



President's Message

President's Message

David Cohen

The 24th IAGS in Fredericton, Canada was a great success with the most diverse technical program for many years, and a series of very high quality presentations.

Papers ranged from the scale of tree rings and mineral grains to surveys of entire continents. While we always enjoy catching up with old friends in the geochemical mafia, it was also very encouraging to see many new faces from around the planet, especially those of students. We only had one major argument over the definition of an "anomaly".

The AAG and Council are very grateful to Dave Lentz and his local organising committee for their massive efforts in putting together the technical program, social events and field excursions. You can never get enough lobster. Such activities always come on top of the day jobs for LOC members. We are also grateful to the companies that sponsored the symposium, especially those who have supported us for so many years.

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The symposium also represented a successful collaboration between AAG and IAGC, IAG and NAMS, in running various thematic sessions spanning the wide world of geochemistry. The symposium has provided further opportunity to canvass ways in which the various geochemical societies can support each other and collaborate on ventures such as conferences.

We now look forward to the 25th IAGS in August 2011 in Rovaniemi, Finland. This will mark the most northern site ever for an IAGS/IGES. It is very likely that the 2013 IAGS will score a new record for latitude in the opposite direction. Various options for 2015 and 2017 are already being discussed. AAG will also be hosting a session of the IGC in Brisbane in 2012. Mark these events into your diaries now.

David Cohen
President, AAG



24th International Applied Geochemistry Symposium (IAGS 2009)

The biennial meeting of the Association of Applied Geochemists was held in Fredericton, New Brunswick, Canada June 1-4, 2009 as the 24th International Applied Geochemistry Symposium. The meeting was co-sponsored by the International Association of GeoChemistry (IAGC) and the International Association of GeoAnalysts (IAG) and included the North Atlantic Minerals Symposium (NAMS). The meeting was jointly organised by geoscientists from the University of New Brunswick (UNB), New Brunswick Department of Natural Resources, New Brunswick Research and Productivity Council, New Brunswick Department of the Environment, and professionals drawn from the consulting engineering and mineral exploration industry in New Brunswick, in conjunction with a professional conference organiser (PCO) from UNB.

The meeting was preceded by professional development workshops on Sunday, May 31st and also featured

several field trips. A conference banquet and awards ceremony, featuring lobster, was held on June 3, during which the AAG's Gold and Silver Medals were awarded, as well as the 2009 Student Paper Prize and student poster prizes. In all, it was a remarkable few days in New Brunswick attended by approximately 300 people, including about 100 students. This issue of **EXPLORE** reports on the various conference activities, including field trips, workshops, awards presented, and the AAG Annual General Meeting. AAG and the local organizing committee thank the Symposium sponsors (see page 3) whose financial support is greatly appreciated. A special thanks to Dave Lentz for overseeing the organization of this excellent event!

Beth McClenaghan
Editor



24th IAGS Workshop Reviews

Isotope Applications in Mineral Exploration and Environmental Management

As part of the 24th International Applied Geochemistry Symposium, the 'Isotope Applications in Mineral Exploration and Environmental Management' one day workshop was held at the spacious and picturesque University of New Brunswick campus in Fredericton. The workshop

chair, Bruce Eglington (Saskatchewan Isotope Laboratory, University of Saskatchewan), began the day with a brief introduction, followed by the first talk from Rob Creaser (University of Alberta) reviewing the concept of Radioactive Isotopes and Geochronology for the workshop participants. Bruce then undertook a detailed review of U-Th-Pb geochronology.

Mike Villeneuve (GSC, Ottawa) then took over and gave us the history of, and a detailed methodology and

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Isotope Applications in Mineral Exploration.. *continued from page 1*

theoretical background about ^{40}Ar - ^{39}Ar thermo- and geochronology. Mike then handed back to Bruce who gave a very informative session on assessing the quality of geochronology isotope results which looked at how to interpret and assess isotope dating results by both isotope specialists and non-specialists from all sub-divisions of the geological sciences.

Next, Kurt Kyser (Queen's Facility for Isotope Research, Queens University) discussed stable isotopes as added value to exploration geochemistry. In addition to a review of isotope fractionation mechanisms, Kurt discussed whether stable carbon isotopes can be used as a tool to find evidence of microbes that are indicative of exotic-type mineralization and stable isotopes in regional and district exploration for Principal Copper Deposits (PCDs). Kurt's talks certainly served to indicate the variety of uses of isotopes for varied mineralization types and also the variety of techniques developed, including very interesting research on Pb and S isotope signatures in black spruce tree tops and tree rings over VHMS mineralization in the Flin Flon belt.

Bruce Eglinton then talked about mixing and fluid-rock interactions and exchanges in terms of two component mixing, simple equilibrium and kinetic exchange models. This informative talk was then followed by Rob Creaser delving into the systematics of ^{187}Re - ^{187}Os geochronology and the overview of recent successes with crustal matrices and developments in reliable Re-OS geochronology. The introduction of non-traditional isotopes into this workshop is certainly a subject many may have not explored and was very informative indeed! Bruce then returned to the metaphorical stage to discuss the applications of Pb isotopes in exploration closely followed by Kurt Kyser discussing other non-traditional isotope systems in exploration geochemistry with particular focus on current research into lithium isotopes. Finally, to wrap a most informative and useful workshop

up, Bruce Eglinton gave some detailed case studies on other applications of isotopes, particularly concerning acid mine drainage in Southern Africa. Thanks must go to all the speakers and participants for very informative and enthusiastic talks and discussions! Everyone then left to enjoy the delights of Fredericton on a sunny Sunday afternoon and the start of what was to be a thoroughly excellent 24th International Applied Geochemistry Symposium.

Hannah Grant

Uranium Deposits: Genetic Geochemical Models to Prospect-Scale Geochemical Exploration Technologies

Climbing the stairs of Tilley Hall to attend the "Uranium Deposits: Genetic Geochemical Models to Prospect-Scale Geochemical Exploration Technologies" workshop took me back several decades to my university days at Acadia University, Nova Scotia. The workshop was held in Fredericton, New Brunswick, Canada at the University of New Brunswick as part of the 24th International Applied Geochemistry Symposium. The workshop started like any university course except the overhead machines I was familiar with had been replaced with a laptop connected to an overhead projector (that didn't re-produce primary colors very well!!!).

The workshop chair, Irvine Annesley (JNR Resources Inc.), gave a brief introduction of the topics to be covered during the day long session. Irvine introduced the first presenter, Sam Romberger (Colorado School of Mines), who dazzled the audience with a plethora of phase diagrams as he described geochemical modeling of hydromorphic uranium deposits. It was clear from Sam's presentation that uranium is a very complex element. Sam did such a great job, he was also presenting in the number two slot. His second talk focused on the petrogenesis of sandstone-hosted uranium deposits. Sam introduced a concept that certainly was foreign to me, fluid flow associated with roll front uranium deposits perpendicular to the conventional model! I am still thinking about this one.

Next, Ken Wheatly (Forum Uranium Corp.) gave an excellent presentation on uranium exploration in the Athabasca Basin from the perspective of an experienced field geologist. Ken's pragmatic approach stressed the importance of structure particularly as it applied to the formation of a uranium deposit by localizing fluid flow. Next up was Julien Mercadier who came all the way from France to present results from his Ph.D. research. Julien talked about fluid inclusions and how they can be used as a tool for structural and alteration studies associated with uranium mineralization.

Dave Lentz (University of New Brunswick) gave an enthusiastic talk summarizing magmatic uranium deposits.

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BARRICK



Uranium Deposits: Genetic Geochemical Models to Prospect-scale ... *continued from page 2*

With boundless energy, he discussed solubility melts and partition coefficients in granite magmas as well as the role of partial melting and crystal fractionation. (Dave was doing quadruple duty as Chairman of the Local Organizing Committee for the 24th International Applied Geochemistry Symposium). Workshop chair, Irvine Annesley, finished the day with two short talks (down from six!) on the geochemistry of fluid flow in the Athabasca Basin and U-Pb geochronology at McArthur River.

Like an exciting hockey game, the workshop ran into overtime because of plenty of questions from class participants throughout the entire session, not to mention the enthusiasm of the speakers some of whom continued to talk... well after they were told their time was up! All in all, it was an excellent workshop that paralleled the excellence of the 24th International Applied Geochemistry Symposium.

Terry Goodwin

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Indicator Mineral Methods in Mineral Exploration Workshop

The University of New Brunswick, located in the picturesque city of Fredericton, New Brunswick, Canada, hosted the 24th International Applied Geochemistry Symposium (IAGS), from June 1-4, 2009. A one-day workshop was held May 31, 2009, prior to the official start of the conference proceedings. The focus of the workshop was indicator mineral methods and their importance to mineral exploration. Approximately 30 people of varying backgrounds including students, industry personnel and research scientists attended the workshop. It consisted of presentations from some of the most experienced geoscientists in the field. Topics discussed included: an introduction to indicator minerals, survey design, sample processing, analytical methods and procedures, quality assurance and control and multiple case studies on various deposit types from within Canada and world wide.

The morning session began with an enthusiastic introduction by co-chair Harvey Thorleifson (Minnesota Geological Survey) in which he provided an overview of the principles of clastic sediment transport, characteristics of indicator minerals and their importance to mineral exploration. Chris Benn (Goldfields Ltd.) followed with a compelling discussion on the benefits of a well-developed survey design to optimize sampling quality and efficiency. Beth McClenaghan (Geological Survey of Canada), assisted by Wile E. Coyote, presented

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Indicator Mineral Methods in ...

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a concise and visually entertaining talk about methods for processing and recovering indicator minerals from glacial sediment and bedrock. Next up was Simon Jackson (Geological Survey of Canada), who discussed several micro analytical techniques such as the electron microprobe and laser ablation inductively coupled plasma mass spectrometry, routinely used to determine mineral chemistry and trace element characteristics of indicator minerals and their application to various deposit types. Paul Spry (Iowa State University) educated the audience about ghanite and its usefulness as an indicator mineral for metamorphosed massive sulphide deposits. Mary Doherty (ALS Chemex) gave an informative talk on the do's and don'ts of effective quality assurance and control ending with a tantalizing photo of apple pie just before lunch.

After lunch, Beth McClenaghan presented a talk on indicator minerals for Au and PGE deposits, specifically looking at grain morphology and composition. John Armstrong (Stornoway Diamond Corporation), ditched the long johns long enough to discuss kimberlite indicator anomalies at a regional, local and bedrock scale. Geologically young, experienced and dashing Stu Averill (Overburden Drilling Management Ltd.) presented current information on viable indicators for Ni-Cu-PGE and porphyry Cu deposits. Stu's right-hand-man, Mike Michaud (Overburden Drilling Management Ltd.) spoke about the unexpected anthropogenic

influences on samples, indicating there are more bullets in American till than Canadian till. Captivating the audience with an excellent talk on indicator mineral signatures of the NICO-Co-Au-Bi deposit in the Great Bear magmatic zone was Isabelle McMartin (Geological Survey of Canada). Straight from a project on Baffin Island in Canada's arctic, Brooke Clements (Peregrine Diamonds Ltd.) illustrated that big discoveries can come from keeping your eyes open and your nose to the ground, with his presentation on the kimberlites of the Chidliak property. Harvey Thorleifson wrapped up the day with an entertaining, exuberant, couldn't drift off if you tried presentation that made you want to go out and start digging for indicator minerals.

Overall the workshop was an informative and entertaining experience in which participants learned about advancements and case studies in indicator mineral exploration. A special thank you to the co-chairs for organizing the workshop, the speakers for passing on their knowledge and expertise for the advancement of indicator mineral research, and to the Association of Applied Geochemists and IAGS for their sponsorship.

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24th IAGS Post Symposium Field Trips: Bathurst Mining Camp June 4-7, 2009

Trip 1: Tectono-stratigraphic setting of VMS deposits of the Bathurst Mining Camp, New Brunswick

This field trip was a 3-day (4-7 June) tour of the mineralisation and stratigraphy of the Bathurst VMS district, led by Steve McCutcheon and Jim Walker (New Brunswick Geological Survey) run in parallel with a second tour covering the environmental aspects of mining in the district. Nine geologists/geochemists and one accompanying person, representing five countries, participated in the VMS tour.

We met at the University of New Brunswick campus late in the afternoon of the 4th and after being issued with field guides and a boxed 'supper' we drove in to Bathurst, our base for the remainder of the trip, stopping only for the nearly obligatory Tim Hortons en-route. The next morning, fuelled by more Tim Hortons food & drink, we departed at about 6am for the Brunswick No. 12 mine where our guides, Xstrata geologists Pierre Bernard, Stuart Wells and Neil Tobey (Fig. 1), provided an excellent introduction to this super-giant deposit - well worth some of the group having to remove their beards. After lunch with the mine geologists, we spent the remainder of the day acquainting ourselves with the Nepisiguit Falls Formation, the host sequence to much of the mineralisation in the district, mosquitoes, the Austin



Looking at level plans, underground at Brunswick No. 12 Mine, from left to right, Stuart Wells, Pierre Bernard and Gabriela Budulan (photo: Mark Cooper).

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24th IAGS Post Symposium Field Trips... continued from page 5

Brook Mine (Fig. 2), mosquitoes and black flies, and the Brunswick No. 6 mine, with added mosquitoes and flies.



Contemplating structures in the Austin Brook mine iron-formation (photo: Mark Cooper).

Day 2 was another early start with a stop at the Department of Natural Resources office for a talk outlining the regional geology, with more Tim Hortons, then out into the field for a traverse along Route 180 visiting the Caribou and Murray Brook deposits and more of the Tetagouche Group stratigraphy. Apart from the geology, highlights (for

non-Canadians) were several moose sightings and a stop at a 'sugar shack' for a beer and to buy maple syrup. To round off another enjoyable day we, and the environmental group, were treated to a lobster dinner (Fig. 3) followed by a game of Boules which continued until 'bad light stopped play.'



Alice Walker, hosts a lobster bake in her country kitchen.

On the last day of the tour we joined up with the environmental group to visit the Wedge mine and, after a short delay caused by a flat tyre, the Heath Steele mine, where we saw the major environmental remediation works being undertaken by Xstrata, which had incidentally produced some

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good new outcrop of the mine host sequence. After Heath Steele all that was left was the drive back to Fredericton and other destinations.

Thanks go to the tour organisers and leaders, the mining companies who allowed us access to their properties, to Jim Walker and family for hosting the lobster feast, and to everyone else who contributed to making this such a well organised, enjoyable and informative tour.

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Trip 2: Environmental geochemistry and reclamation and remediation techniques as applied in the Bathurst Mining Camp, New Brunswick

Less friendly weather broke into four warm, sunny days for the Bathurst Camp Field Trip at the conclusion of the 24th IAGS, June 1st-4th, 2009 in Fredericton, New Brunswick, Canada. The last major Association meeting in these famous woods dates back to April, 1976! In 1953-1954, H.E. Hawkes, H. Bloom, J.E. Riddell, and J.S. Webb used in-field geochemical stream sediment methods for the first time and discovered previously unknown mineralization at Nash Creek, Mount Pleasant, and Restigouche in northern New Brunswick and the Gaspé. A decade later, G. Govett picked up the baton to continue geochemical research at University of New Brunswick (UNB) for yet another decade.



Photo 1. left to right (standing): Sean, Pride, Dominique, Gabriella, LeeAnn, Stephen, Joseph, Gerry, Barbara, Keith, Andrew, Jean Luc, Mark, Clark, Jim, Tom, Tony; (kneeling): Bryan, Steve

The trip was divided into two tribes: one focused on the geology of VMS in the context of geochemical exploration, while the other focused on environmental, reclamation, and remediation. You could say, one was interested in metal discovery, extraction, while creating a mess while the other was interested in cleaning it up. Poetically, the trip captured the



Stressed pine rooted in VMS sulfides, displaying chlorotic late growth compared to more viable early growth (lower branches and needles).

transition, tensions, and balance between solid earth and liquid earth. The Environmental tribe was led by Tom Al and Sean McClenaghan, with tribal drummers Pride Abongwa, Dianna Christie, Tony Christie, Keith Scott, Barbara Sheriff, Shea Clark Smith, and Gerry Stanley. A peace pipe with sedative herbs was invoked before engaging in polarizing discussions. The Environmental group enjoyed a wet experience, with discussions about the aqueous chemistry of pit lakes (Brunswick No. 6) and cyanide induced mercury leakage from tailings at Murray Brook. When low pH water from the Murray Brook pit encounters high pH seepage from the tailings, a mercury-rich hydroxy-aluminum sulfate precipitate obscures the original red indicator precipitates of mineralization in Gossan Creek. So much "irony".

By day three, everyone was thoroughly saturated with rock and water geochemistry. Kindly, Jim and Alice Walker graciously hosted a traditional Maritime lobster bake at their home, with an evening game of boules (Pétanque). There were tribal contests, but all other tensions were relaxed. Thank you Jim and Alice for a wonderful evening!! Tours of the Wedge Mine and Heath Steel concluded the four day trip. Mineralized exposures at the Wedge that support marginally viable, chlorotic pine trees got one biogeochemist very interested in the apparent distribution of metal in early versus late growth branches.

All field trip participants thank Steve McCutcheon, Jim Walker, Tom Al, and Sean McClenaghan for a delightful and very informative excursion into the hallowed woods of northern New Brunswick.

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AAG Medals



The AAG presented two medals at the 24th IAGS in Fredericton, Canada. The first, the gold medal, is presented for scientific contributions to geochemistry. The second, the silver medal, is awarded for dedicated service to AAG with the awardee nominated by the immediate past president.

AAG Gold Medal Citation for Gerry Govett

I am deeply honored to give the citation for this year's recipient of the AAG Gold Medal, Dr. Gerry Govett. It seems highly appropriate that this award would be presented at this university where Gerry spent a good part of his career, at this IAGS symposium 33 years after the first regional symposium organized by Gerry and his graduate students, and in the presence of so many former colleagues, students and close friends. Gerry is highly deserving of this award as most of you who are familiar with his prodigious research already know.

Govett's career spans almost 40 years from the time he received his Ph.D. in 1958 from Imperial College in London, UK, until he retired in 1996 from the University of New South Wales in Sydney, Australia. During this career, Gerry



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was a research scientist at the Alberta Research Council, Professor and Director of Graduate Studies at the University of New Brunswick, and Professor, Head of the School of Applied Geology, and Dean of the Faculty of Applied Science at the University of New South Wales in Australia. He has inspired a generation of undergraduate and graduate students from almost every continent with his energy, enthusiasm and the scientific rigour of his ideas. Gerry's academic career was also interspersed with periods as consultant to the United Nations Development Programme, international mining companies including Anglo-American, Bethlehem Steel, Dresser Minerals, Chartered Exploration, AMAX, Preussag, Esso, CRA, and smaller companies in Canada and Australia. He has had extensive exploration experience in 15 countries including Australia, Canada, Ethiopia, Fiji, Finland, Greece, Guyana, Jordan, Indonesia, the Philippines, Papua New Guinea, Turkey, Zambia and Zimbabwe. He was also geochemical adviser and consultant to the Geological Surveys of both Greece and Finland, and Director of Delta Gold Limited.

Gerry served on the editorial boards of Resources Policy, the Journal of Geochemical Exploration, and Exploration and Mining Geology. He was a founding member of the Association of Exploration Geochemists and served on Council, including a term as President. Gerry was also a member of the Canadian Geoscience Council, Councilor for the Australian Mineral Foundation, and founding member of the Australian Geoscience Council on which he served as both Vice-President and President. Professor Govett has an enviable publication record that comprises more than 90 significant papers, as well as authored and edited books on mineral economics and exploration geochemistry. He also conceived here at UNB the Handbook of Exploration Geochemistry and was Series Editor from 1974 to 2001.

One of Gerry's greatest talents was a natural creativity and an ability to anticipate future developments in the field of exploration geochemistry. To give you an example, Gerry was already discussing the decline of base metal reserves in established mining camps and exploration methods that could see deeply into the Earth's crust 30 years before the GSC finally got around to funding a Deep Search research project. Another example of Govett innovation is the role of electrochemical fields that develop around ore deposits in the generation of surface and near surface soil geochemical anomalies. Gerry was not content to just measure the classic "rabbit ear" anomalies in soils but insisted that we undertake elaborate tank experiments at UNB. I well remember tank experiments on sulphides in a porous sediment medium pierced by a complex array of platinum electrodes connected to more switches for measuring potential fields than you would see on the flight deck of a modern jetliner. Thank heavens for Radio Shack. For those of you who were not at Gerry's talk on Monday, the tanks came in different shapes and sizes and can best be visualized as pots or fish tanks with a tangled array of wires going everywhere.

I would like to finish on a personal note. I first met Gerry in 1968 or 1969 when he was invited to Mount Allison University where I was an undergraduate in geology to give a lecture, not on exploration geochemistry, but on archaeol-

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AAG Medals... *continued from page 8*

ogy. Gerry had marshaled a lot of evidence to support the idea that the caldera at Santorini in the Aegean Sea was the site of lost city of Atlantis. After the talk, we gathered at the home of John Moore, who was head of the Geology Department, where I believe we met for the first time. Later on, I was recruited by one of Gerry's graduate students, Bob Whitehead or whom Gerry like to call "young Robert" to undertake a Ph.D. thesis on the Brunswick No. 12 base metal deposit in the Bathurst Mining Camp.

The UNB geology department back in those days was a bustling hub of activity with two economic geologists and two exploration geochemists in a group of over 20 professors. Gerry's graduate students resembled a mini-United Nations originating from all over the world - Greece, Finland, Turkey, Malaysia, Philippines, Canada and the U.S. to name a few. And it is great to see so many of them here this evening. The Exploration Geochemistry Group was a rather close knit fraternity and had its own building, the Geology Annex across the road from the main geology building which we shared with the drafting/photographic group and the thin section preparation lab in the basement.

Gerry was always very kind to his students, inviting them to receptions at his home when speakers were in town and commonly to Thanksgiving dinners prepared by Marjorie Govett who was an amazing cook not to mention a highly accomplished Economist. I have very fond memories of those get-togethers just down the road from here on Lincoln Road that runs along the St. John River where Gerry designed and had built his home (Many of you would have passed by Gerry's home on Lincoln Road on your way in from the airport). My wife, Marianne, and I rented an apartment on Lincoln Road and you could almost set your clock to the minute when Gerry and Marjorie drove by on their way to the university each day in their green Camaro convertible, of course with the top down in the summertime. Gerry kept a highly productive vegetable garden and even offered space in his garden for Marianne and me to grow tomatoes. However, since I was in the field during the summer and Marianne did not have a car.....at least that was the excuse we used....it was left to Gerry to do most of the weeding. Of course, this did not prevent us from showing up in late summer when I returned from the field to harvest our tomato-laden plants in "our garden"!

Gerry left UNB in 1977 for a position at the University New South Wales in Australia with the intention of returning in five years. As so often happens, Gerry had put down roots in Australia and the rest is history. You might say that Canada's loss was Australia's gain. As many of you may know, Marjorie Govett passed away in 1990 in Greece and Gerry subsequently married Idelies whom he had known at the University of New South Wales and who is here this evening on her first trip to Fredericton? I had the pleasure of meeting Idelies on Sunday, however through the letters that accompanied the Govetts' Christmas card each year describing the trials and tribulations of homesteading in Australia, I felt we already knew her. Gerry and Idelies retired in 1996, bought a piece of land in the Southern Highlands of New South Wales and, true to form, designed a "house for two" as

described by Gerry with lots of space for books and a large underground cistern with 100,000 liter capacity to collect rain water, the only source of water. Now if you are thinking that this "house for two" may seem to have been designed to exclude visitors, you will be relieved to know that Gerry has a shed out back for such purposes. Actually, it is not as bad as it sounds. Gerry has renovated the shed – "insulating it, putting in walls and ceiling" – and it is now a very comfortable bed-sitting room, with bathroom, for visitors.

From the foregoing, I fear that I may have given you the wrong impression that Gerry has led the perfect life as a highly successful geochemist, designer and builder of homes, and gardener extraordinaire;well I want to dispel you of that notion right here and now. And to do this, I am relying on a direct quote from Gerry based on their experience homesteading in the wilds of New South Wales. To quote - "We planted 8 fruit trees in 1997 before house building started. Until the first fruit appeared in 2000 we never saw a parrot here. Then, they came from nowhere in their hundreds. Visitors gaze in wonder at these multi-coloured beasts. We have other views!" I don't know if Gerry has brought out the artillery yet but clearly these "beasts"....not birds but "beasts"....are far from welcome. The good news is that they persevered and seem to have won out over the ravenous parrots. To quote again: "Anyway, we now have about 30 fruit trees, mostly apples, plums of various kinds, quince, and pears." What is not clear, however, is 1) the current size of the parrot population in the southern highlands, and 2) how the fruit is shared among the Govetts and their feathered friends (Let me do some math: if 8 fruits trees attract 100's of parrots, 30 fruit trees probably attract close to 1000!). There must be a UN program, perhaps a save the parrot program, to recognize the Govetts contribution to local parrot population. The garden also includes raspberries and black currents and the original bull paddock has been landscaped with trees and shrubs and roses. Needless to say, the traverses across rocky outcrops and alder swamps collecting samples for geochemical studies must seem a faint memory at times, as Gerry drives around in his Kubota tractor with its front end loader piled high, you might say, with the fruits of his labour.

In conclusion, I would ask you to join me in congratulating Gerry for a remarkable career and offer our best wishes for many, many more productive years in Highlands of New South Wales.

Wayne Goodfellow

Geological Survey of Canada

AAG Silver Medal Citation for David Smith



It is my privilege as past president of AAG for 2008 to 2009 to present this award to Dr David Smith of the USGS. David is a research geochemist at USGS where he has been for over 33 years. David holds a BA and MSc in Geology from Vanderbilt University, Nashville, Tennessee

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AAG Medals... *continued from page 10*

and a PhD in geochemistry from Colorado School of Mines, Golden, Colorado. He started professional life during the first uranium boom and this led to his PhD dissertation covering uranium in volcanic ash. He has served his time in USGS management as associate and as chief for the branch of geochemistry. He is currently the USGS leader for soil geochemical baseline landscape project and has served as co-leader of the IAGC-IUGS global geochemical baseline since 1997. He joined AEG in 1975, has been a fellow since 1982 and has served as secretary since 1998. During this time he has served nine AAG or AEG presidents and has overseen changes in the Association in terms of name and overhauled our articles of Association. He has seen through two mineral booms and brings his good sense of humour, patience, courtesy, organizational skills and good old southern charm to his position of secretary and dealings with others. On behalf of AAG, may I ask President Cohen to present Dr David Smith with his much deserved medal.

Rob Howell

AAG Past President



24th IAGS Student Awards

Student Poster Prizes

Sponsored by the Engineers and Geoscientists of New Brunswick, prizes were awarded for outstanding student poster presentations at the 24th IAGS. First prize (\$1000 CAN) was awarded to



Mike Parkhill of the New Brunswick Dept. Natural Resources presenting first prize to Sabine Schwarz.

Second prize (\$500 CAN) was awarded to Gabriela Budulan, Queen's University, for her poster entitled "Indicator mineral signature of the Halfmile Lake Zn-Pb-Cu volcanogenic massive sulphide deposit, New Brunswick, Canada", co-authored by Beth McClenaghan, Michael Parkhill and Dan Layton-Matthews.



Mike presenting second prize to Gabriela Budulan.

Third prize (\$250 CAN) was awarded to Nathan Bridge, University of Western Ontario for his poster "Geology and Geochemistry of the Lac Cinquante Uranium Deposit, Nunavut" co-authored with Neil Banerjee, Craig Finnigan, Rob Carpenter and Jeff Ward. Honourable Mention was



Mike presenting third prize to Nathan Bridge.

A second Honourable Mention was awarded to Yask Shelat, University of Toronto, for his poster "Lithological Identification of Rocks in Cape Smith Fold Belt Region; New Quebec Using Remote Sensing Applications" co-authored with James Mungall. Honourable mention awards consisted of a gift from the University of New Brunswick.

Student Travel Bursaries

Nine students received financial support (\$600 USD) to attend the 24th IAGS symposium in Fredericton:

Kerstin Brauneder, University of Ottawa

Molly Dendas, Juniata College

Hannah Grant, Queen's University

Stelly Lefort, McGill University

Stephanie Palmer, McGill University

Benoît Plante, L'Université du Québec en Abitibi-Témiscamingue

Kirsten Rasmussen, University of British Columbia

Marc Rinne, Lakehead University

Jennifer Wehby, University of Georgia



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24th IAGS Awards Banquet



Association of Applied Geochemists 2008 Student Paper Prize winner Jorge Benavides receiving his award from Pierrette Prince of SGS.



Enjoying the lobster feast.



Wayne Goodfellow presenting the citation for Gerry Govett's gold medal award.



Chief Conference organizer Dave Lentz and AAG Past President Rob Bowell.



AAG president Dave Cohen and AAG Gold Medal recipient Gerry Govett.



AAG president Dave Cohen presenting the AAG Silver Medal to Dave Smith.

Minutes of the 2009 Annual General Meeting of the Association of Applied Geochemists

Held at the International Applied Geochemistry Symposium (IAGS)

Fredericton, New Brunswick, June 2, 2009

Call to Order – Establishment of Quorum

President D. Cohen called the Annual General Meeting (AGM) to order at 6:05 PM local time and determined that 30 Fellows were present for the meeting. The required number for an AGM is 15.

II. Discussion and approval of 2008 AGM minutes

The minutes for the 2008 AGM were published in EXPLORE #142 (March 2009). No corrections or additions were noted

It was moved (D. Smith) and seconded (E. Weiland) that the minutes of the 2008 AAG Annual General Meeting be accepted. The motion was passed unanimously.

III. President's report (D. Cohen)

The Association has a primary focus on educational work thru its journal (Geochemistry: Exploration, Environment, Analysis) and newsletter (EXPLORE). In terms of finances, E. Cameron has overseen our accounts with great expertise. The Association currently has about 400K (Canadian) in investments.

Distinguished Applied Geochemists Fund: A protracted effort has been ongoing to get charitable status for AAG from Canada Revenue Agency (CRA). Our initial effort was denied because of the perception that some of our activities are not charitable. We seem to have two options: 1. Amend the AAG By Law to remove the very few items considered to be non-charitable. 2. Separate the DAGF off into separate entity. We have a recommended way forward from our attorney. Need to establish guidelines for disbursing funds from the DAGF.

Membership: As of May 2009, AAG has 471 members (31 Students, 260 Members, 180 Fellows). This compares with 505 in 2008. The Association has seen a 5-10% reduction in membership over each of the past 2 yrs.

Education: AAG sponsored successful workshops at several venues during the past few years. With fewer universities offering applied geochemistry curricula, AAG has a responsibility to at least partially fill this niche.

AAG Council has reviewed its current committees and has concluded that the current structure is not serving the Association as well as it could. The number of committees will be reduced as outlined in the minutes of the November 2008 Council meeting. The new committees will consist of the following: Membership; Awards and Medals; Publicity and Publications; Education. We need an enthusiastic and active coordinator for each of these four. As outlined in the AAG By Laws, each committee will be dissolved at the end of each calendar year and will be reconstituted as necessary.

The awarding of AAG's Student Paper Prize has changed somewhat. All nominated papers must have been published in GEEA and any student who is first author is

automatically considered. A committee of 3 evaluates each eligible paper. This year, 9 papers were eligible and all were of high quality.

AAG will have role in 2012 International Geological Congress to be held in Brisbane, Australia.

Future directions of the Association: Over the past 10 years, we have seen a decline in membership. Our options are threefold: 1. Observe the decline and act in a reactive manner; 2. Actively attempt to expand our membership by more aggressive marketing; 3. Cooperate with kindred societies to better meet the needs of our membership. Some societies are small because they draw membership from a small geographic area, while others are small because they are so specialized. AAG falls into the latter category, and we must improve our marketing to that specialized community.

President Cohen thanked AAG Council and Executive for their work during the past year. He also thanked the Association's Business Manager, B. Areseneault, for her many contributions to AAG. A special thank you was issued to M. Scrimgeour for her dedicated work on GEEA over the past years.

President Cohen recognized Finland as the host for the 2011 IAGS and thanked the Organizing Committee for their excellent proposal and planning. He also recognized D. Lentz and the Organizing Committee for their tireless work to organize the very successful 2009 IAGS.

IV. Secretary's report (D. Smith)

In 2009, the following Fellows were elected to Council to serve a 2-year term (2009 and 2010):

Robert Eppinger, Chris Oates, John Carranza, Erick Weiland, Elizabeth Bailey

The Association continues to need Fellows to stand for election to Council during the fall elections. Anyone interested should contact the Secretary.

V. Treasurer's Report (G. Hall)

We have received the Auditor's report for 2008 (previously distributed to Council by email). Our auditor continues to be McCay, Duff and Co.

It was moved (G. Hall) and seconded (D. Smith) that

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Minutes of the 2009 AGM... *continued from page 13*

AAG accept the 2008 auditor's report by McCay, Duff and Co. and that this firm be retained for preparing the 2009 report. President Cohen asked for a vote on this motion and it passed unanimously.

Our current assets are as follows:

CIBC Canadian	\$23,447.44
CIBC US	\$74,341.04
TD Investments	\$397,324

Thanks to the outstanding financial management of E. Cameron, we have weathered the economic downturn far better than most.

VI. GEEA (G. Hall)

Three special issues were published in 2008. Papers from the previous IAGS in Oviedo, Spain will be published this year. The Association tried to increase the annual allowable number of pages for GEEA this year, but the Geological Society of London did not agree to the increase. We will soon be moving to complete on-line submission of papers. Information for authors will be posted on the AAG web site. In 2010, AAG members can request a printed version of GEEA; but the journal will only be available on-line beginning in 2011.

VII. EXPLORE (B. McClenaghan)

EXPLORE 143 (June issue) is just being mailed out in the first week of June and includes one technical article by John Lee et al. describing Falconbridge's diamond exploration activities in Botswana between 1978 and 1982. The September **EXPLORE** issue will feature highlights from the Fredericton Meeting. Members are encouraged to submit photos of the Fredericton events, workshops and field trips to **EXPLORE** for this next issue. Two scientific articles are in the queue for the December and March issues of **EXPLORE**. Reminder to Regional Councillors that contributions to **EXPLORE** are welcome — including reports of research or exploration activity, upcoming conferences or photos of events in their region. Steve Amor has taken on the responsibility for compiling the **EXPLORE** events list — thanks to Steve for this contribution. **EXPLORE** advertisers/sponsors have been invoiced for 2009 and payments are slowly being submitted.

VIII. Other business

R. Harmon, President of the International Association of GeoChemistry (IAGC) addressed the AGM. IAGC, established in 1967, is about same size as AAG and is addressing the same questions about relations with other societies. Previous discussions between AAG and IAGC led to IAGC's organizing three sessions at the current IAGS. IAGC would like to have an active role in future AAG symposia and would like to have AAG participate in IAGC Working Group Meetings. These Working Group Meetings, such as Water-Rock Interaction, are international symposia that usually have between 100-400 attendees. IAGC would offer reduced registration fees to AAG members. IAGC is also interested

in identifying other ways to collaborate. In 2015, IAGC has a person in Anchorage, Alaska who would be interested in organizing the IAGS. AAG Council requested that Dr. Harmon put this information in writing and he agreed to do so.

IX. Adjournment

President Cohen thanked all attendees for their participation and declared the 2009 Annual General Meeting adjourned at approximately 6:55 PM local time.



RECENT PAPERS

This list comprises titles that have appeared in major publications since the compilation in **EXPLORE** No. 143. Journals routinely covered and abbreviations used are as follows: Economic Geology (EG); Geochimica et Cosmochimica Acta (GCA); the USGS Circular (USGS Cir); and Open File Report (USGS OFR); Geological Survey of Canada papers (GSC paper) and Open File Report (GSC OFR); Bulletin of the Canadian Institute of Mining and Metallurgy (CIM Bull.); Transactions of Institute of Mining and Metallurgy, Section B: Applied Earth Sciences (Trans. IMM). Publications less frequently cited are identified in full. Compiled by L. Graham Closs, Department of Geology and Geological Engineering, Colorado School of Mines, Golden, CO 80401-1887, Chairman AEG Bibliography Committee. Please send new references to Dr. Closs, not to **EXPLORE**.

Abzalov, M., 2008. Quality Control of Assay Data: A Review of Procedures for Measuring and Monitoring Precision and Accuracy. *Explor. Min. Geol.* **17**(3-4): 131-144.

Alexandre, P., Kyser, K., and Jiricka, D., 2009. Critical Geochemical and Mineralogical Factors for the Formation of Unconformity-Related Uranium Deposits: Comparison between Barren and Mineralized Systems in the Athabasca Basin, Canada. *EG* **104**(3): 413-435.

Arcega-Carbrera, F., et al., 2009. Variation of Pb in a mine-impacted tropical river, Taxco, Mexico: Use of Geochemical, isotopic, and statistical tools. *Applied Geochem.* **24**(1): 162-171.

Bargar, J.R., et al., 2008. Biogenic Uraninite Nanoparticles and their Importance for Uranium Remediation. **4**(6):407-412.

Bopp, C.J. IV, et al., 2009. Variations in $^{238}\text{U}/^{235}\text{U}$ in uranium ore deposits: Isotopic signatures of the U reduction process? *Geology* **37**(7): 611-614.

Bove, D.J., Walton-Day, K., and Kimball, B.A., 2009. The use of fluoride as a natural tracer in water and the relationship to geological features: examples from the Animas River

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RECENT PAPERS

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Braxton, D.P., et al., 2009. Ultra-Deep Oxidation and Exotic Copper Formations at the Late Pliocene Boyongan and Bayugo Porphyry Copper-Gold Deposits, Suriguo Philippines: Geology, Mineralogy, Paleogeometry, and their Implications for Geologic, Physiographic, and Tectonic Controls. *EG* **104**(3): 333-349.

Christidis, G.E. And Huff, W.D., 2009. Geological Aspects and Genesis of Bentonites. *Elements*. **5**(2):93-98.

Cuney, M. and Kyser, K., 2009. Recent and not-so-recent developments in uranium deposits and implications for exploration. *Min. Assoc. Canada Short Course* **39**. 272 p.

Debba, P., et al., 2009. Deriving optimal exploration target zones on mineral prospectivity maps. *Math. Geosciences* **41**(4): 421-

Dill, H.G., et al., 2008. Fossil Fuels, Ore, and Industrial Minerals *in* The Geology of Central Europe. *Geol. Soc. London* (2 Vols): 1341-1449.

Doornbos, C., et al., 2009. The first integrated use of in situ U-Pb geochronology and geochemical analyses to determine long-distance transport of glacial erratics from mainland Canada into the western Arctic Archipelago. *Can. J. Earth Sci.* **46**(2): 101-122.

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Hannington, M. and Monecke, T., 2009. Global exploration models for polymetallic sulphides in the area: As

assessment of base block selection in the draft regulations on prospecting and exploration for polymetallic sulphides. *Marine Geo-resources and Geotechnology*. **27**(2): 132-

Hasselov, M. and von der Kammer, F., 2008. Iron Oxides as Geochemical Nanovectors for metal Transport in Soil-River Systems. *Elements*. **4**(6):401-406.

Hattori, K.H., et al., 2009. Soil geochemical survey over concealed kimberlites in the Attawapiskat area in northern Canada. *Geochemistry: Exploration, Environment, Analysis*. **9**(2):139-150.

Hein, J.R., Conrad, T.A., and Durham, R.E., 2009. Sea mount characteristics and mine-site model applied to exploration- and mining-lease-block selection for cobalt-rich ferromanganese crusts. *Marine Geo-resources and Geotechnology*. **27**(2): 160-

Hill, X., 2009. Attracting and retaining Gen-Y resources professionals – findings from an industry-wide survey. *Aus. IMM Bull. No. 3* (June): 12, 14-15.

Hochella, M.F., Jr., 2008. Nanogeoscience: From Origins to Cutting-Edge Applications. *Elements*. **4**(6):373-378.

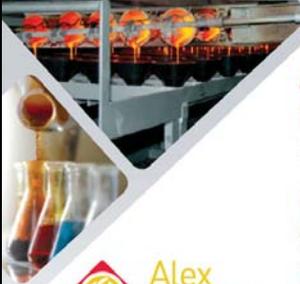
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Kozuskanich, J.C., et al., 2009. Dendrochemical variation over the Cross Lake VMS mineralization – a tool for mineral exploration and decoupling anthropogenic input from background signals. *Geochemistry: Exploration, Environment, Analysis*. **9**(2):1510157.

Leybourne, M.I., Cousens, B.L., and Goodfellow, W.D., 2009. Lead isotopes in ground and surface waters: fingerprinting heavy metal sources in mineral exploration. *Geochemistry: Exploration Environment, Analysis*. **9**(2):115-123.

Mathur, R., et al., Exploration potential of Cu isotope fractionation in porphyry copper deposits. *Geochem. Explor.* **102**(1): 1-12.

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RECENT PAPERS

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Sako, A., Lopes, L., and Roychoudhury, A.N., 2009. Adsorption and surface complexation of palladium, rhodium, and platinum in surface semi-arid soils and sediment. *Applied Geochem.* **24**(1): 86-95.

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Scott, K.M. and Pain, C.F. (eds.), 2008. *Regolith Science*. Springer Sciences/CSIRO Pub. 461 p.

Spitz, K. and Trudinger, J., 2008. *Mining and the Environment from ore to metal*. CRC Press/Balkema. 900 p.

Suh, C.E., et al., 2008. Two Contrasting Iron Deposits in the Precambrian Mineral Belt of Cameroon, West Africa. *Explor. Min. Geol.* **17**(3-4): 197-207.

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Theng, B.K.G. and Yuan, G., 2008. Nanoparticles in the Soil Environment. *Elements*. **4**(6): 395-399.

Unruh, D.M., et al., 2009. Metal contamination and post-remediation recovery in the Boulder River Watershed, Jefferson County, Montana. *Geochemistry: Exploration, Environment, Analysis*. **9**(2):179-199.

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Volchenko, Yu. A., Koroteev, V.A. and Neustroeva, 2009. Platinum-group elements in alpine-type ultramafic rocks and related chromite ores of the main ophiolite belt of the Urals. *Geol. Ore Deposits*. **51**(2):162-

Voroshilov, V.G., 2009. Anomalous structures of geochemical fields of hydrothermal gold deposits: Formation mechanism, methods of geometrization, typical models, and pre-casting of ore mineralization. *Geol. Ore Deposits*. **51**(1): 1-

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Ziaii, M., Abedi, A. and Ziaei, M., 2009. Geochemical and mineralogical pattern recognition and modeling with Bayesian approach to hydrothermal gold deposits. *Applied Geochem.* **24**(6): 1142.



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2009

- 7-11 September 2009. Geoanalysis 2009. Champagne Sports Resort, Drakensberg, South Africa. Website: www.geoanalysis2009.org.za
- 14-18 September 2009. 18th International Symposium on Environmental Biogeochemistry. University of Hamburg, Germany. Website: www.isebiogeochemistry.com/ISEB_19.htm
- 21-23 September 2009. 7th Iberian Geochemistry Symposium. Soria, Spain. Website: www.congresogeoquimica2009.es
- 21-26 September 2009. Association of Environmental and Engineering Geologists 52nd Annual Meeting. Lake Tahoe, CA, USA. Website: <http://tinyurl.com/dkxdv6>
- 18-21 October 2009. Geological Society of America Annual Meeting. Portland, OR, USA. Website: www.geosociety.org/meetings/2009/
- 18-23 October 2009. VIII International Symposium on Environmental Geochemistry. Ouro Preto, MG, Brazil. Website: www.12cbgq.ufop.br/12cbgq/
- 26-30 October 2009. World Gold 2009. Johannesburg, South Africa. Website: www.worldgold2009.com
- 9-11 November 2009. Mineral Symposium 2009. Taiping, Perak, Malaysia. Website: <http://tinyurl.com/d5q9hd>
- 30 November-4-December 2009. Northwest Mining Association 115th Annual Meeting, Exposition and Short Courses. Reno-Sparks, NV, USA. www.nwma.org/pdf/09cv.pdf
- 1-3 December 2009. 7th Fennoscandian Exploration & Mining, Lappia Hall, Rovaniemi, Finland, www.lapinliitto.fi/fem2009/index.htm
- 7-11 December 2009. AGU Fall Meeting. San Francisco, CA, USA. Website: www.agu.org/meetings/fm09/

2010

- 7-10 March 2010. Prospectors and Developers Association of Canada Annual Convention. Toronto, Canada. Website: www.pdac.ca/pdac/conv/index.html
- 6- 9 April 2010. 13th Quadrennial IAGOD Symposium "Giant Ore Deposits Down-Under". Adelaide, Australia. Website: <http://tinyurl.com/caoys8>
- 10- 13 May 2010. GAC/MAC Annual Meeting. Calgary AB, Canada. Website: www.gac.ca/activities/index.php
- 13-18 June 2010. Goldschmidt 2010. Knoxville, TN, USA. Website: www.goldschmidt2010.org
- 21- 24 June 2010. 11th International Platinum Symposium. Sudbury ON, Canada. Website: <http://11ips.laurentian.ca>
- 27 June-2 July 2010. 27th Society for Environmental Geochemistry and Health, European Conference. Galway, Ireland. Website: www.nuigalway.ie/seg2010
- 4-8 July 2010. Australian Earth Sciences Convention (AESC) 2010. Canberra, Australia. Website: www.gsa.org.au/
- 19-24 September 2010. IWA World Water Congress and Exhibition, Montreal, Canada. Website: www.iwa2010-montreal.org/
- 2-5 October 2010. SEG 2010 Conference. Keystone, CO, USA. Website: www.seg2010.org/
- 31 October-3 November 2010. Geological Society of America Annual Meeting. Denver, CO, USA. Website: www.geosociety.org/meetings/index.htm

2011

- 25-27 May 2011. GAC/MAC Annual Meeting. Ottawa, ON, Canada. Website: www.gac.ca/activities/index.php
- August 2011. 10th International Congress for Applied Mineralogy. Trondheim, Norway. Website: www.icam2011.org

2012

- 5-15 August 2012. 34th International Geological Congress. Brisbane, Australia. Website: <http://www.34igc.org/>

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I certify that the applicant is a full-time student at _____ in pure or applied science.

 (institution)

 (Professor/ AAG Fellow Signature)

 (Printed Name and Title)

Witness my hand this _____ day of _____, 20_____.

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Association of Applied Geochemists

P.O. Box 26099, 72 Robertson Road, Ottawa, Ontario, CANADA K2H 9R0

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announces the

The logo for SGS (Société Générale de Services) features the letters 'SGS' in a bold, sans-serif font. A vertical orange line is positioned to the right of the 'S', and a horizontal orange line is positioned below the 'S'.

2010 AAG Student Paper Competition



The AAG announces the 8th biennial Student Paper Competition.

The paper must address an aspect of exploration geochemistry or environmental geochemistry related to mineral exploration and be based on research performed as a student. The student must be the principal author and the paper must have been published in **Geochemistry: Exploration, Environment, Analysis** no more than three years after completion of the degree.

All eligible papers in 2009 and 2010 volumes of GEEA will be reviewed by the selection panel.

The winner will receive:

A cash prize of \$1000CAD generously donated by SGS Minerals Services.

A 2-year membership of AAG, including the society's journal – GEEA, **EXPLORE** newsletter, publication of an abstract and CV of the winner, a certificate of recognition and \$500US towards expenses to attend an AAG-sponsored meeting, courtesy of AAG.

The results of the 2010 competition will be announced at the 25th IAGS in mid 2011.

Details are available from the chair of the committee or the AAG Students' page (<http://www.appliedgeochemists.org/>).

David Cohen

Chair, Student Paper Competition

School of BEES

The University of New South Wales

UNSW, NSW 2052 Australia

Email: d.cohen@unsw.edu.au

Books Available

Arsenic in Groundwater: A World Problem

ISBN/EAN: 978-90-808258-2-6
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Editor: T. Appelo

Contents:

1. Introduction
2. Sources and distribution of arsenic in groundwater and aquifers
3. Geochemical experimentation and modelling are tools for understanding the origin of arsenic in groundwater in Bangladesh and elsewhere
4. Review of arsenic behaviour from groundwater and soil to crops and potential impacts on agriculture and food supply
5. Health effects in inorganic arsenic
6. Mapping of hazardous substances in groundwater on a global scale
7. Arsenic in the Dutch coastal provinces
8. Regional occurrence with relation to drinking water production in the Netherlands

To order: janpiet.heederik@infram.nl
To download: Full report [15 Mb pdf]
<http://www.igrac.nl/publications/302>

GEOCHEMICAL ANOMALY AND MINERAL PROSPECTIVITY MAPPING IN GIS, 11

By E.J.M. Carranza

Included in series:

Handbook of Exploration and Environmental Geochemistry

Description: The book documents and explains, in three parts, geochemical anomaly and mineral prospectivity mapping by using a geographic information system (GIS). Part I reviews and couples the concepts of (a) mapping geochemical anomalies and mineral prospectivity and (b) spatial data models, management and operations in a GIS. Part II demonstrates GIS-aided and GIS-based techniques for analysis of robust thresholds in mapping of geochemical anomalies. Part III explains GIS-aided and GIS-based techniques for spatial data analysis and geo-information synthesis for conceptual and predictive modeling of mineral prospectivity. Because methods of geochemical anomaly mapping and mineral potential mapping are highly specialized yet diverse, the book explains only methods in which GIS plays an important role. The book avoids using language and functional organization of particular commercial GIS software, but explains, where necessary, GIS functionality and spatial data structures appropriate to problems in geochemical anomaly mapping and mineral potential mapping. Because GIS-based methods of spatial data analysis and spatial data integration are quantitative, which can be complicated to non-numerate readers, the book simplifies explanations of mathematical concepts and their applications so that the methods demonstrated would be useful to professional geoscientists, to mineral explorationists and to research students in fields that involve analysis and integration of maps or spatial datasets. The book provides adequate illustrations for more thorough explanation of the various concepts.

Audience: Professional geochemists, geologists, geoscientists, mineral explorationists and researchers and graduate students in fields that involve analysis and integration of maps or spatial datasets.

Bibliographic details:

Hardbound, 368 pages, publication date: NOV-2008
ISBN-13: 978-0-444-51325-0
ISBN-10: 0-444-51325-6
Publisher: ELSEVIER <http://www.elsevier.com/>

Price: USD 165, EUR 135, GBP 83



ioStipend



In-kind Analytical Research Fund for BSc(Hons), MSc and PhD students

Much has been said and written about the broadening gulf between the demand for qualified explorationists and the supply coming out of our colleges, technical institutes and universities. One merely has to attend any geo-conference and gaze out over the sea of grey to fully grasp the situation our industry faces. This is all the more evident in the field of exploration geochemistry whose members have always been in short supply.

As consultants and service industries, we owe our livelihood to mining and exploration and thus have a vested interest in its development. We believe that any aid to promote fresh faces into our sector is helping to secure our future.

Acme Analytical Laboratories Ltd. and **ioGlobal** are taking the bold initiative of directly aiding students in the geosciences via the **ioStipend**. The **ioStipend** is a grant available to students conducting exploration-related geochemical studies at a recognized educational institution. The grant is in the form of analytical services using any package provided by Acme Analytical Laboratories Ltd. Students and/or their teachers/advisors can apply for the grant by submitting the application to ioGlobal who will vet the proposals.

The grant is intended to promote the collection of high quality, base-line data for comparison with more “esoteric data” (eg, isotopic data, partial digests, non-standard sample media) generated during the course of research, and to promote broad training in fundamental geochemical principals across the geosciences.

The **ioStipend** allows for amounts of approximately \$5,000 (AUD, CAD or equivalent) for in-kind analytical work. Successful applicants will also be provided with 3 academic licences of **ioGAS**, the new exploratory data analysis software package available from ioGlobal.

The application form is available at www.ioglobal.net.

It is envisaged that three or four of these awards will be made each year.

Applications are reviewed by an expert group of ioGlobal’s geochemists

Eligibility Criteria

Preference will be given to:

- students with no other source of funding
- students working on exploration geochemistry projects
- projects no or very minimal confidentiality requirements

The ioStipend is international. Applications are welcome from qualified institutions globally.

Some technical input may be provided by ioGlobal on request.

Requirements for receiving the ioStipend

Firstly, there are minimal strings attached. Recipients would have to agree to

1. Have their project promoted on the ioGlobal web site in an area devoted to R&D carried out under the program (couple of passport photo shots, brief description)
2. Acknowledge ACME Labs and ioGlobal for support in technical and public presentations of results
3. Write a short article for Explore describing the project outcomes, and allow this to be published on the ioGlobal web site.

David Lawie, John Gravel



EXPLORE

Newsletter No. 144

SEPTEMBER 2009

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Quarterly newsletters in March, June, September, December

Deadlines for submission of articles or advertisements:

March newsletter: January 15

June newsletter: April 15

September newsletter: July 15

December newsletter: October 15

Manuscripts should be double-spaced and submitted in digital format using WORD. Photos and figures (colour or black and white) should be submitted as separate digital files and as high resolution jpeg or PDF files. Tables should be submitted as separate digital files in EXCEL format. All scientific/technical articles will be reviewed. All contributions may be edited for clarity or brevity.

Formats for headings, abbreviations, scientific notations, references and figures must follow the Guide to Authors for *Geochemistry: Exploration, Environment, Analysis* (GEEA) that are posted on the GEEA website at: http://www.geolosc.org.uk/template.cfm?name=geea_instructions_for_authors

Submissions should be sent to:

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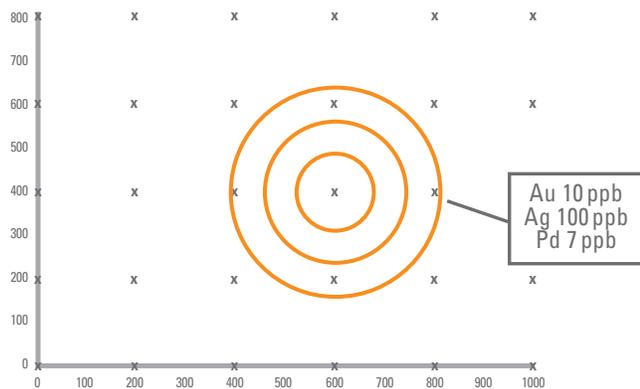
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