



# HALIFAX 2022



## SYMPOSIA

### **SY-01 Supercontinents, orogenic processes and magmatism: a celebration of the career of Brendan Murphy**

*Organizer(s): Damian Nance, Rob Strachan, Cecilio Quesada, and Shoufa Lin*

Duration: Two days (oral and poster)

This symposium is intended to honour the career of Brendan Murphy who has been an international ambassador for Canadian geoscience for more than 40 years and whose contributions to our understanding of orogenic processes, magmatism, the supercontinent cycle, mantle plumes, and the use of isotopic systematics as tectonic tracers have profoundly influenced geologic thinking around the world. We are soliciting presentations that focus on topics and processes related to supercontinents, orogenic processes, and magmatism from the very large international community that Brendan’s work has influenced. As part of this celebratory special session, we will also be seeking contributions to a major publication in Brendan’s honour.

Proponents: Volcanology and Igneous Petrology Division of GAC

### **SY-02 Pre-Atlantic geological connections among northwest Africa, western Europe, and eastern North America**

*Organizer(s): Sandra Barr, Saïd Belkacim, Faouziya Haissen, Yvette Kuiper, Pilar González Montero, and John Waldron*

Duration: Two days (oral and poster)

This symposium is part of the activities of IGCP 683 entitled "Pre-Atlantic geological connections among northwest Africa, Iberia and eastern North America: Implications for continental configurations and economic resources". For this symposium, the theme of IGCP 683 has been expanded to include not only Iberia but the rest of western Europe to broaden the

participation and focus specifically on connections, rather than plate tectonic reconstructions, to avoid overlap with other sessions. We anticipate up to two days of oral presentations (in person) combined with poster session (both in person and virtual). We anticipate mainly volunteered talks but will also have several invited speakers. Talks and posters by early-career and student researchers in NW Africa and elsewhere working in areas and topics relevant to IGCP 683 are especially welcome. The session is linked to a 4.5-day post-conference field trip. For more information, contact any of the symposium organizers listed above

Proponents: IGCP 683; Canadian Tectonics Group

### **SY-03 The geological setting of Romer's Gap: a session in memoriam Jenny Clack**

*Organizer(s): Adrian Park, Steve Hinds, Matt Stimson, and Olivia King*

Duration: Two days (oral and poster)

Romer's Gap is a purported hiatus in the fossil record of tetrapod evolution during the early Carboniferous (latest Famennian to late Viséan) first identified by Alfred Romer a century ago. Substantial new fossil discoveries, many by the late Jenny Clack and her colleagues in Scotland and the Maritime Provinces of Canada have done much to fill in the Gap. This special session aims to draw in contributions not just to tetrapod paleontology during this interval, but to draw attention to the often unusual geological environments in which these fossils are preserved (many a consequence of the final assembling of Pangaea). Contributions are elicited in paleontology, sedimentology, tectonics, and other disciplines especially from Scotland and Northeastern North America.

Proponents: TBA

### **SY-04 IUGS, Geoparks, and IGCP - Retrospection, today and the future**

*Organizer(s): Peter Bobrowsky, Katherine Boggs, John Calder, Mostafa Fayek, Stephen Johnston, Daniel Lebel, John Ludden, Guy Narbonne*

Duration: Two days (oral and poster) and linked to a two-day conference field trip to Cliffs of Fundy Geopark

This special session commemorates the sixtieth anniversary of the International Union of Geological Sciences (IUGS), the fiftieth anniversary of the International Geoscience Programme (IGCP). It aims to underline the importance of Canadian geoscience diplomacy in achieving positive global outcomes such as through the United Nations Sustainable Development Goals (SDG). A Canadian, J.M. Harrison was the first president of IUGS in 1961, which now represents more than 500,000 geoscientists worldwide. IUGS facilitates and supports international cooperation in the Earth Sciences and promotes the study of Earth Science problems (particularly those of global significance). The International Geoscience and Geoparks Programme (IGGP) of UNESCO is implemented through the IGCP and the Global Geoparks Network (GGN). Since 2008, Canada has seen the establishment and recognition of five Geoparks as part of the UNESCO GGN which aims to combine conservation with sustainable development while involving local communities in sustainable geoscience tourism. IGCP is co-

sponsored by UNESCO and IUGS, was launched in 1972 at the time of the Montreal International Geological Congress, and is acknowledged for promoting international collaborations and the mentorship of young Earth Scientists from developing countries. Roughly 50% of the IGCP projects have had Canadian participation. We welcome contributions that provide retrospection on past Canadian contributions to science diplomacy through IUGS, IGCP and other such initiatives, reflect on the present and provide vision for the future and contributions to the UN SDG.

Proponents: IUGS, IGCP, Geoparks

## **SPECIAL SESSIONS**

### **TECTONICS**

#### **SS-01 Tectonic evolution and secular changes in metallogenesis: a special session honouring the dedication to public geosciences of Frank Blackwood**

*Organizer(s): Alana M. Hinchey, Hamish Sandeman, and Steve Piercey*

Duration: One day (oral and poster)

This special session invites contributions in honour of the career of Frank Blackwood, a life-long supporter of local and national geoscience, geological surveys, and the resource industries. Frank's passion for the Geological Survey of Newfoundland and Labrador was matched only by his dedication to the Geological Association of Canada. This session focuses on topics that were the focus of Frank's career and interests, including: the geology and tectonic evolution of the Appalachians (and other orogenic belts); natural resources, including both minerals and oil and gas, and their relationships to mountain belt evolution, including the regional tectonics and metallogeny of supercontinents; public geoscience and its contributions to society; and geoscience outreach.

Proponents: TBA

#### **SS-02 From the mantle to the crust, the geochemical signatures of igneous processes: a session in honour of Jarda Dostal.**

*Organizer(s): John Greenough, Nance Van Wagoner and Gregory Shellnutt*

Duration: One day (oral and poster)

Dr. Jarda Dostal has been a leader in using geochemistry to decipher the petrogenesis of diverse types of igneous rocks. In the spirit of his innovations, this session will examine new research advancing the understanding of igneous rocks, as well retrospectively look at where Jarda's discoveries have taken igneous petrology. Abstract submissions are welcome on new

innovative research as well as papers that examine the impact of Dr. Dostal's past contributions to igneous petrology.

Proponents: Volcanology and Igneous Petrology Division of GAC

### **SS-03 Zooming in to see the big picture: using nano- to micro-scale observations to better understand Earth processes**

*Organizer(s): Noah John Phillips, Crystal LaFlamme, and Stan Roozen*

Duration: One day (oral and poster)

Advances in microanalytical techniques now allow us to quantify changing physio-chemical conditions, kinetics, mechanics, rates, and timing of Earth processes, including (but not limited to) the movement of tectonic plates, magmatism and volcanism, the formation of mineral systems, fluid-rock interactions, sedimentation, metamorphism, and deformation. This session invites micro- to nano-analytical case studies aimed at understanding larger Earth processes as well as breakthroughs in method development. The goal is to discuss advances, challenges, and future directions of micro- and nano-analytical techniques, and to highlight studies where these techniques have been used to understand complex Earth processes.

Proponents: Canadian Tectonics Group, Mineralogical Association of Canada

### **SS-04 It's about time! Advances in petrochronology/thermochronology and applications to tectonics**

*Organizer(s): Antoine Godet, Jamie Cutts, Jeff Marsh, Dawn Kellett, Isabelle Coutand, Chris McFarlane, Kyle Larson, Jeff Pollock*

Duration: One day (oral and poster)

Geochronology provides one of the most fundamental sets of data to our understanding of tectonic processes. Proper interpretation and application of geochronology data requires a multidisciplinary, integrated approach that enables quantitative links between time and specific petrological-tectonic processes. Recent analytical and conceptual advances in petrology, geochemistry, chronology, and thermodynamic/thermomechanical modelling form the basis of petrochronology (*sensu lato*), which aims to link thermobarometric, chemical, and deformation histories of magmatic and metamorphic rocks, most often expressed as quantitative P-T-t-D-X paths. The most common tools of choice include coupled U-Pb-TE data from accessory phases, such as zircon, monazite, titanite, or rutile, compared against data from rock-forming minerals, such as garnet. In addition, thermochronology techniques such as Ar-Ar are used to extract exhumation histories. The dates and TE partitioning between these phases are used to constrain complementary snapshots along a same P-T-t-D-X path. This multi-scale and continuously evolving discipline opens new horizons in deciphering prograde, peak, and retrograde evolution, and contributes a better understanding of physio-chemical processes such as nucleation and growth mechanisms, major and trace element distribution and behavior, duration of magmatic and metamorphic episodes, or rates of tectonic systems.

This session invites contributions ranging from advances in (petro-thermo-)chronological techniques and methods (either conceptual or analytical) to their applications in both in metamorphic, magmatic, structural, and detrital provenance studies.

Proponents: TBA

### **SS-05 Cratons, cratonic magmatism and diamonds**

*Organizer(s): Yana Fedortchouk, Maya G. Kopylova, and Andrew Schaeffer*

Duration: One day (oral and poster)

Cratons are the oldest and most tectonically stable parts of the continental lithosphere. They are home to some of the most exotic magmas on Earth including kimberlites, lamproites, and carbonatites, in addition to hosting primary diamond deposits. Methodological advances in seismic tomography studies of cratons improved our understanding of the structure and extent of cratonic mantle roots and crust as well as craton evolution. We combine geophysical information on cratons with new petrological, geochemical and geochronological data on tectonic evolution of the crust and the origin of mantle domains. Cratonic magmatism, from Archean komatiites and basalts, kimberlites and related ultramafic alkaline volcanics, provide a rich source of information on the timescales of mantle and deep crust processes. Studies of mantle-derived xenoliths, diamonds and their inclusions as well as mantle melting experiments further improve our understanding of the cratonic mantle and its modification. The session welcomes contributions across all these different fields of cratonic studies, which advance our understanding of craton formation and stabilization, mantle metasomatism and diamond formation, origin and triggers of diverse crustal and mantle magmatism and studies advancing diamond exploration techniques.

Proponents: TBA

### **SS-06 Expressions of mantle plume–lithosphere interaction on the Earth’s surface**

*Organizer(s): Florian C. Krob, Ulrich A. Glasmacher, and Hans-Peter Bunge*

Duration: One-half day (oral and poster)

Since the 1960s, one commonly accepts plate tectonics (plate mode) as an expression of the Earth's convecting mantle, yet numerous geological features within plate interiors and at some plate margins remain unexplained. The plume-driven vertical material flow (plume mode) in the non-lithospheric mantle serves as a viable physical model to approach such features that constantly modify the Earth’s surface, independently of, or in the interplay with the plate-mode.

The general aim of the session is to present and discuss the state-of-the art of the plume-mode of mantle convection to unravel the influences of upwelling mantle material on the dynamics and changes in the asthenosphere, the lithosphere, as well as its expressions on the Earth’s surface. Thereby, mantle flow driven vertical movement of the upper Earth’s mantle often causes vertical and horizontal deflections of the lithosphere that often provoke rifting and breakup of lithospheric plates, and sometimes even pave the way for mantle material to form Large Igneous Provinces (LIP) on the Earth’s surface. Inevitably, those mantle plume–

lithosphere interactions drive the dynamic topography processes, e.g. rock and surface uplift, and burial and subduction of the uppermost crustal rocks that leave its expressions on the Earth's surface. However, those expressions, such as interregional domal uplift and tectonic reactivation, the emplacement of dike swarms and flood basalts, the enrichment of mineral ore deposits, and drastic climate change, their signals, and temporal and spatial scales are yet to discuss.

For this interdisciplinary session, we very much appreciate contributions from all natural case studies such as tectonic and basin evolution, thermochronology and long-term landscape evolution, geophysical data, paleoclimate research - and mineral ore deposits. Geo-dynamic and geomaterials-based analog and numerical modeling, which address the interplay of deep mantle – asthenosphere – lithosphere – basin – surface processes in all plate environments are very welcome. We are looking forward to all geoscientific studies that contribute to the feedback processes causing the evolution of dynamic topography.

Proponents: TBA

### **SS-07 Recent advances in the study of Appalachian metamorphism**

*Organizer(s): Deanne van Rooyen and Aphrodite Indares*

Duration: One day (oral and poster)

The Appalachian Orogen in eastern North America and its extension in the European Caledonides, preserves a complex tectonic history that is commonly obscured by post-orogenic crustal reworking. The metamorphic rocks of the orogen provide an important window into the original conditions during mountain building and highlight the significant differences in tectonic evolution interpreted along the length of the Appalachian-Caledonide system. This session will focus on new work in metamorphism from all over the Appalachian orogen and its European counterparts from all stages of its evolution. The goal is to bring together researchers concentrating in any aspect of metamorphic geology in the Appalachian-Caledonide system to share new advances in the field. We welcome all types of work from field, experimental, modelling and interdisciplinary perspectives.

Proponents: GAC Precambrian Division

## **ECONOMIC GEOLOGY AND MINERAL DEPOSTS**

### **SS-08 The critical metal-magma connection: Tracing metal source, transport, and ore formation**

*Organizer(s): James Brenan, Erin Adlakha, Neil Bennett, and Jacob Hanley*

Duration: One day (oral and poster)

The so-called “critical metals” represent a group of elements that are essential to sectors such as the high technology industry and sustainable energy, and crucial to the economic security of producing countries. There are few or no substitutes for these elements, and for many of those elements supply is at risk due to a reliance on imports that could be affected by geopolitical

instability especially if production is regionally concentrated. The Government of Canada has recently identified 31 critical metals as national mineral exploration priorities. More than half of these are primarily concentrated through magmatic processes (e.g., Cr, Ni, V, PGEs, Cu, Li, REEs, HFSEs, W, Sn). Whereas typical mantle and crustal concentrations of these elements are in the  $\mu\text{g/g}$  range or below, enrichments beyond 1000-fold are required to produce an economically-viable mineral deposit. Despite considerable focus on characterizing the nature of critical metal mineralization and related laboratory experiments of element mobility, there is still uncertainty as to why certain magmatic systems develop economic deposits and others do not. This session will bring together researchers studying all aspects of critical metal deposits related to magmatic and magmatic-hydrothermal processes, with the goal of developing better linkages amongst diverse approaches, spawning new thinking on ore-forming processes, and defining new directions for future research and its application to mineral exploration in Canada and abroad. Proponents: The Mineralogical Association of Canada and the Mineral Deposits Division of the GAC have been contacted to solicit their sponsorship.

### **SS-09 Advanced targeting of minerals critical to a changing economy**

*Organizer(s): Neil Rogers, Mike Gadd, and Chris Lawley*

Duration: 1 day (oral and poster)

Natural resources considered essential to economic development or national security are classified as critical minerals. In many cases supply chain risks related to these minerals come from them being geologically scarce or difficult to economically extract, but they may also be subject to political factors too. In 2021 the Government of Canada developed a list of 31 minerals that are considered critical for the sustainable economic success of Canada and our allies and will play an important role in Canada's transition to a low carbon economy.

To help secure the supply of critical minerals the Geological Survey of Canada, Geoscience Australia and the United States Geological Survey have partnered together in the Critical Mineral Mapping Initiative to facilitate the sharing of data and knowledge. This session will feature presentations that highlight advanced methods of targeting prospective regions and identifying next generation critical mineral deposits. In particular it will demonstrate how critical mineral resources discovery is advanced through the application of a 'mineral systems' approach, which aims to integrate all of the aspects of enrichment, deposition and preservation involved in the formation of a deposit.

Proponents: Geological Survey of Canada (GSC), Geoscience Australia (GA), and U.S. Geological Survey (USGS)

### **SS-10 Current perspectives on the setting and origin of volcanogenic massive sulfide (VMS) Deposits**

*Organizer(s): Steve Piercey, Michelle DeWolfe, and James Walker*

Duration: 1 day (oral and posters)

Volcanogenic massive sulfide (VMS) are critical sources of base, precious, and strategic metals globally. This session will focus on the setting and origin of VMS deposits from the nano- to craton-scale covering topics including, but not exclusive to: the tectonostratigraphic setting of deposits; secular evolution and variation in their settings through time; deposit-scale stratigraphic, volcanic facies, structural, and hydrothermal studies; ore mineralogy and paragenesis; sources of metals and fluids; role of leaching vs magmatism in VMS deposit genesis; and any other thematic research related to VMS or seafloor massive sulfide (SMS) systems. This session is a contribution to ongoing studies in the NSERC CREATE in Marine Geodynamics and Georesources (iMAGE).

Proponents: Volcanology and Igneous Petrology Division of GAC

### **SS-11 Metasomatic iron oxide and alkali-calcic systems with IOCG and associated critical mineral deposits**

*Organizer(s): James Conliffe, Erin Adlakha, and Louise Corriveau*

Duration: One day (oral and poster)

Metasomatic iron and alkali-calcic (MIAC) systems are produced by the ascent of voluminous saline to hypersaline fluid plume that chemically and mineralogically replace upper crustal rocks from depth to surface and along regional fault zones. The systems produce a variety of polymetallic ore deposits [e.g., iron oxide-apatite (IOA), iron oxide-copper-gold (IOCG), albitite-hosted uranium, Au-Co-Bi-Cu, Mo-Re, etc.]. These deposits contain critical metals and minerals (e.g. Bi, Co, Cu, Mo, Ni, PGE, REE, and U) which are essential for advancing technology for clean and sustainable energy, and maintaining economic security for producing countries.

This session aims to highlight recent advances in our understanding of the geochemical, geophysical, mineralogical, structural and fluid chemistry characterization of these regional-scale metasomatic systems from various mining districts and prospective geological settings worldwide. Presentations are also encouraged on any aspect of the geo-metallurgy and environmental studies associated with IOCG and affiliated critical metal deposit types.

Sponsorship: No sponsor societies at present, but will approach MDD and MAC.

Proponents: TBA

### **SS-12 Thar's gold in them thar hills! Gold mineralization in the Appalachians and beyond**

*Organizer(s): Aaron Bustard, Wouter Bleeker, Mitchell Kerr, Ian Honsberger, and Kevin Neyedley*

Duration: One day (oral and poster)

This session will focus on the understanding of gold deposits in the Maritimes, Newfoundland, and the Appalachians (Caledonides) in general given the recent rise of gold exploration and production in the region. Contributions related to all aspects of gold mineralization in the Appalachians are invited including: deposit scale studies, studies on tectonic relationships, and comparisons to processes in other terranes. The session will provide a

venue for discussing the diversity of Appalachian gold deposits and advance understanding of gold-forming processes in Canada and beyond.

Proponents: TBA

### **SS-14 Advances in hyperspectral methods for mineral exploration and production: new techniques in the search for critical minerals**

*Organizer(s): Derek Wilton, Gary Thompson, and Philip Lypaczewski*

Duration: 1 day (oral and poster)

Recent advancements in spectroscopy techniques allow for fast and reliable analysis of geological materials. In particular, hyperspectral imaging can visualize alteration, and in some cases ore, minerals associated with ore forming processes. These methods can aid in quick, quantitative documentation of the physiochemical natures of a given mineral deposit, ultimately leading to more informed decision-making through life-of-mine from exploration, through mining to reclamation. This type of innovative mineral spectroscopy tool will be required in the search for increasingly more remote and hidden Critical Mineral deposits. This special session is intended to showcase advancements in hyperspectral techniques within the earth sciences.

Participants are encouraged to describe their application(s) of hyperspectral imaging to the mineral exploration and mining industries.

Proponents: Mining Innovation Network, College of the North Atlantic

### **SS-15 Toward environmentally responsible resource extraction**

*Organizer(s) David Blowes, Matt Lindsay, and David Wilson*

Duration: One day (oral and posters)

The Toward Environmentally Responsible Resource Extraction Network (TERRE-NET) is a multi-disciplinary research program with the overall goal of promoting environmentally responsible and socially acceptable handling of wastes generated as part of mineral and energy resource extraction. Working toward this goal are leading researchers from eight Canadian Universities are using cutting-edge approaches and technologies in collaboration with an extensive network of Canadian and international partners representing the mining industry, industry organizations, and provincial, territorial, and federal government agencies. Presentations in this session will focus on research conducted using advanced data collection and analytical techniques for the characterization, management, and rehabilitation of mine wastes in addition to research focused on community engagement for mine planning and rehabilitation as abandoned and active mine sites are transitioned towards supporting their pre-mining ecosystems.

Proponents: NSERC-TERRE-NET

### **SS-16 Advanced analytical techniques applied to geochemical and indicator mineral exploration, and or mineralogy**

*Organizers: Sheida Makvandi and Roger C. Paulen*

Duration: One day (oral and poster)

Increased demand for key metals and minerals will require a better understanding of how to detect new deposits under overburden cover of varying thickness and complexity. To do this efficiently and effectively to increase exploration success, trace element geochemistry and indicator minerals recovered from surficial sampling programs can be subjected to numerous spatial statistical analyses. Further quantitative analysis on indicator minerals is also useful to target prospective regions to follow up for exploration and to determine possible deposit type or assess the fertility of host rocks. This session welcomes all submissions reporting novel uses of quantitative mineralogy, trace element geochemistry, geochronology, and multivariate statistical techniques in surficial and indicator mineral exploration for various deposit types.

Proponents: Mineralogical Association of Canada (MAC); Association of Applied Geochemists (AAG),

### **SS-17 The International Ocean Discovery Program (IODP): Advances in earth sciences from marine scientific drilling**

*Organizer(s): John Jamieson, Anne de Vernal, Calvin Campbell, Mark Hannington, Dominique Weis*

Duration: One day (oral and poster)

The International Ocean Discovery Program (IODP) is a multi-nation research collaboration to investigate Earth's geological record that is buried in sediments and rocks beneath the seafloor. For over 50 years, deep-sea drilling IODP expeditions have led to many fundamental breakthroughs in the understanding of our oceans, climate, and Earth evolution. Significant contributions to the scientific community that have grown out of IODP research include major progress in the understanding of plate tectonics, critical components of the climate system, gas hydrate reservoirs and the factors controlling their formation, as well as the dynamics of ice sheets and their vulnerability under climate warming. This session aims to highlight ongoing research that uses samples or data collected as part of the IODP program to advance our understanding of climate and ocean change, deep life and biodiversity, connections between deep geological processes and the surface environment, and geohazards.

Proponents: Canadian Consortium for Ocean Drilling, NSERC CREATE in Marine Geodynamics and Georesources (iMAGE), GAC Marine Geosciences Division

## **QUATERNARY STUDIES**

### **SS-18 All Aboard the Glacial Dispersal Train! Developments in Understanding Areas of Complex Glacial History, a Session in Honour of Dr. Rudolph (Ralph) Stea**

*Organizer(s): Denise Brushett, Roger Paulen, Michael Parkhill, and Heather Campbell*

Duration: one-half day (oral and poster)

As we continually gain a better understanding of the glacial history of Canada, we recognize that glacial landsystems, the product of multiple ice advances and retreats during the Quaternary,

are usually very complicated with highly varied mosaics of glacial history preserved at surface. The concept of mobile ice dispersal centres and their impact of landform generation and/or reworking was applied by Dr. Rudolph (Ralph) Stea and colleagues by addressing the sedimentary properties and geochemistry of till. The concept of inheritance and overprinting in landforms and application of that concept to mineral dispersal trains all started in Nova Scotia. Ralph's research also included the onshore-offshore correlations of glacial and postglacial sediments and processes and Quaternary stratigraphy and sedimentology of Atlantic Canada, work which laid a foundation on which significant developments have been made in understanding the paleo-ice dynamics of the Appalachian Ice Complex and the chronology and extent of the Younger Dryas cooling event. This session invites all submissions related to improving our understanding of subglacial processes, modelling of glacial dispersal and glacial flow reconstructions, surficial geology mapping applications, and deglacial models that refines global climatic models from the Late Wisconsin into the Holocene.

Proponents: TBA

### **SS-19 Novel applications and technique advances of cosmogenic nuclides**

*Organizer: Gerald Raab*

Duration: One-half day (oral and poster)

Terrestrial cosmogenic nuclides have been an important quantitative tool in the field of Geomorphology since their introduction as a geochronological technique. The majority of cosmogenic nuclides are produced primarily in the upper two meters of the Earth's surface. Therefore, they are used to provide important information about the exposure age of features at the surface such as river terraces, glacial moraines, burial ages, as well the speed of surface processes such as erosion or weathering. The range of applications for cosmogenic nuclides is constantly expanding through the continuous development of techniques and creative approaches.

This session serves as a platform for both novel applications and technical developments of cosmogenic nuclides. We invite projects in every phase, from theoretical ideas to established methods applied to novel situations or reaching new areas of research. In particular we encourage contributions with multiple nuclides, links to other geochronological technologies, creative applications and muon-based research.

Proponents: TBA

## **SEDIMENTARY GEOLOGY**

### **SS-21 Evaporites: deposition, deformation, dissolution**

*Organizer(s) John W.F. Waldron, Markus Albertz, Paul Durling, Steven J. Ings, Mo Snyder*

Duration: One day (oral and poster)

This session will focus on the formation of evaporite sedimentary rocks, their deformation in extensional, strike-slip, and contractional environments, and their dissolution, with resulting impacts on resources, environments, and society. Evaporites are major components of the subsurface geology of Atlantic Canada, both in the Paleozoic basins and in the Mesozoic continental margin; participants to the session are encouraged to attend the related field trip.  
Proponents: CSPG

### **SS-22 Sedimentary basins: new approaches and integrated studies**

*Organizer(s): Lynn Dajoe and Nikole Bingham-Kosłowski*

Duration: One day (oral and poster)

Sedimentary basins house important stratigraphic records, energy and mineral resources, paleoclimate signals, and evidence of tectonic processes. As datasets and techniques improve over time, and new approaches are recognized, sedimentary basins in Canada and globally, both onshore and offshore, continue to benefit from research regarding their geological evolution. Integrated studies, which combine a variety of datasets, are especially useful in furthering our understanding of the geology of associated features, environments, and stratigraphic regimes. We welcome presentations from a variety of fields related to the study of sedimentary basins including stratigraphy, sedimentology, petrography, paleontology, geochemistry, seismic interpretation, and tectonic evolution.

Proponents: Canadian Sedimentology Research Group

### **SS-23 Tectonics, stratigraphy, and natural resource potential of rifted continental margins: North Atlantic Ocean and beyond**

*Organizer(s): Luke P. Beranek, Emily G. Johns-Buss, and David G. Lowe*

Duration: One day (oral and poster)

Passive or rifted continental margins result from extensional processes that deform the entire lithosphere and host economically relevant, sediment-hosted base-metal and hydrocarbon resources. We invite geological- and geophysical-based contributions that characterize the magmatic, structural, and stratigraphic evolution of modern and ancient rifted continental margins, including multi-scale investigations of magma-poor and magma-rich rift systems in the North Atlantic Ocean region. Multidisciplinary studies that address how long-term rift evolution, development of lithosphere-scale faults, and basin-filling mechanisms affect the generation and preservation of sediment-hosted resources are especially welcome.

Proponents: Canadian Tectonics Group, CSPG

### **SS-24 Orogenic processes seen through the sedimentary rock record**

*Organizer(s): Shawna White, Ben M. Frieman, and Rasmus Haugaard*

Duration: One day (oral and poster)

Erosional products from orogens are an important recorder of their geodynamic evolution throughout Earth's history. Traditionally studies focusing on orogenic processes have leaned

more on geochronological, isotopic and structural studies within the orogen itself. Because clastic sediments represent material removed from orogenic source terranes, they offer a unique scope into processes which may be obscured from the geologic record or overprinted by later deformation or thermal episodes preserved within an associated orogen. Sedimentary basins eroded from and formed adjacent to or on top of orogenic belts commonly represent critical temporal markers linked to orogenic processes. Therefore, temporal and spatial changes in facies, basin geometry, and provenance within these basins record the unique episodes or pulses of tectonism through time. A corner stone of many basin analyses studies involves detailed mapping and lithofacies analyses. However, advancements in analytical techniques have facilitated the integration of a wide variety of geophysical, geochemical and isotopic datasets to address fundamental tectonic processes at all scales. This session seeks contributions that integrate transdisciplinary approaches to address how orogenic processes are seen through the sedimentary rock record. Examples include but are not limited to: the geodynamic environments associated with orogenic basins, provenance and associated crustal growth, and orogenic stabilisation and modification processes.

Proponents: TBA

### **SS-25 Deepwater depositional systems: from processes to deposits**

*Organizer: Lilian Navarro*

Duration: One day (oral and poster)

The interest and understanding of deep-water systems has grown significantly in the last decades. New observations, concepts, models on the nature and character of sediment gravity flows and mass movements, as well as on the architecture and stacking patterns of their resulting deposits, have been widely documented from the modern and ancient record. Moreover, remarkable projects in oil and gas exploration and production have been successfully conducted in offshore Brazil and West Africa, and Gulf of Mexico, which might be useful to consider as important referents for deep-water appraisal and development in offshore Nova Scotia. This general session will provide insights of the wide spectrum of processes, features and deposits developed in different parts of these systems, ranging from slope to basin-floor settings.

Proponents: SEPM Deepwater Research Group.

## **PALEONTOLOGY**

### **SS-26 Dynamic transitions in earth's Proterozoic surface environments and biosphere**

*Organizer(s): Leslie J. Robbins, Michael G. Babechuk, and Kurt O. Konhauser*

Duration: One day (oral and poster)

The Proterozoic Eon (2500 – 541 Ma) is canonically broken into the Paleoproterozoic, Mesoproterozoic, and Neoproterozoic Eras and is defined by series of dynamic events and transitions with respect to both Earth's surface environments and increasingly complex biosphere. These events include the first rise and accumulation of stable oxygen (O<sub>2</sub>) in Earth's

atmosphere – the Great Oxidation Event – and a putative subsequent return to a low O<sub>2</sub> state, the largest marine carbon isotope excursion in Earth’s history, a proposed period of extended tectonic quiescence, fundamental changes in nutrient cycling, and the appearance and diversification of single and multicellular eukaryotes. Covering just over 40% of Earth’s history, the Proterozoic can be viewed as a period bridging the low productivity Archean Eon with the animal- and plant-rich Phanerozoic Eon. This session encourages contributions documenting novel approaches and insights into the Proterozoic that may include chemostratigraphy and detailed sedimentology, non-traditional stable isotope geochemistry, modelling approaches, phylogenomics, or the statistical analysis of large datasets, amongst others. We seek a diverse array of presenters and particularly encourage submissions from early-career researchers, as well as graduate and undergraduate students.

Proponents: Precambrian, Isotope Sciences, and Paleontology divisions of GAC; GSA’s Geobiology and Geomicrobiology Division and the Geobiology Society

### **SS-27 Life and environments through time**

*Organizer(s): Katie Maloney and Brandt Gibson*

Duration: One-half day (oral and poster)

Canada hosts a valuable repository for the history of life on Earth through its exceptional fossil deposits. This inclusive session will highlight innovative techniques and new discoveries in paleontological research within Canada and globally. We welcome submissions for presentations or posters that relate to ancient life, preservation, taxonomy, biomarkers, paleoecology, paleobiology, trace fossils, and paleoenvironments documented throughout the geologic past.

Proponents: GAC Paleontology Division

## **EARTH SCIENCES AND SOCIETY**

### **SS-20 Geohazards in Canada**

*Organizer(s): Maureen Matthew, Sophie Norris, and John Gosse*

Duration: One day (oral and poster, with panel discussion)

Against a backdrop of seismic hazards, climatogenic hazards are affecting Canadians from coast to coast to coast. This day-long session will focus on recent or pre-historic (i) stream, coastal and glacier floods, (ii) landslides ranging from rock avalanches to mudslides, (iii) tsunamis generated by seismicity and coastal or submarine mass wasting. Talks will highlight innovations in studying them and insights into their causes and mitigation. The afternoon will include a panel discussion on Arctic and Atlantic Canada geohazards with invited speakers.

Proponents: TBA

### **SS-28 Canadian Earth Sciences needs everyone**

*Organizer(s): Carla Skinner, Jennifer P. Cuthbertson, Nicole LeRoux, Ricardo Ferreira Louro Silva, and Dawn Kellett*

Duration: One-half day (oral and poster)

Canada's future depends on diverse, community solutions to Earth Science issues. No groups should be excluded from these discussions. Yet, Earth Sciences remains the least diverse STEM field in Canada. What are the biggest barriers to increasing diversity in our field? What actions truly build equity, diversity and inclusion? What doesn't work? In this session, we welcome your experiences, best practices, initiatives, and honest examination of challenges and failures. We especially seek contributions from under-represented groups. As part of GAC's commitment to growing Equity, Diversity, Inclusivity and Indigeneity in Canada's Earth Sciences community, support will be offered to those that have financial barriers to presenting in this session.

Proponents: TBA

### **SS-29 Indigenous contributions to Canadian geoscience**

*Organizer: Jason Loxton*

Duration: One-half day (oral and poster)

This session will examine the often unheralded contributions of Canada's Indigenous communities to the advancement of Canadian geoscience, including the role of traditional knowledge in shaping our understanding of the geological past, the role of Indigenous guides and workers in the early geological exploration of Canada, and biographies of Indigenous geoscientists.

Proponents: TBA

### **SS-30 Geoscience in the Energy Transition**

*Organizer(s): Carla Skinner and Grant Wach*

Duration: One day (oral and poster)

To meet our 2030 and 2050 targets, Canada and other countries will need to rapidly increase growth of low carbon renewable energy supply and decarbonization. The subsurface will play a critical role in the energy transition and strong geoscience knowledge in diverse areas will be required for our success. Important research topics include geothermal energy, carbon capture and storage, thermal storage, compressed energy storage, and mineral/metal acquisition. In addition to understanding the subsurface requirements for the safe development of these, geosciences will also be needed for the support of new technologies through monitoring, measuring, and verifying as well as integrated risk assessments. Finally, in order to develop robust policy and social support, geosciences will play an important part in public communication.

Proponents: CSPG

### **SS-31 Forensic geoscience**

*Organizer(s): Grant Wach, Shari Forbes, Laurence Donnelly, and Alastair Ruffell*

Duration: One day (oral and poster)

This session will investigate new developments in the field of forensic geoscience for serious crime and terrorism investigations and the geological, environmental science, forensic science, geophysics, engineering, geotechnical, mining, and archaeological disciplines. These will include new technologies and new directions for example HTF (Human Taphonomy), drones and drone mounted geophysics, 2D and 3D image analysis, techniques at crime scenes, environmental crime and critical resource material

Proponents: IUGS Initiative on Forensic Geology

### **SS-32 The wonders of wine geoscience**

*Organizer(s): John Greenough and Denise Brushett*

Duration: One-half day (oral and poster) and associated with the field trip “Geology, Groundwater and Wines of the Annapolis Valley, Nova Scotia”

Many factors give individual wines from around the world distinct taste, olfactory and “textural” characteristics. Some of these factors are impacted by winemaking practises but many reflect a plethora of geological and environmental inputs summarily referred to as terroir. Examples are inputs from bedrock composition, groundwater geochemistry, soil texture and geochemistry, anthropogenic history, climate and localized microclimates. Thus, geoscientists can play a role in understanding and controlling the composition and terroir of wine. Further, they can contribute in areas such as the certification (geographic origin) of wine to improving the quality of wine. Papers that look at any and all soil, groundwater, geochemical, environmental and anthropogenic controls on wine composition and quality are welcome for this Special Session on the Wonders of Wine Geoscience during Halifax 2022.

Proponents: TBA

## **GEOSCIENCE EDUCATION**

### **SS-33 Geoscience Education and Outreach in Canada 2.0: Setting a roadmap for the future.**

*Organizer(s): Beth McLarty Halfkenny, Amanda McCallum, Lesley Hymers, and Courtney Onstad*

Duration: One day (oral and poster)

The year 2022 marks both the fiftieth anniversary of the founding of EdGEO Canadian Earth Science Teacher Workshop Program and the thirtieth anniversary of the first meeting of the Canadian Geoscience Education Network (CGEN). At a time when geoscience is facing a crisis in public perception, and geoscientists are needed to support Canada’s response to global challenges including climate change and energy transition, earth science communication, education and outreach are needed more than ever. This special session will revisit the hugely successful geoscience education and outreach program held in conjunction with the 2007 GAC-

MAC in Yellowknife NWT and provide an opportunity to reflect on the past, examine the present and create a vision for the future. The format will include talks on progress achieved since the landmark session fifteen years ago, followed by a strategic planning session to allow participants an opportunity for deep discussion on the challenges ahead, culminating in a strategic, actionable plan. Presentations and participation by organizations or individuals working in geoscience communication, education and outreach are encouraged, including but not limited to K-12 and post-secondary education, museums and science centres, geoheritage, geotourism and knowledge mobilization initiatives, geoscience policy development and science communication.

Proponents: CGEN, EdGEO and TBA

### **SS-34 Geoscience education: teaching the earth sciences in a (post) pandemic era in higher education**

*Organizer(s): Anne Marie Ryan and Charly Bank*

Duration: One-half day (oral and poster)

Teaching during the pandemic has challenged educators to reflect on their approaches in a new setting, and has also raised a number of questions geoscience teachers need to answer as we move forward. Some of these questions include: What has changed in our teaching? What will we keep, why do we want to keep it, and how do we want to keep it? How are we responding to the ongoing and evolving needs of our students? What have been successful ways to include quantitative reasoning, discussions of sustainability, geoethical reasoning, social justice, and concerns related to equity, diversity, and inclusion into our courses? How have we adapted our assessment practices? What about teaching in the field? Which program learning outcomes could not be adapted to online learning, and which could? This session is an opportunity for university and college geoscience educators to participate in the discussion around adapting our teaching in the modern era. We welcome proposals on a variety of aspects of earth sciences education, including the sharing of best practices, lessons learned, new course designs, and results from geoscience education research. Note that research into the teaching of the geosciences involving humans directly is required to have research ethics approval.

Proponents: TBA

### **SS-48 Exploring the relationship between environmental science/geoscience and environmental studies: a panel discussion.**

*Organizer: Canadian Colleges and Universities Environmental Network*

Duration: 90 minute panel discussion with invited speakers

## **HYDROGEOLOGY**

### **SS-35 From land to sea: groundwater-ocean interactions along the world's longest coast**

*Organizer(s): Barret Kurylyk, Julia Cantelon, and Cécile Coulon*

Duration: One-half day (oral and poster)

Coastal groundwater systems are characterized by distinctive density-driven dynamics and marine forcing and are highly vulnerable to climatic changes manifested in the atmosphere and ocean. Canada boasts over 240,000 km of coastline with changing morphology due to sea-level rise, sea ice melt, and ground thaw. These processes impact groundwater systems and are superimposed on hydraulic and salinity disturbances arising from coastal flooding and groundwater pumping. Such changes can influence the rate and quality of submarine groundwater discharge and/or facilitate saltwater intrusion into formerly freshwater aquifers. We welcome any abstracts related to coastal groundwater systems, including talks focused on human impacts, emerging monitoring technologies, numerical modeling, and observational changes.

Proponents: IAH-CNC

### **SS-36 Groundwater and agriculture: quantitative and qualitative linkages**

*Organizer(s): Serban Danielescu and Yefang Jiang*

Duration: One day (oral and poster)

Advancing the understanding of the linkage between agriculture and groundwater is critical as the agricultural sector accounts for 67% of the world's total withdrawal of groundwater and 86% of its consumption. Groundwater can be used as a source of water for many areas of the agricultural sector including supplemental irrigation to crops, for raising livestock and for dairy production among other uses. In the same time, groundwater could be the receptor of contaminants from the agricultural sector such as fertilizer and pesticides and thus potentially impact for example the quality of the drinking water or the quality of water in downgradient aquatic ecosystems. In Canada, similar to other areas of the world, the agricultural sector has been going through a general intensification and industrialization process in the last decades and hence, the interest in the environmental sustainability of agriculture has also gained interest with governments, academia, NGOs and the public at large. Contributions within this broader subject could include but are not limited to aspects related to sustainability of groundwater use; groundwater as a resource; soil salinization; modelling of transport and fate of contaminants; use of tracers and water indices, emerging issues; etc.

Proponents: IAH-CNC

### **SS-37 Groundwater and climate change**

*Organizer(s): Marie Larocque and Diana Allen*

Duration: One-half day (oral and poster)

Climate change is projected to cause shifts in hydrological regimes and more extreme hydrological conditions, such as drought and flooding. How these changes will impact groundwater recharge, the interactions between groundwater and surface water, and the seasonal storage of groundwater is largely unknown. Also unknown are the potential ecological consequences of changes to the groundwater system, specifically groundwater discharge to surface water bodies, which may impact groundwater dependent ecosystems. When combined

with changes in land use and water use, the cumulative impacts to groundwater systems due to these various stressors may be significant over a range of spatial and temporal scales. Contributions are invited on a variety of topics linked to these problems, including for example modified recharge and water storage patterns, impacts to surface water-groundwater interactions, impacts to groundwater dependent ecosystems, applications of groundwater flow models, using long-term monitoring networks to detect changes, and considering future stresses for integrated water management.

Proponents: IAH-CNC

### **SS-38 Numerical modelling in hydrogeology: new insights and innovative applications**

*Organizer(s): John Molson and Rene Therrien*

Duration: One-half day (oral and poster)

New challenges in hydrogeology have arisen from areas including climate change, energy and mineral development, and changes in land use. Associated stresses on groundwater quantity and quality are increasing and water resources must be protected and better managed. Numerical modelling can help address these challenges by providing new insights into process understanding, testing mitigation approaches and for supporting strategies for water management. This session will focus on innovative developments and applications of numerical modelling to hydrogeological systems. Coupled models, multi-component and multi-dimensional models crossing different disciplines are particularly welcome.

Proponents: IAH-CNC

### **SS-39 Groundwater in cold regions**

*Organizer(s): Nathan Young, Aaron Mohammed, and Jean-Michel Lemieux*

Duration: One-half day (oral and poster)

Temperatures in high-latitude regions are currently rising at more than twice the rate of the global average. This continued warming is altering precipitation patterns and thawing frozen ground across the arctic and subarctic. Together, these two consequences of global warming have the potential to substantially alter the water cycle in cold regions. The reduction in the extent of perennially or seasonally-frozen ground represents one of the most significant ecosystem shifts in the arctic, as it has been shown to significantly alter the hydrological characteristics of Northern watersheds. Due to the complex interactions and nonlinear feedbacks exhibited by the individual components of the water cycle, how the water cycle as a whole will be influenced by these changes, such as continued permafrost thaw, is not well understood. This session seeks contributions from within the field of cryo-hydrogeology, as well as related disciplines, such as hydrology, geophysics, geochemistry and remote sensing. Our aim is to provide a forum for the synthesis of recent field, laboratory, or theoretical research in groundwater, surface-water, or the critical zone in the cryosphere.

Proponents: IAH-CNC

## **SS-40 Understanding frozen ground impacts on critical zone hydrology in a changing climate**

*Organizer(s): David L. Rudolph and Edwin Cey*

Duration: One-half day (oral and poster)

In cold regions around the world, the relatively thin zone of frozen or partially frozen ground has a major influence on near surface hydrology and the complex interplays between soil, water, air, and ecosystems. Freezing and frozen ground conditions can alter infiltration-runoff partitioning, soil deformation, sensible and latent heat exchange, and groundwater recharge processes, and carbon cycling. Climate warming is significantly influencing the distribution and fate of permafrost potentially impacting land surface conditions and subsurface water circulation. Further understanding of these complex interconnected systems is required to inform projections of local and regional water budgets, groundwater-surface water interactions and associated ecological changes, especially in the face of a changing climate. This session welcomes studies examining the impacts of frozen ground on hydrological systems across a variety of temporal and spatial scales. Areas of interest include innovative monitoring approaches for frozen soil/permafrost environments, soil freeze-thaw dynamics, characterization of surface and subsurface water flows, groundwater recharge estimation, geotechnical challenges, and hydrologic or climatic feedback and response mechanisms. Multidisciplinary studies in cold regions involving either observational or numerical methods applied to frozen ground are encouraged.

Proponents: IAH-CNC

## **SS-41 Freshwater groundwater - surface water interactions**

*Organizer(s): James (Jim) Roy, Clare Robinson, and Lamine Boumaiza*

Duration: One-half day (oral and poster)

Groundwater can influence freshwater lakes, streams, and wetlands through maintenance of water levels and flows, and modifying temperature regimes and water quality (including contaminant and nutrient levels and loading). Likewise, surface water recharge can influence the receiving groundwater systems. The interaction between groundwater and surface waters, within the transition zone, can lead to sharp gradients and highly dynamic and heterogeneous processes with broader-scale implications. For instance, processes occurring within the transition zone may reduce contaminant loading to surface waters through attenuation, or lead to the release of contaminants stored in surficial sediments. This session welcomes studies that investigate the nature of groundwater – surface water interactions at a broad range of scales, their controlling factors and their repercussions for water resources, for water quality, and for the ecological functioning of freshwaters. Related studies on methods i) to identify and quantify groundwater – surface water interactions (including related nutrient / contaminant fluxes), and ii) to assess ecological impacts associated with groundwater discharge to surface waters, are also welcome.

Proponents: IAH-CNC

### **SS-42 Energy development and groundwater**

*Organizer(s): Jasmin Raymond and Steve Grasby*

Duration: One-half day (oral and poster)

Geothermal is riding the waves of change! As the Canadian population is transiting toward renewable energy systems, energy developments involving groundwater are becoming more common. This includes geothermal heat pump systems using groundwater as the heat carrier fluid or closed-loop ground heat exchangers installed through aquifers. Such shallow systems are commonly used for space heating and cooling and are now seen as a solution to fight the urban heat island effect. Exploration of deep geothermal resources suitable to produce electricity and/or heat has also taken place with efforts to characterize resources at the regional scale and pilot projects at promising sites. Hydraulic stimulation of reservoirs and ground heat exchangers are now emerging as technologies to exploit deep geothermal resources. Presentations on the topic of energy development and groundwater are welcome for this session, whether they focus on environmental impacts of energy development on groundwater or development of underground energy resources using or interacting with groundwater.

Proponents: IAH-CNC

### **SS-43 Geogenic groundwater contaminants and drinking water**

*Organizer(s): Vincent Cloutier and Gavin Kennedy*

Duration: One day (oral and poster)

Geogenic contaminants (e.g. As, Ba, F, Mn, U) present in groundwater are a health concern in rural areas of Canada, where public and private wells are important sources of drinking water, and can have adverse impacts on drinking water quality at local to regional scales. Understanding the geogenic sources and distribution of these naturally occurring contaminants in groundwater is crucial to ensure sustainable management of water resources and protection of public health. Several processes and factors (e.g. pH, redox potential, microorganisms, groundwater flow) affect the geochemical reactions controlling the mobilization of these geogenic contaminants. This session aims to present studies focusing on multidisciplinary approaches that may include, but are not limited to, redox reactions, speciation, water-rock interaction, mineralogy and reactive transport to understand and constrain the processes controlling the mobilization and fate of geogenic contaminants in all types of aquifers. Contributions addressing the major challenges associated with sampling methods, monitoring and modeling are also welcomed. Finally, broader studies aimed at developing innovative, integrated methods to encourage safe water well stewardship behaviours and to facilitate the communication of groundwater quality information to the public, such as water quality indicators or risk maps, are also welcome.

Proponents: IAH-CNC

### **SS-44 “High-drogeology”: groundwater in mountains and highlands**

*Organizer: Lauren Somers*

Duration: One-half day (oral and poster)

Mountains and highlands are disproportionately important landscapes for global water supply. Despite relatively thin soils and steep slopes, mountain/highland groundwater plays a key role in generating streamflow and recharging central valley aquifers. This session invites submissions that expand our understanding of groundwater processes in or near mountain/highland landscapes. Potential themes include: groundwater recharge and discharge pathways, investigation of mountain/highland aquifers, mountain block recharge to valley fill aquifers, and the impact of climate change or other human influences on mountain/highland groundwater systems.

Proponents: IAH-CNC

### **SS-45 Coupled processes in deep geological repositories**

*Organizer(s): Magdalena Krol, Jamie Noël, Josh Neufeld, Sarah Hirschorn, and Peter Keech*

Duration: One-half to one day (oral and poster)

Deep geological repositories (DGRs) are considered international best practice for safe and reliable long-term storage of spent nuclear fuels. The conditions in these deep environments, where repositories will be constructed, are complicated and will change temporally. Because many underground processes are linked, changes in one can lead to changes in others; as such, these interactions must be considered as part of DGR safety assessments. This session will host presentations that focus on the interdisciplinary nature of DGR processes, through experimental work, in-situ studies, and modelling efforts.

Proponents: IAH-CNC

### **SS-46 Hydrogeophysical characterization and monitoring**

*Organizer(s): Christopher Power and Colby Steelman*

Duration: One-half day (oral and poster)

Hydrogeophysics has emerged as an important sub-discipline in hydrogeology and ecohydrology. A multidimensional suite of geophysical methods, including electrical resistivity tomography (ERT), induced polarization (IP), ground penetrating radar (GPR), electromagnetics and seismics, are transforming our ability to image the composition of the subsurface and monitor the dynamics of processes occurring within it. These methods offer a degree of subsurface coverage and scale of spatiotemporal resolution that are unattainable by only using more traditional characterization and monitoring approaches such as borehole/log analyses and pumping or tracer tests. This session invites studies that are using geophysical measurements to delineate structural features and monitor dynamic processes that are important to hydrogeological, geoenvironmental and engineering studies, such as those associated with fluid and gas transport, remediation, saltwater intrusion, water resources, permafrost, ecology, and natural and anthropogenic hazards. Studies at different spatial (from sample to the catchment scale) and temporal scales (from seasonal to high frequency monitoring) are welcome, and can include field studies, laboratory experiments, theoretical and numerical modeling.

Proponents: IAH-CNC

### **SS-47 Contaminants hydrogeology: the sources and fate of pollutants in groundwater**

*Organizer(s): Geneviève Bordeleau and Eric Rosa*

Duration: One day (oral and poster)

Groundwater is an essential drinking water resource for human populations and contributes to the development of groundwater dependent ecosystems (GDE). However, the functions of the groundwater resource can be compromised when the latter is affected by anthropogenic pollution. The protection and sound management of aquifers therefore requires the identification of contaminant sources and a thorough understanding of the transport processes and transformation mechanisms of contaminants in groundwater flow systems. The issue is of significant complexity, especially in a context where anthropogenic impacts on the quality of groundwater are increasing in intensity and diversity. Current scientific issues related to groundwater contamination include, among other aspects, the lack of knowledge regarding (1) the hydrogeochemical behavior of several contaminants of emerging concern (CEC), (2) the cumulative human impacts on groundwater flow systems and (3) the evaluation of natural background groundwater quality at different scales. This session targets contributions on the assessment of the sources, transport and transformation of contaminants in groundwater. Studies presenting innovative approaches to monitoring, tracing, modeling and controlling contaminants fluxes in groundwater are invited. Studies on specific contaminants in groundwater (eg.: pharmaceutical substances) or on the impacts of targeted human activities (eg.: mining industry) are also invited.

Proponents: IAH-CNC

## **General Sessions**

**GS-01 Environmental geoscience**

**GS-02 Hydrogeology**

**GS-03 Geophysics**

**GS-04 Igneous and metamorphic geology**

**GS-05 Mineralogy and crystallography**

**GS-06 Paleontology**

**GS-07 Planetary geology**

**GS-08 Sedimentology and stratigraphy**

**GS-09 Structure & tectonics**

**GS-10 Marine Geology**

**GS-11 Economic Geology**