geological Sciences (IUGS).

The conference brought together almost 300 high-level participants from over 25 countries, representing the European Commission, governments, over 10 embassies, numerous government agencies including strong representation of national geological surveys, International Energy Agency (IEA), European Federation of Geologists (EFG) and other international organizations, universities and R&D centers, industry and several NGOs.

In a crowded conference hall, the event featured opening speeches by: the President of Poland, Mr. Bronislaw Komorowski, who emphasized the importance of shale gas issues; the Minister of Environment of the Republic of Poland and incoming President of COP19, Mr. Marcin Korolec, who emphasized the perfect timing of the conference, when the

world climate summit is debating how to cut down GHG emissions and when the United States has shown shale gas to be a concrete tool for to curb emissions with concomitant benefits for the economy; and the hosts, Mr. Jerzy Nawrocki and Mr. Mart J. van Bracht, respectively – EGS Executive Committee Member and PGI-NRI Director, and EGS President and Managing Director of TNO-Geological Survey of the Netherlands.

After a day-long series of presentations and debates by top level EU experts in representation of leading institutions, such as the International Energy Agency, the European Commission and EuroGeoSurveys, a concluding conference panel was moderated by Mr. Luca Demicheli, EGS Secretary General. The panelists included Mr. Piotr Woźniak (Undersecretary of State of the Polish Ministry of Environment and Chief National Geologist), Prof. Hans-Joachim Kuempel (President of the German Federal Institute of Natural Resources, BGR), Prof. John Ludden (Executive Director of the British Geological Survey, BGS), Prof. Shaminder Puri (Secretary General of the International Association of Hydrogeologists, IAH), Dr. Peter Britze (GEUS and Chair of EGS GeoEnergy Expert Group), Prof. Richard Davies (EFG / Geological Society of London / University of Durham) and Dr. H.-P. Broers (TNO / Chair of EGS Water



Marcin Korolec, Polish Minister of Environment and COP19 President for this term in the office (2013/2014).

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Resources Expert Group). The vivid discussions initiated by the panelists raised several issues of key importance for the future of shale gas exploration and exploitation in Europe. This was especially the case of the necessity of appropriate language for communicating with the societies and NGOs, further studies on the role of local geological conditions with respect to environmental risks, and a real challenge for hydrogeologists – that is the need of more unequivocal definition of groundwater and protection of drinking water resources with reference to the ongoing hot debate on the environmental impact of shale gas prospecting.

The last but most important point of the conference was the presentation of the Statement of the EuroGeoSurveys on Shale Gas Exploration and Exploitation, read by Mr. van Bracht and Mr. Nawrocki.

PGI-NRI took care to provide conditions for continuation of discussions at the Networking Event organized in the historical building of the PGI-NRI Geological Museum.

The second day of the conference (13th of November) was devoted to an excursion to Wojcieszkow (Lublin Province, about 130 km east of Warsaw) to visit shale gas exploration drilling works conducted at the Kock-Tarkowica concession held by the Polish Oil & Gas Company S.A.

The presentations and recording may be found at the conference website <http://konferencje.pgi.gov.pl/shalegasbridge-home>. It should be also noted that for the conference PGI-NRI issued a book on Shale gas as seen by Polish Geological Survey and a special English issue of *Przegląd Geologiczny* (vol. 61, no. 11/1 - November, 2013).

## Statement of the EuroGeoSurveys on Shale Gas Exploration and Exploitation

Taking into account the key importance of energy and mineral resources for safe and reliable economic development of communities throughout the EU, EuroGeoSurveys strongly support actions which would facilitate sustainable production and use of these resources in individual Member States.

Aware that any process of exploitation of georesources imposes anthropogenic pressure on the natural environment, that the combustion of fossil fuels increases global greenhouse gas emissions and influences the climate, and that the growing demand for energy in Europe will, for some decades, require some nations to rely on fossil fuels, while at the same time changing to other sources of energy:

We consider that the use of fossil fuels which provide lower greenhouse gas emissions such as natural gas, extracted from both conventional and nonconventional resources, can act as a bridge to significantly lower emissions. The potential to bridge rely on in-depth assessments, based on research to be followed up by political and business decisions allowing exploration. These decisions must be based on analyses conducted by non-partisan bodies of Earth science experts, such as those of the National Geological Surveys and will include both natural gas resource assessment as well as environmental impact assessment.



## The Tenth Plenary Session of the Group on Earth Observations (GEO-X) and the 2014 GEO Ministerial Summit

The Tenth Plenary Session of the Group on Earth Observations (GEO-X) and the 2014 GEO Ministerial Summit, hosted by Switzerland, will take place in Geneva from 15 to 17 January 2014. The major aim of the Summit is to decide the continuation of GEO after 2015 by Ministers and define the "Second Implementation Plan 2025".

The Ministers will also review the progress against the GEOSS Strategic Targets and will confirm their commitment to complete the current 2005-2015 Implementation Plan.

During the GEO Week several meetings and side events will take place. A key component of these events is the Group on Earth Observation Exhibition, where European Member States, participating organisations and EC-funded research projects

will showcase their contributions to the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS).

EuroGeoSurveys, as a part of the European Commission delegation, will have a stand in the exhibition area as well as a slot in a speaker's corner in order to showcase its contributions and results achieved to serve in-situ data to GEOSS, presenting in particular the work done in the PanGeo project and the progress of the EGDI-Scope feasibility study.

We invite you to attend the presentation on Wednesday 15th from 10:30 to 10:45, «The Geological Surveys of Europe efforts to serve in-situ data to GEOSS» by Luca Demicheli – EuroGeoSurveys Secretary General.

## European Raw Materials University Day - launching event

The launching event European Raw Materials University Day took place in Rome at La Sapienza University on 6th December 2013.

The event was opened by the European Commission Vice-President Antonio Tajani, at the presence of university and secondary school students, who could engage in a debate with Mr. Tajani and the several high level speakers from the research, industry, academia and public administration sectors, among whom Mr. Luca Demicheli, Secretary General of EuroGeoSurveys.

The initiative, organised in the framework of the communication strategy of the European Innovation Partnership on Raw Materials, aims to promote sectorial competitiveness, sustainable growth and employment by showing the huge potential of European raw materials.

Europe has many universities with long traditions and excellent programmes in the raw materials sector and the demand for knowledgeable and skilled professionals is still high. However, not enough students are attracted to study such technical subjects. Therefore, the Commission would like to support the raise of awareness in this matter.



The main objectives of the Raw Materials University Day initiative are to:

- show to potential students the attractiveness of the raw materials sector and career opportunities for future graduates
- inform them that the industries using raw materials will become increasingly innovative and green in the future - e.g. digital and green economy.

The Raw Materials University Day represents one of the actions foreseen by the recently adopted Strategic Implementation Plan of the European Innovation Partnership on Raw Materials. Further events will take place throughout 2014 across the EU in different universities which have expressed their interest for collaboration [http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item\\_id=7157&lang=en](http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=7157&lang=en).

## EGS Feasibility Study on 'Geoscientific knowledge and skills in African Geological Surveys' successfully launched in Accra, Ghana

Last September the new EGS Feasibility Study on "Geoscientific knowledge and skills in African Geological Surveys" was kicked off. The project is carried out by the EGS International Cooperation and Development Task Force (ICDTF) on behalf of DG DEVCO, and is technically coordinated by the Polish Geological Institute (PGI-NRI). The main objectives of this Feasibility Study is to find the best ways to strengthen the operational and administrative capacity, knowledge and skills of the Geological Surveys of African countries, through their umbrella organisation OAGS, in governance of natural resources, enforcing sustainable mineral resources exploitation as well as preventing and mitigating natural disasters, by establish a long-term strategic cooperation relationships in these areas.

A successful OAGS-EGS workshop was held in Accra, Ghana on the 25th September 2013. 17 EGS experts coming from 9 different European Geological Surveys (Poland, Spain, Czech Republic, Finland, Sweden, France, Italy, Lithuania, and United Kingdom) and 12 experts from 12 African geological surveys (Algeria, Botswana, Egypt, Ghana, Ivory Coast, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal and South Africa) along with the OAGS President and the EGS Secretary General participated in this meeting.

The Workshop, which was hosted by Mr. John Duodu, Director of the Geological Survey of Ghana (GSD), in the framework of the OAGS General Meeting and of the celebrations of the centennial anniversary of GSD, was opened by Mr Luca Demicheli, EGS Secretary General, and by Mr Lhacene Bitam, OAGS President.

In the same framework also a major GIRAF "Geosciences information in Africa" Workshop took place.

During the meeting in Accra a new Executive Committee of OAGS was appointed: President: Ms. Gabi Schneider (Director of Geological Survey of Namibia); Vice President, Mr. Adriano Silvestre Senvano (Director of Geological Survey of Mozambique); Vice President Mr. Hassane Amadou (Director of the Geological Survey of Niger); Secretary, Mr. Mxolisi Kota (CEO of the Council for Geoscience of South Africa).

Mr Marek Graniczny (Technical Coordinator of the project) & Ms Izabela Ploch (Technical Coordinator Support) presented the introduction to the project - "Geoscientific knowledge and skills in the African Geological Surveys".

The workshop was a success, and the following institutions were identified as responsible for co-leading the following key Activities:

### **Activity 1: Coordination "Geoscientific knowledge and skills in the African Geological Surveys"** Feasibility Study

**EGS:** Polish Geological Institute – National Research Institute (PGI-NRI)

**OAGS:** President (Geological Survey of Namibia) and Vice-President (Geological Survey of Niger)

### **Activity 2: "Activities needed to strengthen OAGS"**

**EGS:** Geological Survey of Denmark and Greenland (GEUS) and EuroGeoSurveys Secretariat (EGS)

**OAGS:** Secretariat (Council for Geoscience of South Africa) and Geological Survey of Ivory Coast

### **Activity 3: "Gap Analysis of Geoscientific Mapping"**

**EGS:** Czech Geological Survey (CGS), and BRGM (France) with the contribution of the Giraf Network

**OAGS:** Geological Survey of Namibia and Geological Survey of Senegal

### **Activity 4: "Mineral Resources Assessment Gap Analysis"**

**EGS:** Geological Survey of Finland (GTK), GeoZS (Slovenia), GEUS (Denmark) and SGU (Sweden)

**OAGS:** Geological Survey of Nigeria, Geological Survey of Ghana, Geological Survey of Ivory Coast and Council for Geoscience of South Africa

### **Activity 5: "Geohazards Mapping and Monitoring and Geoheritage gap analysis"**

**EGS:** Geological Survey of Lithuania (LGT), IGME (Spain) and ISPRA (Italy)

**OAGS:** Geological Survey of Algeria, Geological Survey of Mozambique and Council for Geoscience of South Africa

### **Activity 6: "Capacity Building and Training Concept"**

**EGS:** Institute for Environmental Protection and Research - Geological Survey of Italy (ISPRA), BRGM (France), CGS (Czech Republic)

**OAGS:** Geological Survey of Niger and Geological Survey of Botswana

A second EGS-OAGS workshop will take place in Brussels on 27th March 2014, in the framework of the EGS General Meeting.

## Clemens Reimann honoured with Gold Medal for outstanding scientific achievement in exploration geochemistry

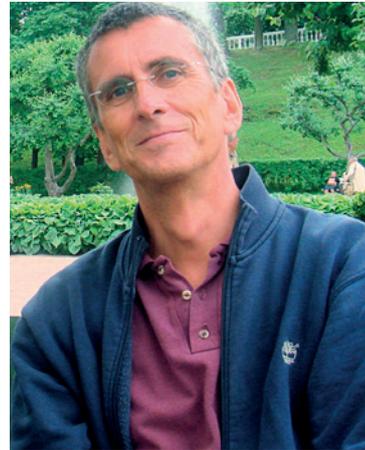
Clemens Reimann honoured with Gold Medal for outstanding scientific achievement in exploration geochemistry

EuroGeoSurveys congratulates and is proud to announce that the chair of the EGS Geochemistry Expert Group, Clemens Reimann, has been honoured with the Gold Medal from the Association of Applied Geochemists. The award comes as recognition for his exceptional contributions to the scientific fields of exploration and environmental geochemistry and geochemical mapping, and his exemplary service in promoting the exchange of ideas and the dissemination of information in these fields. Mr. Reimann was officially presented with the award

during the 26th International Applied Geochemistry Symposium on the 19th November 2013 in Rotorua, New Zealand.

The «Gold Medal» is the highest award the Association of Applied Geochemists bestows and up to now there have only been six other such commendations – Mr. Reimann becoming the first European to receive it.

Mr. Reimann has been a pioneer in regional geochemical mapping, from the initial planning and organisational stages, through to sample collection and analysis, to data analysis and interpretation.



**Clemens Reimann**  
EGS Geochemistry Expert Group Chair

## The COBALT project contributing to building of awareness, learning and transfer of knowledge on sustainable use of raw materials

Achieving a more sustainable management of raw materials requires integrating the expertise and views of a multitude of different actors across the entire value chain as well as life-cycle from exploration, extraction through production and final consumption to re-use and after-use. Discussions and debates on these issues must, therefore, include industry and businesses perspectives, as well as policy making, civil society, science and academia. Thus, COBALT project aims to bring together these stakeholder groups and stimulates a joint debate on sustainable raw materials management.

COBALT project focuses particularly on identifying the best ways to put sustainable raw materials management into practice, help inform future innovation activities, and support the European Innovation Partnership on Raw Materials. In doing so the proposed project runs a series of workshops and two large European-wide conferences enable knowledge exchange and debate on current challenges and future

options regarding the sustainable management of raw materials in Europe and beyond.

The Institute for Managing Sustainability is coordinating the COBALT project ([www.cobalt-fp7.eu](http://www.cobalt-fp7.eu)) which is funded by FP7 under the Environment (including Climate Change) theme and runs from May 2013 until April 2015.

## Sustainable Aggregates Planning in South East Europe

The goal of public policies, and the planning undertaken to implement them, is to connect desired ends with practical means for their achievement. How the desired ends are determined, and whose goals and objectives they incorporate, depends upon the culture and political system of the country in question. This has led to a diversity of approaches to aggregates policies, planning and management in South East Europe. Aggregates policies are declared governmental objectives; planning is the creation of formal procedures to be followed to achieve objectives; and management is the administration of plans.

Unfortunately, there are dislocations among mineral policies, plans and management at different political scales within and across the region that are hindering resource efficiency and economic development. Policies and plans are distributed among many different legal documents, making coordination difficult, and often the capacity for aggregates planning is inadequate. Further, there is an almost complete lack of coordination between planning for primary and secondary aggregates, with competence and capacity typically residing in different authorities. Many countries and regions lack the necessary data to manage aggregates sustainably or ensure secure, sustainable supply and the level and nature of stakeholder participation in the development of aggregates management plans differs and in many countries is either limited or nonexistent.

Partners who participated in the Sustainable Aggregates Resource Management Project ([www.SARMaProject.eu](http://www.SARMaProject.eu)) recognized the gap between their enhanced understanding of sustainable aggregates management (SARM) and sustainable supply (SSM), and the existing aggregates plans in their countries. They, together with additional new partners, initiated the Sustainable National Aggregates Planning in South East Europe (SNAP SEE) project to address the question: how can SEE countries improve their aggregates planning processes, integrate

planning for primary and secondary aggregates to increase resource efficiency, and raise capacity levels among authorities, industry and civil society with respect to aggregates management, planning and supply. New partners joined the SNAP-SEE project to learn about SARM and SSM and to enhance the quality of planning in their countries. The composition of partnership in the SNAP-SEE project reflects a mix of the institutions involved in planning of primary and secondary aggregates supply in the SEE area, including Ministries, regional authorities, and the quarrying and recycling industries, plus civil society.

Figure 1 shows the 14 participating countries (AT, BG, GR, HU, IT, RO, SK, SI, AL, BA, HR, ME, RS, TR) of the 27 partners. There are representatives of old and new EU member states, as well as candidate and potential candidate countries, bringing together various levels of experience so as to capitalize on existing knowledge. The project (SNAP-SEE, SEE/D/0167/2.4/X) runs from October 1, 2012 through September 30, 2014, and so is now slightly past the half-way point.

SNAP SEE is identifying best practices in planning and creating a suite of supporting materials to raise the quality of strategic

aggregates planning in SEE countries. Partners are developing a Toolbox for Aggregates Planning in SEE that will contain: a Handbook on Capacity Building and Stakeholder Consultation, a Handbook on Data and Analysis Methodologies, National Planning Guidance reports and a Vision for Aggregates Planning in SEE, i.e., a description of the principles that will achieve the objectives of resource efficiency, high rates of recycling, and sustainability, and an

Aggregates Planning Scheme, i.e. a set of generic planning modules that embody the principles, approaches and actions necessary to achieve the goals of the Vision plus a framework that shows how they fit together.

The work of SNAP SEE is divided into 6 Work Packages. The 4 thematic WPs are closely interlinked, with interim outputs feeding to other WPs. To date, a set of Powerpoint presentations on SARM, SSM, data and analysis methods, and other background information have been prepared and translated into all partner languages so as to ensure a common base of understanding. Partners are sharing these materials with their stakeholders during National Consultations

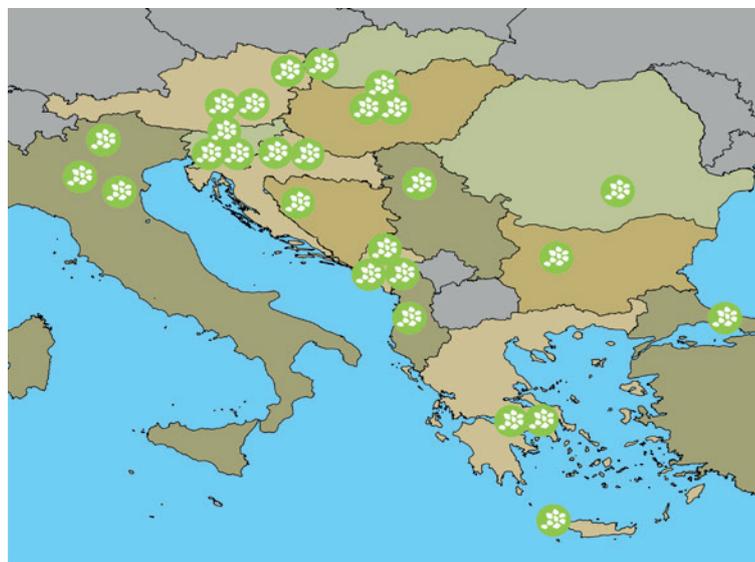


Figure 1. The SNAP SEE project has 27 partners in 14 countries.

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(Fig. 2), along with information about the primary and secondary aggregates industry and current state of planning in their respective countries. During a 2nd consultation partners and stakeholders will identify best planning practices in their countries, and create National Guidance documents on how planning can be improved. This suite of recommendations will form the basis for the SEE Vision document. In addition, these results will be utilized in the Aggregates Planning Toolbox and Scheme.

Each partner is preparing a flow diagram that describes their planning process. Figure 3 shows the scheme for Parma Province in Italy. These will be merged into a generalized flow diagram of best planning practice. Each step will be linked to specific recommendations regarding primary and secondary aggregates policy and planning and examples of text that could be used in planning documents. This result, plus the Vision, will form a road map to better aggregates planning practice in SEE.

The SNAP SEE partners have been very active during the first year of this two year project. We invite you to visit the project website ([www.snapsee.eu](http://www.snapsee.eu)) or to contact us to learn more about our process and interim results. All SNAP SEE products will be available on the website in all partner languages, as well as in English.

## G. Tiess

University of Leoben, Austria  
 Guenter.Tiess@unileoben.ac.at



## D. Shields

Colorado State University, USA &  
 Politecnico di Torino, Italy  
 dshields@colostate.edu



Figure 2. First National Stakeholder Consultation in Slovenia

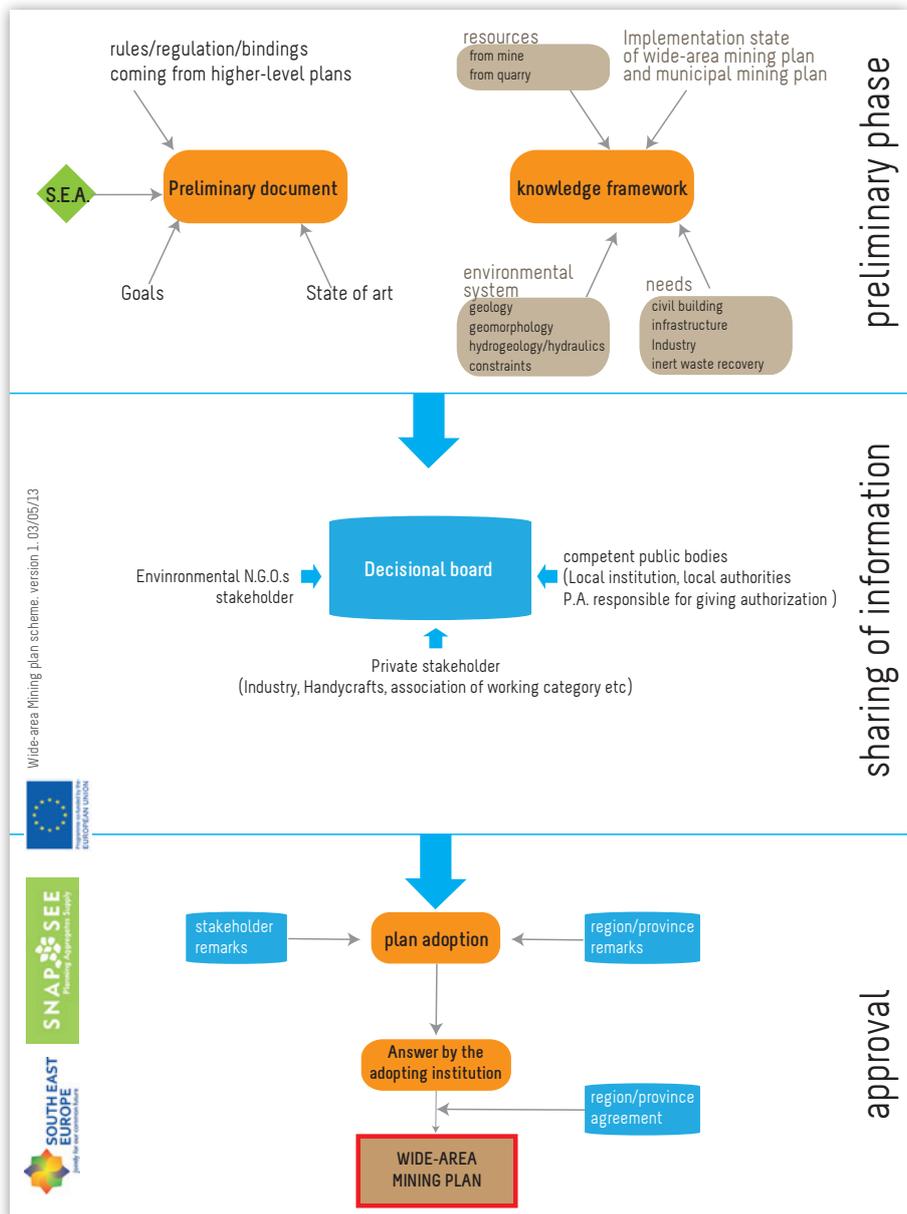


Figure 3. The Planning Scheme diagram for Parma Province in the Emilia Romagna Region, IT

## New Vice-President of EuroGeoSurveys

From January 2014, Mr. Koen Verbruggen, Director of the Geological Survey of Ireland (GSI), has joined the Executive Committee of EuroGeoSurveys in the position of Vice-President. We wish Koen much success.

EuroGeoSurveys is most grateful to the outgoing Vice-President, Mr. Peter Seifert, Director of the Geological Survey of Austria (GBA), who has been an example of seriousness and commitment to the EGS values.



## New Director of the State Geological and Subsurface Survey of Ukraine (SGSSU)

Mr. Roman Storozhev has been appointed as the new Head of The State Geological and Subsurface Survey of Ukraine (SGSSU). EuroGeoSurveys congratulates Roman on his new appointment and welcomes him to the EGS Board of Directors.

## EGDI Corner



## Sharing geological information

The vision of the EGDI is to build a platform to enable the sharing of geological information, tools and services with policymakers and those in other disciplines. These goals are widely held and there are many examples of other infrastructures and specifications that can facilitate this exchange. As one element of the conclusion to the EGDI Scope project, a session on e-infrastructures will be led by the project team at the European Geosciences Union General Assembly held in Vienna 27th April -2nd May 2014.

The session will focus on collaboration. It will enable exchange of methods and ideas between those working in different disciplines to discuss the integration and harmonisation of geological information and services. These will inform on-going European and global initiatives, such as those through EuroGeoSurveys, INSPIRE, One Geology and research infrastructures such as EPOS.

The call for abstracts is open until 13:00 CET 16th January 2014. Please submit an abstract and consider attending to contribute your experience and views or to find out what is happening in Europe and globally. Listen to what stakeholders want and what we can all do to satisfy these needs.

# Interview with Prof. Bloeschl

President of European Geosciences Union

## Could you summarise the EGU scope and goals, and how the organisation is evolving over time?

The EGU, the European Geosciences Union, is the leading European organisation that aims to promote cooperation and discussion among researchers in the Earth, planetary and space sciences for the benefit of humanity, worldwide. It covers a very broad range of disciplines, from the Earth's internal structure and atmosphere to solar-terrestrial sciences and planetary exploration, including climate, oceans and freshwater, energy and resources, and many more scientific topics.

As a union with over 11,000 individual members from all over the world, we foster the development of relevant disciplines through the organisation of conferences, the most important of which is the annual EGU General Assembly. Further, we publish 15 diverse journals with an innovative, interactive open access format that the EGU pioneered with its publisher Copernicus. We have an awards and medals programme to promote the geosciences in Europe. Many of the world's top geoscientists are recipients of a prestigious EGU award. We also aim to engage the broader public and, to this end, organise a number of education and outreach activities, including workshops for teachers, press releases and a strong social media presence.

The organisation was established in September 2002 as a merger of the European Geophysical Society and the European Union of Geosciences. Since then the EGU has greatly evolved, establishing an Executive Office in Munich in 2010. The Union has enriched its publications portfolio by launching over 10 journals in as many years, with publications such as Hydrology and Earth System Sciences becoming leading journals in their field. Last but not the least, the attendance to EGU General Assemblies has steadily increased, reaching 9,000 participants in 2009 and surpassing 11,000 in the past couple of years. The meeting is now the largest and most prominent European geosciences event.

## As the President of EGU, what is your vision for the future of European geosciences and the role the EGU will play in their development?

In a world that is changing rapidly, the geosciences have an increasingly important role to play in a Europe-wide open space for knowledge. There is a drive to better understand the Earth system in order to improve the scientific knowledge base. Embracing the full complexity of the coupled, non-linear processes governing the Earth system is still a major challenge. Geosciences are also extremely relevant to society. Understanding and anticipating natural hazards such as floods and earthquakes, and optimising resource use of energy, water and other raw materials in the light of sustainable development are of key societal and economic relevance.

Most of these problems involve long time scales; therefore, the future of European geosciences should rest on solid foundations

and long-term strategies. The EGU has helped strengthen the science base of all of these challenges, and will continue to do so. Further, my vision for the future is for the EGU to strengthen the connection between geoscientific research and decision making by providing advice and forward-looking recommendations on societal issues related to the geosciences.

To do so, it is important to improve collaboration between countries and scientific disciplines. The EGU can play an important catalytic role in enabling researchers to increasingly cooperate across borders to enhance the competitiveness of geoscientists in Europe. The Union also has a key role to play in helping strengthen connections across the geosciences. There is a lot the different Earth sciences can learn from each other and the EGU is a superb forum for achieving this, given its interdisciplinary nature and the collaboration between different scientific divisions during its annual General Assembly. Many of the most interesting research questions are interdisciplinary, so connecting them can make a huge difference to our understanding of the geosciences.

We cannot talk about the future of geosciences without mentioning young researchers: our biggest resources are the talent and enthusiasm of young scientists. In this regard, the EGU supports, and will continue to support, an environment that fosters a free and open exchange of ideas, according to the bottom-up philosophy of the EGU, where contributions of each individual are valued and encouraged. In the future we aim to raise the level of excitement and relevance of the geosciences amongst young researchers by encouraging them to take up leadership positions within the EGU as conveners, session chairs and journal editors. We should also strive to educate a new generation of 'generalists', who are much needed in cooperating with decision makers.

## One of the most prominent geoscience events is the annual EGU General Assembly. In what ways could the meeting contribute to achieve your vision for the future of European geosciences and the EGU?

The General Assembly, as the highlight of the EGU calendar each year, is crucial to achieving the vision I described above for the future of geosciences and the Union. The focus goes to fostering collaboration across international borders and scientific disciplines at the meeting and to get scientists to be inspired by presentations outside their core area of expertise. The EGU truly embraces all the geosciences and is proud to host a meeting of so much diversity, with people from more than a hundred countries, from countless disciplines and cultural backgrounds.

Increasing importance is also given to young people. About half of General Assembly participants are under 35 years old and we aim to increase this by providing more financial support to young



researchers, particularly from economically disadvantaged countries in Europe. The EGU is also reaching out to even younger audiences by spreading first hand scientific research to teachers at the Geosciences Information For Teachers (GIFT) workshops at the Assembly.

In addition to giving a more prominent role to young scientists at EGU General Assemblies and fostering interdisciplinarity, we aim to improve the organisation of high-quality special sessions and continue to promote excellence in geoscientific research through our awards and medals, which are presented at the conference. We further aim to improve the role the General Assembly plays in fostering innovation by identifying which future advances can be generated from basic research in the geosciences and improving discussion in these areas.

### **The next General Assembly is taking place in Vienna from 27 April to 2 May 2014. What will be the key features of this meeting?**

The EGU 2014 General Assembly will have the same overall setup of previous years, bringing together over 11,000 scientists from around the world. The meeting will feature a vibrant programme of some 500 scientific sessions, workshops, short courses and great debates.

A key development for the next EGU meeting is the introduction of a theme: The Face of the Earth – Process and Form. Like a human face, our planet exhibits a large diversity of intricate shapes and patterns. In the dynamic Earth system, processes continuously create, modify and destroy specific forms while, at the same time, individual forms and larger patterns constrain how processes operate. The Face of the Earth theme intends to celebrate the diversity of geoscience processes and the great variety of associated forms, across all scales and from the core of the Earth to interplanetary space. This diversity is reflected in the five subtopics of the 2014 meeting: Rocks of the Earth, Waters of the Earth, Life of the Earth, Atmosphere of the Earth, and Space and the Earth.

We will further improve the General Assembly by continuing to implement key developments in scientific presentation, discussion and navigation from the past couple of years. To help participants navigate their way through the meeting programme using their smartphones and enhance their conference experience, we are also improving the General Assembly app, introduced in 2012. To improve interaction, we will also increase the number of PICO (Presenting Interactive Content) sessions, first implemented in 2013. PICO is a novel presentation method that combines the strengths of oral and poster presentations, giving authors a platform to introduce their research to an interactive audience on large display panels, followed by group viewing and stimulating discussions.

### **Nowadays networking and building synergies is increasingly important for success. International geoscientific cooperation could be strengthened further, particularly between EGU and EGS, two organisations with several common goals. In what ways do you think European geosciences would benefit from improved cooperation between EGU and EGS?**

The EGU recognises the importance of international geoscientific cooperation, as reflected by the agreements we have with sister organisations in America and Asia. Within Europe, the cooperation between EuroGeoSurveys and the EGU is natural because the two organisations have similar goals and complementary strengths. The EGU brings together the international research community while EGS has an operational role, focusing on the applications of the geosciences to the society and economy in the EU.

The benefits of these cooperations are clear: fulfilling the role of promoting research in the Earth sciences in Europe and elsewhere; effectively communicating scientific research to decision makers, professionals in academia, government agencies and the private sector, as well as to the general public; providing advice to European funding bodies and expert panels; and contributing to the education and training of the next generation of Earth scientists.

To achieve these goals, the EGU and EGS are cooperating closely during next year's General Assembly. The two organisations are collaborating in the organisation of a science policy session at the conference aimed at informing geoscientists about the role they can play in public policy. Further, for the first time this year, EGS will have an exhibition booth at the EGU meeting and will co-sponsor scientific sessions.

There is also scope for collaboration outside the General Assembly. As the EGU increases its role in communicating geoscientific research to policymakers – the field of expertise of EGS – joint activities in Brussels could be considered. Joint publications targeting both the EGU's and the EGS's constituents are another option. The two organisations are also cooperating, together with other associations, to see the geosciences included as a specific and independent research field in the Euraxess classification, improving access to funding and jobs for researchers in this field.

#### **Prof. Bloeschl**

Professor of Hydrology and Water Resources at TU Wien, is the current EGU President



# Message from Expert Groups

## Interview with Dr. Gerardo Herrera

Chairman of the Earth Observation and Geohazards Expert Group (EOEG)

**You have just been appointed Chair of the EGS Earth Observation Expert Group (EOEG). You are inheriting the challenging work initiated by Prof. Stuart Marsh. What will be the main actions you intend to pursue in this new role?**

Following the work started by Professor Stuart Marsh I would like to help increasing Earth Observation and Geohazards activities of the European Geological Surveys (EGS) within the Group of Earth Observation (GEO) and Global Monitoring for Environment and Security (Copernicus). EOEG members now have a strong GEO and Copernicus portfolio of projects that address geohazards, also achieving a breakthrough for minerals tasks in GEO. Through these projects remote sensing data has been used to map and monitor geohazards like flooding, subsidence, landslides, volcanoes and earthquakes at a European level. EOEG members played a key role combining remote sensing data and geological expertise to deliver high level products for the definition of the risk associated to geohazards. The forthcoming launch of the ESA Sentinel missions has to certainly give the opportunity to systematically extend the activities of mapping, monitoring and forecasting in wide areas of the planet never or just occasionally covered beforehand. Taking into account EGS strengths gained in Earth Observation and Geohazards and the cross group collaboration capabilities, the EOEG could work towards

the implementation of specific Geohazard exploitation platforms where remote sensing technology and innovative geo-scientific knowledge are combined to monitor geohazards, providing usable tools and products embracing all the disaster cycle phases including prevention, preparedness, response, and recovery.

**In January 2014 the GEO Ministerial Summit will take place. Also this time EGS will be present with a very high-level delegation. What will be the main position EGS will bring there?**

Maybe it is too early for me to say just been appointed chair of the EOEG in December 2013. However, from the EOEG perspective I believe that a Geo-hydrological Risk Exploitation Platform targeting geo-hydrological hazards (flooding, landslide, subsidence, etc.) is necessary to complement the Global Earth Observing System of Systems (GEOSS) SuperSites Exploitation Platform (SSEP), which mainly targets earthquakes and volcanos.

In terms of a new focus, minerals represent a growing opportunity within GEO and Copernicus related activities that the EOEG will actively push forward through the EGS point of contact for minerals in GEO.

## Earth Observation Expert Group

**EOEG from its creation in December 2009** exists to increase the quality, efficiency and cost-effectiveness of EGS members' science delivery and to capitalise on European and International Earth Observation (EO) science opportunities. It's doing this by ensuring that members share their EO expertise and research, utilise state-of-the-art in-situ, airborne and satellite EO techniques and datasets, and pool their EO expertise, experience, resources and facilities to pursue opportunities related to the Global Monitoring for Environment and Security program (Copernicus) and the FP7 SPACE and ENVIRONMENT Themes. Several EOEG members have played a key role in relevant EU funded projects, where the combination of Earth Observation data, in situ data and geological expertise permitted to deliver high level products for the definition of the risk associated to geohazards. Through the execution of these projects EuroGeoSurveys is helping GEO to create a Global Earth Observing System of Systems.

**In 2013, several EOEG members have played a key role in a growing portfolio of EU funded projects where new GMES services have been developed.** Four of the five GEO related FP7 and GMES were concluded in 2013. EO-Miners ([www.eo-miners.eu](http://www.eo-miners.eu)) targets monitoring mineral resources exploration and mining, observing their impact on the

environment and society. Subcoast ([www.subcoast.eu](http://www.subcoast.eu)) provides a service for monitoring and forecasting subsidence hazards in coastal areas that can influence on flood risk around Europe. Doris ([www.doris-project.eu](http://www.doris-project.eu)) fulfils the gap in GMES Emergency services for detecting, mapping, monitoring and forecasting landslides. Firstly, Terrafirma ([www.terrafirma.eu.com](http://www.terrafirma.eu.com)) and then PanGeo ([www.pangeoproject.eu](http://www.pangeoproject.eu)), for which EGS has federated the geological survey input from the EU27, provide a Geohazard Information Service for 52 urban areas across Europe. The geohazard information in each city combines InSAR derived ground motion and geological information, being accessible through PanGeo webservices via open access.

**The 2013 was a year of changes for Earth Observation Expert Group (EOEG), changes in chairmanship, changing topics, and ready to face new challenges.** During EOEG meeting held in Brussels on the 7th of February, following the National Delegates meeting recommendations, it was decided that the Expert Group would be renamed into Earth Observation and Geohazards Expert Group trying to embrace more members from both Earth Observation and Geohazards communities. In June 2013, two new positions (deputy Chairs) were created to assist the EOEG Chair, Stuart Marsh (BGS, UK): Deputy Chair



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(for GeoHazards): Eleftheria Poyiadji (IGME, Greece) and Deputy Chair (for Earth Observation): Claudie Carnec (BRGM, France). Finally, after the leave of Stuart Marsh on the 30th September as the Chair in Geospatial Engineering in the Nottingham Geospatial Institute, Gerardo Herrera (IGME-Spain) was appointed as Chair of EOEG in December 2013.

## In 2014, the EOEG faces new Earth Observation and Geohazard opportunities will arise from the EGS members collaborative action

in ongoing FP7 projects ([www.egdi-scope.eu](http://www.egdi-scope.eu) and [www.lampre-project.eu](http://www.lampre-project.eu)), the new Copernicus and H2020 programs and the forthcoming launch of the ESA Sentinel missions, which will certainly give the opportunity to systematically extend the activities of mapping, monitoring and forecasting geohazards in wide areas of the planet never or just occasionally covered beforehand. In this framework, the EOEG together with key scientific partners from Doris and Subcoast projects replied in November 2013 to ESA request for information to implement Thematic Exploitation Platforms by pointing out the strong need of a Geo-hydrological risk Exploitation Platform (GEOREP), where remote sensing technology and innovative geo-scientific knowledge would be combined to monitor geohazards, providing usable tools and products embracing all the disaster cycle phases including prevention, preparedness, response, and recovery.



**Gerardo Herrera**  
Chairman of the Earth Observation and GeoHazards Expert Group



**Eleftheria Poyiadji**  
Deputy Chair of EOEG



**Claudie Carnec**  
Deputy Chair of EOEG

## InGeoCloudS - Inspired GEOdata Cloud Services



**InGeoCloudS**  
Inspired GEOdata CLOUD Services

### What is InGeoCloudS?

InGeoCloudS is a cloud-based infrastructure to publish and share geo-data on the Internet. It features a set of web tools permitting import and synchronisation of data, advanced customized mapping and generation of OGC/INSPIRE compliant services. Data providers also have the possibility of easily modelling and linking their own data with peers' data following Linked Open Data principles, thus making their data rated 5\* (five star).

**InGeoCloudS services are free** up to certain volumes of data and internet traffic. Behind the scene, cloud technology proposes unlimited resources in terms of storage and computing power – it scales transparently and in a semi-automated manner, while offering up-to-date underlying technology. It enables InGeoCloudS to implement a pay-as-you-go/pay-per-use delivery model with potential reduction of traditional IT infrastructure provisioning and maintenance costs.

InGeoCloudS groups eight partner institutions from five different countries. The project is partially funded by the European Commission under the CIP-Pilot actions program. Current pilot proposes several environmental data and services scenarios spanning hydrogeology and natural hazards applications.

### Assessing InGeoCloudS technical and economical pertinence

In November 2013, InGeoCloudS organized its second public workshop in Brussels

The workshop benefited from the intervention of 4 invited speakers, including Luca Demicheli from EuroGeoSurveys, Robert Tomas from the EC/JRC, Vitor Correia from the European Federation of Geologists (EGF) and Rob van der Krogt from the EGDI-Scope project. It allowed tackling some fundamental questions around InGeoCloudS thematic:

- Why Cloud Computing and How?
- Opportunities of Linked Open Data?
- Facilities for fulfilling INSPIRE-related obligations

### Why Cloud Computing and How?

From an IT resource management point of view, hardware and network resources have become a critical bottleneck and major cost item. Moreover, data producers, whether they are national/governmental organisations or private actors, must face uneven usage of their services, especially in the case of environmental data and crisis situations (e.g. post-earthquake consultation of data, events leading to local pollution of waters, etc.).



# Message from Expert Groups

Cloud computing seems to offer a pertinent response to these problematic through rapid provisioning (scaling) and release (downsizing) of resources, self-service and low-prices promoted by IaaS (Infrastructure as a Service) providers.

Discussions highlighted the importance of transparency and control demanded by the users: "Where are my data physically located? Do I have clear view and control on my cost items? Is reversibility (back to home-infrastructure) ensured? Is it really competitive from an economical point of view? How is such a cloud-based infrastructures governed?"

The different presentations made by the team tried and presented how InGeoCloudS infrastructure answers these requirements:

- Usage of one the most popular and efficient IaaS, provided by Amazon in its European data centre (Ireland) and constant effort of isolating technical dependencies in order to ensure cross-compatibility with other cloud providers and open source solutions like Openstack.
- Additionally to built-in data and application persistency at the infrastructure level, technical RESTful APIs propose on-demand back-up of data and various synchronization mechanisms between in-house data and the cloud.
- The six use cases integrated in current Pilot, data and services brought by the 5 institutions currently generate an average cost between 700 and 1000 Euros monthly, which is considered competitive. InGeoCloudS integrates monitoring and supervision tools that allow the consortium to keep a watchful eye on the resource consumption and induced costs, distributed by data provider. It allowed so far a clear view on accounting and fair share of costs.
- Governance based on a clear identification of responsibilities, share of costs and revenues is of the utmost importance in order to ensure sustainability of any innovative solution. The project is building detailed exploitation plans mainly leaning on well-identified offers supported by business partners, collaboration with other projects and initiatives, systematic share and dissemination of scientific outcomes and usage benefits.

## Why Linked Open Data?

-Linked Open Data technologies come as a candidate solution for answering fundamental requirements frequently faced by data providers:

- **Data/information integration:** data comes out of silos through publication on the Web, sharing and linking with peers data.
- **Data retrieval in a uniform way:** same tools and technologies are used for discovering and searching data from different domains, thus enriching data consumers experience.
- **Data export** to other formats (e.g. INSPIRE compliant XML formats)

An open and extensible conceptual model (GSOM) integrates and covers the thematic fields so-far addressed in the project's six pilot user scenarios (hydrogeology and natural hazards) and therefore a wide range of geo-data.

Decisions about what and how data and datasets are included remain entirely with the scientific experts, who devise the use

cases, standardise data definitions, develop and specify formal conceptual models for semantically linking the data. This not only leads to simplified technical integration workflows, but also fosters the emergence of new and efficient services: as an example, embedded linked data technology and data integration facilities allowed the creation of new search and display services (SmartQueries), enabling scientists to easily publish and disseminate pertinent/popular data searches, potentially including correlation with other domains data.

## Facilities for fulfilling INSPIRE-related obligations

Many legal obligations make it mandatory to publish and share environmental information. The 2007 Infrastructure for Spatial Information in the EC (INSPIRE) Directive establishes rules for geographic and environmental data (geodata) supporting environmental policies or relating to any activities which might have an impact on the European environment, to ensure that the geodata were consistently available, interoperable and usable across European regional and state boundaries. The consequence of the Directive is a requirement that geodata definitions follow agreed and established norms standards and that the data be readily available online. InGeoCloudS supports data providers in fulfilling their obligations with regards to INSPIRE through dedicated Web tools and data-mapping facilities. The workshop included hands-on session for discovering and learning InGeoCloudS Data Publication online tool (which allows design and production of WMS/WFS/CSW web services), Linked Open Data facilities (including export towards INSPIRE data models) as well as the accompanying RESTful APIs for an even more customised usage.

## InGeoCloudS Recent Achievements and Perspectives for 2014

At the service offering level, the InGeoCloudS project reached in October 2013 a major milestone by opening its Pilot2 services on the Internet to external data providers (see notably free trials opportunities described on our site).

The heterogeneity of current use cases and of their initial "IT-maturity" provides an interesting mix and illustrates the diversity of data providers requirements; it is also a very useful collection of experiences that will be documented in details for those who want to use the cloud infrastructure to publish public data, regardless whether they rely on the InGeoCloudS infrastructure or not.

In 2014, the consortium is completing the definition and implementation of governance structures and collaboration agreements for ensuring sustainability of InGeoCloudS. In parallel, responsive support services are developed including helpdesk, comprehensive documentation and training material.



**Benoit BAURENS**  
(AKKA Informatique et Systèmes)  
InGeoCloudS Project Coordinator  
Contact: benoit.baurens@akka.eu  
[www.ingeoclouds.eu](http://www.ingeoclouds.eu)

## Minerals are forever

### Raw materials boom upgrading EU minerals value chain

#### Changing times for minerals

One of the earlier James Bond films had the name «Diamonds are forever», and this might probably be true. There is on the other side no doubt that minerals added value applications and industrial end-using do last forever. After a «low profile» for a longer-time period, during 80s and 90s, minerals are back as a priority Raw Materials (RM) resource to secure EU's industrial supply needs, in order to achieve a sustainable and competitive growth. As a matter of fact the growth of industrial economies, like for instance the BRIC countries, has led to a tremendous upward spiral of mineral consumption, in this case accompanied by a shift of emphasis to base metals and industrial minerals for steel manufacturing and building. In a sense, it is widely recognized that, along with increasing global population, China is changing RM production and demand. This demand is nowadays becoming so great that even low-grade and deep-seated mineral concentrations can reasonably be considered ore deposits. This means of course the European mineral industry should probably have to be reshaped accordingly, in terms of exploration and exploitation practices, whereas at the same time the EU has to address these challenges so that the appropriate technologies, processes and products are in place, along with adequate policies to implement and stimulate the required changes. Europe is not self-sufficient in the extraction of essential raw materials (e.g. EU stands for more than 20% of the global consumption but produces only 3% of the world metals) for efficient up- and downstream industrial production, sound functioning of the economy and progressing employment (about 30 million EU jobs depend on the availability of raw materials), skills, competences and expertise opportunities. This requires resource efficient, reliable and undistorted access to mineral raw materials from indigenous primary and secondary sources in the EU.

#### Raw materials initiatives at EU level

In November 2008 the EU launched the non-energy Raw Materials Initiative (RMI - <http://ec.europa.eu/enterprise/policies/raw-materials>) and the Roadmap for a Resource-Efficient Europe (<http://ec.europa.eu/resource-efficient-europe>). Following the Raw Materials Initiative, on 2 February 2011 the European Commission adopted a strategy document which sets out targeted measures to secure and improve access to RM for the EU. To develop this new strategy the Commission proposes concrete targets to be achieved by 2020 at the latest, such as up to ten innovative pilot actions (e.g. demonstration plants) for exploration, extraction and processing, collection and recycling substitutes for at least three key applications of critical and scarce raw materials enhanced efficiency in material use and in prevention, re-use and recycling of valuable raw materials from waste streams, with a specific focus on materials having a potentially negative impact on the environment, a Network of Research, Education and Training Centers on Sustainable Mining

and Materials Management European standardized statistical instruments for the survey of resources and reserves and a 3D geological map, a dynamic modelling system linking trends in supply and demand and a full lifecycle analysis a pro-active strategy of the EU in multi-lateral organisations and in bilateral relations, such as the US, Japan, Australia in the different areas covered by the Partnership.

A programme of European Innovation Partnerships (EIPs) was established by the Commission in 2010 as part of the Innovation Union flagship initiative. The EIP on Raw Materials (EIP-RM) will promote innovation along the entire value chain of raw materials (i.e. raw materials knowledge base, exploration, licensing, extraction, processing, refining, recycling, substitution) involving stakeholders for relevant upstream and downstream sectors (<http://ec.europa.eu/enterprise/policies/raw-materials/innovation-partnership>). The overall objective of the EIP-RM is to contribute to the 2020 objectives of the EU Industrial Policy to increase the share of industry on GDP to 20%, the Innovation Union flagship initiative, and the Resource Efficiency Policy by ensuring the sustainable supply of raw materials to European economy and society. This will be achieved by reducing Europe's import dependency on the raw materials that are critical to Europe's industries (<http://ec.europa.eu/enterprise/policies/raw-materials/critical>), providing Europe with enough flexibility and alternatives in the supply of important raw materials, making Europe a leader in the capabilities related to exploration, extraction, processing, recycling and substitution and taking into account the importance of mitigating the negative environmental and social impacts of some materials during their life cycle. The EIP RM Strategic Implementation Plan (SIP-<http://ec.europa.eu/enterprise/policies/raw-materials/innovation-partnership>), published at 25 September 2013 and launched officially at 5 December 2013 addresses all actions necessary to achieve the objectives and targets, including research and development along the value chain, raw materials intelligence, revisions of selected legislations, licensing steps, standardisation, and policy dialogues. Actions by EU institutions alone will not be sufficient, nor will funding from the EU budget alone. This is why the European Commission is launching an open call for commitments by actors in the private, public and non-governmental sectors including academia.

#### Unlocking mineral resources potential of Europe

It has generally been stated that the reason for the difference between consumption and production is to a large extent due to the lack of many commodities in European crust, i.e. the geological potential is lacking. However, this is mainly based on models relying on the current knowledge base of previously and currently mined commodities in Europe and not based on a sound geological estimation of undiscovered resources, and geological mineral deposits and predictive modelling of geology in three



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dimensions down to mineable depth in the European continental or oceanic crust. As a matter of fact, based on recent results from mining related projects, among others the FP7 ProMine project (<http://promine.gtk.fi/>), it can be demonstrated that Europe possesses several "world class" mineral deposits. The evidence of potential metallogenetic belts proves that major new ore deposits may still be found. Europe has a very good potential for extraction of "critical metals", and Europe is a leading technology provider for underground mining. In Europe, especially in the central and southern parts, competition for land is a major concern for the extractive industry (<http://ec.europa.eu/enterprise/policies/raw-materials/files/best-practices>). At the same time there are fewer and fewer new "world class" discoveries made at the surface, and exploration will in the future be focused to a larger extent on deep, hidden resources. This is now a global trend and since the potential for finding new economic metal and mineral deposits is very high in Europe, the fact that most of these will be "blind" and mined in underground mines, will also decrease the burden for land utilisation by extractive industry. The deepest mine in the world is now 4000 meters, and the deepest mine in Europe is 1500 meters below surface. It has been estimated that the in situ value of unexploited minerals at a depth of 500-1000 meters is about € 100 billion.

This will also make possible to develop an EU vision of the world on minerals (EU minerals intelligence) to be in the position to provide the knowledge on the ability to exploit them with respect to sustainability. Europe should become world's key asset in promoting sustainable use of mineral resources. Both primary and secondary resources, in terms of re-use of by-products and mine wastes/tailings should be explored, evaluated and exploited. The SIP of EIP-RM highlights the need for establishing and permanently updating a common and uniform EU Knowledge Base on RM, focusing mainly on Minerals Intelligence Information. National Geological Survey Organizations (NGSO) is the institutions responsible for the collection, management and delivery of data and information relating to mineral resources on land and the marine environment. NGSO have gathered those unique and authoritative databases over many decades, informing many national and EU policies and providing highly knowledge and applied research intensive technical advice to various stakeholder groups. Through EuroGeoSurveys and EU funded projects, NGSO have already taken a number of steps towards the objectives of the EIP-RM in terms of creating a permanent Minerals Intelligence Network structure (providing and delivering web portal, minerals yearbook and statistics, foresight studies) to be part of a sustainable European Geological Service. Examples of ended and ongoing NGSO driven EU projects addressing, and making reference and data sources for developing this pan-European minerals information infrastructure are ProMine, EuroGeoSource ([www.eurogeosource.eu](http://www.eurogeosource.eu)), EO-Miners ([www.eo-miners.eu](http://www.eo-miners.eu)) ERA-MIN ([www.era-min-eu.org](http://www.era-min-eu.org)), SNAP-SEE ([www.snapsee.eu](http://www.snapsee.eu)), and those recently granted and started like Minerals4EU ([www.eurogeosurveys.org/minerals4eu](http://www.eurogeosurveys.org/minerals4eu)), Minventory ([www.minventory.eu](http://www.minventory.eu)) and EURARE ([www.eurare.eu](http://www.eurare.eu)). The ProMine project completed and established a GIS mineral database of about 13.000 deposits, including Critical Raw Materials, an anthropogenic concentrations/

mine wastes database, making potential secondary resources, and the mining district database, to serve as dynamic sources of information and knowledge. Minerals4EU aims to become the leading European mineral information network structure that will provide tools and expertise to enhance resource efficiency, minerals supply security and support sustainable minerals development for Europe. In the EURARE (Development of a sustainable exploitation scheme for Europe's Rare Earth ore deposits) project, an integrated knowledge management system will be created, linking and expanding various European geological databases, detailing both primary REE deposits and secondary REE sources across Europe, and providing for each, techno-economical as well as policy-related information on available or proposed beneficiation and extraction technologies and finally linking the established resources to the European industrial demand. This work will result in the development of the Integrated Knowledge management system for REE exploitation in Europe (<http://ec.europa.eu/enterprise/policies/raw-materials/erecon>). This will make the first REE database to become a potential source of a new pan-European minerals information and knowledge, having also a global value. The Minventory project has been commissioned by the European Commission Enterprise and Industry Directorate-General to carry out an analysis of available geological data to establish the basis for a pan-European database on resources and reserves of non-energy RM. The intention is all this, along with other thematic fields of geoscientific information to make part of the European Geological Data Infrastructure (EGDI- [www.egdi-scope.eu](http://www.egdi-scope.eu)) currently designed, and the new Strategic Research Agenda (SRA) of the European Technology Platform for Sustainable Mineral Resources (ETP SMR- [www.etspmr.org](http://www.etspmr.org)), aiming also at the development of an EU geological knowledge.

## Challenging innovative technologies and new products

For many years, the basic geological exploration and mapping in the EU has been carried out by national geological surveys that have to operate within the constraints of national frameworks and regulations. Today, the full benefits of an appropriate coordination or even integration of some of the activities of the EU's different geological surveys have not been achieved. Yet, innovative thinking based on increased networking and cooperation offers a huge potential to move forward. Setting European standards will facilitate the creation of a uniform EU geological knowledge base, and can also lead to a more cost-effective development and use of required modern technologies, such as satellite-based resource information and advanced 4D computer modelling systems.

Understanding geology in two dimensions is no longer enough to meet the great challenges presented by society's insatiable demand for raw materials. In order to explore, quantify and extract raw materials from the earth's crust it is now essential to understand mineral deposits and their formation in three or even four (including time) dimensions. Through 3D/4D modelling applications and interpretations, ore exploration can extend to deeply seated locations, including deep-sea exploration. Search for deeply concealed metal deposits onshore (>3 km) will reduce



# Message from Expert Groups

environmental impact and provide clean, silent and unseen mines. Calibrating geological models with 'time' (4D) and 'uncertainty' (5D) is in its early stages but is already leading to the improved understanding of some physical processes. Rapid improvements in information, management and modelling systems have made this possible. As these methods mature they will no doubt offer further opportunities for improving the ways mankind discovers models and exploits mineral resources. It is recommended to start this effort with a study looking into the feasibility, state-of-the-art of the technology, costs and benefits, timeframe and opportunities offered by a large-scale 3-D/4-D modelling effort geared towards mineral exploration. This effort should also look into pan-European information systems able to disseminate such large-scale models to stakeholders, as well as their applicability and added value to other domains (groundwater, development of subsurface storage, geothermal energy exploitation, natural hazards impacts mitigation ...).

In the ProMine project pilot actions have been taken for the first robust three-dimensional models of the continental crust down to mineable depth in some of Europe's major mineral belts. The results are "proof of concept" and now call for a coordinated Pan-European action to put Europe in the forefront of "deep exploration". By building on the concept defined in ProMine it is timely to, in full scale, add development of new deep penetrating geophysical technologies, to implement a better understanding for where the mineral deposits have formed in Europe and finally to build knowledge and develop skills among European industry, survey organisations and academia to foster an environment which will attract exploration investment based on a sound knowledge of European mineral resources down to mineable depth. ProMine is therefore promoting smart deep exploration methods and applies predictive 3D & 4D modelling and visualization approaches to identify deep-seated mineral resources. ProMine is also promoting advanced mining methods of deep ore bodies that may lead to reducing the mining footprint. ProMine is also producing new high-value (nano-) metal and mineral products from mining waste and introduces new biotechnologies in processing ore and mining waste.

There are several project initiatives going on aiming at developing exploration concepts and technologies in brownfields and other previously explored crystalline rock areas to demonstrate the exploration concept development and novel applications of deep data acquisition and modeling. The models and estimation of mineral potential may extend to 2 km (optionally to 5 km) depth.

## Public awareness issues in the focus

There is a clear need and demand in enhancing society's opinion on minerals extraction by providing information and related activities about sustainable development of mineral resources, waste management and recycling, implications of knowledge economy, innovation in scientific and technological capabilities, organization of information, education and communication, identifying the factors underpinning the image and the social acceptance of mining, establishing outreach programmes to promote the acceptance of mining, developing education in

mineral resources management and generally ensuring a strong mining industry for Europe. Industry commitment to sustainable development, in terms of minimising any possible adverse effects on the community or environment, is well recognized. The resources sector should be aware that, to maintain its social license to operate, it must engage constructively with communities and stakeholders already at the very early stage of exploration activities. An open and effective social engagement involves transparency and communication on mineral resources economic potential and development perspectives. The accessibility to an interoperable digital data base on European mineral resources will make an efficient tool in achieving high potential exploration areas and new mineral resources. In this respect GIS models should be used interactively for land-use planning purposes, to measure the likely environmental and societal impacts of mineral extraction throughout the entire life cycle from discovery to closure, as well as financial and legislative limitations, as a communication tool to avoid NIMBY issues and conflicts in land use. Also there should be efforts in promoting sustainable management related to the implementation of Environmental and Minerals Policies in Member States, particularly in the field of land use and in mining waste, as well as public procurement, by stimulating and promoting the use of recycled materials, are some of the most characteristic socio-economic challenges, and devising new technologies to identify environmental short and long-term hazards and mitigate their impacts, reduce energy and water consumption in mining and improve the recovery of all the economic part of the resource.

There is a necessity to introduce a new mining industry profile by demonstrating this ability to operate in a progressive, considerate manner and is acting in local partnership with local communities and local economies. On the other hand societies accept that minerals and metals are an integral part of modern everyday life and that the industry is making efforts to decrease its environmental impact and footprint through the use of innovative technologies whilst providing Europe with the necessary raw materials for modern life. Thus, genuine engagement with stakeholders and communities is essential for promoting and achieving sustainable development.

## Global and European stakeholders joint efforts

Minerals related topics returned to the political and research agenda at the European level since the Communication "Raw Materials Initiative (RMI)", the related WG reports on Best Practices and Criticality with respect to non-energy minerals industry, the European Innovation Partnership (EIP) on raw materials, the Europe 2020 Strategic targets towards resource efficiency, as well as several European Research Program (e.g. FP7) calls for minerals related projects. This trend is set to continue across Europe and there should be more synergy among minerals teams of EGS members and other relevant stakeholders to create a critical mass. This development creates a historic opportunity to establish the Mineral Intelligence on an EU level that would be built on existing national /member states capacities and other international ones. All kinds of projects, with respect to the existing funding schemes (e.g. collaborative, coordination and



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support actions etc.) or their possible successors in Horizon 2020, have been or will be used to address these research challenges e.g. ERA-MIN. However to make it really happen a critical mass of all stakeholders involved needs to be created. EGS and NGSO should further strengthen the relations with other relevant bodies or institutions or events by improved communication, coordination and knowledge sharing e.g. ETP-SMR, JRCs, EUROSTAT etc., and improve the links and joint efforts with European Mining Industry representative associations e.g. EUROMINES, IMA, UEPG, EUROMETAUX etc. Connections to other programmes could consider the regional/global approaches, such as the Norwegian perspective on infrastructure, networking and collaborative research, the Fennoscandian ore deposit database (FODD-<http://en.gtk.fi/information/services/databases/fodd>) including Norway, Sweden, Finland, Estonia and NW Russia, the Atlas of geological maps of Circumpolar Arctic 5M by the countries north of 60 degrees N, the Fennoscandian gold transect including Norway, Sweden, Finland and NW Russia, as well as the Finnish Green Mining concept and related project initiatives. The incorporation of mineral resources topics to be addressed as thematic priorities called under the Horizon 2020 and other EU R&D programs and funding schemes make an opportunity for new joint projects, as well as the challenging involvement of representative stakeholders across the minerals value chain in the Knowledge & Innovation Communities (KICs- <http://eit.europa.eu/kics>) initiative on raw materials (sustainable exploration, extraction, processing, recycling and substitution of raw materials) introduced by the European Institute of Innovation and Technology (EIT), to be launched in 2014 under Horizon 2020.

The international cooperation component forms an important and overarching part considering the global aspects and perspective of the European Raw Materials. Enhancing an EU geopolitical role in ensuring access for European companies to raw materials in the world, while respecting as far as possible the European environmental standards, and setting up a pro-active strategy of the EU in multi-lateral organisations and in bilateral relations, such as the USA, Japan, Australia ([http://ec.europa.eu/research/industrial\\_technologies/event-13](http://ec.europa.eu/research/industrial_technologies/event-13)) in different areas of minerals value chain, make examples of priorities. Issues related to Minerals Intelligence Networking and Interoperability, as well as critical raw materials assessments are paid central attention. There have been already developing cooperation actions on Raw Materials with Africa, Greenland, USA, Canada, Japan, BRIC and ACP countries. The EGS was commissioned by DG-ENTERPRISE to carry out a scoping study addressing EU-Africa cooperation on geoscientific issues.



**Nikolaos Arvanitidis**  
Chair of EGS Mineral Resources  
Expert Group

The commission has identified a need to have European standardized statistical instruments for the survey of resources and reserves. To respond this, Mart van Bracht, EGS President, gave a following statement in the first EIP SIP High Level Steering Group meeting: "EuroGeoSurveys welcomes the EIP-RM and expects the EIP will contribute to a more efficient and sustainable exploration, production, recycling and substitution of raw materials in Europe. In that respect geological information and knowledge is of vital importance. The joint Geological Services of Europe, united in EuroGeoSurveys, can provide these information and knowledge. That is why we are pleased that the EIP-RM recognizes the establishment of a Knowledge Base on raw materials. However, we propose to make explicit in the SIP, that geological information and knowledge is a basic layer of this Knowledge Base. This EU geological knowledge base should contain seamless, high quality data and information. To maintain and update this system a permanent structure is necessary. We think that this structure should be part of the SIP. EuroGeoSurveys is more than willing, with help of all their stakeholders, to establish such a permanent structure."

## Interview with Marko Komac

Director General of the Geological Survey of Slovenia

**Dear Mr. Komac, it is probably the first time that a Geological Surveys Director seats in the International Union of Geological Sciences (IUGS) Executive Committee. What will you bring to IUGS, and will this have an impact on the Geological Surveys work?**

I cannot confirm that to be true, as I believe that at least Eduardo De Mulder and Arne Bjørlykke have been the president and a member of the IUGS EC, but it is a fact that there are currently two members of the IUGS Executive Committee that are or were directors of a Geological Survey, dr. Ian Lambert, a former director of Geoscience Australia and myself, the current director of Geological Survey of Slovenia. I'm convinced that this is a reflection of the importance of the general mission geological surveys have in geological community despite the fact that within this same community it is often debated whether surveys can (or even should) perform top scientific research. I see geological surveys as a structure or as an environment that brings together top scientific research and development, public service and market oriented service, where the results of the first are effectively applied into the latter two. Consequentially I hope I could bring to the IUGS an enhanced outreach component so general (and non-geological expert) public could be more informed about what geology is and why it is essential in managing contemporary societal challenges. As I'm as the IUGS EC member responsible for Geoparks and (for now) OneGeology I'm confident that with these two vehicles this goal could be reached. At the same time, still being a director of the Geological Survey of Slovenia, I hope my international endeavours will help my home institution getting larger international recognition and eventually also projects.

**You have recently been appointed as Director of OneGeology, after having served this programme as the European representative for several years. Could you explain the tasks of this new position?**

That is correct and I would thank all individuals and institutions that believed in me and supported me in my activities related to OneGeology in the past. From mid-October I'm the Managing Director of OneGeology, which I take as a big honour. With this appointment Consortium Members have placed a huge responsibility on me and very challenging goals in front of me. It is important that I emphasise that I'm not alone in this new role, BGS is offering the secretarial and technical and BRGM is offering the technical support, while all Consortium Members also actively contribute in-kind. As OneGeology has stepped into the next phase – a Consortium, our main goals are basically the same, but the structure is much more defined, and at the same time more open to non-geological survey institutions. There are several very interesting opportunities open at this very moment that I think OneGeology should and can engage into, and it's very rewarding to work with the individuals who also see the importance and possibilities of this great project.

**Geo-hazards are probably not high in EU Agenda, as should be. This is probably different at the national level, what is the situation in Slovenia?**

You're right about geohazards not being of high priority to the EC and this is always a bit of a puzzle to me. In the past 30 years

roughly 150,000 people in Europe have died because of natural hazards of which geohazards are an important part. In addition hundreds of thousands were affected by the same events, which also caused damages that resulted in 360 billion Euros losses. Now, I understand that EU has other, more serious problems; still costs of natural hazards are not negligible and I would expect EC would take these hazards including geohazards more seriously at the European, cross border level – from the research to the implementation and awareness part. When considering the national level it's inappropriate for me to discuss other European countries, so I'll focus on my country. Despite its small size Slovenia has very versatile geology and consequentially we have almost all geohazards one could imagine, except those related to volcanism, tsunamis and permafrost thawing. Most of the existing geohazards are infrequent and of small extension, yet three of them pose most nuisances to Slovenian society – earthquakes, floods and landslides.

Although Geological Survey of Slovenia is also engaged in tackling the first two, we're not institutionally responsible for them, but we are responsible for landslide issue. In all three areas notable development has happened in the past decade and some very important steps have been made. In short, we have very good seismic network, relatively detailed flood maps for the whole country and in the area of landslides our survey has developed two linked platforms, one containing publicly available high resolution landslide susceptibility maps and other containing publicly available near real-time landslide hazard forecast model based on the precipitation forecast. Despite these achievements there's much more to be done, mainly on the systematic coverage level and on the level of in-depth understanding of geohazard processes. I'm positive we're moving in the right direction and that at least in the case of former we'll get there in five to ten years and I sincerely hope that Europe as a whole will achieve similar level too. Remember, European Union has a responsibility towards its citizens to improve their safety and wellbeing and EuroGeoSurveys through its members' experts can considerably help achieving this goal.



### The Geological Survey of Slovenia in brief

Geological Survey of Slovenia (GeoZS) is a public research institute established by the Government of the Republic of Slovenia. Our purpose is to provide knowledge about the Slovenian geology. In its six departments there are currently 59 researchers (27 with PhD, 3 with MSc, and 30 with BSc) and 30 technical and support staff. The main research fields of Geological Survey of Slovenia are basic geology, regional geology, mineral resources, groundwater, geohazards, geochemistry, environmental geology and IT/GIS. Geological data represent a basis for solving numerous questions of national importance, such as: protection of health and environment, drinking water supply, mitigation of natural catastrophic events, urban planning, prospecting and assessment of mineral deposits, and mineral resource management, etc, so the purpose of Geological Survey of Slovenia is to collect, store, interpret and distribute geological data of Slovenian territory.

## Minerals4EU

**The Minerals4EU project is designed to meet the recommendations of the Raw Materials Initiative and will develop an EU Mineral intelligence network structure delivering a web portal, a European Minerals Yearbook and foresight studies.**

The network will provide data, information and knowledge on mineral resources around Europe, based on an accepted business model, making a fundamental contribution to the European Innovation Partnership on Raw Materials (EIP RM), seen by the Competitiveness Council as key for the successful implementation of the major EU2020 policies.

The Minerals4EU project will firstly establish the EU minerals intelligence network structure, comprising European minerals data providers and stakeholders, and transform this into a sustainable operational service. Minerals4EU will therefore contribute to and support decision making on the policy and adaptation strategies of the Commission, as well as supporting the security of EU resource and raw materials supply, by developing a network structure with mineral information data and products, based on authoritative of information sources.

The Minerals4EU project is built around an INSPIRE compatible infrastructure that enables EU geological surveys and other partners to share mineral information and knowledge, and stakeholders to find, view and acquire standardized and harmonized georesource and related data.

The target of the Minerals4EU project is to integrate the best available mineral expertise and information based on the knowledge base of member geological surveys and other relevant stakeholders, in support of public policy-making, industry, society, communication and education purposes at European and international levels.

The Minerals4EU consortium possesses the skills and resources to make this the leading European mineral information network structure that will provide tools and expertise to enhance resource efficiency, minerals supply security and support sustainable mineral development for Europe.

## Interview with Mr. Germán Esteban Muñiz

Industrial Technologies, EC, DG RTD

**The Minerals4EU project has been designed to meet the recommendations of the Raw Materials Initiative and the action areas of the Strategic Implementation Plan for the European Innovation Partnership on Raw Materials. Do you think the Minerals4EU objectives respond to the needs of developing an EU Knowledge Base service for mineral resources?**

Minerals4EU represents the continuation of the Commission effort in supporting the Raw Materials (RM) Initiative, revised in 2011.

DG Research and Innovation invested in FP7 more than 70 million euros in different projects, which covered many areas in the Raw Materials sector. Some of these projects (e.g. Promine) started to settle down a European Database that Minerals4EU will further develop in order to achieve an EU Mineral intelligence network structure.

I believe that Minerals4EU will achieve its objectives and that they will provide with highly valuable and key information to the European Innovation Partnership on Raw Materials (EIP RM) led by DG Enterprise, which will continue under Horizon 2020 the Commission commitment with the RM Initiative.

**The economic crisis is imposing budget cuts on each country and research is usually one of the first victims. Do you think that, due to its relevance to the EU raw materials agenda, Minerals4EU has the potential to revert this trend, attracting new research funds in the future?**

Despite the budget cuts in many countries in Europe, the European Union supports Research and Innovation for growth and jobs through H2020 with a € 79 billion budget, an increase of 20 % over the previous programme, from 2014 to 2020.

In the context of Minerals4EU, the project will represent the meeting point for the European minerals data providers with a wide variety of stakeholders. This will allow Minerals4EU to transform all this information into a sustainable operational service and therefore to give an important added value to it. The potential interest of the companies in such information is clear, since this will give a complete picture of the mineral information data and products in Europe. New investment will be encouraged since further Research and Innovation will have to be developed in order to extract those unexploited minerals.



Research Programme Officer - Industrial Technologies, EC, DG RTD



## In relation to the investment made by the EC on Minerals4EU, what benefits and/or impacts do you expect it may bring to the economy and to society?

The ratio benefit / investment in a project like Minerals4EU is huge, especially in the current context where the prices for many raw materials have increased significantly over the past few years. This situation makes more attractive and economically

interesting to exploit the remaining mineral resources in Europe. Minerals4EU will collect all this mineral information and knowledge.

In the coming years, Europe will have the opportunity to grow towards a sustainable mineral development, one of the objectives of Minerals4EU. The transfer of this Research and Innovation to the market will be translated in growth and jobs in Europe.

## Interview with Mr. Juha Kaija

Minerals4EU Project Manager

### The European Geological Surveys and other partners have, last September, launched Minerals4EU. What are the main objectives of the project?

Minerals4EU is currently one of the 1st priority European Commission funded projects in the field of mineral raw materials. The target of the Minerals4EU project is to integrate the best available mineral expertise and information based on the knowledge base of geological surveys and other relevant stakeholders, in support of public policy-making, industry, society, communication and education purposes at European and international levels.

The most ambitious goal of the Minerals4EU is eventually to become the leading European mineral intelligent network structure which should provide to European Commission and relevant stakeholders the tools and expertise to enhance resource efficiency, minerals supply security and support sustainable minerals development for Europe.

Before the end of the Minerals4EU project, this network must be transformed into a sustainable operational service. It should be able to provide information and knowledge on mineral resources around Europe to EC and relevant stakeholders on a regular basis, based mainly on the most directly involved public regional, national and European minerals data providers and stakeholders.

Other important objectives of the project are:

Development of a 'European Mineral Raw Materials Yearbook',  
Development of an operational EU Minerals Knowledge Data Platform compliant to INSPIRE that enables partners to share mineral knowledge, and the public and private stakeholders to find, view and acquire standardized and harmonized information and finally Production of a foresight study on mineral raw materials future supply and demand in the EU with special attention given to critical minerals.

I have to mention that we have only two years to meet our goals that were defined in the Description of Work document of the Grant Agreement with the European Commission. In order to reach these goals, the commitments of the WP Leaders to the project is crucial and of course the work of all partners. One of the great challenges in coordinating the work is the fact that we have 31 partners from 26 countries in the consortium.

Almost whole Europe is covered! But I am confident that we will be successful, we have excellent partners and best European experts in the field of mineral raw materials working in this consortium and of course in due course the consortium will be weaved together.



### How will Minerals4EU contribute in practice to the European Innovation Partnership on Raw Materials (EIP RM)?

The European Innovation Partnership (EIP) on Raw Materials wants to see that by 2020, Europe will have made a great step in reducing its import dependency on raw materials. Minerals4EU impacts directly on the underlying aims of these important policies. The Minerals4EU project is specifically designed to meet the recommendations of the Raw Materials Initiative and it will deliver a fundamental contribution to the European Innovation Partnership on Raw Materials (EIP RM).

We will develop a user-centred intelligence network structure for delivering data, information and knowledge on mineral resources in the Europe Union. The network will enable a number of deliverables such as a web portal, a European Minerals Yearbook and foresight studies.

Eventually, this would make all the information on mineral resources available in one location. There is currently no harmonized information available on mineral resources within the EU and their use.

More specifically, Minerals4EU will contribute to:

- Raising public awareness on the vital need of minerals and metals to the European Society
- Better integration of geological knowledge and data in EU policymaking
- Fostering better knowledge of European mineral resources, of the geological constraints of their worldwide distribution, the technical constraints for their exploitation and the sustainability consequences of their use;
- Support to renewed modern exploration of Europe's domestic mineral resources;
- Development of a European Minerals Statistics and Information capacity on a par with the global capacity



## What information do you expect to be available at the end of the project and how will it be accessible? Who do you think will be the main beneficiaries of the products delivered?

At the end of the project we will have the EU minerals intelligence network structure established as operational service i.e. permanent body. The Minerals4EU project is built around an INSPIRE compatible infrastructure that enables EU geological surveys and other partners to share mineral information and knowledge, and stakeholders to find, view and acquire standardized and harmonized georesource and related data.

Furthermore we will have a new knowledge base, interoperable with national databases, of primary and secondary resources; a forward-looking foresight analysis on the minerals supply and demand situation in Europe with special attention given to the critical minerals, a comprehensive European Mineral Statistic yearbook where national-level data on minerals has been collected. Main beneficiaries are European public policy-making, industry, whole society. Basically the European economy!

## You have recently successfully coordinated the ProMine project. What was that project about? Do you see any links to Minerals4EU?

The challenge for the four-year ProMine Project, was to find ways to reduce the EU's overall dependence on metals and mineral

imports. ProMine started in 2009 and was followed by intense research and development work until 2013. The project brought together 31 partner organizations from 11 countries. It was actually an interim research organisation with over 400 «Prominers» working to reach our goals. The project covered a wide range of themes from 3D and 4D modeling for the mining industry and mapping of Europe's strategic metal and mineral resources to creation of novel nanoproducts and sustainable mineral processing methods.

In the project the contribution of industrial partners was extensive. At the end of the project there were 14 patents filed (granted or pending). Of the filed patents, five relate to the use of rhenium compounds in industry and one the use of schwertmannite as an adsorbent for wastewater treatment. The other eight have to do with uses of nanosilica in the construction and paper industries. One of the project's major accomplishments was the online Pan-European Mineral Deposit Database, that comprises the European Mineral Deposit database and the Anthropogenic Concentration Database, (<http://ptrarc.gtk.fi/ProMine/default.aspx>). One of the goals of Minerals4EU is to create a knowledge data platform with much of the content coming from ProMine sources. We have also many same persons and partners working in Minerals4EU (BRGM, GTK, EKBAA, LNEG, IGME, SELOR) and that helps a lot. Personally, without ProMine management experience, the Minerals4EU project could be much more difficult to manage.

# ETP SMR Corner



## I2Mine reaches its half way point

The I2Mine project is now two years in and is beginning to see some results coming through. The project consortium gathered together for the annual meetings of the Management Committee, Advisory Board and the General Assembly in October 2013, in Levi, Finland.

The General Assembly provides the twenty seven partners involved in the project with the opportunity to share the latest progress that has been made over the last year and to exchange thoughts and ideas. The project is on track and some of the technological developments are close to testing phase, including a new cutting head for cutting very hard rock, machine guidance systems and a new "intelligent rock bolt". The meetings were rounded off with an interesting visit

to the nearby Agnico-Eagle gold mine in Kittilä.

For 2014, as results start to take shape the promotional activity will increase and a number of workshops will be organised at relevant events in order to raise awareness amongst stakeholders, gather feedback on the project and to engage with local communities and stakeholders on the societal aspects of the project and deep mining in general. There will be a special session dedicated to I2Mine at the Aachen International Mining Symposia (AIMS 2014) conference and exhibition, which will take place on 11-12 June 2014 in Aachen, Germany (see [www.aims.rwth-aachen.de](http://www.aims.rwth-aachen.de) for more details). Watch this space for workshop announcements!

The I2Mine project is an initiative focused on the technological challenges the mining industry is currently facing including the exploitation of ever deeper deposits and the aspiration for an invisible, safe, zero impact mine. The project involves a consortium of 27 companies and academic institutions from 10 European countries, co-funded by the EU over a period of 4 years. For additional information about the I2Mine project, please visit the website at [www.i2mine.eu](http://www.i2mine.eu).



# Secretariat's agenda

- **13-17 January** Luca Demicheli, Gerardo Herrera, Chair of the EGS Earth Observation Expert Group (EOEG), and EGS delegation at Group on Earth Observation (GEO) Ministerial Summit in Geneva.
- **21-22 January** Luca Demicheli at PanGeo project final meeting in Brussels
- **21-22 January** Henry Vallius and Alan Stevenson, Chair and Deputy Chair of the EGS Marine Geology Expert Group (MGEG), at EMODnet2-Geology project kick-off meeting in Lisbon, Portugal
- **23 January** EGS Marine Geology Expert Group (MGEG) meeting in Lisbon, Portugal
- **23-24 January** EGS Mineral Resources Expert Group (MREG) meeting in Uppsala, Sweden
- **27-28 January** Luca Demicheli and EGS delegation at EGS-JRC meeting in Ispra, Italy
- **10-11 February** EGS National Delegates Forum and Expert Groups Chairs meeting in Brussels
- **11-12 March** Luca Demicheli and Nikos Arvanitidis, Chair of the EGS Mineral Resources Expert Group (MREG), at Minerals4EU Project Progress Meeting in Cyprus
- **20-21 March** Luca Demicheli and François Robida, Chair of the EGS Spatial Information Expert Group (SIEG), at EGDI-Scope Board meeting in London
- **25-26 March** EGS General Meeting in Brussels
- **26 March** EuroGeoSurveys - Russian Federation bilateral meeting in Brussels
- **27 March** Marek Graniczny, Chair of the EGS International Cooperation and Development Task Force (ICDTF) at EGS-OAGS (Organisation of African Geological Surveys) Workshop in Brussels
- **31 March - 1 April** Luca Demicheli at 5th EU-AU Business Forum in Brussels
- **1-2 April** François Robida, Chair of the EGS Spatial Information Expert Group (SIEG), at EGDI-Scope consortium and EGS Expert Groups meeting in Brussels
- **2-3 April** Luca Demicheli at 4th EU-AU Summit in Brussels

## EU agenda

### ➤ Council adopts «Horizon 2020»: the EU's research and innovation programme for 2014-2020

On 3 December 2013 The Council adopted the «Horizon 2020» programme for research and innovation for the years 2014 to 2020. Horizon 2020 will replace the EU's 7th Research Framework Programme (FP7), which runs until the end of 2013. Compared with FP7, the new programme is expected to further eliminate fragmentation in the fields of scientific research and innovation. Horizon 2020, which has a budget of around 77 billion euros, will underpin the objectives of the Europe 2020 strategy for growth and jobs, as well as the goal of strengthening the scientific and technological bases by contributing to achieving a European Research Area in which researchers, scientific knowledge and technology circulate freely.

Horizon 2020 focuses on three priorities, namely generating excellent science in order to strengthen the Union's world-class scientific excellence and make the Union research and innovation system more competitive, fostering industrial leadership to speed up the development of technologies that will support businesses and innovation, including for small companies, and tackling societal challenges in order to respond to the priorities identified in the Europe 2020 strategy by supporting activities covering the entire chain from research to market.

### ➤ First Horizon 2020 calls for projects launched

On 11 December 2013 the European Commission has presented the first calls for projects under Horizon 2020, the new EU programme for research and innovation which replaces the Seventh Framework Programm for Research (FP7). The Horizon 2020



Programme aims to support ideas, growth and jobs for Europe's future. Other than previous programmes it brings together all existing support for research and innovation, including the innovation-related activities of the Competitiveness and Innovation Framework Programme and the activities of the European Institute of Innovation and Technology (EIT), into one single funding programme. Worth more than €15 billion over the first two years, the funding scheme is intended to boost Europe's knowledge-driven economy, and tackle issues that will make a difference in people's lives.

Source: [www.eurogeologists.eu](http://www.eurogeologists.eu)

## ➤ **Seventh environmental action programme: on the path to green growth**

On 20 November 2013, EU ministers and MEPs have formally approved the seventh environment action programme, setting out the long-term policy direction for the environment and climate until 2020. The seventh action programme, proposed in November 2012, lists nine priority aims to be achieved by 2020, including protection of the environment and the strengthening of ecological resilience, support for sustainable and efficient growth, and protection against environmental threats to health. The programme, 'Living well within the limits of our planet', aiming to push the EU in the direction of so-called 'green growth', will enter into force by the end of 2013.

Source: [www.eurogeologists.eu](http://www.eurogeologists.eu)

## ➤ **MEP's stress that carbon capture and storage projects should be encouraged**

According to a report adopted by the Environment Committee of the European Parliament on 27 November 2013, Carbon capture and storage (CCS) projects have the potential to allow the EU to meet its 2050 low-carbon goals, in particular for decarbonising high CO<sub>2</sub>-emitting industries, and should receive more support from Member states and the EU. In the non-legislative text, MEPs say that CCS may also contribute to the diversity and security of energy supplies while maintaining and creating employment opportunities. They affirm the need to develop a range of full-chain CCS flagship projects in order to identify the best and

economically most advantageous solutions. CCS deployment should not only be encouraged with coal and gas power generation, but in a range of industrial sectors, such as chemicals, metallurgy, iron and steel, cement and refineries.

Source: [www.eurogeologists.eu](http://www.eurogeologists.eu)

## ➤ **Recycled waste could be a valuable source of rare earth elements**

According to a recent study recycling offers a promising means of supplying the rare earth elements neodymium and dysprosium, used in computing and low-carbon technologies. If recycling infrastructure and technologies are prepared now to deal with the larger volumes of high-tech waste expected in the future, 7-9% of global demand for these critical elements could be met by recycling by the year 2030.

More information can be found with the link below:

<http://ec.europa.eu/environment/integration/research/newsalert/pdf/353na2.pdf>

Source: [www.eurogeologists.eu](http://www.eurogeologists.eu)

## ➤ **€40 million for new EU research on resource efficiency**

The European Commission has approved funding for 14 new research projects to shape a more resource-efficient economy in Europe. The projects, which involve the collaboration of over 140 partners from research organisations and private companies, will tackle the challenges of recycling waste materials from manufactured products and the agricultural sector to improve the quality of the environment and save money. Each project addresses a key issue such as reusing discarded automobile tyres, recovering key elements from batteries, producing green fertiliser from animal waste, and generating renewable clean energy from food and plant waste. The €40 million funds are included in the 2013 Environment call of the EU's Seventh Framework Programme for Research and Technological Development (FP7) and will involve partners from 19 European countries.



## ➤ **Public consultation on the implementation of the Infrastructure for Spatial Information in the European Community - INSPIRE Directive (2007/2/EC)**

Open from 02.12.2013 to 24.02.2014  
Assess whether the actions already underway to

establish an Infrastructure for Spatial Information in the European Community according to the INSPIRE directive 2007/2/EC are still on course to meet the objectives pursued.

[http://ec.europa.eu/environment/consultations/inspire\\_en.htm](http://ec.europa.eu/environment/consultations/inspire_en.htm)

## Upcoming Events

### ➤ **Seminar on exploration, sustainable access and extraction of raw materials** Scotland House Conference Centre, Brussels 9 January 2014

Europe is one of the world's largest consumers of metals, minerals and rare earth elements in the industrial production. Resources, however, are limited. This seminar is a part of an initiative towards tackling the increasing need for raw materials. The seminar will discuss the necessary steps towards a fusion of raw materials exploitation with Europe's high production standards and knowledge of green and clean technology in order to secure a stable access of raw materials for Europe in a sustainable manner.

[www.eo-miners.eu](http://www.eo-miners.eu)

### ➤ **GEO-X and 2014 Ministerial Summit** Geneva, Switzerland 13-17 January 2014

The Summit would have one major outcome, which is Ministers – through a declaration - to decide the continuation of GEO after 2015 and give a mandate to define the "Second Implementation Plan 2025". The Ministers are also expected to review the progress against the GEOSS Strategic Targets and to confirm their commitment to complete the current 2005-2015 Implementation Plan.

[www.earthobservations.org/geo10](http://www.earthobservations.org/geo10)

### ➤ **First Vertical Geology Conference (VGC14)** University of Lausanne, Switzerland 6-7 February 2014

The organisers invite you to contribute to this conference which will focus on remote sensing of ground surface and digital processing to support 3D geological modelling and interpretation in various fields of the geosciences. The objectives of the VGC14 conference are:

1. To present and discuss the most recent scientific results and techniques for vertical mapping by remote sensing as input for 3D geomodelling
2. To identify related critical issues and promising developments
3. To provide a forum for information and knowledge exchange between academic, government and practical geoscientists about 3D digital geology.

[www.unil.ch/vgc14](http://www.unil.ch/vgc14)

### ➤ **North Atlantic Craton Conference 2014** University of St. Andrews, Fife, Scotland, UK 19-21 March 2014

The organizing committee of the NAC Conference 2014 would like to invite you to attend a two day conference on craton specific exploration targeting, using the North Atlantic Craton (NAC) as the area of interest. This event is organised by the Cardiff and St. Andrews University Chapters of the Society of Economic Geologists, and the Applied Mineralogy Special Interest Group of The



# Upcoming Events

Mineralogical Society of Great Britain and Ireland, in conjunction with the British Geological Survey and Geological Survey of Denmark and Greenland. This workshop, on the mineral potential of the North Atlantic Craton (NAC) as a whole, is aimed at initiating and furthering trans-Atlantic collaboration in understanding the Archaean cratonic controls on ore deposit formation through time. The Archaean high-grade gneiss terrain of the NAC stretches from Labrador, Canada, through Greenland and into NW Scotland, UK. Acceleration in exploration efforts for various commodities across this region, particularly in Greenland, has highlighted the potential of its mineral resources. More recently, the importance of a craton-specific approach to mineral exploration has been realised.

[www.nac-conference2014.org.uk/](http://www.nac-conference2014.org.uk/)

## ➤ VIII International Brown Coal Mining Congress 2014

**Bełchatów, Poland 7-9 April 2014**

We have the pleasure of inviting you to participate at the next edition of the VIII International Brown Coal Mining Congress, which will be held in Bełchatów - the biggest Polish mining and power generation basin, from 7 to 9 April 2014. During these days Bełchatów will be again the capital not only of Polish but also world brown coal mining. It will be the place of integration of people from mining and energy environment. We believe that during the VIII International Brown Coal Mining Congress issues related to an important sector of Polish mining industry, which is the mining of brown coal will be taken into account. Scientists, specialists and those directly associated with the mining industry will enter into the topics of high importance for the economy, related to the future of the cheapest sources of energy which is brown coal as an important element stabilizing Poland's energy security.

[www.kwbbelchatow.pgegiel.pl](http://www.kwbbelchatow.pgegiel.pl)  
[www.sitgbelchatow.pl](http://www.sitgbelchatow.pl)

## ➤ Industrial Technologies Conference 2014

**Athens, Greece 9-11 April 2014**

Europe's leading Industrial Technologies conference brings together 1500 representatives of research, industry and policy in the fields of nanotechnology, materials and production technologies. The event provides valuable opportunities to network, find new opportunities of collaboration, and stay up-to-date with the cutting-edge research, industrial news and innovation in Europe. The conference is 3 days and includes 150 Speakers from 50 countries. Following the successes of the previous Industrial Technologies conferences in Brussels in 2010 and in Aarhus in 2012, the event is the key enabler for networking, establishing innovation partnerships and creating new products in the field of Industrial Technologies. The main focus of the event is on growth through smart specialisation, re-industrialisation and regional development in Europe. Industrial Technologies 2014 will also provide information about new opportunities in Horizon 2020 in the field of enabling technologies.

[www.industrialtechnologies2014.eu](http://www.industrialtechnologies2014.eu)

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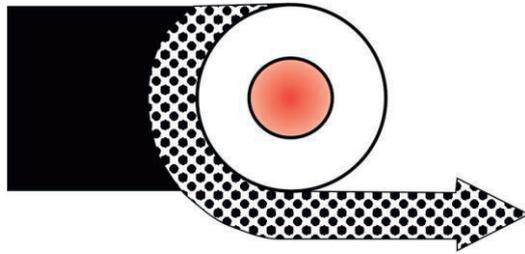
**EuroGeoSurveys, the Geological Surveys of Europe**  
36-38, Rue Joseph II - 1000 Brussels (Belgium)  
Tel.: +32.2.888.75.53 - Fax: +32.2.503.50.25  
[info@eurogeosurveys.org](mailto:info@eurogeosurveys.org)  
[www.eurogeosurveys.org](http://www.eurogeosurveys.org) - [www.geology.eu](http://www.geology.eu)

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Patrick Wall, Isabel Pino de Juana, Celine Andrien,  
Woody Hunter

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AACHEN INTERNATIONAL MINING SYMPOSIA

AIMS 2014



June 11-12  
**2014**  
Aachen, Germany

SIXTH INTERNATIONAL SYMPOSIUM

# High Performance Mining

Special Focus Area:  
The „i<sup>2</sup>Mine“ Project

## AIMS Aachen International Mining Symposia

Ever since the first AIMS conference in the year 1987, the annual Symposium brings together mining and minerals experts from all over the world.

To secure the continuous supply of mineral raw materials the mining sector strives for increased performance. Next year's AIMS "High Performance Mining" stands as a synonym for increased efficiency, increased productivity, higher production rates and cost effectiveness in raw materials extraction. The papers presented at AIMS 2014 will deal with latest technological developments and challenges based on industrial experience and research results in order to meet current and future requirements of the minerals sector.

The special presentations on topical research results of the i<sup>2</sup>Mine Project – which currently is the largest EU-funded mining research project – will be focused on requirements of ever increasing depths of mining in Europe.

Cooperating Partners:



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# FIRST CIRCULAR & CALL FOR SESSIONS AND PAPERS

**25th COLLOQUIUM OF  
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15th Congress of  
Geological Society of  
Africa (GSAf15)

“Earth Sciences for  
Improving Livelihood in  
Africa”



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CONGRESS**

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Generation into Global  
Earth Sciences  
Integration’

MWALIMU JULIUS NYERERE INTERNATIONAL CONVENTION CENTRE (MJNICC)  
DAR ES SALAAM, TANZANIA

11th - 16th, August 2014  
[www.yescongress.org/2014](http://www.yescongress.org/2014)  
[www.cag25.or.tz](http://www.cag25.or.tz)





# The Face of the Earth

## EGU General Assembly 2014

Vienna, Austria | 27 April – 02 May 2014

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[www.egu2014.eu](http://www.egu2014.eu)

Abstract submission deadline | 16 January

