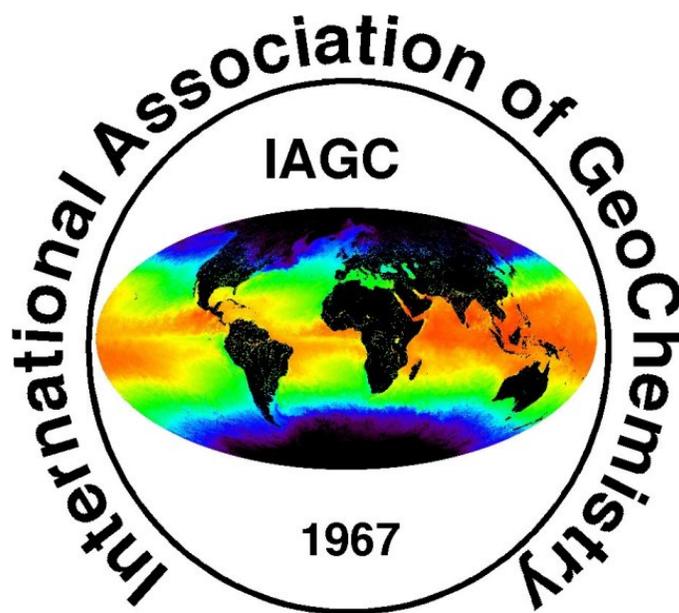


# Newsletter

of the  
**International Association of GeoChemistry**  
Number 54



May 2011

## FROM THE PRESIDENT

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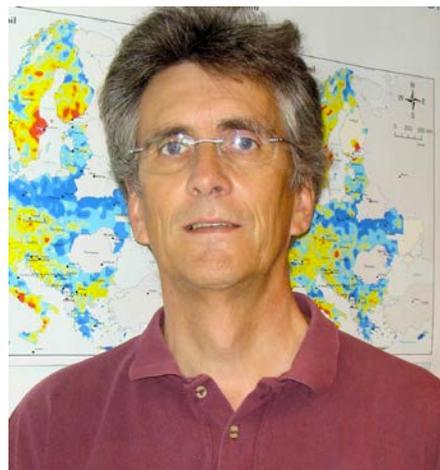
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### **- - NEWS FLASH - -**

#### **GES-9: 2-7 JUNE**

Get Ready! Next month from 3-7 June, IAGC members are cordially invited to participate in the triennial gathering of international researchers interested in the geochemical processes operating at the Earth's surface. GES-9, which will be held at the University Memorial Center on the campus of the University of Colorado in Boulder, will emphasize human interactions with geochemical processes at all spatial and temporal scales. The meeting will offer a comfortable and friendly setting, with most presentations offered in unhurried poster sessions. In-depth presentations from invited speakers will synthesize recent research. Full information is on the GES-9 website: <http://instaar.colorado.edu/GES-9/>.

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IAGC members,

In my last message I mentioned that IAGC was re-negotiating our contract for Applied Geochemistry with Elsevier. We managed to obtain a new contract at good conditions – but only for three years. Rich Wanty will have the next round of negotiations already during his term of presidency. The publications world is changing rapidly. Through my books I have good contacts to several publishing houses – it appears that at present nobody really knows where things will head. But all agree on one thing: tough times! The message that the paper issue of Applied Geochemistry will soon be history has reached you all. From what we have seen so far the interest of the membership to take out a personal subscription to the electronic issue is meagre. Elsevier plans to offer the authors in the future the possibility to buy an “open access” version of their paper (they talk about \$3000 US for that option). We will see how such a mixed business model (partly subscriptions, partly open access) for a classical journal will work out. I personally am still not so sure that we, the scientists, will in the end be better off with open access publishing. That really means that each author has to pay for his/her paper to be published, from the price ranges I have heard so far between \$1000 and 3000 US per paper. That may in the end turn out to

be much more expensive to the science world than the library subscriptions for the classical journals ever were. I know many people for whom having to pay at least 1\$000 to get published would be a serious obstacle. In any case, one message is clear: the IAGC cannot count on the royalties for Applied Geochemistry continuing to be our main source of income. Your board wants to establish an ad hoc committee looking into “options for the future of the IAGC”. Options that have been discussed include the “IAGC foundation” that I mentioned in my first message, another possible option is a merger with one of the other associations, we can look into possibilities to earn money from our working group meetings, we might even consider to bundle several working group meetings to have a large “IAGC conference” – or to start a new conference series. Please contact me (clemens.reimann@ngu.no) or any member of the board (listed on the last page of this Newsletter) if you have any good ideas or want to be part of these discussions.

For the near future Elsevier wants to see more review articles in Applied Geochemistry and a clear increase in the science citation index. This is something where you, the members, can help to provide Rich with a better start into the next round of contract negotiations. Please continue to support your journal, Applied Geochemistry, via submitting some of your best research results to your journal. Consider Applied Geochemistry when planning to write a review article and discuss your idea with AG editor Ron Fuge (rrrf@aber.ac.uk) early on to discuss details should you have such plans. And, last but not least, don't forget to cite good articles that you have read in Applied Geochemistry in your work, wherever you publish.

As another result of the negotiations with Elsevier our student research grants are now the “Elsevier student research grants”. The application and selection procedures remain unchanged, but \$5000 US of the IAGC income from Elsevier are now clearly earmarked as “sponsored by Elsevier for

student research grants”. This year's recipients are:

- Rixiang Huang, Baylor University
- Anita Thapalia, University Texas, El Paso
- Oluyinka Oyemumi, Virginia Tech
- Karla Leslie, University Kansas

My sincere congratulations to all the awardees, I hope the recognition (and the money) makes a significant difference to your research. All 2011 IAGC awards will be announced in the upcoming issue of Elements (two new IAGC fellows, a distinguished service award and two certificates of recognition).

Since my last message we have seen a complete re-structuring of the business office and the IAGC website. I feel Chris Gardner did a really great job here, the new website is very informative and I urge all of you to pay it a visit (<http://www.iagc-society.org>) and if only to give it a “thumbs up” (like it) on Facebook (or to actually join the IAGC Facebook group). I think those of you who do not usually visit these homepages will be positively surprised by the information provided and the “new look”. Let us all work together to make this even better and to provide the needed input.

Last but not least, do not forget that two of our working groups have their conferences this year: the 9<sup>th</sup> International Symposium on Geochemistry of the Earth's surface will take place in Boulder, Colorado in June 2011 (<http://instaar.colorado.edu/GES-9/>) and the 9<sup>th</sup> AIG (International Symposium on Applied Isotope Geochemistry) will be held in Tarragona (Spain) from 19-23 Sept. 2011 (<http://congress.cimne.com/AIG-9/frontal/invitation.asp>). Further information on both conferences is provided in a later portion of the Newsletter

Clemens Reimann, Trondheim  
President

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# ASSOCIATION NEWS

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## IAGC AWARDS FOR 2011

IAGC is proud to announce the recipients of its society awards for 2011. The official announcement and presentation of the awards will occur during the AIG-9 meeting in Tarragona, Spain from 19-23 September. Since IAGC is an associated society of the Geological Society America, these awardees will also be recognized during the "Hall of Fame" display at the 2011 GSA Annual Meeting scheduled to be held in Minneapolis, MN from 9-12 October-2011.

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### *DISTINGUISHED SERVICE AWARD*

The **IAGC Distinguished Service Award** recognizes outstanding service by an IAGC member to the Association or to the geochemical community that greatly exceeds the normal expectations of meritorious voluntary service. The 2011 recipient is **Mel Gascoyne**.



**Mel Gascoyne** was born in Blackpool, UK, and obtained a BA in Chemistry in 1969 and then a MSc in Environmental Sciences in 1973 from Lancaster University (UK). He then moved to McMaster University in

Hamilton, Ontario (Canada) where he began a PhD in Geology under Derek Ford and Henry Schwarcz. A love of caving took him to many limestone areas around the world, collecting stalagmites for U-series dating and O-isotope measurements for palaeoclimatic studies. In 1982, Mel and his wife, Simcha, moved to Pinawa, Manitoba, where they both began studies related to nuclear waste disposal for Atomic Energy of Canada Limited (AECL). In 1988, he became an Associate Editor of Applied Geochemistry and from 1992 to 2011 was first IAGC Secretary and then Business Office Manager.

In 1998 Mel left AECL and set up his own geoscience consulting company and, since that time, has since been involved in numerous contracts for geochemical, isotopic, and gas analysis of groundwater, document review, report preparation. Clients have included SKB (Sweden); POSIVA OY (Finland); OPG, AECL, and NWMO (Canada); the US DOE (Yucca Mountain Project); and the OECD/NEA and ANDRA (France). Mel has published over 70 journal and conference papers and written over 50 technical reports.

*Many thanks Mel for your  
dedicated service to IAGC!*

## IAGC FELLOWS

The honorary title of IAGC Fellow is bestowed annually on outstanding scientists who are IAGC members and who, over the course of some years, have made significant contributions to the field of geochemistry. The IAGC Fellows for 2011 are **Shaun Frape**, Professor of Geochemistry in the Department of Earth and Environmental Sciences, University of Waterloo (Canada) and **Avner Vengosh** Professor of Earth & Ocean Sciences in the Nicholas School of the Environment & Earth Sciences, Duke University (USA).



**Shaun Frappe**  
**University of Waterloo**

**Shaun Frappe** received his BSc, MSc. and PhD in geology and geochemistry from Queen’s University, Canada and has taught hydrogeochemistry and isotope geology at the University of Waterloo since 1980. He specializes in groundwater flow systems using isotopic and geochemical tracers to delineate the transport of natural and contaminant parameters in groundwater flow systems, as well as in regional groundwater resource studies. Shaun specializes in developing new isotopic tools for use in tracing natural and anthropogenic processes in hydrogeological and ecological environments. He is an elected Fellow of the Geological Society of America and recipient of the GSA O.E. Meinzer Award in 2007. Shaun is the author of more than 350 publications, including over 90 refereed international journal articles and 50 other refereed articles. He is an active peer reviewer of radioactive waste programs in Canada, Finland, and the USA and has collaborated with SKB, Sweden, GTK, Finland and AECL, NWMO, Canada for over 25 years. Shaun served as an Associate Editor of Applied Geochemistry from 2000-05 and as an IAGC Council Member from 2004-10.

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**Avner Vengosh**  
**Duke University**

**Avner Vengosh** is a Professor of Geochemistry and Water Quality and Chair of the Water and Air Resources Program at the Nicholas School of Environment in Duke University. Avner also holds a secondary appointment in the Department of Civil and Environmental Engineering and is an Associate Editor for the *Applied Geochemistry*. Avner’s research aims to integrate environmental geochemistry, advanced isotope geochemistry (boron, strontium, carbon, and radium isotopes), and environmental health (e.g., arsenic in toenails) in order to delineate the sources and pathways of contaminants in the environment and their possible impacts on human health. Currently this research is focused on three major themes:

- (1) Salinization of water resources and impacts on development and health. Current studies focused on shallow groundwater in the sub-Saharan basins of Morocco and coastal aquifer of the southeastern United States. Studies also include the geochemistry of “new water” generated by reverse osmosis desalination of seawater and saline groundwater.
- (2) The energy-water quality-health nexus that includes (i) studies on the impact of coal combustion products on the environment (e.g., the TVA coal ash spill in Tennessee); (ii) the origin of contaminants associated with mountaintop mining in valley fill head waters in West Virginia; and (iii) the impact of deep shale gas drilling and hydraulic

fracturing on the quality of shallow groundwater and surface water (methane and brine contamination from the Marcellus Shale, Pennsylvania). (3) The relationships between groundwater geochemistry, water quality, and human health in different aquifer systems, worldwide. Current studies including high arsenic drinking water in private wells from Union County, North Carolina; high fluoride and arsenic in groundwater from the Rift Valley in Ethiopia; high salinity, fluoride, and radium in groundwater in Morocco; and high radium in fossil groundwater in the Middle East. Studies include developing new diagnostic tools to evaluate their bioaccumulation in the local populations by measuring the contaminants in nails and conducting health surveys in exposed populations.



**Norbert Clauer**  
**Université Louis Pasteur**

Norbert Clauer received his PhD from the Université Louis Pasteur in Strasbourg, France in 1976 and presently is Emeritus Research Director of the French National Research Council (CNRS). His research interests are in low-temperature elemental and isotopic tracing and dating applied to clay minerals and other surface minerals from continental weathering to low-grade metamorphic environments and Norbert is a recognized international authority on the chemistry and isotope chemistry of detrital and authigenic components and of brines of sediments in deposition, diagenetic, low-grade metamorphic and weathering conditions, and the mechanisms of clay crystallization and recrystallization. IN recognition of his research, Norbert has been awarded the bronze (1978) and silver medal by the CNRS (1991) and the Georges-Millot Price by the French Academy of Sciences (1992 the Bailey Distinguished Member Award of the Clay Minerals Society (2008) and Chevalier of the French National Order of Merit (2008). He served on the IAGC Council from 2004-10, during which time he Chaired the IAGC Publications Committee.

*Congratulations Shaun & Avner !*

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***IAGC CERTIFICATE OF RECOGNITION***

The ***IAGC Certificate of Recognition*** is awarded (i) to any scientist for scientific accomplishment in a particular area of geochemistry, (ii) to other geochemists for excellence in teaching or public service, or (iii) to an IAGC member for meritorious service to the Association or to the international geochemistry community. The recipients for 2011 are: **Norbert Clauer** of the Université Louis Pasteur (France) and **David Mogk** of Montana Sate University (USA).

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**Dave Mogk**  
**Montana State University**

David Mogk received his BS from the University of Michigan and his MS and PhD from the University of Washington. Presently, he is professor of geology at Montana State University. His research interests range from the evolution of Archean continental crust in SW Montana, to petrologic processes at mid-crustal levels, spectroscopy of mineral surfaces and the search for life in extreme environments (such as Yellowstone hot springs to Lake Vostok ice core). He has worked to promote excellence in geoscience education, particularly in mineralogy, petrology and geochemistry, for the past 20 years. He has served as program officer in the NSF Division of Undergraduate Education, was recipient of the AGU Award for Excellence in Geophysics Education in 2000 and continues this work as co-PI for the *On the Cutting Edge* program for faculty professional development in the geosciences.

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**Check IAGC out on  
Facebook!**

Sign up at:  
<http://www.iagc-society.org/>

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### ***PHD STUDENT RESEARCH GRANTS***

The **Elsevier/IAGC Student Research Grant Program** is designed to assist PhD students in geochemistry in undertaking and acquiring geochemical analyses in support of the student's research based upon a meritorious proposal. In addition to their grant stipend, each student receives a 1-year membership to IAGC.

This year's recipients are:

**Rixiang Huang** (\$2000) - Baylor U, *Effects of Surface Heterogeneity on Nanoscale Interfacial Processes*

**Anita Thapalia** (\$1500) – U Texas, El Paso *Application of Zn Isotopic Signatures as Tracers of Anthropogenic Contamination in Lake Sediment Cores*

**Oluyinka Oyemumi** (\$1000) - Virginia Tech *Evaluating Mobilization and Transport of Organoarsenicals Released from Poultry Litter within an Agricultural Watershed on the Delmarva Peninsula, DE.*

**Karla Leslie** (\$1000) - University of Kansas *Microbial Controls on Metal Ion Mobility*



***Oluyinka Oyewumi***  
***Virginia Tech***

Oluyinka is a PhD student in the Department of Geosciences at Virginia Tech, Blacksburg VA, USA. My research, being conducted under the supervision of Dr. Madeline Schreiber, is on trace element cycling in agricultural watersheds, specifically addressing the release and subsequent environmental transport of arsenic and other trace elements from poultry litter. The research project has allowed Oluyinka to develop skills in instrumenting field sites, conducting field and laboratory experiments, using new and established analytical methods for sample analysis, constructing GIS maps, and modeling reactive transport. Results of this research will provide relevant data on the historical and current impacts of poultry litter on water quality within agricultural watersheds. Prior to joining the program at Virginia Tech, he completed a Master's of Science degree in Environmental Geochemistry at the University of Toledo, OH (USA).

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***Rixiang Wang***  
***Baylor University***

Rixiang was born and raised in Baise - a small beautiful city in southern China. He received a BS degree in environmental engineering and a minor in biological engineering in 2006, from Harbin Institute of Technology in Harbin (China). After that, Rixiang attended the Research Center for Eco-Environmental Sciences (RCEES) of the Chinese Academy of Sciences in Beijing and received a MS degree in environmental science in 2009. Presently, he is a PhD student in the Geology Department at Baylor University in Waco, Texas (USA.) Rixiang has a broad interest in understanding physicochemical processes at various interfaces. He worked on the speciation of contaminants and it's effects on the bioavailability and toxicity of these contaminants to soil organisms during his three years at RCEES, His PhD research is exploring the physicochemical mechanisms underlying many nano-scale interfacial biogeochemical processes within the context of the environmental fate of nanoparticles and biomineralization. Rixiang is a sports fan and plays tennis, badminton, and soccer regularly in his spare time.

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**Anita Thalalia**  
**University of Texas – El Paso**

A career in Geological Sciences, focused in the areas of natural resources management, mining and engineering geology, began in 2001 after Anita earned a bachelor's degree from Tri-Chandra Multiple College, in Kathmandu (Nepal). This was followed with a Master's degree in geology in 2005 from the Tribhuvan University in Nepal. She worked briefly for Mineral Exploration and Geo Research Ltd in Nepal and also taught mining techniques at Tribhuvan University before deciding to pursue further education in the U.S. Anita joined the MS program in geology at the University of Texas at El Paso in the Fall of 2007 and completed my second Master's degree in May 2009. Her thesis project focused on using Zn and Cu isotopes to investigate the metal contamination record of a sediment core collected from an urban lake in Seattle, Washington. Currently Anita is working on my PhD at UTEP. The project for which I received the IAGC award is collaborative with members of the U.S. Geological Survey in Austin, Texas and focuses on expanding my initial Zn isotope work to look at Zn contaminant records in sediment cores from lakes across the US. This research will focus on determining what are the major Zn inputs for these lakes and whether they are uniform across the United States.



**Karla Leslie**  
**University of Kansas**

Karla Leslie earned her undergraduate degree in Geological Engineering at Queen's University, Canada (2001-05). Presently, she is working on her PhD under the supervision of Dr. David Fowle at the University of Kansas, sponsored by Anglo American Inc. Karla's PhD project focuses on determining microbial controls of indicators developing above deeply buried mineral deposits that can be used for exploration purposes.

**Congratulations  
Rixiang, Anita,  
Oluyinka, & Karla !!**

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## MEETINGS IN 2011

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### AIG-9

The next IAGC-sponsored **International Symposium on Applied Isotope Geochemistry** (AIG-9) will be held in Spain, from 19-23 September 2011. The venue for the meeting will be the city of Tarragona, which is located on the Mediterranean, in the heart of the Costa Daurada (less than 100 km a from Barcelona). Tarragona has many monuments that survive from the ancient Roman era, including the archaeological complex of Tarraco, one of UNESCO's World Heritage Sites. Following previous AIG conferences, the organizers (Dr. Albert Soler et al.) are planning to have the accommodation, conference sessions, and lunch in the same venue - Hotel Imperial Tarraco, and to hold a mid-conference field trip. Scientific themes for the conference are:

- Advances in techniques/instrumentation
- Isotope signals of climate change
- Environmental and forensic isotopes
- Unraveling biogeochemical cycles
- Isotope hydrology
- Isotope geology
- Isotopes in biomedical studies

Further information about the meeting, including the on-line registration, is available on the conference website:

<http://congress.cimne.com/AIG-9/frontal/invitation.asp>

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### GEOMED 2011

The **4th International Conference on Medical Geology** will be held 20-25 September 2011 in **Bari, Italy**. GeoMed2011 is being organised by Prof Saverio Fiore, Institute of Methodologies for Environmental Analysis - CNR (National Research Council), Italy. Organisation of the

meeting is progressing excellently. The sessions proposed include topics of mutual interest to IAGC as well as IMGA:

- Air, Soil & Water Pollution & Quality
- Minerals & Environment
- Environmental Toxicology & Epidemiology
- Biominerals & Biomaterials
- Risk Assessment & Communication in Medical Geology

The web-site and advertising for the conference are already up and running at:

<http://www.geomed2011.it/>

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### FEG 2011

The **Frontiers in Environmental Geoscience Conference** will be held in **Aberystwyth, Wales (UK)** from 21-23 June 2011.

The meeting will cover a number of 'hot topics' that will be of interest to those working in mineralogy, environmental mineralogy, waste management and contamination clean-up. Conference technical sessions will include:

1. Mine drainage: geochemistry and mineralogy
2. Tracking contaminant transport from geological media through the food chain to humans
3. Urban geochemistry and mineralogy: impacts on water, air and health
4. Toxicity and environmental behaviour of man-made materials
5. Applied mineralogy in the critical zone: metal reactions at mineral surfaces
6. Integration of computational and experimental environmental mineralogy
7. Environmental clay mineralogy and technology
8. Geochemistry of platinum-group minerals

IAGC members are cordially invited to attend and to get involved in co-convening a session or in proposing/organizing special theme sessions. Those interested should contact the Convenor, Dr. Nick Pearce by

e-mail (npj@aber.ac.uk). Information, circulars and registration details as they emerge will appear on the Mineralogical Society's web pages:

(<<http://www.minersoc.org/pages/meetings/frontiers-2011/frontiers-2011.html>>)

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## GSA ANNUAL MEETING

As an Affiliated Society, IAGC continues to have a strong presence and involvement in the **Geological Society of America Annual Meeting**, which is scheduled to be held in Minneapolis, MN from 9-12 October 2011.

Complete information about the meeting, the 217 technical sessions, special Pardee symposia, and field excursions is available at the GSA web site: <http://www.geosociety.org/meetings/2011/> The window for abstract submission is open and closes at midnight on 26 July.

IAGC is sponsoring three technical theme sessions at this international conference:

### T122. **Sources, Transport, and Fate of Trace and Toxic Elements in the Environment**

Co-Chairs: LeeAnn Munk, David T. Long, W. Berry Lyons

Relevant research dealing with trace and potentially toxic elements in the environment. Basic and applied research topics on trace elements in water, sediment, and rocks that relate to sources, transport and fate are encouraged.

### T127. **Tropical Small Mountainous River Biogeochemistry: Terrestrial Losses, Internal Processing, Coastal Inputs, and Marine Burial**

Co-Chairs: Steven Goldsmith, Ryan Moyer

Contributions are encouraged that examine biogeochemical cycling and fluxes, as well as paleo-records of temporal and spatial changes in fluxes and fate, of material

delivered by tropical mountainous rivers and associated estuarine and coastal waters.

### T129. **Spectroscopy for the Geosciences in the 21st Century**

Co-Chairs: Russell S. Harmon, Nancy McMillan

This session will examine current geoscience applications and future possibilities of absorption, fluorescence, X-ray, emission, and other types of spectroscopy.

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## REGISTRATION PROTOCOLS FOR IAGC-SPONSORED MEETINGS

Three years ago, to bolster membership, Council changed the IAGC Statutes & Bylaws to implement a 2-tier registration fee structure for all IAGC-sponsored symposia and conferences. This new procedure has been implemented and now pertains to all Working Group meetings.

The way that this works is that there is a registration fee for IAGC Members and a second fee for non-Members that is higher by the cost of the IAGC annual dues, but comes with an IAGC membership for the year after the meeting. This is detailed below for the information of all Members. Conversations with other societies that employ this procedure suggests that between 25-33% of the new members acquired in this way find value in the membership and become long-term members of the society.

A set of business protocols for this process have been developed by the IAGC Business Office. This information is available from the Business Office Manager Chris Gardner ([christopherbgardner@gmail.com](mailto:christopherbgardner@gmail.com)).

# SPECIAL FEATURES

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## REPORT FROM THE IAGC WORKING GROUP ON GLOBAL GEOCHEMICAL BASELINES

### 1. Overview

The Working Group on Global Geochemical Baselines, operating under the auspices of both the International Union of Geological Sciences (IUGS) and the International Association of Geochemistry (IAGC), has the long-term goal of establishing a global geochemical database to document the concentration and distribution of chemical elements in the Earth's near-surface environment. The database and accompanying element distribution maps represent a geochemical baseline against which future human-induced or natural changes to the chemistry of the land surface may be recognized and measured.

### 2. Background

There is worldwide concern about the potentially damaging effects of chemicals in the environment on the health of humans, animals, agriculture, and ecosystems. Economic and population growth exacerbate such problems as land degradation and pollution from uncontrolled urbanization, industrialization, and intensive agricultural practices. These and other problems are having an impact on the geochemistry of the Earth's surface and the sustainability of its life-support systems from the local to the global scale.

Defining and understanding the current abundance and spatial distribution of chemicals in different environmental compartments (e.g., soils, sediments, surface and ground water) are essential first steps in being able to recognize and quantify natural or human-induced changes

in the future. Dr. Mary Lou Zoback, former President of the Geological Society of America, stated the issue eloquently:

“Documenting and understanding natural variability is a vexing topic in almost every environmental problem: How do we recognize and understand changes in natural systems if we don't understand the range of baseline levels?” (Zoback, 2001).

Systematic geochemical mapping is the best method available to provide this information about the natural variability of the geochemical background. Geochemical maps have traditionally been valuable in addressing a wide range of environmental problems at the local to national scale, as well as for identifying potential mineral resources. Several decades of geochemical mapping by national geological surveys and related organizations throughout the world have resulted in a wealth of valuable information. However, many of these data sets cannot readily be applied to broader regional or global studies because there was no standardization of the sampling and analytical protocols used. It was this issue that led to the establishment of the predecessor of the current Working Group.

### 3. Evolution of the Working Group

The Working Group traces its origins to 1988 as Project 259, International Geochemical Mapping, of the International Geological Correlation Program (IGCP), now known as the International Geoscience Program. IGCP is a cooperative enterprise of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and IUGS. It was also during this phase, in 1990, that IAGC began its support of the project (Darnley, 1997). IGCP 259 ran until 1992 under the leadership of Dr. Arthur G. Darnley of the Geological Survey of Canada. The project's final report, A global geochemical database for environmental and resource management (Darnley et al., 1995), was published by the Earth Sciences

Division of UNESCO with financial support from IUGS, IAGC, Association of Exploration Geochemists (now Association of Applied Geochemists), International Atomic Energy Agency, and the Royal Society. The report provided a comprehensive review of methods of regional- and national-scale geochemical mapping. It also detailed the requirements necessary for establishing a global geochemical database through multi-media, low-density sampling on the basis of the Global Reference Network (GRN), which covers the Earth's land surface with about 5000 grid cells of 160 x 160 km.

From 1993 to 1997, the project continued under IGCP as Project 360, Global Geochemical Baselines, again under the leadership of Arthur Darnley. The design of the GRN was finalized and sampling sites were selected in a statistically random manner. Standardized methods for geochemical sampling, sample preparation, chemical analysis, and data management to be used in conducting the global-scale geochemical survey, agreed upon by representatives of more than 100 countries, were also prepared during this phase of the project.

Following completion of the two IGCP projects, IUGS, in collaboration with IAGC, established the current Working Group on Global Geochemical Baselines in 1997. It was also at this time that Arthur Darnley transferred leadership of the group to Prof. Jane Plant (British Geological Survey, now at Imperial College) and Dr. David B. Smith (U.S. Geological Survey), who were co-leaders until 2008. At that time, Prof. Plant stepped down and Dr. Xueqiu Wang of the Institute of Geophysical and Geochemical Exploration in Langfang, China became the new co-leader. The current Working Group's main objective is to encourage and facilitate the population of the GRN worldwide through application of the sampling, sample preparation, analytical, and data management protocols established in the earlier phases of the project.

In order to accomplish this objective, the current activities of the Working Group include:

- Developing partnerships with countries conducting broad-scale geochemical mapping studies;
- Providing consultation and training in the form of workshops and short courses;
- Organizing periodic international symposia to foster communication among the geochemical mapping community;
- Developing criteria for certifying those projects that are acceptable for inclusion in a global geochemical database;
- Acting as a repository for data collected by those projects meeting these criteria;
- Preparing complete metadata for the certified projects;
- Preparing, ultimately, a global geochemical database.

#### 4. Current Status and Achievements

Geochemical surveys based on the GRN or based on a sample design compatible with the GRN have been undertaken in several countries worldwide. The GRN geochemical sampling has already been completed for China (Xie and Yin, 1993; Xie and Cheng, 1997, 2001; Xie et al., 2008) and parts of Russia. In India, the National Geophysical Research Institute (NGRI) in Hyderabad has recently completed a national-scale soil geochemical survey based on the global-scale recommendations. The U.S. Geological Survey and the Mexican Geological Survey are collaborating on a soil geochemical mapping project covering all of those two countries that should be completed in 2013. The National Geochemical Survey of Australia is expected to be published during 2011. Considerable progress has also been made in South Africa, Colombia, Brazil, Korea, Cyprus, Japan, and many other countries. In more general terms,

geological survey organizations worldwide are increasingly using the standard protocols established under this project.

Some of the most significant international progress has been achieved within Europe. A two-volume Geochemical Atlas of Europe, based on sampling and analytical protocols recommended in Darnley et al. (1995) has been published: Part 1: Background Information, Methodology and Maps (Salminen et al., 2005); and Part 2: Interpretation of Geochemical Maps, Additional Tables, Figures, Maps and Related Publications (De Vos et al., 2006). Both volumes are available on-line from <http://www.gtk.fi/publ/foregsatlas/>. The complete European database of all field and geochemical data collected as part of this project, and the related digital photo archive, are also freely available at this website. Geochemical mapping projects at the European scale continue under the Geochemistry Expert Group of EuroGeoSurveys. This Group is led by current IAGC President, Dr. Clemens Reimann (Geological Survey of Norway).

## 5. Funding, Oversight, and Outreach

Most of the current Working Group's funding comes from IUGS in the form of an annual stipend. IAGC provided funding in 2003, 2005, and 2006 to offset travel expenses for Dr. Pradip Govil from India to attend Working Group business meetings. Dr. Govil went on to establish the national-scale soil geochemical survey of India, so IAGC's financial assistance was extremely useful and greatly appreciated.

IUGS conducts periodic reviews of its Working Groups to evaluate progress towards meeting the stated goals. The latest IUGS review of the Working Group on Global Geochemical Baselines was conducted in December 2007. IAGC was invited to participate in the review, but declined. The review committee consisted of Dr. Ryo Matsumoto (University of Tokyo), Dr. Mikhail Fedonkin (Russian Academy of Sciences), and Dr. James Hein (U.S. Geological Survey). The committee's

report, submitted to IUGS in 2008, congratulated the Working Group on its long history of productivity and recommended that IUGS provide additional funding to the Working Group to help facilitate establishing geochemical mapping programs in developing countries and to train geochemists in these countries on the global-scale protocols.

The Working Group convenes a symposium on national- and international-scale geochemical mapping at the IUGS-sponsored International Geological Congress (IGC), held every four years. Starting with the 2008 IGC in Oslo, Norway, this symposium is now called the Arthur Darnley Symposium, in memory of the founder of the predecessor projects and current Working Group, who died in 2006. Papers from the 2008 Darnley Symposium were published as a thematic issue of *Geochemistry: Exploration, Environment, Analysis*. The next Darnley Symposium will be held at the 34<sup>th</sup> IGC in Brisbane, Australia in August 2012. The Working Group convenes other symposia on a more irregular basis, the latest of which was the Global Geochemical Mapping Symposium held in Langfang, China in October 2009.

Each year, the Working Group submits a detailed annual report to both IUGS and IAGC that summarizes the year's activities, including publications and presentations. This report is posted on the IUGS web site. Hopefully these reports will also be posted on the IAGC web site in the future.

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## THE 13TH INTERNATIONAL SYMPOSIUM ON WATER-ROCK INTERACTION (WRI-13)

An abridged report about WRI-13 appeared in the last issue of the Newsletter. What follows is the formal report on the meeting from WRI Working Group Chair Halldór Ármannsson, with photos added as considered appropriate.



**WRI-13 Participants**

The 13<sup>th</sup> International Symposium on Water Rock Interaction (WRI-13) was held from 16-20, August 2010 in the UNESCO World Heritage city of Guanajuato, Mexico. The Organizing Committee of WRI-13 was ably led by its Secretary General, Prof. Thomas Kretzschmar (CICESE, Ensenada, Mexico), who was greatly assisted by many colleagues and graduate students.



**WRI-13 Secretary General  
Thomas Kretzschmar**

At registration, participants received a hard cover WRI-13 proceedings volume, edited by Peter Birkle (Instituto de Investigaciones Eléctricas de Geotermia, Cuernavaca) and Ignacio S. Torres-Alvarado (Centro de Investigación en Energía, Universidad Nacional Autónoma de México, Temixco), and published by the Taylor & Francis Group of the CRC Press, comprising 233 papers, on a total of 1008 pages peer reviewed by more than 260 expert reviewers.



**WRI-13 Working Group Member  
Yousif Kharaka with proceedings  
volume co-editor Peter Birkle**

Scientifically, WRI-13 continued the excellent traditions of previous WRI symposia. The oral and poster presentations covered the latest research results of water-rock interaction ranging from methodological topics such as *Advances in Numerical Modeling of Water-Rock Interaction* to more geological ones like *Water in Petrogenetical, and Ore Forming Processes*. A special memorial session on “Measurements and Applications of Stable and Radiogenic isotopes and Other Tracers” was held in honour of Professor Hitoshi Sakai, who passed away in September 2008. Prof. Sakai was Secretary General for WRI-4 in Missasa, Japan in 1983, Chairman of the IAGC Water-Rock Interaction Working Group from 1983-1989, Vice President of the IAGC from 1988-1992, and its President from 1992-1996. Professor Sakai. Before the session one of his former students and colleagues, Akira Uéda, delivered a memorial talk and played a video message from his son, Dr. Ken Sakai. The Hitoshi Sakai memorial session was in fact the session that attracted most contributions, followed closely by sessions on “Characterization of Mineral Surfaces and Water/Mineral Interfacial Processes” and “Role of Water-Rock-Gas Interaction in the Sequestration of CO<sub>2</sub>.”



**WRI-13 Opening Ceremony**

**Editor's Note:**

Given the long history of dedicated service to IAGC by Prof. Hitoshi Sakai detailed in the previous paragraph, it seems only fitting that this be formally recognized. One way to do this would be to formally name the IAGC Distinguished Service Award the "IAGC Hitoshi Sakai Distinguished Service Award." Of course, such an action requires approval by the IAGC Council, so any Members in agreement should send an e-mail of support to one of the current Council members listed on the last page of the Newsletter.

The WRI Working Group encourages student excellence by providing awards for the best student oral and poster presentations. One more award is given for the best poster presentation, which at this symposium was won by an Israeli student **Yoav Rosenberg** and his coauthors J. Ganor and S. Zmora-Nahum for the paper: *The Effect of pH on the Formation of Gypsum Scale in the Presence of Phosphonate Antiscalant*. The best student poster award was given to the Mexican **Daniel Perez-Zarate** and his coauthors I.S. Torres-Alvarado, E. Santoyo and I. Martinez-Frias for their paper: *Statistical Methodology to Predict Reaction Time of Water-Rock Experiments Under Quasi-Steady State Conditions*. Finally the award for best student oral presentation was given to a German student **Andre Banning** and his coauthors T. Rude, A. Cardona, A. Aguiln-Robles and L. Padilla-Snchez for the paper *Uranium and Arsenic in Some Aquifers from Mexico and Germany – A Common Geogenic Development?*

Keynote lectures, covering the various themes of WRI were among the highlights of the symposium. The scientific program started with the first keynote speaker **W. George Darling** (BGS, UK) discussing the *Uses of CFCs and SF<sub>6</sub> for Groundwater Dating* as part of the Hitoshi Sakai Memorial

Session. A keynote lecture on the topic "Water-Rock Interaction in Mine Tailings" *Drainage Water–Mine Tailings Interaction: Environmental Risk and Origin of Secondary Metal Deficit* was given by **Svetlana Bortnikova** (Trofimur Institute of Petroleum Geology and Geophysics, Novosibirsk, Russia).



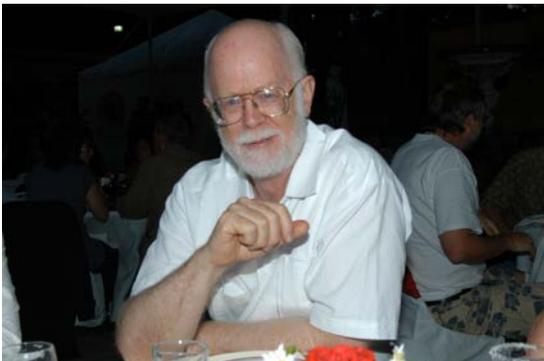
**Svetlana Bortnikova at Fiesta Night**

**Roland Hellmann** (University of Grenoble, France) discussed *Chemical Weathering of Silicate Minerals: Linking Laboratory and Natural Alteration* in a keynote lecture on the topic "Characterization of Mineral Surfaces and Water/Mineral Interfacial Processes." The topic "Solute Interactions During Transport in the Vadose Zone" was treated in a keynote lecture entitled *The Unsaturated Zone as an Observatory for the African Sahel* by former WRI Chairman, **W. Mike Edmunds** (University of Oxford, UK). The keynote lecture covering the topic "Water-Rock Interaction in Geothermal Systems" was *Integrated CO<sub>2</sub> Sequestration and Geothermal Development: Saline Aquifers in the Beitang Depression* delivered by **Pang Zhonghe** (Chinese Academy of Sciences). **J. Aparico** gave a keynote lecture *The San Juan del Grijalva Landslide* on the topic "Geological Hazards Related to Water-Rock Interaction." The last keynote lecture *Ascent and Cooling of*

*Magmatic Fluids: Precipitation of Vein and Alteration Minerals* was given by **Mark H. Reed** (University of Oregon) with reference to the topic “Water in Petrogenetical, Magmatic and Ore Forming Processes.”

As has been the custom at previous WRI meetings people who have been active in connection with the symposia were honoured by the WRI Group. Five people were designated as “Friends of WRI”: **Stefán Arnórsson** (University of Iceland), **Russell S. Harmon** (North Carolina State U), **D. Kirk Nordstrom** (US Geological Survey, Boulder, CO), **Paul Shand** (CSIRO Land and Water, **Glen Osmond**, Australia) and **Ignacio S. Torres-Alvarado**, Universidad Nacional Autónoma de Mexico). Two members of the Executive Committee, **Yousif K. Kharaka** and **Oleg V. Chudaev** were given Leadership awards, and the Secretary-General of WRI-13, **Thomas Kretzschmar** received a special acknowledgement for his excellent effort.

Before the symposium Schlumberger Water Services offered a 2 day short course on “Characterization and Management of Mine Waste” at the Hotel Real de Minas, coordinated by **Patrick Williamson** and attended by 8 participants from Mexico, USA and Peru. An Exhibits Fair was held at the Hotel Real de Minas during WRI-13, the most popular stand being the tequila stand, where generous sample administration ensured smooth flow of people to the other exhibitors.



**“Friend of WRI” Kirk Nordstrom**

Each participant took part in one of the four one-day long mid-session field trips to Valle de Santiago, La Bufa – Calderones, Tailings of Guanajuato and El Gigante Hill. I myself experienced the Santiago Valley including the visit to the Crater Lake after emerging from the 400 m long dark tunnel leading to it, a memorable moment. Eight people took part in the pre-session field trip to the Yuacatan peninsula led by Mario Rebollar and Luis Marin which by all accounts was a great success. Twenty five people took part in the 1 day post-session field trip Minas de Guanajuato led by **Eduardo Gonzalez Partida** and twenty four took part in the 5 day Chihuahua field trip led by **Ignacio Reyes** and **Alejandro Villalobos-Aragón**, myself one of them. This trip was a mind bending experience first with the colourful stalactites and stalagmites of the Nombre de Dios Caves, then the largest naturally grown selenite crystals on earth in the Naica Cave and last but not least the Copper Canyon in all its splendour. Also memorable was the visit to the people of Creel with their ethnic church and uncomplicated dwellings such as a cave, features that sadly may disappear before long.



***Entertainment at the Welcoming Reception***

Water-rock-human interaction was not left out either. The Organizing Committee of WRI-13 planned an excellent social program for all the participants. At the main banquet participants were shown and made to participate in Mexican dancing and some could not stop dancing for the rest of the symposium.



**WRI-14 Secretary General Pierpaolo Zuddas (left of the waiter) at the WRI-13 Banquet**

During the General Business Meeting of WRI-13, the attendees voted for **Halldór Ármannsson** (Iceland) to carry on as the Chairman of the Working Group on Water-Rock Interaction for the next three years. They also selected as Secretary General for WRI-14 **Pierpaolo Zuddas** of Lyon, France. WRI-14 will be held in the vicinity of Lyon where 4 potential venues were introduced: Lyon, St. Etienne, Avignon and Arles. Another excellent symposium and a large attendance is expected for WRI-14 in 2013.

\* \* \* \* \*

## BUSINESS OFFICE REPORT - MEMBERSHIP UPDATE

Many thanks to everyone who renewed their IAGC membership online this year! 2011 is the first year we are responsible for collecting our own dues and payments for online access to *Applied Geochemistry*, and thanks to your patience it has been a seamless transition. As of March 2011, the IAGC has 414 members (up from 301 last year) from 46 countries. The table below summarizes your payment methods:

#	Payment Method
259	Online - PayPal
8	Online - Google Checkout
27	Check
120	WRI-13

As a small organization, we must rely on online vendors (PayPal and Google) to process our credit card transactions. Despite some issues, our experience has been generally good. If you have any comments or suggestions about this process, please feel free to email Chris Gardner, the Business Office Manager, at [iageochemistry@gmail.com](mailto:iageochemistry@gmail.com). Like our journal, we hope to soon transition our membership renewal and payment process to be "online only" to reduce costs, but we also want to make it as easy as possible for you!

Remember, to update your contact information, get your membership number, view a list of IAGC members, or renew your membership, please visit our website at [www.iagc-society.org](http://www.iagc-society.org) and click on Society - > Membership.

### Did you know?

Members can now make a charitable gift to support IAGC special initiatives like the PhD Student Research Grant program on their annual membership renewal form.

Many thanks to the following members made this important decision in 2011:

- Marty Goldhaber
- Russell Harmon
- Berry Lyons
- Radomir Petrovich
- Arndt Schimmelmann
- Cynthia Venn
- Richard Wanty
- Robert Zielinski

Why not join this group in 2012?

\* \* \* \* \*

### **Contacting IAGC or Renewing Your Membership for 2011:**

To renew your IAGC membership, subscribe to or track down errant issues of *Applied Geochemistry* or *Elements*, or to send in comments, etc., contact:

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### **RECENT GEOCHEM PUBS**

With this issue of the newsletter, IAGC is commencing a new initiative for you, the IAGC membership. Going forward, each issue of the Newsletter will have a list of recent journal publications by IAGC Members. Given the vast array of journals in which geochemistry papers appear, it is hoped that this initiative will provide a service to the Associations members, particularly those in developing countries.

As conceived, this IAGC Geochemistry Reference List will work as follows. Members will send a reference citation for each new journal publication, as it appears in press, to the IAGC Business Office ([iageochemistry@gmail.com](mailto:iageochemistry@gmail.com)). If a reprint of the paper is available from the author by request, then the Member should also include his/her e-mail address after the reference citation. These submissions will be compiled and used to select the list of papers published in the next Newsletter. This limited initiative could be expanded into a general listing of significant recent papers across the spectrum of geochemistry by both members and non-members, if a volunteer Member were to step forward and volunteer to be the curator of this more

expansive publication list. This first edition contains a selection of recent publications by the IAGC Officers, Council Members, and Working Group Leaders. The formatting is presented as received, but for the future it is requested that citations be provided in the Applied Geochemistry format. Going forward, the Newsletter list will be selected from Member contributions.

Please let us know what you think about this and any ideas you might have for its improvement as a member service. And, most importantly, this service is for each and every IAGC Member, so please make it a success by contributing.

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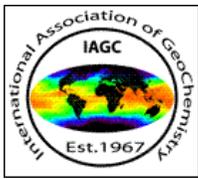
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