

Newsletter

of the International Association of GeoChemistry

Number 62, June 2015

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From the President

Strangely, I was asked to write something for the spring newsletter as I was digging out my sweaters and coat in preparation for winter. Still, it reminds me about the global nature of geochemistry that the IAGC represents with members scattered across the globe. One of my first tasks as president is the pleasant one of congratulating the award winners and student grant recipients for 2015, details of which appear elsewhere in this newsletter. Having served over the last few years on the panel that judges student grants, I have been impressed by the calibre of work being done by the new generation of geochemists and know that the field will be in good hands in the future. Sadly, I also have to acknowledge the untimely passing of Mike Edmunds and to convey that we are considering ways to honour his considerable legacy within the society.



We have an exciting program of working group meetings in 2015 with the Applied Isotope Geochemistry and Medical Geology holding meetings. We are also sponsoring sessions at the upcoming Goldschmidt conference and GSA annual meeting. The IAGC is different than many scholarly societies in that it holds a number of workshops and conferences via the working groups usually on a two or three year rotation,

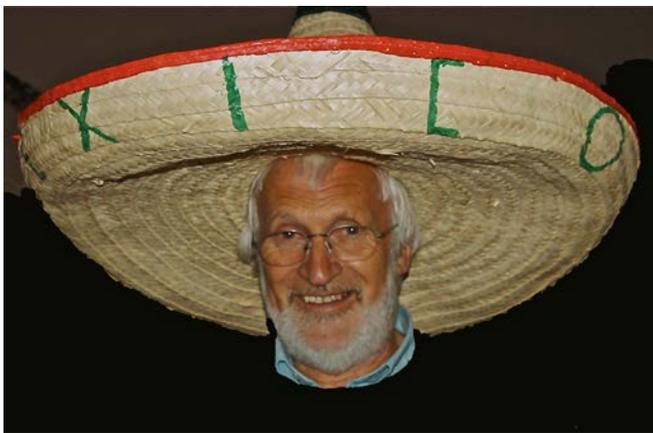
rather than a single large annual conference. The IAGC meetings are great opportunities to interact with a range of scientists and I hope that many of you will attend.

Finally, I would like to say that this is your society, so if there are matters that you want to raise or suggestions, please get in touch with myself or others on the council and we will try to take them on board.

Ian Cartwright, President
(ian.cartwright@monash.edu)

Obituary

**Professor Wyndham Michael
(Mike) Edmunds**
(31 July 1941 – 28 April 2015)



Mike Edmunds at WRI-13 conference in Guanajuato, Mexico, August, 2010

We are greatly saddened to announce that Professor Mike Edmunds died on Tuesday 28 April, 2015 after a short battle with cancer. During a distinguished career spanning close to 50 years, Mike will be remembered for his outstanding record of scientific contributions in geochemistry, especially in hydrogeochemistry,

palaeohydrology and water resources. Our deepest sympathies and thoughts are with his wife Kathy, their four children and six grandchildren.

Mike obtained his PhD in geochemistry from Liverpool University in 1966. That year he joined the British Geological Survey where, from 1986 to mandatory retirement in 2001, he held an Individual Merit Promotion research position, conducting pioneering basic and applied research in the broad fields of groundwater quality, including groundwater acidification, hydrogeochemical processes, trace element studies, isotope hydrology, palaeohydrology, mineral and thermal waters, and arid and semi-arid zone studies, including groundwater recharge assessment. After 2001, Mike had a position with BGS as Honorary Research Associate, and was Visiting Professor of Hydrogeology and, since 2003, Senior Research Associate in the School of Geography & Environment, Oxford University, promoting water issues, and developing links between science and policy via the Oxford Centre for Water Research as its Research Director since 2002.

Mike pioneered new methodologies and approaches to study water-rock interactions, using high resolution interstitial water depth profiles to characterise natural processes and pollution migration. Using an array of environmental tracers (e.g. chloride mass balance and stable isotopes) applied to the unsaturated zone, he was among the first to show how tracer based approaches may be used to resolve recharge rates and recharge history. The results have had profound implications for recognizing the limits of renewable groundwater, especially in semi-arid regions. With many co-workers and students from all over the world, he investigated many of the classic aquifers and large sedimentary basins in UK, Europe and around the world to define the controls on water quality evolution, especially the origin and migration of

palaeowaters. His other contributions include some of the earliest investigations of geothermal resources, with pioneering results on Hot Dry Rock reservoir geochemistry, and the impacts of acid rain on shallow aquifers. His studies more recently have been instrumental in the recognition of off-shore palaeowaters as an important new water resource.

Mike contributed 230 scientific reports, book chapters and journal articles, including 150 in externally reviewed publications. His publications are of the highest quality and continue to have a huge impact on hydrogeochemists throughout the world. Because Mike was passionate about science and achieved the highest international stature in geochemistry, he was often invited as plenary or keynote speaker at international meetings. He was involved in the supervision of 16 PhD theses in UK and overseas. He organised courses on water quality in UK, Greece, India, Honduras, Mexico, Ethiopia and elsewhere. In the past decade alone, he was coordinator and leader of over 10 major projects on aquifer management, groundwater pollution, mineral and hydrothermal waters, palaeowaters and water recharge in basins located in Europe, Africa, North America, the Middle East and China. He carried out international training, mentoring, and joint and consultancy work in the water quality sector for various UN organisations, notably the IAEA and UNESCO.

Mike was made a fellow of the Geological Society of London (GSL) in 1972. On the basis of his scientific leadership and many pioneering and internationally important scientific discoveries Mike was awarded the GSL's Whitaker Medal in 1999; elected Fellow and awarded the O. E. Meinzer Award of the Geological Society of America as the first British recipient in 2009; and received the first Vernadsky Medal of the International Association of GeoChemistry (IAGC) in 2010.

Mike was a strong supporter of the IAGC via the Water-Rock Interaction Working Group. One of the founding fathers of WRI, Mike was the only person to have attended all the 14 triennial WRI symposia, always playing an important role. He was elected Chairman of the WRI Working Group (1989-2001) and Secretary General of a highly successful WRI-6 (1989) conference held in Malvern, England. Mike was a founding Associate Editor, reviewer and author for *Applied Geochemistry*.

Mike's death 'in harness' is a great loss to geochemistry, and water science and policy, and his passing will sadden the large number of colleagues, scientist and students that he influenced worldwide.

- Kharaka, Harmon, and Darling

Association News

2016 Awards Nominations

The IAGC is accepting award nominations for 2016 between June 15 and November 15. Beginning in 2016, the Distinguished Service Award is named in honor of Russell Harmon as a tribute to his exemplary service to the IAGC over several decades.

The Vernadsky Medal - awarded for a distinguished record of scientific accomplishment in geochemistry over the course of a career:

<http://www.iagc-society.org/vernadsky.html>

The Kharaka Award - bestowed to two deserving scientists (which may include senior graduate students) from developing countries. The award consists of a framed certificate plus an IAGC membership and Applied Geochemistry subscription for a term of three

years:

http://www.iagc-society.org/kharaka_award.html

The Harmon Distinguished Service Award - bestowed on a deserving candidate to recognize outstanding service by an IAGC member to the Association or to the geochemical community that greatly exceeds the normal expectations of voluntary service:
http://www.iagc-society.org/distinguished_service.html

IAGC Fellow - bestowed to a scientist who has made significant contributions to the field of geochemistry:
http://www.iagc-society.org/iagc_fellows.html

Certificate of Recognition - awarded to IAGC Members for outstanding scientific accomplishment in a particular area of geochemistry, for excellence in teaching or public service, or for meritorious service to the Association or the international geochemistry community:
http://www.iagc-society.org/certificate_recognition.html

Renew Your Membership for 2016!

It's never too early to renew your IAGC membership for the next calendar year. Our annual membership fee is STILL only \$25 and includes a hard copy subscription to *Elements* as well as online access. Membership also rewards you with lower cost registration rates at IAGC-sponsored working group conferences

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Membership Demographics

As of the time of this writing, we have 355 IAGC members in 43 countries. This number includes 34 new members from GES-10 meeting in Paris, France, and 7 new members from the Urban Geochemistry meeting in Columbus, Ohio, USA who joined as part of their registration.

2015 Governance Changes

Vice President

Philippe Négrel of the French Geological Survey (BRGM) is the new IAGC vice-president, beginning in January, 2015. Philippe received his PhD in isotope geochemistry (1992, University of Paris 7, France) and an ability to supervise research work in 2005 from the University of



of Toulouse, France. He joined BRGM in 1993 as research geochemist and specialized radiogenic (Sr, Nd, Pb) and stable (O, H, B, Li) isotopes in environmental studies for 20 years. Philippe was a senior research project leader in BRGM, Head of the Isotope Geochemistry Unit (2005-2010), and he is now Deputy Director of the BRGM Laboratories Division. He has more than 150 publications in peer reviewed international journals, and more than 270 communications at international conferences. He is an associate editor of *Applied Geochemistry*, served as an editor of the proceedings of the 14th Water-Rock Interaction International Symposium, and is a member of the organizing team of the next Applied Isotope Geochemistry (AIG-11) Conference to be held in Orléans, France, September 21st-25th 2015. Since 2010, Philippe

has been a Council Member of the IAGC and acted as chair of the Publication Committee.

In January, Rich Wanty transitioned to the Past-President position, and Ian Cartwright began his tenure as current President. Finally, the IAGC would like to thank Clemens Reimann for his eight years of dedicated service to the IAGC as he steps out of the Past-President role. Clemens served for four years as Vice-President, two years as President, and two years as Past-President, and his leadership has provided stability and helped make us into the strong organization we are today.

IAGC Council

We would like to thank the outgoing members of the IAGC council, whose terms ended at the end of 2014 – Martine Savard (NRC/GSC, Canada), Philippe Negrel (BRGM, France – currently Vice President), Janet Herman (University of Virginia, United States), and Thomas Kretzschmar (Geology Department CICESE, Mexico). Thank you for your service to the IAGC!

On January 1, we welcomed six new council members to the IAGC Board of Directors to serve a 2 year term:

Patrice deCaritat is a Principal Research Scientist at Geoscience Australia and was leader of the National Geochemical Survey of Australia (NGSA) project. He has a Lic Sci (BSc Hons) and PhD in Geology. He has worked in Australia, Belgium, Canada and Norway, with a focus on sediment, regolith and groundwater geochemistry. Of particular interest to him are the nature and origin of geochemical patterns at the regional to continental scales, the effects of surficial processes on regolith and groundwater composition, the elemental and isotopic



fingerprinting of mineralization and contamination, and modeling and prediction of geochemical patterns and processes.

Jodie Miller is a senior lecturer in the Department of Earth Sciences, Stellenbosch University, South Africa. She has diverse research interests spanning field geology, petrology, geochemistry and hydrogeology, but has a special interest the application of isotopes to solving field-based geological problems. Dr. Miller is also the undergraduate program coordinator for the BSc Earth Science program at Stellenbosch University and teaches a wide range of topics to undergraduate and postgraduate students including mineralogy, optical mineralogy, isotope geochemistry, geochronology, field geology, and introductory minerals processing.



Avner Vengosh is a Professor of Geochemistry and Water Quality at the Nicholas School of Environment in Duke University and has a secondary appointment in the Department of Civil and Environmental Engineering. He is an Associate Editor for the IAGC's journal *Applied Geochemistry*. His research aims to delineate the sources and pathways of contaminants in the environment and their possible impacts on human health through integration of environmental geochemistry, advanced isotope geochemistry (boron, strontium, carbon, and radium isotopes), and environmental health



research. Avner received IAGC Fellow Award in 2011.

Romain Millot has a PhD in Isotope Geochemistry (IPGP, University of Paris 7), and is currently a researcher in the Laboratory Division of BRGM (French Geological Survey) in Orléans, France. He is a senior project manager in the field of multi-isotope tracing in the environment and the manager of the Multi-Collector ICP-MS laboratory. He has published more than 30 scientific articles concerning river weathering mass budgets, characterization of thermo-mineral and geothermal waters, metal pollution source investigation, and the development of new analytical tools in isotope geochemistry. Since joining the BRGM in 2003, he has been involved in different projects dealing with the development and utilization of isotopic tracer in water/rock interaction processes.



Sophie Opfergelt obtained her MSc in geology from the Université Catholique de Louvain (UCL), Belgium and went on to work as a project geologist for a mining company in West Africa. She then obtained her PhD in agronomical sciences and biological engineering from UCL, Belgium. She was later a postdoctoral fellow at the University of Oxford, UK and at UCL, Belgium. She was



appointed in 2014 as a professor in the Earth and Life Institute at UCL, Belgium. Her research interests include the release and export of mineral nutrients from rock-soil-plant-water systems during weathering, and the application of stable isotope systems such as Si and Mg to trace sources and processes controlling the mobility of mineral nutrients. Sophie earned the IAGC Ebelmen Award in 2014.

Steve Grasby Since completion of his PhD at the University of Calgary in 1997, Dr. Steve Grasby has worked at the Geological Survey of Canada. His research has focused on the Canadian High Arctic and includes work on low temperature geochemistry, permafrost hydrogeology, as well



as paleo-environmental studies, with specific attention to the Latest Permian Extinction and Early Triassic recovery. In addition, he has conducted extensive research on the biogeochemistry of thermal and mineral springs across Canada, including several of the northern most springs in the world. He was awarded the Queen Elizabeth II Diamond Jubilee Medal in recognition of his research in 2012.

2015 IAGC Awards

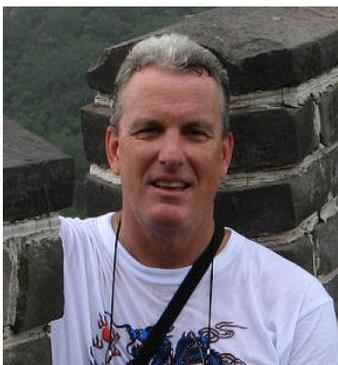
We are pleased to announce our Society Awards for 2015. Congratulations to all the recipients, and thank you for your service to the IAGC and the geochemical community!

Distinguished Service Award

The 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 voluntary service.

Tom Bullen, US Geological Survey

Tom Bullen worked for the US Geological Survey as an isotope geochemist for three decades. During that time he made numerous advances in our understanding of isotope chemistry in geohydrologic systems, in particular using elements such as Fe, Cr, Sr, Ca, Se, etc. But to call Tom an Isotope Geochemist would be to oversimplify his contribution to our science, as he has used isotopes among many tools to characterize water-rock interactions applied to problems such as weathering, catchment hydrology, groundwater-surface water interactions, magmatic evolution, water salinization, and a host of other topics. Tom's h-index of around 40 (!) is a fitting metric of the magnitude of his contributions to the geosciences.



While maintaining this enviable record of productivity, Tom also has made numerous contributions of his time and expertise to advance the art of geochemists by mentoring young scientists and by contributing to the operation of several IAGC working groups. Tom was an ever enthusiastic participant and organizer at the Applied Isotope Geochemistry (AIG) group meetings where he gave presentations that were memorable both for their science and engaging delivery. Tom also worked tirelessly behind the

scenes to organize the Faure awards for the best student presentations and also co-edit the special edition of Applied Geochemistry from AIG-9 in Taragona. Tom also has been an active participant and leader in the Water-Rock Interaction (WRI) Working Group. In addition to his scientific contributions to WRI, Tom served as Treasurer of WRI-7 in Park City Utah in 1992, and as Editor of the Proceedings Volume of WRI-12 in Kunming China in 2007. Both of these roles required a tremendous amount of Tom's time (and patience!), and were fundamental to the success of the WRI and IAGC meetings over several years. Tom also became immersed in the food and culture in the many cities that the working groups visited and was willing to share his findings enthusiastically and knowledgeably with his fellow delegates.

Tom also has had a major role in the success of *Elements* magazine, the joint publication of which IAGC is a consortium member. After serving as Guest Editor of the highly successful issue on metal stable isotopes in 2009, Tom joined the Advisory Board in 2011 as our IAGC representative and he continues in that role to this day. For his contributions to the art of Geochemistry, and for his service to IAGC, few people are as deserving of the IAGC Distinguished Service Award as is Tom Bullen.

Kharaka Award

We are happy to present, for the first time in 2015, the **Kharaka Award** to Dr. Renguang Zuo. The IAGC Kharaka Award is bestowed annually to deserving scientists (which may include senior graduate students) from developing countries. The award consists of a framed certificate plus an IAGC membership and Applied Geochemistry subscription for a term of three years, with award recipients profiled in the IAGC Newsletter and on the Association website. This award was made possible by IAGC member Yousif Kharaka and the many generous donations from our IAGC member community.

Dr. Renguang Zuo

received his PhD degree from the China University of Geosciences (CUG) in 2009. His doctoral dissertation focuses on mapping of mineral prospectivity and identifying of geochemical anomalies using fractal/multifractal models. His doctoral dissertation was awarded the Best PhD Thesis in Hubei Province of China in 2010, and was among the Chinese National Hundred outstanding doctoral thesis nominated in 2011. In recent years, Dr. Zuo's interests focuses on how to identify the weak geochemical anomalies related with mineralization under cover areas. His recent works demonstrate several successful case studies on identifying the weak geochemical anomalies in the covered areas using fractal/multifractal models and spatial robust neighborhood statistics. Dr. Zuo has published more than 30 peer-reviewed papers and he was awarded the First-Class Prize in Sciences and Techniques by Ministry of Land and Resources of the People's Republic of China in 2011, the Second-class Prize of National Science and Technology Progress Award of People's Republic of China, the Highest Prize of Young Geoscientists and the New Century Excellent Talents in University grant of China in 2013. Dr. Zuo is an associate editor for Journal of Natural Resource Research and Journal of Geochemical Exploration. He was guest editor of the special issue "fractal analysis of geochemical data" in Journal of Geochemical Exploration. Due to his excellent work, he has been promoted to a full professor in 2013 at CUG. For this deserving work, Renguang Zuo is the first recipient of the IAGC's Kharaka Award.



IAGC Fellow

The honorary title of IAGC Fellow is bestowed annually to scientists who have made significant contributions to the field of geochemistry.

Gabriel Filippelli

is currently a Professor in the Department of Earth Science at Indian University – Purdue University Indianapolis (IUPUI). He received his BS from the University of California, Davis and his PhD at the University of California, Santa Cruz in 1994. Gabe



spent the early portion of his career investigating the past and present global biogeochemical cycle of phosphorus, and continues to work on important paleo-oceanographic questions relating to climate change and elemental cycling. He is recognized as an international authority in the interdisciplinary field of earth sciences and human health. His work on environmental lead exposure and blood lead levels in children in urban areas has been innovative and transformative. As Director of IUPUI's Center for Urban Health he has engaged both other academics and the lay public in recognizing the link between urban environmental issues, public health, and sustainable cities. He is a former United States Department of State Jefferson Science Fellow. For this important and novel research and his exemplary record of service, Gabriel Filippelli is named an IAGC Fellow for 2015.

Elsevier PhD Student Research Grant Winners

The IAGC is happy to announce the recipients of the 2015 Student Research Grants, sponsored by Elsevier and the IAGC. Every year, we have many strong research proposals from students from around the world, and every year the awards become even more competitive, with a record 30 submissions this year. We are happy to help these four excellent students, and are grateful to Elsevier for providing much of the funding used to make the awards. Congratulations to our grantees! We wish all the students the best of luck as they complete their studies, and look forward to welcoming all of you into the research community.

Jotautas Baronas, University of Southern California, USA – “Si cycling dynamics in the Critical Zone: $\delta^{30}\text{Si}$ and Ge/Si multi-proxy approach”

Jotautas earned his BSc in Chemistry at Jacobs University Bremen in 2011 and his MSc in Earth Sciences at the University of Southern California in 2014. The goal of his PhD research is to develop new tools that can be used to reconstruct how weathering has changed in the geological past.



He applies a multi-proxy approach that utilizes a combination of elemental and isotopic geochemical tracers (Ge/Si, $\delta^{30}\text{Si}$, and a novel proxy $\delta^{74}\text{Ge}$ currently in development, to name a few). His work in tropical river catchments and anoxic ocean basins is aimed at finding a unique response of this multi-proxy system to both

continental weathering and marine sediment diagenesis processes.

Melissa Foster, University of Colorado, USA – “From the mountains to the plains: constraining the evolution of Front Range surfaces through Quaternary dating”

Melissa earned her B.A. in Geology from Humboldt State University in 2003, and then worked in environmental consulting for several years in Arcata, California. Melissa returned to Humboldt State



University for her M.S. in Geology (2010), and she is currently a PhD student at the Institute of Arctic and Alpine Research (INSTAAR) and the Department of Geological Sciences at the University of Colorado. Melissa’s dissertation provides the timeline for Quaternary landscape evolution and surface processes in the Colorado Front Range and western High Plains. She is particularly interested in the Front Range rates of fluvial incision and the exhumation history of the Denver Basin. To quantify rates and timing of sediment production, transport, and deposition in the Colorado Front Range, she measures the concentrations of cosmogenic radionuclides in fluvial sediments, colluvium, and mobile regolith.

Michael Short, The Australian National University, Australia – “Investigating salt and solute cycling in a small endorheic basin using stable halogen isotopes”

Michael graduated from Flinders University of South Australia with a B.Sc. in Environmental Science in 2012. He spent a year working as a hydrogeologist before beginning a Ph.D. at the



Research School of Earth Sciences at The Australian National University. His work is mostly focused on applying environmental tracer techniques to investigate water and salt/solute movement through arid and semi-arid landscapes. Michael is working to advance the understanding of how to apply chloride, bromide and the stable halogen isotopes ($\delta^{37}\text{Cl}$ and $\delta^{81}\text{Br}$) as environmental tracers in catchment hydrology. This has involved investigating large international data sets as well as field work in the Lake George Basin to investigate catchment-scale variations in Cl^-/Br^- ratios and solute transport through a 50 m-thick clay aquitard. He also hopes that these techniques will provide further insight into the rich geologic and hydrologic history of the Lake George Basin.

Yolanda Ameijeiras Mariño, Université Catholique de Louvain (UCL), Belgium – “Tracing the impact of land use change on soil chemical weathering processes”

Yolanda received her bachelor’s and master’s degree in Chemical engineering at the Universidade de Santiago de Compostela in 2011, with a specialization in Environmental

engineering. She is conducting her PhD research at the Earth and Life Institute, Université catholique de Louvain, Belgium. Her interest lies in the impact of land use change on soil weathering processes and chemical solute fluxes to rivers. By using weathering



indices and geochemical tracers such as stable silicon isotopes and Ge/Si ratios, her objective is to identify weathering processes impacted by land conversion from forest to cropland, and to quantify the effect on solutes exported from soils. The research is carried out in a sub-tropical environment in southern Brazil and will contribute to improve our capacity to address the major environmental and socio-economic challenges posed by changing mineral weathering conditions in soils on decadal-to-centennial timescales.

Catching Up with Previous Student Research Grant Winners

We love to hear from previous recipients of the Elsevier Student Research Grant program to learn how the IAGC helped advance their project, as well as to just share their successes. Below, Lee Corbett (2014, Newsletter #60) and William Haskell (2013, Newsletter #58) share what they’ve been up to.

By Lee Corbett – University of Vermont



Lee in the field overlooking the fjord north of Thule

As part of my doctoral dissertation research at University of Vermont, I have been investigating landscape evolution and subglacial erosion in Thule, northwestern Greenland. One of my projects in Thule is targeted at understanding the recent glacial history of the landscape; in particular, my goal is to constrain the age of the glacial sediments and to use those ages to make inferences about past episodes of glacial advance and retreat. In addition to mapping and radiocarbon dating, I utilize cosmogenic radionuclides (^{10}Be and ^{26}Al) to understand the exposure and burial history of glacially-deposited boulders both on the landscape and directly on moraine crests. With help from the IAGC Student Research Grant, I have been able to analyze cosmogenic nuclide concentrations in boulders from Thule. In a recent paper in *Quaternary Science Reviews*, I present age constraints (both radiocarbon and cosmogenic ^{10}Be) for a sequence of moraines that I infer to have been deposited during a glacial re-advance during the early Holocene, possibly in concert with the 8.2 ka

Cold Event. My continuing work seeks to use two-isotope cosmogenic analysis ($^{26}\text{Al}/^{10}\text{Be}$) to investigate the longer-term history of glaciation over the past several glacial-interglacial cycles. I have been fortunate to have made five trips to Greenland (three of which were to Thule) during my graduate career and have loved every minute of my time there. After completing my PhD, I hope to continue working in the high Arctic, utilizing geochemical techniques to address Glacial Geology and Geomorphology questions.

Reference:

Corbett, L.B., Bierman, P.R., Lasher, G.E., and Rood, D.H. (2015) Landscape chronology and glacial history in Thule, northwest Greenland. *Quaternary Science Reviews*, 109: 57-67.

By William Z. Haskell II – University of Southern California

The marine biome is a major component of earth's climate system, yet we still know little about how it will respond to future changes in global circulation, ocean acidification



and rising global temperature. Much of the unknown is in the interaction between physical and biological systems. For my PhD research, I studied how upwelling rate and ecosystem dynamics influence the efficiency at which marine ecosystems export, and ultimately bury, organic material in sea floor sediments in the Southern California Bight. Since up to ~1/3 of marine organic carbon burial occurs in coastal upwelling regions, even small fluctuations in the efficiency of these ecosystems to export organic carbon can have an enormous impact on the global carbon budget (Sigman and Haug, 2003, *Treat. on Geochem. Vol. 6*). The O_2/Ar ratio and

triple oxygen isotope composition ($^{17}\Delta$) of dissolved O_2 can be used to simultaneously estimate net (NOP) and gross biological oxygen production (GOP) in the surface ocean (Juraneck and Quay, 2013, *Annu. Rev. Mar. Sci.*). NOP and GOP are stoichiometrically related to carbon production and therefore, the NOP/GOP ratio reflects the efficiency of an ecosystem to export organic carbon. I used the IAGC student research award towards the cost of analysis of O_2/Ar and $^{17}\Delta$ of dissolved oxygen via isotope-ratio mass spectrometry (IRMS) in Rachel Stanley's laboratory at Woods Hole Oceanographic Institution. By combining profiles of O_2/Ar and $^{17}\Delta$ with concurrent estimates of upwelling velocity and eddy diffusivity based on budgets of 7Be and ^{234}Th in a non-steady state model, I was able to demonstrate that NOP/GOP fluctuates through time during the annual upwelling cycle, likely in response to ecological shifts that coincide with changes in ocean physics along the California coast.

News from our journal *Applied Geochemistry*

The March 2015 volume 55 of *Applied Geochemistry* includes a Special Issue on "Geochemical speciation codes and databases." In a chat with the Editor-in-Chief, managing guest editor Dr. Dmitrii Kulik, a senior scientist from Paul Scherrer Institut, Switzerland, provides some details about it.

Applied Geochemistry: *How did this special issue come about?*

Dmitrii Kulik: This special issue is a follow-up of the Session 23e of the Goldschmidt' 2013 Conference (Florence, Italy, 26–30 August 2013). The Editor-in-Chief, who also attended that conference, suggested to announce the Special Issue during the session, which was readily

followed by the conveners who then also became guest editors: Drs. Dmitrii Kulik, Johannes Lutzenkirchen, Gregory Lefevre, later joined by Werner Hummel. Most manuscripts were collected by end of 2013, and the entire editorial process completed in December 2014.

AG: *Why is this a timely or important topic?*

DK: This Special Issue of 17 total research papers presents a selection of currently developed codes and databases for computer-aided geochemical speciation modeling or shows their usefulness in applications. This is relevant for many geochemical disciplines such as geothermal water–rock interaction, CO_2 geological storage, radioactive/toxic waste disposal, hydrogeology, and aquatic chemistry. The aim of this series of articles was to give an overview to the recent progress in geochemical codes and databases, and to identify open and emerging research topics.

AG: *What aspects of geochemical modeling does this special issue encompass?*

DK: A typical modeling-tool package ideally contains a capable chemical equilibrium speciation solver code; an internally consistent thermodynamic database; and optional databases of interaction parameters for non-ideal mixing in phases and/or kinetic rates. This can be coupled with a transport modeling code to enable reactive transport simulations, may be embedded into a parameter fitting code, or into a tool for generating phase diagrams. For a geochemist, the diversity and limitations of alternative numerical algorithms and databases may greatly complicate the choice of the appropriate code package for a prospective application. Consequently, we grouped the submitted titles into four sub-topics: codes, databases, applications and comparisons:

- **Codes** (4 papers): So far, the chemical knowledge and familiarity with the existing modeling software are keys to gain insight into the modeled geochemical phenomena. In this regard, sophisticated codes for optimization of

thermodynamic data (*Shvarov*) and for fitting other input parameters of forward and inverse (geo)chemical models (*Miron et al.*) against the experimental or geochemical data remain at high demand. Another line of progress is the extension of chemical speciation algorithms with rigorous numerical methods for embedding time dependencies and kinetics (*Leal*), further on also into reactive transport simulations.

• **Databases** (5 papers): This work is mainly driven by the need for internally consistent and thus reliable chemical thermodynamic datasets. Such reliability is at utmost importance in the framework of national radioactive waste disposal projects. In Germany, the focus of the THERMODYNAMIC REFERENCE DATABASE (THEREDA) has been on highly saline solutions (*Moog et al.*). In France, clay has been chosen as the host rock for a deep geological repository; hence, the ThermoChimie database for radionuclides and chemotoxic elements (*Grivé et al.*) also contains the data relevant for cement/clay interactions (*Blanc et al.*) and the kinetic data for dissolution and precipitation of minerals in clay rocks (*Marty et al.*). An independent development provides a Pitzer interaction parameter database for hydrothermal reactions in saline waters at elevated temperatures and pressures (*Appelo*), together with the necessary extensions in the most popular PHREEQC speciation code.

• **Applications** (5 papers) of codes and databases embrace a full spectrum of processes including the solid solution formation (*Chudnenko et al.*), the contaminant release (*Gas'kova et al.*), the surface complexation (*Lützenkirchen et al.*), the brine systems (*Nasri et al.*), and the reactive transport (*Tutolo et al.*). For such applications, consistent databases are crucial, as well as the free availability of modeling codes. The case studies give a broad overview of the parameter space that needs to be explored, e.g., from temperature and pressure variation to the range of salinity.

• **Comparisons** (3 papers) improve our understanding of model power and applicability limitations either by using the same case for comparing different versions of the same model framework (Pitzer model, *Rowland et al.*), or for comparing the speciation computed by several teams for the same system using different codes and databases (*Vercoouter et al.*). Another interesting aspect (*De Gaspari et al.*) is the use of the redundant input data to improve the accuracy of computed speciation, in terms of reduced error between calculated and experimental values of species concentrations.

AG: *What major research gaps have you discovered from editing this special issue?*

DK: We've got a clear impression that the current emphasis in research shifts from further elaboration on geochemical speciation algorithms and codes towards providing internally more consistent thermodynamic and kinetic databases for specific application fields, enhanced with new software tools for the optimization of input thermodynamic data using available experimental or geochemical information. This is because major gaps still exist in thermodynamic and kinetic databases (good example is the uranium geochemistry, see the paper by *Vercoouter et al.*). Coupling to the solutes flow in reactive transport simulations is a further challenge, and much remains to be developed in this respect in the years to come.

AG: *Anything else you'd like people to know?*

DK: As guest editors, we learned a lot about the editorial process, which appears quite different from the author's perspective. We thank all contributors to this Special Issue for their efforts in writing and revising their manuscripts (some revised more than once); to all reviewers for their time and valuable comments that helped to improve on the quality of papers; the Editor-in-Chief Prof. Michael Kersten for his initiative and continuous help; and the editorial support by the Elsevier team.

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www.iagc-society.org/donate.html

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The following members donated while renewing their membership dues for 2015. Thanks for your generosity and for supporting the IAGC and our mission!

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2015 Meetings

IAGC Co-Sponsored Sessions at the GSA Annual Meeting

The IAGC is co-sponsoring three sessions at the GSA Annual Meeting, 1-4 November, 2015 in Baltimore, Maryland, USA.

T32. Urban Geochemistry

W. Berry Lyons, David T. Long

This session encourages presentations that qualify and quantify the geochemical and biogeochemical impacts (temporal and spatial) of urbanization and urban activities on soil, water, and air resources, as well as on human and ecosystem health.

[Submit an abstract to this session](#)

T35. Honoring the Diverse Career of Dr. W. Berry Lyons: Geochemistry from Polar Deserts to Tropical Watersheds

Sarah K. Fortner, Carolyn B. Dowling, Karen Johannesson, Klaus Neumann, Carmen A. Nezat

This session honors W. Berry Lyons and his many contributions to geochemistry. Dr. Lyons has investigated polar to tropical settings. His research, collaborative abilities, and leadership inspire many and have built new directions in geochemistry.

[Submit an abstract to this session](#)

T39. Sources, Transport, Fate, and Toxicology of Trace Elements and Organics in the Environment

LeeAnn Munk, David T. Long, W. Berry Lyons

Basic and applied research on trace elements and organics in the environment are encouraged. Topics include those that relate to understanding and modeling sources, transport and fate; human and ecosystem health; environmental assessment and remediation.

[Submit an abstract to this session](#)

IAGC Co-Sponsored Sessions at Goldschmidt 2015

The IAGC is sponsoring or co-sponsoring 5 sessions at the Geochemical Society's Goldschmidt meeting this year in Prague, 16-21 August.

<http://goldschmidt.info/2015/index>

Session 04g: Joint IAGC-EAG-GS Session on Urban Geochemistry

Conveners: David Long, David Bendz

Session 07j: Metal Stable Isotopes (non-CHONS) as Tracers of Ecosystem Processes

Conveners: Sophie Opfergelt, Richard Wanty, Thomas Bullen

Session 10e: Contaminant Hydrogeochemistry

Convener: Anne Hansen

Session 10g: Reactive Transport Modelling: Capabilities, Applications, and Data-Model Integration

Conveners: Henning Prommer, Ulrich Mayer, Ilka Wallis, Dirk Kirste

Session 13h: Geochemical Characterizations of Unconventional Petroleum Reservoirs and Environmental Impacts Associated with their

Production

Conveners: Hamed Sanei, Bernhard Mayer, Avner Vengosh

6th International Conference on Medical Geology (MEDGEO '15)

July 26 – August 1, 2015

Aveiro, Portugal

<http://medgeo15.web.ua.pt/>

MEDGEO conference bring together researchers and decision makers from the physical sciences and the medical sciences who are interested in solving health problems caused by natural processes and materials. The participants of the conference will convey expertise in a range of scientific fields, such as geochemistry, biology, engineering, geology, hydrology, epidemiology, chemistry, medicine, nutrition and toxicology. Known as the “Venice of Portugal”, Aveiro is surrounded by salt-flats, beaches and lagoons, and dominated by the Central Canal running through town. Once a big sea port, Aveiro lies in a region of mountains cutted by valleys and fertile lagoon plains.

The conference venue is the campus of Aveiro University, near the city centre. The conference is organized by the Aveiro University (UA), the Instituto Superior Técnico (IST) and the International Medical Geology Association (IMGA).

Themes:

- 1 - Environmental contaminants in health and disease
- 2 - Environmental toxicology, pathology and epidemiology
- 3 - Climate change and human health
- 4 - Therapeutic properties of minerals and waters
- 5 - Urban medical geology

- 6 - Modeling, mapping and monitoring of environmental hazards and diseases
- 7 - Advances in analytical methods
- 8 - Environmental risk assessment and remediation technologies

AIG-11 : Applied Isotope Geochemistry

21-25 September, 2015
BRGM, Orléans FRANCE

Registration Deadline: 1 August
<http://aig11.brgm.fr>

The 11th international meeting on Applied Isotope Geochemistry will be held from September 21st to 25th 2015, at the French Geological Survey (BRGM), in Orléans, France.

The purpose of this international conference is to bring together specialists in the different fields related to applied isotope geochemistry, to present state-of-the-art developments as well as key examples of application and to promote exchange of ideas between scientists.

Applied Isotope Geochemistry (AIG) is a working group of the International Association of GeoChemistry (IAGC). The aim of the 11th Applied Isotope Geochemistry conference is to provide a forum where a wide range of applications of isotope analyses in geosciences and related fields are presented.

A special focus will be put on water resources, as the downstream Loire River is scheduled to become a Unesco World Heritage site and to join the Natura 2000 network.

AIG-11 conference welcomes contributions on a wide range of the related topics including:

- Technological achievements and their applications concerning the use of isotopes in environmental geochemistry.

- Isotope hydrology as a tool for water supply policy, paleoclimatology and paleo-environmental changes, (climate re-construction, retrospective on pollution).
- Recent applications and developments in dendroisotopes.
- Applications for understanding ecosystem behavior and function.
- Isotopic tools applied to degradation of organic contaminants (including biodegradation and non-biotic processes, passive barriers...).
- Gas isotope geochemistry.
- Isotope geochemistry of sedimentary to high temperature geological processes, ore genesis and hydrocarbon exploration.
- Non-geoscience applications (archeometry, forensic studies, food authenticity, medical studies, doping investigations, etc.).

2016 Meetings

Water Rock Interaction 15 (WRI-15)

16-21 October, 2016
Évora, Portugal

Abstract submission: 14 September, 2015 through 29 January, 2016
Early registration deadline: 31 May, 2016.
<http://wri15portugal.org/>

The WRI-15 Symposium will represent an exceptional opportunity to update knowledge about each WRI core investigation activity, among Earth Scientists from National and International Institutions who have already been involved in R&D Projects focused on related WRI research.

The three main scientific topics of the Symposium will be:

- A. Essentials of water-rock interaction**
- B. Particular environments**
- C. Case studies and applications**

Essentials of water-rock interactions

1. Recent developments on groundwater reactive transport modeling in fractured and porous media
2. Future challenges on aqueous geochemistry and biogeochemistry: from nano- to basin-scale approaches
3. New trends on isotope hydrology, isotopologues and noble gases
4. New insights into thermodynamics and kinetics of water-rock interactions
5. Developments on water-gas-rock interactions
6. Advances and technological challenges in experimental design for laboratory and field investigations of water-rock interactions

Particular environments

1. Water-rock interaction in volcanic systems and natural hazards
2. High- and low-enthalpy geothermal systems
3. Organic geochemistry and pore water chemistry of sediments and sedimentary basins
4. The origins and special challenges of high salinity continental fluids
5. Emerging issues related with ore deposits and ore forming processes
6. Geochemical controls and influences on the genesis of conventional and unconventional oil and gas fields
7. Insights on the evolution of karst water systems and global climate changes
8. Improvements in water-rock interaction and ecohydrology of arid and semi-arid environments

9. Advances on water-rock interactions in tropical and subtropical settings
10. Developments on water-rock interaction studies ascribed to astrobiology

Case studies and applications

1. Developing issues on water-rock interaction ascribed to energy resources
2. Water-energy nexus: special challenges of shale gas and other low permeability reservoirs
3. Controls and impacts on groundwater quality and quantity
4. Challenges of water-rock interaction at high temperatures and pressures
5. Alternatives for deep geological repository of nuclear waste
6. Updating gas-water-rock interaction processes for CO₂ geological sequestration
7. Water quality at active and abandoned mines
8. Transport, fate and tracers of contaminants in shallow and deep aquifers
9. Tracer isotopes for tracking processes and contamination: advances in stable and radiogenic isotope
10. Recent approaches on water-rock interaction and its impacts on human health
11. Water-rock interaction vs. stone decay and conservation ascribed to Cultural Heritage
12. Geomicrobiology in groundwater environments: microbe-mineral-water interactions

ISEG10 – 10th International Symposium on Environmental Geochemistry

19-21 January, 2016
Perth, Western Australia
Abstracts due: 3 August, 2015
<http://www.iseg10.com>

Background

The ISEG symposium series commenced in 1988 and symposia are held every three years. The Environmental Inorganic Geochemistry Group (EIGG), in association with the Australian Centre for Geomechanics (ACG), is delighted to be hosting this event in Australia for the first time.

Who Should Attend

ISEG-10 is relevant to international academics and researchers working in the broad field of environmental geochemistry, but is also of interest to consultants, regulatory authorities and public managers. The Perth symposium aims to bring together geochemists, environmental scientists, biologists, geologists, soil scientists, aquatic scientists and medical specialists. Symposium participants will share their expertise in a broad array of scientific fields including: geochemistry, environmental chemistry, medicine and toxicology, public health, hydrogeology, biology, ecology, environmental science, engineering, mining and resource management.

Symposium Objective

A growing world population combined with rapid economic uplift is placing ever greater demands upon natural resources, while waste products of industry, intensive agriculture, transport, and energy generation pose difficult questions for the chemical integrity of water, soils and air. An

understanding of natural geochemical systems and the impacts upon them from human activities is essential for long-term sustainable development and environmental management. ISEG-10 provides a forum for presenting the results of original and innovative studies across a very broad spectrum of environmental geochemistry. The Perth symposium aims to promote awareness and enable recognition of the trans-boundary nature of environmental issues and to assist in environmental understanding and management through the application of appropriate techniques and strategies. We encourage scientists, public and environmental health professionals, environmental managers, consultants, and regulatory officers with an interest in the behaviour of chemical I the environment and their affects on human health and natural ecosystems to meet, discuss and share their research findings and experience.

Symposium themes:

1. Environmental Impacts of Small Scale Mining and Industry in the Developing World
2. Geochemistry of Acidic and Alkaline Environments
3. Geochemical Aspects of Climate Change
4. Emerging Contaminants
5. Mercury and the Metalloids in the Environment
6. Urban Geochemistry
7. Water Resources and Aquatic Environments
8. Analytical Environmental Geochemistry

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