Fredericton 2014

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May 21-23, 2014

Fredericton, New Brunswick

GEOLOGICAL ASSOCIATION OF CANADA
ASSOCIATION GÉOLOGIQUE DU CANADA

ATLANTIC GEOSCIENCE SOCIETY
SOCIÉTÉ GÉOSCIENTIFIQUE DE L'ATLANTIQUE
AGS

University of New Brunswick
fredericton2014.ca

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Call for Abstracts

On behalf of the Geological Association of Canada, Mineralogical Association of Canada, the Atlantic Geoscience Society, and the University of New Brunswick, the Fredericton 2014 Organizing Committee invite you to submit an abstract for one of several Symposia or Special Sessions being offered at the Joint Annual Meeting, May 21-23, 2014. Enjoy a diverse scientific program and field trips exploring the spectacular exposures and scenic views along the east coast. Abstracts may be submitted online before **February 10, 2014** at: **fredericton2014.ca**

Join us in Fredericton to celebrate 175 years of geological research and exploration in New Brunswick, starting with the appointment of Abraham Gesner, discoverer of kerosene, as the first provincial geologist in Canada, in 1838. For additional information, please visit our website: **fredericton2014.ca.**

Symposia

Evolution of the Appalachian-Caledonide-Variscan and Correlative Orogens: Recent Developments

Reg Wilson, Cees van Staal, Brendan Murphy, Sandra Barr

The Appalachian, Caledonide, and Variscan orogens record the opening and closure of the Iapetus and Rheic oceans, the accretion of exotic terranes, and the terminal continental collisions that gave rise to the supercontinent Pangea in the Late Paleozoic. Correlative orogenic belts worldwide record comparable evolutions that provide valuable constraints on events leading to the assembly and amalgamation of Pangea. Recent developments have shifted attention from the documentation of events to an understanding of the mechanisms responsible for them. We encourage the presentation of new and exciting data and ideas concerning the evolution of the Appalachian-Caledonide-Variscan orogens and the processes that formed them. We also encourage talks on other Paleozoic mountain belts in order to stimulate discussions and provide insights into potential geodynamic connections among them. ***Sponsored by: GAC®***

This symposium is linked to pre-meeting field trip A2

Properties, Processes and Phenomena of Strain Localization in the Lithosphere: From Mantle Shear to Volcanic Eruption

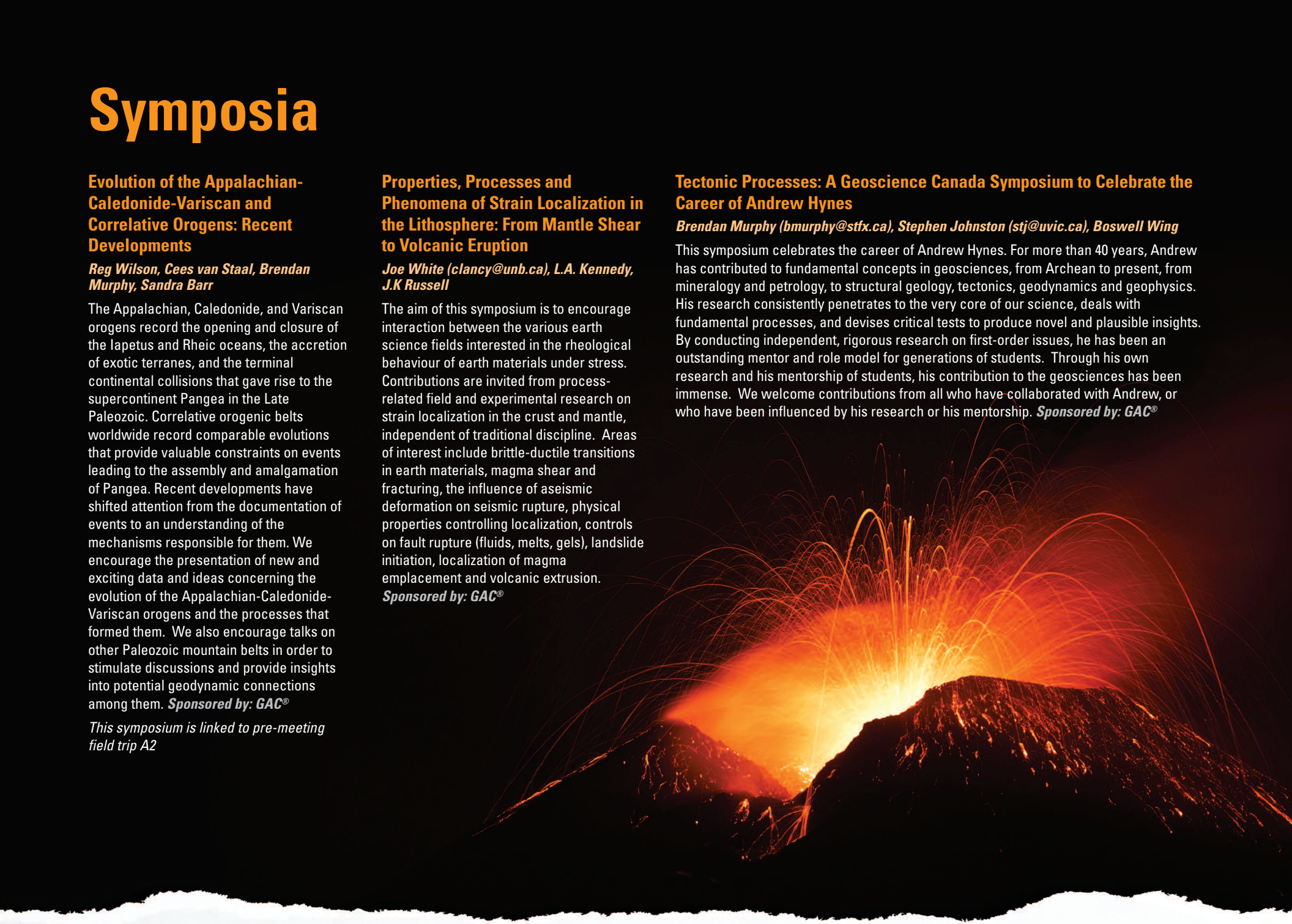
Joe White (clancy@unb.ca), L.A. Kennedy, J.K Russell

The aim of this symposium is to encourage interaction between the various earth science fields interested in the rheological behaviour of earth materials under stress. Contributions are invited from process-related field and experimental research on strain localization in the crust and mantle, independent of traditional discipline. Areas of interest include brittle-ductile transitions in earth materials, magma shear and fracturing, the influence of aseismic deformation on seismic rupture, physical properties controlling localization, controls on fault rupture (fluids, melts, gels), landslide initiation, localization of magma emplacement and volcanic extrusion. ***Sponsored by: GAC®***

Tectonic Processes: A Geoscience Canada Symposium to Celebrate the Career of Andrew Hynes

Brendan Murphy (bmurphy@stfx.ca), Stephen Johnston (stj@uvic.ca), Boswell Wing

This symposium celebrates the career of Andrew Hynes. For more than 40 years, Andrew has contributed to fundamental concepts in geosciences, from Archean to present, from mineralogy and petrology, to structural geology, tectonics, geodynamics and geophysics. His research consistently penetrates to the very core of our science, deals with fundamental processes, and devises critical tests to produce novel and plausible insights. By conducting independent, rigorous research on first-order issues, he has been an outstanding mentor and role model for generations of students. Through his own research and his mentorship of students, his contribution to the geosciences has been immense. We welcome contributions from all who have collaborated with Andrew, or who have been influenced by his research or his mentorship. ***Sponsored by: GAC®***



Environmental and Economic Significance of Gossans Associated with Mineralization in Rifts and Large Igneous Provinces

Marie-Claude Williamson, Jeff Harris, Cole Kingsbury

Gossans preserve anomalous concentrations of metals that are routinely investigated in the search for new ore bodies. Under certain conditions, gossans also constitute analogues of mine waste deposits. On a regional scale, the streams, lakes and permafrost that are affected by the unusual mineralogy of gossans provide indicators of environmental impact. This session will highlight recent research on gossans as natural laboratories used in environmental geosciences and metallogeny with special emphasis on their genesis in continental rift settings and flood basalt provinces. We welcome multidisciplinary scientific and technical reports on a wide range of topics including: the mapping of gossans by remote sensing in arid climates and polar regions; mineralogy and geochemistry of surficial deposits; models of development; environmental impacts; and economic geology. ***Sponsored by: Environmental Earth Sciences Division of GAC®***

Gold in 2014: A Holistic Approach

Dan Kontak (dkontak@laurentian.ca), Richard Goldfarb, Gema Olivo, Bruno Lafrance, Benoit Dube, Craig Hart, Bob Linnen, Robert Creaser

There have been considerable advances made in recent years towards constraining models applied to our understanding of the genesis of gold deposit types due to the integration of field studies with new analytical methods. The purpose of this session is to examine the current understanding of all gold deposit types from several perspectives and we encourage presentations that focus on the following themes: space-time-lithological correlations and controls on gold deposits and terrane endowment; structural controls from terrane boundaries to deposit scales; advances in deposit classification and characterization; application of analytical methods (e.g., mineral chemistry/fluid inclusions/isotopes) to deposit formation; application of geochronometers to constraining the timing and duration of deposit formation.
Sponsored by: Mineral Deposits Division of GAC®

Applied Aspects of Mineralogy: A Tribute to John Leslie Jambor

Robert Martin, David Blowes, Tom Al

John Jambor was a scientist of distinction who lived life to the fullest, not only contributing significantly to his scientific endeavors and collaborations, but building strong and lasting friendships in the process. John published widely, making important contributions in the fields of mineralogy, petrology, crystallography, and mineral deposits. Consistent with John's career interests, we are inviting contributions that span a wide range of applied mineralogy, including new minerals, mineralogical characterization, ore mineralogy and low-temperature mineralogy related to mine-waste materials. We particularly welcome contributions in line with John's earlier career interests in ore mineralogy. Please join us in honoring John's illustrious career. We do plan a thematic issue of The Canadian Mineralogist dedicated to John. Note that attendance at the 2014 GAC®-MAC meeting is not a prerequisite to contribute to the volume; however, the editor, Prof. Lee A. Groat, requests that manuscripts be made ready for submission at the time of the meeting.
Sponsored by: MAC

Super-continent Cycles: The Influence of Geodynamics on Ore-forming Processes

Luke Ootes, Bruce Eglington, Kevin Ansdell, Toby Rivers, Sally Pehrrson

Supercontinent amalgamation and fragmentation are surface manifestations of the continued tectonic activity on Earth and were major factors determining the distribution and timing of orogenesis, ore deposit formation and the environments in which life evolved. This theme will bring together cross-disciplinary presentations, which investigate the nature and timing of formation and breakup of supercontinents and supercratons Nuna, Rodinia, and Pangea/Gondwana, the influence they have had on mineralization, the structure of Earth as we see it today, changes in the atmosphere and oceans, and the development of life.

Special Sessions

The Dynamics and Facies Characteristics of Tidal Mud Deposits

Elisabeth Kosters (eckosters@hotmail.com), Bob Dalrymple

The dynamics of the transport and deposition of fine-grained sediment is complex and conditions vary on a wide range of time scales, from the scale of the turbulence within the flow to annual and longer periods. The role of high-density suspensions in the extraction of mud from the water column and its transfer to the sediment bed, and the role of organisms, ranging from microbes to benthic invertebrates, in the deposition of muddy sediments and their post-depositional modification remain only imperfectly understood. Recent work indicates, however, that mud deposition is far more complex than many geologists have appreciated. Within the resulting deposits, our ability to reconstruct the conditions under which an individual mud deposit formed is rudimentary by comparison with what can be deduced from sandy deposits, although great strides have been made in recent years. This Special Session is open to contributions on any aspect of the transport and deposition of fine-grained sediment in tidal settings, and the environmental interpretation of the muddy deposits, modern or ancient, formed by these processes. This session is intended as a forum for the exchange of information and ideas between process-oriented scientists and the geologists who study such deposits in the rock record. This session will also be an ideal introduction to the companion post-conference field trip to the Bay of Fundy, on which muddy deposits in a wide range of tidal environments will be examined. ***Sponsored by: AGS/GAC®***

Metalliferous Black Shales: Resolving Among Various Metal Sources

Andrey Bekker (bekker@cc.umanitoba.ca), Clint Scott, Dave Lentz

Many black shales contain economic concentrations of base and platinum-group elements. However, the ultimate sources of these metals and the processes that led to their metal enrichment are poorly understood. Among the mechanisms proposed for metal enrichments are scavenging from seawater at depositional sites with extremely low sedimentation rates, derivation from fallen giant iron meteorites, delivery with hydrothermal fluids circulating through unconsolidated sediments and with petroleum fluids generated upon contact of igneous intrusions with organic matter-rich sediments. The geochemical and sedimentological criteria required to resolve among these sources are not well defined. We invite broadly based contributions on sedimentology, geochemistry, tectonic setting, and basin analysis focused on the theme of metalliferous shales. ***Sponsored by: GAC®***

Discovering the Next Generation of Porphyry Deposits: Advancements in Locating and Understanding Hidden Intrusion-related Mineralization

Neil Rogers (Neil.Rogers@NRCan-RNCan.gc.ca), Bob Anderson, John Chapman, Dawn Kellett, Beth McClenaghan, Alain Plouffe

Porphyry-style deposits are the world's foremost sources for Cu, Mo, W and Sn, plus major sources of Au, Ag, and PGEs. They are typically large, low- to medium-grade deposits hosted within and near distinctive intrusive phases. Metal content is diverse and reflects tectonic settings; Cu and Cu-Mo deposits are relatively abundant in island- and continental-arc terranes, whereas Mo and W-Mo deposits are associated with extension of continental crust. This Special Session will investigate their genetic controls and distal footprints that identify hidden economic porphyry-style deposits by highlighting new ways to predict, identify, model, and evaluate fertile intrusive mineralizing systems. Themes will include tectonic settings, structural controls, mineral and fluid inclusion compositions, and surficial and biogeochemical indicators of covered and deep porphyry deposits. ***Sponsored by: GSC***

This special session is associated with TGI-4 sponsored pre-meeting field trip A3 and post-meeting field trip B1.

Geoscience Canada Reviews

Brendan Murphy (bmurphy@stfx.ca)

Geoscience Canada is the main publication of the Geological Association of Canada. Since January 2012, it has been published online only, a strategy that has allowed for greater flexibility in the number and type of articles we can publish. See http://journals.hil.unb.ca/index.php/GC/about/submissions. In addition to our traditional series and reviews, we now have series including Google Earth and Geology, Modern Analytical Methods, Great Geological Debates, articles by recent Logan and Hutchinson medal recipients and "Tooth of Time" contributions by our regular columnist Paul Hoffman. The purpose of this special session is to allow authors of recently published or of forthcoming articles to present summaries of these articles and so demonstrate the range of activities undertaken by geoscientists in Canada. ***Sponsored by: GAC®***

Granites and Crustal Evolution: Acadian-Caledonian Connections

Dave Gibson (dgibson@maine.edu), Mike Dorais, Martin Feely

Granites (sensu lato) play an important role in the assembly of the continental crust. An integral part of collisional tectonics is the melting of crustal material, at various levels, and the subsequent ascent and emplacement of that magma to differing levels of the crust. In this session we would welcome contributions that examine source melting and the role of mantle input, the ascent and emplacement of magmas, magma chamber dynamics, host-magma interactions and granite metallogeny along and across the extent of the Acadian-Caledonian belt. ***Sponsored by: GAC®***

Volcanology: Volcanic Processes, Products and Relation to Economic Resources

Rodney Allen (rodney.allen@ltu.se), Harold Gibson

Volcanism spans an incredible and fascinating range in age, style, setting and composition, and together with subvolcanic processes is a driving force for the formation of a range of metallic ore deposits, industrial mineral deposits and geothermal energy. In this scientific session we seek contributions from geologists, geochemists, geophysicists and mineral explorationists on all aspects of volcanism and subvolcanic processes, volcanic rocks, high-level subvolcanic intrusions, and their relationships with associated economic resources. ***Sponsored by: Mineral Deposits Division of GAC®***

Uranium Ore Genesis and Exploration at Depth

Eric Potter (Eric.Potter@NRCan-RNCan.gc.ca), Dave Quirt, Kurt Kyser

With uranium exploration in Canada shifting towards greater depths, advances in our understanding of the key factors leading to localization of ore-bearing fluids and formation of uranium ore bodies is essential for increased exploration effectiveness. Building on these advances, new exploration methods applying the unique geochemical and geophysical properties of uranium ore systems likely hold the most promise for success. This session invites submissions outlining advances in our understanding of uranium ore systems with a focus on developing the next generation of exploration methods. ***Sponsored by: Mineral Deposits Division of GAC®***

Geoscience and Management of Radioactive Waste in Deep Geological Repositories

Julie Brown, Mostafa Fayek (mostafa.fayek@umanitoba.ca)

Countries with nuclear capabilities are in search of a solution for the safe disposal of high-level nuclear waste (HLNW). Currently, the Canadian strategy is to dispose of HLNW in deep geological repositories and as a result, Canada is re-establishing its research programs on deep geologic storage. This session will focus on current research related to geologic disposal and storage of HLNW generated by the nuclear fuel cycle. We invite contributions from various disciplines, including, but not limited to, geochemistry, geomechanics and hydrogeology, and from various institutions including regulatory agencies and government, waste management organizations, and academia. ***Sponsored by: MAC***

Natural Hazards and Risk

Bruce Broster (broster@unb.ca), Peter Bobrowsky, John Clague

This session features recent research on hazardous natural processes in Canada. We seek papers on earthquakes, tsunamis, landslides, snow avalanches, floods or severe weather. Many historic natural disasters have resulted in considerable economic loss and casualties, and hazardous phenomena continue to damage local and regional infrastructure. We invite contributions that address natural hazards as well as those contributions that provide insight into local, regional, or national vulnerability to disasters in the context of the country's growing population and changing climate. We welcome presentations representing the perspectives of physical and social scientists and others (i.e., emergency responders, catastrophic-event managers, planners, etc.). ***Sponsored by: GAC®***

Engineering Geology in Glaciated Terrain

Bruce Broster (broster@unb.ca), David Huntley, Ian Spooner

Urban development in glaciated terrains involves complex interaction with surficial geology and awareness of conditions that may present challenges for new engineering projects or limitations to sustainable growth or proposed land use. Often such projects may concern construction of major structures or control of water courses, such as dams or diversion channels, or development of transportation corridors and shore facilities. We encourage contributions that highlight the role of geological mapping and analysis in the broad field of engineering geology and sustainable development.

Remote Predictive Mapping for Northern Geological Mapping

Jeff Harris (Jeff.Harris@NRCan-RNCan.gc.ca), Brigitte Leblon, H. Russell, V. Singhroy

This session will entertain papers that have developed techniques or have applied remote predictive mapping techniques for geological mapping or associated geoscience applications. Topics of interest would include the application of various types of remotely sensed imagery (including geophysics, optical, radar, hyperspectral) to bedrock, surficial, geomorphic and alteration mapping as application directed towards hazards such as landslides, permafrost and earthquakes. Topic involving mineral potential mapping (2D or 3D) techniques and application studies will also be included. ***Sponsored by: GAC®***

This special session is linked with the proposed post-meeting workshop on remote predictive mapping (see below).

Conventional and Unconventional Petroleum Systems of Eastern North America

Grant Wach (Grant.Wach@dal.ca), Denis Lavoie, Robert Milici

Eastern North America and Frontier petroleum systems include conventional and unconventional hydrocarbon resources and cover a range of exploration and development opportunities; from onshore tight gas sands and shale opportunities, to new exploration activity offshore Atlantic Canada and the Canadian Arctic. This session will examine both the opportunities and the challenges that these developments provide. ***Sponsored by: GAC®***

Sedimentary Signatures of Tectonic Events

Elisabeth Turner (eturner@laurentian.ca), Robert MacNaughton, Heinrich Bahlburg, Brian R. Pratt

Tectonic setting and history are fundamental controls on the morphology, facies, architecture and resource potential of sedimentary basins. This special session will highlight new work on the interplay of sedimentation and tectonics at all scales, from profound tectonic unconformities to subtle effects of epeirogeny, from the deformation caused by earthquakes to the emplacement of individual beds attributable to tsunamis, and from development of facies belts along uplifts to distal signals of uplift in source areas. The session is inspired by New Brunswick's rich stratigraphic record, which was deposited in a range of Proterozoic and Phanerozoic tectonic settings. Although studies of Atlantic Canadian examples are especially appropriate, work from elsewhere in Canada and worldwide is welcome. Theoretical and applied presentations are both appropriate for this session. ***Sponsored by: Canadian Sedimentology Research Group***

Ancient and Modern Base Metal Sulphide Deposits, Environments and Formational Controls

Patrick Sack (Patrick.Sack@gov.yk.ca), Jan Peter, Bruce Gemmell

Sedimentary exhalative (SEDEX) and volcanogenic massive sulphide (VMS) deposits both formed on the paleo-seafloor, but in different tectonic and depositional settings. VMS and SEDEX deposits are a significant source of metals, accounting for over half of the world's Zn+Pb reserves and production. Recent research in modern and ancient sediment-dominated marine environments continues to improve our understanding of SEDEX and VMS deposits and is helping the exploration community discover increasingly hard to find deposits. This session calls for contributions that examine the geological, chemical and physical controls on mineralization and exploration methods for volcanogenic, volcanic-sediment hosted, and sedimentary exhalative massive sulphide deposits (i.e., VMS and SEDEX); contributions on sediments and those from industry are particularly encouraged. ***Sponsored by: Mineral Deposits Division of GAC®***

This special session is associated with pre-meeting field trip A1 (see below).

Geoheritage: The Earth's Past, Our Future

John Calder (jhcalder@gov.ns.ca), Steven Hinds, Matt Stimson

Far from a 'feel good' exercise, the emerging concept of Geoheritage is our best hope for connecting society with geoscience and with the lessons of Earth history as we face growing local and worldwide challenges of resource use and global change. The formal recognition of Geoheritage is gaining momentum globally; this session will look at the breadth of Geoheritage recognition across Canada from geological highway maps and community-managed sites to UNESCO World Heritage, at the methodology of formally defining geoheritage sites, and will help to move us toward a Canadian and North American Geoheritage network.

Environmental Aspects of Resource Development

Heather Jamieson (jamiesonhedith@gmail.com), Michael Parsons

Environmentally responsible development of metal mines, energy resources (including oil sands and shale gas), pipelines and transportation corridors requires innovative geoscience information to inform environmental assessments and to help guide monitoring and restoration activities. This session will demonstrate how geoscience knowledge can be used to better understand baseline conditions, ecosystem and human health risks, and environmental processes throughout the development life cycle. We invite contributions on a broad range of these topics including, but not limited to, resource development issues in Atlantic Canada. ***Sponsored by: GAC®***

The Age of the Earth Revisited: High-precision U-Th-Pb Geochronology of Igneous, Metamorphic, and Sedimentary Processes

Sandra Kamo (skamo@es.utoronto.ca), Mike Hamilton, Larry Heaman, Paul Sylvester

Just over 100 years since Arthur Holmes published his seminal book, The Age of the Earth (1913), the precise measurement of geologic time by U-Th-Pb dating is undergoing another revolution. Advances in ID-TIMS, SIMS, and LA-ICPMS methods applied to zircon and other accessory minerals, innovative geochronological applications, and the use of community isotopic tracers and mineral standards, are permitting earth scientists to resolve geological events more precisely, and to ask bold new questions about Earth and solar system evolution. We encourage contributions that highlight the latest advances in analytical techniques, and which integrate multiple methods of investigation. This session is open to studies from a spectrum of U-Th-Pb dating applications including cosmochronology and earliest plate tectonic processes, to investigations of deep crustal development, orogenesis and growth of the continents, provenance studies, the dating of mineral deposits, precise temporal constraints on species evolution and extinction, LIPs and meteorite impact events, and absolute timescale issues that so intrigued Holmes. *Sponsored by: MAC*

Hard Living: Paleobiology of Substrates. A Special Session in Honour of Prof. Ron Pickerill

Steve Donovan, Murray Gingras (mgingras@ualberta.ca), Dave Keighley, Rob McNaughton

In 2014 Professor Ron Pickerill will have been a member of the UNB faculty for 40 years. During his career he has made significant contributions to the fields of ichnology, paleontology and sedimentology. This special session will be open to contributions from these fields within the general theme of substrate-biota interactions. *Sponsored by: MAC*

Linking Metamorphic Processes with Large-scale Geodynamics

Dave Pattison (fgaidies@earthsci.carleton.ca), Fred Gaidies, Doug Tinkham

This session seeks to address ongoing research aimed at elucidating relationships between regional-scale geodynamics and the conditions and rates of metamorphic processes that operate at the micro- to nanoscale. We invite contributions that highlight the integration of phase equilibria modeling, reaction kinetic theory, or reaction mechanism theory with geochemical, geochronological, or microstructural analyses to advance our understanding of the petrogenetic record preserved in metamorphic rocks. Presentations based on experimental and theoretical work and the investigation of natural rocks are welcome. *Sponsored by: MAC*

High-temperature Metasomatic Processes Recorded by Trace Element and Isotopic Systematics in Major and Accessory Minerals

Chris McFarlane (crmm@unb.ca), Richard Cox, Jacob Hanley

Open-system behaviour in magmatic, metamorphic, and ore forming systems can be manifested by cryptic and episodic variations in trace element and isotopic zoning (both stable and radiogenic) in major and accessory minerals. High-temperature metasomatic processes are also characterized by recrystallization phenomena and textural changes that can also provide telltale evidence for open-system behaviour. Deviations from chemical, isotopic, and textural equilibrium with host rocks arising from metasomatic processes renders these systems inherently challenging to study. However, as new analytical tools are developed to help reveal and systematically fingerprint the nature of metasomatic processes, novel (re)interpretations of mineral-scale zoning phenomenon are likely to emerge. In doing so, the source(s) of metasomatic fluids may ultimately be constrained and related to the regional geological and geochronological framework of a region or deposit. This session welcomes contributions integrating textural, mineralogical, trace-element, and isotopic datasets to understand the nature and impact of metasomatism in a variety of geological settings. *Sponsored by: MAC*

The Appalachian Glacier Complex and Implications for Mineral Exploration, Landscape Evolution, and Land/Sea Interactions

Mike Parkhill (michaeal.parkhill@gnb.ca), Toon Pronk, Al Seaman

This session will present new surficial mapping initiatives in onshore and offshore Atlantic Canada and several regional and deposit scale TGI-4 drift prospecting case studies.

20 Years of the Canadian Geomorphology Research Group (CGRG): Trends, Advances, and Opportunities in Canadian Geomorphology

Ian J. Walker (ijwalker@uvic.ca), Olav Slaymaker

The Canadian Geomorphology Research Group (CGRG) was established in 1993 at the International Association of Geomorphology (IAG) Congress in Hamilton, Ontario. To celebrate CGRG's 20th anniversary, this session will host papers that discuss progress in Canadian geomorphology since inception of CGRG and highlight key advances, new opportunities, and future prospects. Emphasis on the breadth and integration within the Canadian geomorphology community will also be highlighted and encouraged. *Sponsored by: CGRG*

Alkaline Magmatism and Associated Mineralization

Anne Sylvie André-Mayer, Michel Jébrak (jebrak.michel@uqam.ca), Daniel Onhenstetter, Anthony Williams-Jones

Alkaline magmatism appears as the key element for the mineral resources of a low-carbon energy world. Major issues remain in the understanding of the genesis of these magmas and their associated mineralization. Recent progresses are based on integrated studies of Archean to recent systems involving field observations, detailed mineralogy, textural interpretations, and geochemistry. Contributions on all subjects relevant to advancing our understanding of processes involved in the development of alkaline magmatism and associated mineralization are welcome to this special session.

Mineralogy of Plutonic Rocks: From Magmas to Ores. A Tribute in Honour of Andre E. Lalonde

Keiko Hattori (keiko.hattori@uottawa.ca), Robert Linnen

In honour of the passion for mineralogical studies by Andre E. Lalonde (1955-2012), we propose a session at the GAC®-MAC 2014 meeting. The session, entitled "Mineralogy of Plutonic Rocks" reflects on Andre's early work on the mineralogy of granite and syenite during his graduate program and later research on alkaline intrusions. Furthermore, Andre had an enthusiastic interest in optical properties of minerals and their relationship with the hosting igneous rocks. He was a strong advocate of mineralogy in all scientific fields. In consideration of his wide interests, papers in broader fields related to the physics and chemistry of minerals are welcome. We plan one full day for the oral and poster presentations and papers to be published in a special volume of The Canadian Mineralogist. ***Sponsored by: MAC***

Mineral Systems: Beyond Source, Transport and Trap

David Huston (David.Huston@ga.gov.au), Cam McCuaig, Richard Blewett

Although the concept of source-transport-trap is a well-established way of understanding how mineral deposits form, this concept is limited as it does not explicitly consider geological processes and features, such as geodynamic setting and basin make-up that fundamentally define the characteristics of mineral deposits. The mineral systems concept, which considers all geological processes that form and preserve mineral deposits, expands the source-transport-trap concept to include geological processes that operate beyond the district scale to form and preserve mineral deposits. The purpose of this symposium is to examine mineral deposits from the broader mineral systems perspective, illustrating how this approach is predictive and can provide new insight into relationships between apparently disparate mineral deposit types, how it has been used successfully in discovering new deposits, and how it can be used to explore under cover. ***Sponsored by: GAC®***

Geoscience Professionalism 2014: Issues, Responsibilities and Information – What's New That You Need to Know?

Annie Daigle (annie.daigle@gnb.ca), Paul Rennick, Oliver Bonham

The profession of geoscience around the world is looked upon by governments, by industry and by academic institutions to assist with the setting of standards for communication of geoscience information relevant to public safety, sustainable development and capital investment; it is also looked upon to ensure that training of geoscientists achieves the academic outcomes, skills and competencies necessary for modern, safe and effective practice. Geoscientists, as P.Geo's, are independently and publically accountable for all the work they do in serving the needs of society. They have a duty, not only to stay abreast of new scientific developments and advances in technology in their area of expertise and for an ever changing workplace, but also, to be informed of evolving affairs concerning their profession.

This annual session is intended to again provide topical information to the geoscience community and practitioners alike about professionalism and ethics in geoscience in Canada and globally, trends toward professional registration, greater public protection and accountability. Students, those preparing to become P.Geo's, as well as those preparing others to become P.Geo's, should also find this session to be highly informative.

Papers are invited that relate to any aspect of competencies, admissions for registration, professionalism and ethics in Earth science - in all its practice contexts, be they local, regional, national or global.

Supported by: Geoscientists Canada; Engineers and Geoscientists New Brunswick

Geoscience for Environmental Management

Brian Marker (brian@amarker.fresserve.co.uk), Jonas Satkunas, Ben Mapani

Geoscience has an important part to play in environmental management and planning but is often neglected by administrators, planners and the general public leading to inefficient use of land and resources, increased risks from natural hazards and unnecessary damage to the environment. This session will focus on approaches to using and communicating geoscience information to achieve more sustainable development, including capacity building and adaptation to social, economic and environmental change. ***Sponsored by: IUGS***

Short Courses

Space Rocks! New Results in the Earth Sciences from the Study of Meteorites, Planetary Missions, and Terrestrial Analogues

Gordon Osinski (gosinski@uwo.ca), Paul Sylvester, Livio Tomabene

The rocky or terrestrial planets share many similarities but also exhibit some fundamental differences in terms of their geological history. Understanding these similarities and differences is important not only for planetary science but also for reconstructing the first few hundred million years of Earth's history – a record that has been largely lost through destruction of the early rock record. The Earth and planetary science communities both, therefore, stand to benefit from increased collaborations and implementing novel approaches to address old questions. This session seeks to bring together scientists studying meteorites, satellite and ground-based datasets from other planets, and terrestrial analogue sites on Earth, both from a geological and astrobiological perspective. Results from current planetary exploration missions will be highlighted and submissions highlighting the increasing commonalities and synergies in the techniques and technologies employed for Earth and Space exploration are particularly welcome. ***Sponsored by: GAC®***

Cathodoluminescence and its Application to Geoscience

Ian M. Coulson (ian.coulson@uregina.ca), Michael Robertson (michael.robertson@acadiau.ca)

The MAC sponsored Short Course will address both the theory behind the phenomenon of cathodoluminescence (CL) and the application of this microscopic technique to all fields of geoscience investigation. Aimed at the graduate student, researcher and practicing professional, short course modules will cover the basics of theory, causes of cathodoluminescence in minerals and materials, instrumentation, recent advances in cathodoluminescence imaging and spectroscopy data collection, and interpretation of spectral responses. Case studies relating to sedimentological, petrological, mineralogical, petroleum geology and economic geology fields will be included. University of New Brunswick has excellent analytical facilities in house and we have been offered access to this instrumentation (i.e., cold CL and Chroma SEM/CL) for demonstrations as part of the Short Course.

Duration: 2 to 2.5 days (pre-meeting)
Short Course fees: Professionals - $525 / students - $225. Includes shortcourse volume, coffee and lunch breaks, instrument demos, and additional hand-outs

GAC® Workshops

Structure and Ore Deposits

Bruno Lafrance, Shoufa Lin, Adrian Park

A two-day pre-meeting workshop that will address the role of structural geology studies in exploration models and ore genesis. ***Sponsored by: GAC®/Canadian Tectonics Group***

Fees (taxes incl.):
Industry (Non-GAC® Member): $350
GAC® Members: $200
Students: $70

Remote Sensing and Hyperspectral Mapping

Jeff Harris, Vern Singhroy

A two-day post-meeting workshop focusing on the compilation and application of remotely-sensed geoscience data sources to produce predictive geological maps. ***Sponsored by: Geomatics Division of GAC®***

Fees (taxes incl.):
Industry (Non-GAC® Member): $250
GAC® Members: $100
Students: $35

Molar Element Ratio Analysis: An Important Lithogeochemical Data Analysis

Cliff Stanley, Kelly Russell (1 to 1.5 days post-meeting)

Lithogeochemical exploration data have historically been evaluated by geoscientists using relatively simple graphs and more complicated multivariate statistical procedures. New ways of investigating rock compositions utilizing molar element ratios (MER's) now allow geoscientists to directly relate the lithogeochemistry to the petrology of the rocks (or surficial materials) under investigation. These MER methods have now made substantial contributions to the disciplines of igneous, sedimentary and metamorphic petrology, hydrothermal alteration, weathering, and diagenesis, and have advanced procedures and knowledge in the mining-related fields of applied (exploration and environmental) geochemistry, mineral deposit genesis, metallurgy, and even hydrogeochemistry.

This post-meeting workshop will present the theory, principles, and procedures of MER analysis, as well as the practical considerations of sampling, sample preparation, and analysis appropriate for the technique. In addition, a number of case histories will be presented that illustrate how MER analysis can be used in a variety of applications to solve geochemical problems of interest to the geoscience community. These will include examples involving investigations into rock forming processes of volcanic, plutonic, and sedimentary rocks, mineral exploration for deposits in these same rocks, studies of hydrothermal alteration, diagenesis, and weathering, how MER analysis can 'see through' metamorphism, and how it can be applied in 'greenfields' and 'brownfields' mineral exploration programs.

Most importantly, free, dedicated, platform independent software (MERLIN; development costs funded by the Centre for Excellence in Mining Innovation, Sudbury, Ontario) will be distributed to participants to allow them to generate MER diagrams using several example datasets provided to the participants in CSV format. This software generates camera-ready output complete with propagated error ellipses, illustrations of the effects of user-defined material transfer processes, and allows data classification and symbol colour/shape/size control to enable exploratory data evaluation. Participants should bring a laptop computer with CSV-capable spreadsheet software. ***Sponsored by: Centre for Excellence in Mining Innovation (CEMI)***

Fees (taxes incl.):
Industry (Non-GAC® Member): $250
GAC® Members: $100
Students: $35

Technical Writing Workshop for Students

Jacob Hanley

A one day workshop with contributions from GAC®, industry/consulting, NSERC and Springboard involving 5-6 technical presentations on the key elements of scientific/technical communication with a group presentation/technical report and critique of this report by the workshop presenters in the afternoon. The technical workshop will involve presentations/materials/contributions by the following (no cost involved, all contributions/participation will be in kind from these organizations): Science Writers Association, Ottawa; Springboard Atlantic, Halifax; NSERC; APGEO; Barrick Gold, Mercator Geoscience, SRK, Golder, and Watts Griffis and McOuat; Jacob Hanley (SMU).

Fees: Free to students

Field Trips

Pre-Meeting

A1. Tectono-Stratigraphic Setting of Base-Metal Deposits of the Bathurst Mining Camp, New Brunswick, Canada

James Walker (Jim.walker@gnb.ca), Sean McClenaghan

Duration: 3 days / Maximum: 16 /Start Date: Saturday, May 17 / Cost: $625.00

Bimodal volcanic and associated sedimentary rocks of the Middle Ordovician Bathurst Mining Camp are host to one of the world's greatest accumulations of massive sulphides. To date, the 46 Zn-Pb-Ag-Cu volcanogenic massive sulphide deposits that have been identified, collectively account for a pre-mining resource in excess of 500 million tonnes. The most famous of these, the world class Brunswick No.12 deposit, is a supergiant, which produced in excess of 136 million tonnes of ore grading >12% (Zn + Pb) during its 49 year mine life. The trip will focus on the stratigraphic setting of massive sulphide deposits in the Bathurst Mining Camp with an emphasis placed on the type section of the Nepisiguit Falls Formation, which constitutes the immediate footwall of the Brunswick No.6 and No.12 deposits. The trip will feature visits to several past-producing mine sites, Brunswick No.6, Austin Brook, and Restigouche, and if mining operations permit, underground tours of the recently opened Halfmile Mine and past-producing Caribou Mine, which are scheduled to resume operations in 2014.

A2. The Popelogan Arc-Tetagouche Backarc Basin, the Brunswick Subduction Complex and the Salinic Orogeny in Northern New Brunswick

Cees van Staal, Reg Wilson (Reg.wilson@gnb.ca)

Duration: 3 days / Maximum: 16 / Start Date: Saturday, May 17 / Cost: $650.00

Ganderia is a Gondwanan-derived microcontinent that underlies a large part of the central orogenic core of the Northern Appalachians. Its history is fundamental to understanding the post-Middle Ordovician orogenic evolution of the Appalachians. This field trip presents an overview of the tectonic setting of the leading edge of Ganderia (Miramichi, Elmtree, and Popelogan belts) and associated Middle Paleozoic cover rocks in northern New Brunswick. Deformation of these rocks is a result of tectonism that accompanied closure of the oceanic Tetagouche–Exploits back-arc basin, which culminated in terminal collision of Ganderia with Laurentia (Salinic Orogeny). Field trip stops will examine several manifestations of backarc basin opening and closing, including the Fournier ophiolite, Popelogan arc, polyphase deformation and metamorphism (e.g., blueschist) in the Brunswick subduction complex, and at least three unconformities in Silurian successor basin rocks.

A3. Intrusion-Related Mineralization in Southwestern New Brunswick: The Mount Pleasant and Clarence Stream Deposits

Kay Thorne (Kay.Thorne@gnb.ca), David Lentz

Duration: 2 days | Maximum: 24 | Start Date: Saturday, May 17 | Cost: $425.00

This two-day field trip will focus mainly on the regional geological setting and mineralizing characteristics of two Devonian intrusion-related deposits in the New Brunswick segment of the Northern Appalachians: the Clarence Stream Au-Sb and Mount Pleasant Sn-W-Mo-In deposits. The Clarence Stream deposit is a structurally-controlled intrusion-related gold deposit situated near the Gander-Avalon Boundary that is hosted by volcano-sedimentary rocks, which have been intruded by several generations of gabbroic and felsic dykes in a structural corridor that parallels the northern margin of the Early Devonian Magaguadavic Granite. Two major zones of mineralization are recognized at this deposit: (1) auriferous quartz veins in a northeast-trending brittle-ductile shear zone cutting metagabbroic and metasedimentary rocks (Main Zone - proximal deposits), and (2) gold-bearing, antimony-enriched stockwork mineralization developed within metasedimentary rocks (Anomaly A – distal deposits). The world renowned, former producing Mount Pleasant polymetallic mine contains the world's largest undeveloped resource of indium and is hosted by volcanic and subvolcanic rocks of the Late Devonian Mount Pleasant Caldera Complex along the northern margin of the Saint George Batholith. The Mount Pleasant Granitic Suite comprises three phases of subvolcanic rocks (Granite I, II, and II), which generated mineralized hydrothermal breccias that cut the volcanic stratigraphy. Tungsten-molybdenum mineralization associated with Granite I predominates at the Fire Tower Zone whereas Sn-In-Zn mineralization (associated with the emplacement of Granite II) comprises the North Zone. The trip will consist of visiting road side outcrops, expansive trench exposures, and examining drill core from both deposits.

A4. From the First Reptiles to Super-Reptiles and Protomammals: Travel through the Carboniferous, Triassic and Jurassic with Stops at Joggins (UNESCO World Heritage Site) and Wasson Bluff

Ken Adams (curator@jogginsfossilcliffs.net), Melissa Grey, Deborah Skilliter

Duration: 2 days | Maximum: 25 | Start Date: Monday, May 19 | Cost: $400.00

Joggins Fossil Cliffs UNESCO World Heritage Site provides a unique and unparalleled window into the Late Carboniferous (Pennsylvanian) where fossils from all levels of the food web are preserved within their ecological context, including the world's oldest reptile (*Hylonomus lyelli*) found nestled amongst famous fossilized forests of tree-like club mosses. At Wasson Bluff, Mesozoic deformation produced a fault-bounded rift valley in which varied landscapes were inhabited by Earth's first proto-mammals (our ancient ancestors), crocodiles, reptiles, sharks, fish and Canada's oldest dinosaurs - all survivors of the Triassic-Jurassic mass extinction.

A5. Geo-hazards in New Brunswick

Bruce Broster (Broster@unb.ca), Kirk Howard, Bruce McLean

Duration: 1 day | Maximum: 16 | Start Date: Tuesday, May 20 | Cost: $50.00

The main emphasis of the trip will be a visit to the Mactaquac Dam (approximately 16 km north of Fredericton) with discussions of the engineering, environmental and geological challenges that are part of the questionable future of the dam. Mactaquac Dam, the largest hydroelectric generating station in the Maritimes, is a concrete and rock-filled embankment structure. Constructed in the late 1960s, it's expected lifespan has been shortened significantly by alkali activity reactions causing expansion in the major concrete structures. While inventive engineering solutions have been undertaken to reduce the expansion problems, studies are now underway to examine the possible future of the dam including, de-commission or rebuild the dam, and maintain or drain the headpond that now extends approximately 100 km upstream of the dam. The trip may also offer a short visit to the Atlantic Salmon fish hatchery just downstream from the dam and to other local points of geological interest depending on available time and weather.

Post-Meeting

B1. Granite-Related Mineralization and Alteration in the Acadian Plutonic Belt: Implications for Sn-W-Mo-Cu Exploration in Central New Brunswick

Sean McClenaghan (Mcclens@tcd.ie), Kay Thorne, Neil Rogers

Devonian magmatism associated with crustal thickening during the Acadian Orogeny (circa 390-420 Ma) has produced voluminous granite-granodiorite plutons, which intrude high-grade migmatites and variably altered (greenschist-amphibolite) volcanic and sedimentary rocks in the central Miramichi highlands. The Acadian Plutonic Belt is host to a variety of endo- and exogranitic mineralized zones prospective for Sn, W, Mo, Cu, Sb, Au, and rare earth elements. Devonian plutonism is considered to be the most likely source of the widespread Sn-W-Mo-Cu mineralization in the Acadian Plutonic Belt, with timing and mode of emplacement of these plutons significantly constraining mineralization. High-grade migmatites of the Trousers Lake Complex at the western end of the Acadian Plutonic Belt are typically barren of any Sn-W-Mo-Cu mineralization, whereas metasedimentary lithotypes of the Miramichi Group to the east, host numerous occurrences. The three-day excursion will focus on the style of mineralization at both past-producing and future mines as well as several prominent occurrences with resource potential.

The Sisson Brook Sn-W-Mo-Cu deposit represents one of Canada's largest tungsten resources (334 Mt; 0.066% WO_3 and 0.021% Mo), expected to supply 5% of the world's tungsten once operations commence in 2015. The field trip will visit several trenches and spoils at the Sisson deposit, where participants can examine outcrops of vein mineralization (scheelite, wolframite, molybdenite, chalcopyrite) as well as contacts between associated intrusive suites and host metasedimentary rocks. Similar mineralization will be examined at the Tin Hill and Todd Mountain occurrences, which offer vast exposures of Sn-W-Mo-Cu mineralization and greisen alteration in both intrusive and metasedimentary host rocks. The field trip will conclude with a visit to the Burnt Hill Mine site, mined intermittently during the early 1900's, and the focus of recent exploration efforts. Many of the old mine adits and spoils are still accessible on site, as are well-exposed ore-bearing veins and contacts with the host sedimentary sequence. The Burnt Hill site is known for quality specimens of wolframite, topaz and cassiterite as well as bulk samples of ore breccias and mineralized quartz veins.

Duration: 3 days / Maximum: 17 / Start Date: Saturday, May 24 / Cost: $750.00

B2. Minas Fault Zone, Nova Scotia: Geometry and Processes of Localization in a Mature Zone of Transpression

Joseph Clancy White (Clancy@unb.ca), Noah Phillips

Duration: 2 days / Maximum: 18 / Start Date: Saturday, May 24 / Cost: $280.00

The excursion will examine the geometry, kinematics and processes associated with localization of deformation within a mature fault zone. The Minas fault zone has a protracted transpressional/transtensional history encompassing the upper Paleozoic through early Mesozoic. Fault structures comprise seismic and aseismic features encompassing bulk ductility within fine-grained sediments, through compartmentalized veining to extraction of lower crustal material.

B3. Geology of the Island of Grand Manan, New Brunswick: Precambrian to Early Cambrian and Triassic Formations

J. Gregory McHone (greg@earth2geologists.net), Les Fyffe

Duration: 2.5 days / Maximum: 25 / Start Date: Friday, May 23 / Cost: $355.00

Shoreline exposures on the scenic Island of Grand Manan in the Bay of Fundy display features of both the ancient Gondwanan margin of the Paleozoic Iapetus Ocean and the Early Mesozoic margin of the modern Atlantic Ocean. The eastern part of Grand Manan is underlain by complexly deformed sequences of volcanic and sedimentary rocks, with recently-determined Neoproterozoic to Cambrian ages. Rifting that opened the Atlantic Ocean stranded this Ganderian fragment of the former Gondwanan continent, and also produced the Grand Manan Basin with Late Triassic flood basalts and sedimentary rocks exposed west of the island's basin border fault.

B4. Sedimentological, Structural and Paleontological Highlights of the Carboniferous Maritimes Basin in Southern New Brunswick

David Keighley (Keig@unb.ca), Adrian Park, John Waldron

Duration: 3 days / Maximum: 20 / Start Date: Saturday, May 24 / Cost: $600.00

Over three days, this excursion will offer participants the opportunity to visit spectacular Carboniferous outcrops of palaeontologic, sedimentologic and structural interest in southern New Brunswick. The Norton fossil forest contains upright tree trunks smaller, but considerably older than at Joggins. Near Sussex, soft-sediment deformation (slumping) of shale and oil shale is visible over several magnitudes, with these strata overlain by coarsening upward lake shoreface sandstone. At Albert Mines, solid bitumen (Albertite) is abundant adjacent to abandoned mine shafts and fossil fish may be excavated with a bit of luck. Thick beds of often imbricate alluvial fan conglomerate form the 'flower pots' at Hopewell Cape. Salt diapirism has folded and faulted over a km thickness of non-marine strata on the Maringouin peninsula.

B5. Geoheritage and Geotourism in Stonehammer Geopark: North America's First Global Geopark

Randy Miller (Randall.miller@nbm-mnb.ca), Gail Bremner, Lucy Wilson

Duration: 3 days / Maximum: 20 / Start Date: Saturday, May 24 / Cost: $650.00

In 2010, the Stonehammer Geopark, located in southern New Brunswick, became the first North American member of the Global Geoparks Network, an organization assisted by UNESCO. Geoparks are about rocks, but also about people, society and culture. Geology, geoheritage, geotourism, economic development and public education are all vital elements for a Global Geopark. Geotourism, based on the observation and understanding of geology, is a growing part of the tourism market. While geotourism is not new, the development of the European Geoparks Network, Asian Geoparks Network and the parent Global Geoparks Network are providing models for engaging the public in the appreciation of geology that link sustainable economic develop with the preservation and interpretation of geology. This three day field trip will introduce Stonehammer Geopark and explore some of the localities that make it geologically and historically interesting. The trip will highlight the features that made Stonehammer a successful geopark candidate and examine the vital component of community engagement in developing Earth Science literacy.

B6. The On-going Saint John Enigma: Avalonia vs Ganderia in Southern New Brunswick

Sandra Barr (Sandra.barr@acadiau.ca), Susan Johnson, Chris White

Duration: 2 days | Maximum: 12 | Start Date: Saturday, May 24 | Cost: $350.00

The Saint John area in southern New Brunswick has long been recognized for its geological complexity. In current models, various belts of rocks are assigned to either Avalonia or Ganderia, but not without considerable ambiguity. The purpose of this two-day field trip is to focus on some of the unresolved issues by visiting outcrops, which appear to both support and contradict these models, providing ample opportunity for discussion of fundamental questions about northern Appalachian geological evolution. Stops include ca. 625 Ma and 550 Ma volcanic and plutonic rocks and Cambrian stratigraphic units both in Ganderia and Avalonia, carbonate olistostrome and stromatolite of the Green Head Group, low- and high-pressure metamorphic rocks in the Saint John and Pocologan areas, and various mylonite zones both within and between Avalonia and Ganderia.

B7. Tide-Dominated Sedimentation in the Bay of Fundy, with a Focus on the Nature of Muddy Deposits

Bob Dalrymple, Murray Gingras, Elisabeth Kosters (eckosters@hotmail.com)

Duration: 3 days | Maximum: 21 | Start Date: Saturday, May 24 | Cost: $750.00

The Bay of Fundy is famous for its large tides and strong tidal currents, and this area has become a “type area” for the study of tidal deposits. Previous work has focused on the sandy deposits in which large-scale bedforms are widespread, but more recent work has concentrated on the muddy deposits that are equally widespread. On this trip, we will examine a wide range of tidal depositional environments within the inner parts of Chignecto Bay and the Minas Basin-Cobequid Bay areas, ranging from exposed coasts to sheltered embayments. We will discuss what is known about the sediment dynamics at temporal scales ranging from individual tidal cycles, through annual cycles, to the scale of centuries and longer. The morphodynamics of the channel-bar systems will be also investigated, in order to understand the architecture of the sedimentary succession that has been formed over the last several thousand years. The full spectrum of sedimentary facies will be examined, with a special emphasis on how the nature of the muddy deposits varies spatially within each estuarine system. The physical and biogenic structures will be examined, and the physical dimensions of the muddy deposits will be illustrated. This trip should be of interest to a wide range of sedimentary, environmental and marine geoscientists, and should have special relevance for petroleum geologists who want to understand the nature of the mudstone baffles and barriers that occur within tidally generated hydrocarbon reservoirs.

B8. Late Paleozoic Geology and Geomorphology of the Circum-Chaleur Bay Area of Eastern Quebec and Northern New Brunswick

Pierre Jutras (Pierre.jutras@smu.ca)

Duration: 6 days | Maximum: 12 | Start Date: Saturday, May 24 | Cost: $1500.00

This field trip will highlight some of the most interesting aspects of late Palaeozoic geology in eastern Quebec that will include: (1) Late Silurian tabulate-stromatoporoid reefs from a distal back-arc basin (West Point Formation); (2) Coarsening-upward Lower Devonian foreland basin succession (the Gaspé Limestones and Sandstones of the Forillon Park area); (3) Middle Devonian Acadian folds; (4) Late Devonian UNESCO fossil locality at Miguasha Park and Museum, featuring early lobe-finned fishes with lungs (Eusthenopteron foordi); (5) Early Viséan (mid-Mississippian) tropical arid landscape in the process of being exhumed from contemporaneous red beds that had buried and preserved it (Clemville Hogbacks and Lower Viséan Saint-Jules Formation); (6) Mid-Viséan marine paleowave-cut platform and carbonate bank (Gays River Formation of the Windsor Group); (7) Thick and massive phreatic calcrete hardpan developed in a variety of host materials at the margin of mid-Viséan evaporitic basins; (8) Carbonate melts and thick peperite breccia at the head of large mid-Viséan mafic dykes and at the base of a penecontemporaneous Carboniferous basin; (9) Thick upper Viséan fanglomerates and gravelly braidplain deposits at Bonaventure Island, host of one of the largest and most accessible bird sanctuaries in the world, including nearly 100,000 Northern Gannets; (10) Large early Pennsylvanian brittle strike-slip fault corridors at Percé, along which two Mississippian basins are juxtaposed (the Ristigouche and Cannes-de-Roches basins), and which enclose kilometric slabs of Lower Devonian limestones that now form dramatic monoliths in the landscape (Pic de l’Aurore, les Trois-Soeurs and Percé Rock).

B9. Physical volcanology of Silurian Coastal Volcanic Belt Rocks of Passamaquoddy Bay, Southwestern New Brunswick

Nancy van Wagoner (nvanwagoner@tru.ca)

Duration: 2 days I Maximum: 15 I Start Date: Saturday, May 24 I Cost: $500.00

B10. Stratigraphic and Paleoenvironmental Setting of the Woodstock Fe-Mn Deposits in west-central New Brunswick

Bryan Way (bryan.way1@gmail.com)

Duration: 1 day I Maximum: 30 I Start Date: Saturday, May 24 I Cost: $75

The Woodstock Fe-Mn deposits in west-central New Brunswick consist of six lenticular-shaped, Fe-Mn deposits that collectively represent the largest manganese deposit in North America (194,000,000 tonnes; 13% Fe and 9% Mn). These deposits are situated within the early Silurian strata of the Matapedia-Aroostook Belt and trend parallel to the northeast striking bedrock from Plymouth to Jacksontown, NB. This fieldtrip will: 1) place the Woodstock Fe-Mn deposits in context of their regional and local stratigraphy; 2) showcase the paleoenvironmental conditions of the Silurian Smyrna Mills Formation, in particular, the role of ocean redox within a cratonic margin, and its involvement in the genesis of Fe-Mn mineralization; 3) allow trip participants to examine the various types of Fe-Mn mineralization as well as localized minor base-metal mineralization. This field trip will illustrate the 165 years of mining and exploration history of the Woodstock Fe-Mn deposits and will be of interest to researchers and explorationists involved in iron or manganese exploration and redox geochemistry.

Outreach

Outreach activities include a session of Geoheritage of Canada talks, a one day education outreach teachers workshop, and an all-day field trip to the Stonehammer UNESCO Geopark (North America's first Global Geopark).

Sponsorship and Exhibitors

Those organizations interested in sponsorship opportunities, please contact **Dave Lentz (dlentz@unb.ca)**. For more information on booth space, exhibitors can contact the **Exhibits Chair, Robin Adair (robin.adair@bellaliant.net)**.

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