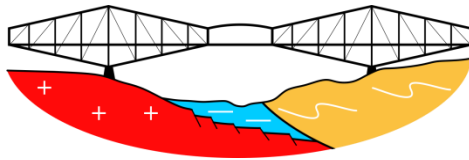


AGC-AMC-AIH
QUÉBEC 2019
Où les géosciences convergent



GAC-MAC-IAH
QUÉBEC 2019
Where geosciences converge

REPORT FROM THE LOCAL ORGANIZING COMMITTEE
QUÉBEC 2019 : WHERE GEOSCIENCES CONVERGE

-

RAPPORT DU COMITÉ ORGANISATEUR LOCAL
QUÉBEC 2019: OÙ LES GÉOSCIENCES CONVERGENT

Joint annual meeting of the Geological Association of Canada and Mineralogical Association of Canada with the Canadian National Chapter of the International Association of Hydrogeologists

Réunion annuelle conjointe de l'Association géologique du Canada et de l'Association minéralogique du Canada avec la section nationale canadienne de l'Association internationale des hydrogéologues

SUBMITTED BY / SOUMIS PAR

MICHEL MALO

and the Local Organizing Committee / et le Comité organisateur local

March 16 2020 / 16 mars 2020

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Preamble

Three geological provinces converge toward Québec City: the Grenville province, the St. Lawrence platform and the Appalachians. Likewise, three geoscientific associations converged their efforts to organise the GAC-MAC-IAH Québec 2019 conference. Fittingly, the Geological Association of Canada and the Mineralogical Association of Canada (GAC®-MAC) held their joint annual meeting in Quebec City, together with the Canadian National Chapter of the International Association of Hydrogeologists (IAH-CNC), which was held from May 12 to May 15, 2019.

Under the theme “Québec 2019: Where geosciences converge”, this event formally brought together, in a unique setting, specialists in geological sciences and hydrogeology to discuss and share the most recent advances in the broad field of Earth Sciences around four unifying themes: Geosystems and Hydrogeosystems; Resources, Energy and Environment; Data Science for Geosciences; and Geosciences and Society. The conference had international appeal, with nearly 800 participants from 17 different countries including from Europe, Asia, North & South America, Africa and Australia. The next generation of geoscientists was well represented with 261 student registrations.

A total of 427 talks and 118 posters were presented within 5 symposia, 30 special sessions and 6 general sessions. Thanks to the well-organized schedule and the spacious Quebec City Convention Center, eleven parallel scientific sessions were held simultaneously and the posters were displayed in the Exhibition Hall each day of the three-day conference. Each conference day was marked by a plenary lecture preceding the lunch breaks. Keynote lectures were given by Dr. Barbara Sherwood Lollar (University of Toronto) on *Subsurface habitability in the Earth’s deep hydrosphere*, Mr. Darrell Beaulieu (Denendeh Investments Inc.) on *A Dene perspective on resource development in Canada for, by and among First Nations*, and by Dr. Guy Desharnais (Osisko Gold Royalties) on *How BIG data is changing mining*.

Eight short courses and one workshop were well attended, and three one-day field trips were a success. Thanks to the financial support of the Canadian Geological Foundation and the Canadian Museum of Nature, the meeting program was supplemented by the outstanding traveling Mineral Exhibit of the Canadian Museum of Nature. The mineral exhibit was set-up in the main hall at the Quebec City Convention Centre and open during the icebreaker party on Sunday night and throughout the three days of the conference. In addition, a public discovery day with Earth Sciences educational activities for primary and secondary schools welcomed 75 students and their teachers from Quebec City.

Ms. Nathalie Camden, Associate Deputy Minister of the *Ministère de l’Énergie et des Ressources naturelles du Québec*, and Ms. Marie-Claude Thériège, Director General of Water Policies of the *Ministère de l’Environnement et de la Lutte contre les changements climatiques du Québec*, opened the congress in welcoming participants at the evening icebreaker on Sunday, May 12. Participants had the opportunity to visit and discover the warmth and charm of Quebec City and to explore its many attractive historical and natural sites during three social events: the Old Québec walking tour, the Quebec City craft breweries and beer tasting tour and the superb dinner cruise on the St. Lawrence River which was enjoyed by many participants.

Organization of the GAC-MAC-IAH Québec 2019 conference began about three and a half years before the conference of May 2019. The GAC council first contacted Michel Malo and Andrea Amortegui in November 2015, asking them if they were interested to organize the meeting in 2019. Discussions with the Quebec City geoscientific community took place in the following months for assembling a local organizing committee (LOC). The first LOC meeting was held in September 2016 and twelve meetings were held before the conference. The first conference website prepared by the LOC was uploaded in April 2017. The GAC committee in Newfoundland regained control of the website with the opening of the abstracts submission in November 2018 and for the registration which opened in the beginning of 2019.

The GAC-MAC-IAH Québec 2019 conference could not have successfully happened without its exhibitors and sponsors, who are thanked for their financial contribution. A special acknowledgement goes to the four organizations involved with the local organizing committee: INRS, the Geological Survey of Canada (Natural Resources Canada), Laval University and the *Québec Ministère de l'Énergie et des Ressources naturelles*. We also sincerely thank employees and volunteers of the GAC and MAC associations. Finally, thanks to all attendees that made this meeting a success.

Préambule

Trois provinces géologiques convergent à Québec : la province du Grenville, la Plate-forme du Saint-Laurent et les Appalaches. De la même manière, trois associations géoscientifiques ont fait converger leurs efforts pour organiser la conférence AGC-AMC-AIH Québec 2019. L'Association géologique du Canada et l'Association minéralogique du Canada (AGC®-AMC) ont tenu leur congrès annuel conjoint à Québec avec la Section nationale canadienne de l'Association internationale des hydrogéologues (AIH-SNC) du 12 au 15 mai 2019.

Sous le thème «Québec 2109 : Où les géosciences convergent», cet événement a réuni formellement des spécialistes des sciences géologiques et de l'hydrogéologie pour discuter et échanger des plus récentes avancées dans le grand champ des sciences de la Terre autour des quatre thèmes unificateurs : Géosystèmes et hydrogéosystèmes; Ressources, énergie et environnement; Science des données en sciences de la Terre; et Géosciences et société. La conférence a attiré la communauté scientifique internationale avec près de 800 participants de 17 pays provenant de l'Europe, l'Asie, l'Amérique du Nord et du Sud, l'Afrique et l'Australie. La nouvelle génération des géoscientifiques était bien représentée avec 261 inscriptions d'étudiants.

Au total 427 conférences et 118 affiches ont été présentées dans 5 symposia, 30 sessions spéciales et 6 sessions générales. Grâce au programme scientifique établi avec soin et au spacieux Centre des congrès de Québec, onze sessions scientifiques ont pu être tenues simultanément. Les affiches géoscientifiques étaient exposées dans la grande salle d'exposition pendant les trois jours du congrès. À chaque jour se tenait une conférence plénière : le lundi par la professeure Barbara Sherwood Lollar (Université de Toronto) sur «*L'habitabilité en sous-surface dans l'hydrosphère profond de la Terre : implications pour la science planétaire et l'astrobiologie*», le mardi par M. Darrell Beaulieu (Denendeh Investments Inc.) sur «*Une perspective des Dénés sur le développement des ressources au Canada pour, par et au sein même des Premières Nations*», et le mercredi par Guy Desharnais, PhD, (Osisko Gold Royalties) sur le thème «*Comment les mégadonnées (Big Data) changent l'industrie minière*».

Les huit cours intensifs et l'atelier, avec tous une très bonne assistance, ainsi que les trois excursions d'une journée ont été un succès. Grâce au support financier de la Fondation géologique du Canada et du Musée canadien de la nature, le programme du congrès a bénéficié de la superbe exposition itinérante des minéraux du Musée canadien de la nature. L'exposition présentée dans le hall principal du Centre des congrès a été ouverte pendant la cérémonie de bienvenue du dimanche soir et puis pendant les trois jours du congrès. De plus, une journée découverte avec des activités d'éducation et de vulgarisation en sciences de la Terre destinée aux écoles du primaire et du secondaire de la Ville de Québec a accueilli 75 élèves et leurs professeurs.

Mme Nathalie Camden, sous-ministre associée du Ministère de l'Énergie et des Ressources naturelles du Québec, et Mme Marie-Claude Théberge, directrice générale des politiques de l'eau du Ministère de l'Environnement et de la Lutte contre les changements climatiques du Québec, ont ouvert le congrès en souhaitant la bienvenue aux participants lors du cocktail de bienvenue au début de la soirée du dimanche 12 mai. Les participants ont eu l'opportunité de visiter et de découvrir la chaleur et le charme de Québec. Les participants

ont pu aussi explorer les nombreux attraits historiques et les sites touristiques de la ville de Québec lors de trois événements sociaux : la Visite à pied privée du Vieux-Québec, la Visite guidée des microbrasseries artisanale de la Ville de Québec avec la dégustation de bières et le superbe Souper-croisière sur le fleuve Saint-Laurent fortement apprécié par les nombreux participants.

L'organisation de la conférence AGC-AMC-AIH Québec 2019 s'est échelonnée sur pratiquement trois ans et demi avant le mois de mai 2019. C'est le conseil de l'AGC qui a contacté Michel Malo et Andrea Amortegui en novembre 2015 afin de leur demander s'ils pouvaient organiser le congrès en 2019. Des discussions auprès de la communauté géoscientifique de Québec ont eu lieu dans les mois suivants afin de former le comité organisateur local (COL). La première réunion du COL a eu lieu en septembre 2016 et 12 réunions se sont tenues avant le début du congrès. Le premier site internet du congrès préparé par le COL a été mis en ligne en avril 2017. L'AGC à Terre-Neuve a repris en main le site internet avec le début de la soumission des résumés en novembre 2018 et pour l'ouverture de l'inscription qui a eu lieu en début d'année 2019.

La conférence AGC-AMC-AIH Québec 2019 n'aurait pas pu connaître une telle réussite sans les commanditaires et exposants que nous remercions chaleureusement pour leur contribution financière. Un remerciement spécial va aux quatre organisations impliquées dans le comité organisateur local : l'INRS, la Commission géologique du Canada (Ressource naturelles Canada), l'Université Laval et le Ministère de l'Énergie et des Ressources naturelles du Québec. Nous voulons aussi remercier sincèrement les employés et les bénévoles de l'AGC et de l'AMC pour leur appui dans l'organisation du congrès. Finalement, des remerciements vont à tous les participants qui ont fait de ce congrès un franc succès.

Summary

Scientific program

Highlights

- Participation of the IAH-CNC with 63 regular members and 19 student IAH members.
- Four unifying themes – Geosystems and Hydrogeosystems – Resources, Energy and Environment – Data Sciences for Geosciences – Geosciences and Society.
- 5 symposia, 30 special sessions, 6 general sessions.
- 10 of the 30 special sessions focussed on hydrogeology-related topics and 1 of the 6 general sessions focussed on General Hydrogeology.
- 427 talks presented and 118 posters displayed during the three days of the conference.

Recommendations

- The open poster sessions at the end of each day (with a cash bar), with posters remaining up all day for the three consecutive days, worked very well and we received much positive feedback. We recommend to keep the same format if possible, as it is a way to acknowledge the work of poster authors. It is also a good way to attract congress attendees to the trade show when both posters and booths are located in the same space.
- Setting a typical daily schedule with talks, poster sessions, plenary sessions, coffee breaks and lunch distribution throughout the day is critical. We recommend setting the schedule as soon as possible in the congress agenda, along with the number of sessions to be held in parallel before looking at accepted abstracts and session distribution, and also before making any attempts to merge special sessions.
- Once abstracts for oral presentations have been reviewed and accepted by session conveners, it is crucial to plan ahead for extra time to organize the daily session schedule in order to avoid overlap or time conflicts between similar themes. A certain amount of time is also needed to make back and forth exchanges with session conveners when deciding on the schedule as various time conflicts may also arise (e.g. attending annual board meetings which are scheduled parallel to the meeting, GAC division meetings, etc.).
- It was a real challenge to work with a developing web platform for abstract submission, abstract revision by conveners, and online registration. We did not have access to real-time information as the web master had to send us daily reports in the form of Excel spreadsheets for every item type (e.g. abstract submission, online registration for activities, secured or pending payments etc.) This was a tremendous amount of work for both the webmaster (GAC board member) and the scientific program LOC subcommittee. We recommend having a

working web platform implemented long before the congress dates. Ideally the web platform should be working a year in advance so that every future LOC has plenty of time to run their own tests (e.g. test the abstract submission process, test the abstract revision interface for conveners, etc.) before going live.

- We also recommend having a website that is easily accessible by (selected) members of the LOC in order to be able to update information rapidly.

Short courses

Highlights

- Twelve short courses/workshops were initially offered, prior to, during, and after the meeting, with a duration of one to two days.
- All the proposed short courses/workshops fell under at least one of the main conference themes.
- Nine short courses/workshops were related to a special session or a symposium.
- Nine short courses/workshops reached the minimum number of registrants and were held as planned.
- Eight short courses/workshops were held at INRS prior to or after the meeting
- 112 participants attended the eight short courses/workshops.
- One workshop with no required conference registration was held at the Québec City Convention Centre during the meeting.
- Short course/workshop notes were produced by the organizers themselves without formal/mandatory formatting requirements. A common cover page, prepared by the short course committees, was added in order to have a uniform presentation with the basic information and conference logos.

Recommendations

- Short courses/workshops should always be related to proposed symposia or special sessions to increase potential registrants.
- Keep the possibility to attend the short courses/workshops without being registered for the conference, but for a small extra fee and keeping priority for delegates.
- Offer some workshops without registration and at no cost for the participants within the main scientific program.
- Clarify as early as possible the role of sponsors for the income and expenses of the short courses/workshops.
- Clarify the need of sponsorships from GAC, MAC and partnered organizations for a short course to be accepted by the LOC as well as for revenue sharing and for covering deficits (in case of unforeseeable complications).

- Provide a distinct sponsorship form for short course and offer a free short course registration for short course sponsors above 2500\$.
- Organize the short courses/workshops at a university (with low rental fees for classroom and equipment) which should significantly reduce the costs associated with these activities. Thus, short courses/workshops with only a few participants could take place.
- Do not include lunch for participants in the conference fee in order to avoid problems of food restrictions/allergies. Instead, give them time to eat (~1-1.5 hours) near the conference building at lunch time.

Field trips

Highlights

- Nine field trips were initially organized and offered, for both before and after the meeting, from day-trips to multi-day far-reaching tours.
- Most trips were related to proposed special sessions and a few trips were sponsored by the scientific associations
- Only three trips reached the minimum number of registrants and were delivered as planned, returning balanced budgets.
- The successful trips were all one-day events, and were relatively low-cost.
- Field guides were produced without formal/mandatory formatting requirements; only a common cover page was added in order to have a uniform presentation with the basic information and conference logos.

Recommendations

- Field-trip programs should include a good base of low-cost (75-125\$), diverse, and multidisciplinary, but not overspecialized day-trips.
- Multi-day field trips should always be related to proposed symposium/special sessions to increase potential registrants.
- Open up some field trips to interested parties who are not attending as conference delegates for a small extra fee; perhaps keeping priority for delegates on popular trips.
- Budget for trips should establish a cost per person, based on maximum and minimum participation, in order to break-even at 75% of the maximum capacity.
- Field trips should be cancelled if they fail to reach 60% of the maximum capacity by the early registration deadline, unless a sponsor formally agrees to compensate by providing funds to equilibrate the budget.
- Field trips should have flexible plans specially for transportation arrangements (mini-vans vs bus or coach rentals, which represent high fixed costs) in order to adapt to the number of registrants. This would allow small trips to break even.

- GAC forms RE safety (HAZARD IDENTIFICATION FORM, EVACUATION PLAN, COMMUNICATION PLAN) should be combined into one master safety form and provided in both official languages.
- GAC should provide clear information and guidance to the LOC/FT subcommittee and FT organizers on issues related to accountability/responsibilities and insurance.
- Clarify the role of sponsors for the incomes and expenses of the field trips

Publications

Highlights

- All abstracts were carefully edited by the publication and scientific committees, addresses have been shortened, and references, contribution numbers, reference citations and acknowledgment removed.
- The 144 page pocket-size program volume was printed and distributed at the meeting; it was also available on-line and on a memory stick.
- The 204 page abstract volume was not printed; it was available on-line and on a memory stick.
- Format of both volumes was refined; they included the usual technical information for delegates and additional information was added: citations of medal and award winners, photos of keynote speakers and award winners, as well as those of the LOC.

Recommendations

- Provide a template of both volumes to the next LOC.
- Provide further guidance to organizers of sessions and symposia for the edition of the abstracts, send them the abstracts as early as possible so that they can be reviewed and ideally sent back to authors for improvements.
- Provide a template of abstracts that highlight the short format of addresses required and further stress that no reference should be cited and that acknowledgments should not be included in the abstract or as a footnote.

Sponsorship and exhibition

Highlights

- Sponsorship and exhibition prospectus was ready in November 2018 (see annex 9).
- 25 sponsors for an income of 65 413.06\$.
- 24 exhibitors for an income of 24 600\$.
- The trade show was held in the Exhibition Hall with the posters.

Recommendations

- Distribute the prospectus in September.
- GAC should provide a list of potential Canadian sponsors and exhibitors for starting the fundraising.

Promotion and publicity

Highlights

- Flyers provided by Québec City Business Destination were distributed in several other scientific meetings during the two year period before the meeting.
- The first website prepared at INRS by the LOC was uploaded on April 2017; the GAC in Newfoundland regained control of the website in November 2019 before the abstract submission.
- A Facebook page for the meeting was prepared and operated by the LOC (see annexe 8).

Recommendations

- Do not change the website during the process of meeting organization.

Registration

Highlights

- Breakdown of categories of attendees :
 - Member of an association: 228
 - Non-member: 129
 - Day pass member: 35
 - Day pass non-member: 33
 - Student member: 170
 - Student non-member: 91
 - Retired member: 28
 - Retired non-member: 14
 - Exhibitor: 1
 - Short course : 19
 - Guest: 31
 - Total: 779
- 703 were paid participants and 76 complimentary.
- 55 on-site registration.

Recommendations

- Make sure that the website works well at the beginning of the on-line registration.

On-site logistics

Highlights

- The conference was held at the Quebec City Convention Center where 11 parallel scientific sessions were held simultaneously.
- Posters were displayed in the Exhibition Hall with the exhibitors.

Recommendations

- Even if it is expensive, it is better to hold the meeting in a convention center where all activities can take place in the same building.
- Organize posters and exhibitors in the same room and offer a cash bar at the end of the day.

Related activities

Related activities included social activities, business meetings and official luncheons of associations with awards.

Highlights

- Four luncheons with awards were held: GAC, MAC, MDD and CNC/IAH.
- 18 business meetings were held including the Annual General Meeting of the associations.
- 6 social events were organized for conference delegates, but only 4 finally took place; 2 of which only reached the minimum capacity of 10 participants.
- Less than 75 attendees booked the gala dinner (cruise on the St. Lawrence River).

Recommendations

- Potentially exclude the gala dinner from the organization of the congress; this activity seems less and less relevant according to today's realities, often because of the high cost of this kind of gala diner, and it becomes difficult to attract enough participants. Alternatively offer it but strongly encourage session and symposia organizers to make it a place to meet together. This approach was tested and proved to work extremely well.
- Association luncheons are also expensive and attract few people; the GAC and MAC luncheons could be merged with the gala diner to limit the total cost for participants.
- Social activities should be very limited, such as walking and food tours, but could be also eliminated, considering the large amount of time to organize them and the low numbers of delegate registrations.

Accommodation

Highlights

- Accommodation in hotels was entrusted to the private firm Conferium which managed the rooms and took its profit directly from the hotel owners; the LOC did not take any risk.
- 419 overnights were booked with the website, which is lower than 30% of total overnights usually booked with congress websites. The two most rented hotels were those very close to the Convention Centre.
- Rooms were also available for the participants at Laval University's student residences with no obligation from the LOC; only 6 of these rooms were used by participants.

Recommendations

- With so many on-line accommodation sites, one must be prudent for the number of blocks of chambers to book from hotels in order to not have to pay penalties if all rooms booked are not rented.

Finances

Highlights

- The Memorandum of Understanding (MOU) between the GAC, MAC and IAH/CNC was signed by all parties during June and July 2018.
- Three preliminary budgets were prepared, a low budget with 600 participants, a medium with 900, and a high with 1200 participants.
- The proposed distribution of profit is:
 - LOC / COL : 20%
 - Remaining profit:
 - GAC: 65.0%
 - MAC: 22.5%
 - IAH/CNC: 12.5%

Recommendations

- The earlier the program is available, the more interest can be generated for the conference. This is particularly true for the announcement of special sessions, symposia, short courses and fieldtrips with many employers requiring travel authorization to be done up to a year before the event.

Sommaire

Programme scientifique

Faits saillants

- Participation de l'AIH-SNC avec 63 membres réguliers et 19 étudiants membres de l'AIH.
- Quatre thèmes unificateurs - Géosystèmes et hydrogéosystèmes - Ressources, énergie et environnement - Science des données en sciences de la Terre - Géosciences et société.
- 5 symposia, 30 sessions spéciales, 6 sessions générales.
- 10 des 30 sessions spéciales et 1 des 6 sessions générales ont porté sur des thèmes reliés à l'hydrogéologie.
- 427 présentations orales données et 118 affiches exposées pendant les trois jours de la conférence.

Recommandations

- Les sessions d'affiches à la fin de chaque jour (avec un bar payant) avec les affiches exposées toute la journée pendant trois jours consécutifs ont bien fonctionné et nous avons reçu beaucoup de commentaires positifs. Nous recommandons de garder le même format si cela est possible. C'est aussi une bonne façon d'attirer des congressistes à l'exposition commerciale quand les affiches et les kiosques commerciaux sont dans la même salle.
- Établir une cédule journalière typique avec des conférences, des sessions d'affiches, des sessions plénières, des pauses-café et des dîners est critique pour le déroulement du congrès. Nous recommandons d'établir cette cédule le plus tôt possible dans l'agenda d'organisation du congrès, de même que le nombre de sessions qui doivent être présentées en parallèle, et ce avant de recevoir et accepter les résumés, et aussi avant d'essayer de fusionner des sessions spéciales.
- Après que les résumés des conférences ont été révisés et acceptés par les organisateurs des sessions, il est important de planifier du temps supplémentaire pour organiser la cédule journalière des sessions afin d'éviter des chevauchements et des conflits d'horaires entre des sessions avec des thèmes semblables. Une certaine quantité de temps est nécessaire pour faire des échanges avec les organisateurs de sessions quand vient temps de finaliser la cédule. Plusieurs conflits d'horaires peuvent se produire avec d'autres activités (par ex. : les réunions annuelles des associations, les réunions de division, etc.).
- Ce fut un vrai défi de travailler avec un site internet en construction pour la soumission des résumés, la révision des résumés par les organisateurs de sessions, et l'inscription en ligne. Nous n'avons pas eu accès à l'information en temps réel et le webmestre devait nous transmettre des rapports journaliers sous forme de tableaux Excel pour chaque item (par ex. : soumission des résumés, inscription en

ligne pour les activités connexes, paiements, etc). Une quantité énorme de travail a été déployée par le webmestre (un membre du conseil de l'AGC) et les membres du sous-comité du programme du COL. Nous recommandons de mettre en place un site internet fonctionnel longtemps avant le début de l'organisation du congrès. Idéalement, le site internet devrait être fonctionnel au moins une année avant le début du congrès de telle sorte que le COL ait le temps de le tester (par ex. : tester le processus de soumission des résumés, tester la révision des résumés) avant de le mettre en ligne.

- Nous recommandons d'avoir un site internet facilement accessible pour certains membres du COL afin d'être en mesure d'obtenir de l'information rapidement.

Cours intensifs

Faits saillants

- Douze cours intensifs/ateliers d'une durée de un ou deux jours ont été initialement offerts avant, durant et après la conférence.
- Tous les cours intensifs/ateliers proposés étaient associés à au moins un des principaux thèmes de la conférence.
- Neuf cours intensifs/ateliers étaient reliés à des sessions spéciales ou des symposia.
- Neuf cours intensifs/ateliers ont atteint le nombre minimal de participants et ont eu lieu comme prévu.
- Huit cours intensifs/ateliers ont été organisés à l'INRS avant ou après la conférence.
- 112 participants ont assistés aux huit cours intensifs/ateliers.
- Un atelier, ouvert à tous, a été tenu pendant la conférence au Centre des congrès de Québec.
- Les notes des cours intensifs/ateliers ont été réalisées sans formatage obligatoire, à la discrétion des organisateurs. Une page-couverture, préparée par le comité des cours intensifs, a été ajoutée dans le but d'avoir une présentation uniforme avec l'information de base et les logos de la conférence.

Recommandations

- Les cours intensifs/ateliers devraient toujours être reliés à un symposium ou une session spéciale pour augmenter le nombre de participants.
- Conserver la possibilité de s'inscrire aux cours intensifs/ateliers sans être inscrit à la conférence, mais avec un coût supplémentaire tout en gardant la priorité au participants du congrès.
- Offrir des ateliers sans inscription et sans frais pour les participants au sein même du programme scientifique principal.

- Clarifier le plus tôt possible le rôle des commanditaires pour les dépenses et revenus des cours intensifs/ateliers.
- Éclaircir le rôle de l'AGC, AMC et organisations partenaires pour l'acceptation des cours intensifs de même que pour le partage des revenus des cours intensifs et pour l'élimination des déficits (en cas de complications non prévisibles).
- Fournir un formulaire de commandites distinct pour les cours intensifs et offrir une inscription gratuite pour les commandites en haut de 2500\$.
- Organiser des cours intensifs/ateliers dans une université (frais de location de locaux et d'équipements faibles) permet de diminuer grandement les coûts associés à ces activités. Ainsi, des cours intensifs/ateliers avec peu de participants peuvent avoir lieu.
- Ne pas prendre en charge le repas du midi pour les participants pour ne pas avoir à gérer le problème des restrictions alimentaires/allergies. Laisser plutôt le temps aux participants sur l'heure du midi (~1H00-1H30) pour aller manger à proximité des locaux.

Excursions

Faits saillants

- Neuf excursions d'une ou plusieurs journées ont été initialement offertes avant et après la conférence.
- La plupart des excursions étaient reliées à des sessions spéciales et des associations scientifiques ont commandité quelques excursions.
- Seulement trois excursions ont atteint le nombre minimal de participants et ont eu lieu comme prévu avec un budget équilibré.
- Les excursions réussies ont été celles d'une journée offertes à des bas prix.
- Les livrets-guides d'excursion ont été produits sans format obligatoire ; seule la page-couverture a été ajoutée dans le but d'avoir une présentation uniforme avec l'information de base et les logos de la conférence.

Recommandations

- Le programme des excursions devrait inclure une bonne base d'excursions diverses et multidisciplinaires, mais pas trop spécialisées et à un bas prix (75-125\$).
- Les excursions de plusieurs journées devraient toujours être reliées à un symposium ou une session spéciale pour augmenter le nombre de participants potentiels.
- Ouvrir des excursions à des participants non-inscrits au congrès avec un coût supplémentaire tout en gardant la priorité aux participants du congrès.

- Le budget des excursions devrait être établi sur la base du coût par personne avec un maximum et un minimum de participants pour un seuil de rentabilité à 75% du maximum de participants.
- Les excursions devraient être annulées si elles n'atteignent pas 60% de la capacité maximale après la fin des inscriptions hâtives à moins qu'un commanditaire accepte formellement de compenser les pertes pour équilibrer le budget.
- Les excursions devraient avoir des plans flexibles pour les transports (location de mini-vans vs autobus qui représente un coût fixe élevé) dans le but de s'adapter au nombre de participants et permettre d'atteindre un seuil de rentabilité et offrir l'excursion.
- Les formulaires de l'AGC pour la sécurité (IDENTIFICATION DES DANGERS, PLAN D'ÉVACUATION, PLAN DE COMMUNICATION) devraient être combinés dans un seul formulaire principal et fournis dans les deux langues officielles.
- L'AGC devrait fournir une information claire et des guides au sous-comité des excursions du COL et aux organisateurs d'excursions sur les aspects liés à la responsabilité et aux assurances.
- Clarifier le rôle des commanditaires pour les dépenses et revenus des excursions.

Publications

Faits saillants

- Tous les résumés ont été édités par les comités de publication et scientifique, les adresses ont été raccourcies pour simplification et clarté du document, et les références, citations de références, numéros de contributions et remerciements enlevés.
- Le volume du programme de format-poche a été imprimé et distribué au congrès ; il compte 144 pages ; il était aussi disponible en ligne et sur une clé de mémoire.
- Le volume des résumés comprend 204 pages ; il n'a pas été imprimé ; il était disponible en ligne et sur une clé de mémoire.
- Le format des volumes du programme et des résumés a été amélioré ; les volumes contiennent les renseignements techniques utiles aux participants et des informations additionnelles ont été ajoutées : citations des récipiendaires des médailles et autres prix, photos des récipiendaires de prix et des conférenciers d'honneur, ainsi que des membres du COL

Recommandations

- Fournir le canevas de ces documents aux prochain COL.
- Fournir plus de guides et de direction aux organisateurs de sessions et symposia pour l'édition des résumés et leur envoyer les résumés aussitôt que possible pour

qu'ils puissent réviser les résumés et idéalement les retourner aux auteurs pour des corrections.

- Fournir un canevas de résumés qui montre le format court des adresses requises et indiquer clairement que les références ne devraient pas être citées et que les remerciements ne devraient pas être inclus en bas de pages des résumés.

Commanditaires et exposants

Faits saillants

- Le prospectus pour les commanditaires et exposants a été distribué en novembre 2018 (voir annexe 9).
- 25 commanditaires pour un revenu de 65 413.06\$.
- 24 exposants pour un revenu de 24 600\$.
- Le salon des exposants a eu lieu dans la salle d'exhibition avec les affiches scientifiques.

Recommandations

- Distribuer le prospectus en septembre.
- L'AGC devrait fournir une liste des commanditaires et exposants canadiens potentiels pour favoriser la levée de fonds.

Promotion et publicité

Faits saillants

- Des prospectus (style carte postale) fournis par Québec Votre Ville Destination Affaires ont été distribués à différents congrès scientifiques pendant les deux ans précédant le congrès.
- Le premier site internet créé par le COL à l'INRS a été mis en ligne en avril 2017; l'AGC à Terre-Neuve a repris l'opération du site internet en novembre 2018.
- Une page Facebook pour le congrès a été créée et opérée par le COL (voir annexe 8).

Recommandations

- Ne pas changer le site internet pendant l'organisation du congrès.

Inscription

Faits saillants

- Ventilation des catégories de participants :
 - Membre d'une association : 228

○ Non membres :	129
○ Membre (1 journée) :	35
○ Non membre (1 journée) :	33
○ Étudiant membre :	170
○ Étudiant non membre :	91
○ Membre retraité :	28
○ Non membre retraité :	14
○ Exposant :	1
○ Cours intensif :	19
○ Invité :	31
○ Total :	779

- 703 participants payants et 76 non-payants
- 55 inscriptions sur place.

Recommandations

- S'assurer que le site internet fonctionne bien au début de l'inscription en ligne.

Logistique sur place

Faits saillants

- La conférence a eu lieu au Centre des congrès de Québec où 11 sessions scientifiques ont pu avoir lieu simultanément.
- Les affiches ont été exposées pendant les trois jours dans la même salle que celle des exposants.

Recommandations

- Même si c'est dispendieux, il est préférable de tenir la conférence dans un centre des congrès où toutes les activités peuvent avoir lieu dans la même bâtisse.
- Regrouper les affiches avec les exposants dans la même salle et avoir un bar payant ouvert en fin de journée.

Activités connexes

Les activités connexes comprennent les activités sociales, les réunions d'affaires et les dîners d'association avec remise de prix.

Faits saillants

- Quatre dîners d'association avec remise de prix ont eu lieu : AGC, AMC, MDD, SNC/AIH.
- 18 réunions d'affaires incluant les assemblées générales annuelles des associations.
- 6 activités sociales ont été proposées aux participants, mais seulement 4 ont eu lieu ; 2 d'entre elles n'ont atteint que le minimum de 10 participants.

- Seulement 75 personnes ont participé au souper gala (une croisière sur le fleuve Saint-Laurent).

Recommandations

- Considérer d'exclure le souper gala de l'organisation du congrès ; cette activité semble de moins en moins en accord avec la réalité actuelle, souvent à cause du prix élevé de ce genre de souper, et il devient difficile de rassembler un grand nombre de participants. Alternativement, encouragé les organisateurs de sessions, de symposia et de cours intensifs à en faire un lieu de rencontre. Cette approche fut testée avec succès.
- Les dîners d'association sont aussi dispendieux et attirent peu de participants ; ces dîners avec remise de prix pourraient être fusionnés avec le souper gala pour limiter le coût global des participants.
- Les activités sociales devraient être limitées, comme des circuits à pied et des tournées de découvertes culinaires, mais pourraient aussi être annulées considérant le temps considérable pour leur organisation et le peu de participants qui s'y inscrivent.

Hébergement

Faits saillants

- L'hébergement dans les hôtels a été confié à la firme privée Conferium qui a géré les chambres et pris son profit auprès des hôteliers ; de cette façon aucun risque n'a été pris par le COL.
- 419 nuitées ont été réservées avec le site internet, ce qui est en deçà du 30% des nuitées totales habituellement réservées avec les sites internet des congrès; les deux hôtels les plus fréquentés étaient ceux très proches du Centre des congrès.
- Les résidences d'étudiants de l'Université Laval offraient des chambres pour les participants sans obligation du COL ; seulement 6 chambres ont été utilisées par les participants.

Recommandations

- Avec tous les sites d'hébergement en ligne , il faut demeurer prudent pour le nombre de blocs de chambres à réserver auprès des hôteliers afin de ne pas avoir de pénalités à payer si les chambres réservées ne sont pas toutes louées

Finances

Faits saillants

- L'entente (*MOU : Memorandum of Understanding*) entre l'AGC, l'AMC et l'AIH/SNC a été signé par tous les intervenants pendant les mois de juin et juillet 2018.

- Trois estimés budgétaires ont été présentés, soit un estimé bas avec 600 participants, un moyen avec 900, et un élevé avec 1200 participants.
- La distribution propose des profits est :
 - COL : 20%
 - Profits restants :
 - AGC : 65.0%
 - AMC: 22.5%
 - AIH/SNC : 12.5%

Recommandations

- Plutôt le programme est disponible, plus facile sera de susciter de l'intérêt pour le congrès. Ceci est particulièrement vrai pour l'annonce des sessions spéciales, des symposia, des cours intensifs et des excursions de terrain, de nombreux employeurs exigeant une autorisation de voyage jusqu'à un an avant l'événement.

Annexe 1. Local organizing committee / Comité organisateur local



Michel Malo

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Scientific program
Président
Programme scientifique
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Andrea Mortegui

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Johanne Caron

Finances
Exhibits
Expositions



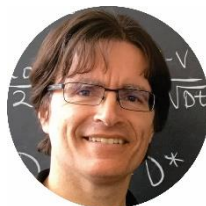
Stéphanie Larmagnat

LOC Secretary
Scientific program
Short courses
Secrétaire CLO
Programme scientifique
Cours intensifs



Jean-Daniel Bourgault

Publicity, web site
Publicité, site web



John Molson

Scientific program
Programme scientifique



Emmanuelle Cecchi

Promotion
Promotion



Anne-Aurélien Sappin

Short courses
Cours intensifs



Sébastien Castonguay

Scientific program
Field trips
Programme scientifique



Louise Corriveau

Publications
Publications

Excursions



Jean-Luc Pilote

Publications
Publications



Aïcha Achab

Finances
Publications
Finances, Publications



Crystal Laflamme

Publications
Publications



Félix-Antoine Comeau

Social events
Événements sociaux



Christine Rivard

IAH-CNC representative
Représentante AIH-SNC



René Lefebvre

IAH-CNC representative
Représentant AIH-SNC



Erwan Gloaguen

Fundraising
Financement



Bernard Giroux

Fundraising
Financement



Robert Thériault

Exhibits
Technical Services
Expositions
Services techniques



Karine Bédard

Accommodations
Hébergement



Marie-Ève Lagacé

Registration
Inscription



Marie Dussault

Exhibits
Expositions

The organizing committee would like to thank James Conliffe (GSNL/ GAC®), Karen Dawe (GAC®), Eleonor Penney (GAC®), Étienne Girard (GSC), Carl Guilmette (U. Laval), Marco Boutin, Richard Martel (INRS), and Normand Tassé (retired INRS) for their help during meeting preparation.

Le comité organisateur tient à remercier James Conliffe (CGTN/AGC), Karen Dawe (AGC), Eleonor Penney (AGC), Étienne Girard (CGC), Carl Guilmette (U. Laval), Marco Boutin, Richard Martel (INRS) et Normand Tassé (retraité INRS) pour leur aide lors de l'organisation du congrès.

Annexe 2. Report for the scientific program / Rapport pour le programme technique

John Molson (john.molson@ggl.ulaval.ca)

The Technical Program was organized by a subcommittee chaired by John Molson (john.molson@ggl.ulaval.ca), and included Michel Malo (Conference Chair), Stephanie Larmagnat, Christine Rivard, René Lefebvre and Sébastien Castonguay.

An initial call for special sessions was circulated in March 2018; the final deadline for proposing themed sessions was May 27, 2018. Special Sessions (as well as short courses and symposia) had to be oriented into one of the 4 themes of the conference: *Geosystems and Hydrogeosystems; Resources, Energy and Environment; Data Science for Geosciences; and Geosciences and Society*.

For those who submitted Special Session proposals, confirmation of acceptance was announced by email in mid-June 2018. The full LOC was consulted on the final draft list of sessions. Confirmation of the final list of sessions had to wait until all abstract submissions were submitted (including oral and poster presentations) before deciding whether to combine or cull any sessions, depending on the abstract subject area and number of abstracts submitted to each session.

Abstract submission opened on November 19, 2018, with an initial deadline of February 4th 2019. This initial closing date was extended by about two weeks to February 15th 2019 (this is very typical for all GAC-MAC-IAH conferences). During this time, the general format of the technical program was planned – including schedules, time slots, breaks, keynotes etc. which would later be filled depending on number of final submissions. As the submissions came in, they were organized via the web master into a global Excel file.

In late February, the technical program committee distributed the submitted abstracts to the corresponding session chairs in an Excel file with a list of the abstracts submitted to their session, including author information, and requests for oral or poster. Session chairs were asked to i) review and edit their abstracts, ii) contact authors to approve any significant changes, iii) make preliminary acceptance decisions and iv) to assign an order to the abstracts according to the provided time schedule. Session chairs were also allowed to invite keynotes which, at their discretion, could use 1 or 2 time slots.

The Technical Committee based their final decisions and schedule on the session Chairs' suggestions. In our case, several sessions had to be merged. A few sessions were also cancelled in which case the abstracts were moved to another session – for this purpose it is useful to have several “General sessions” available in different disciplines.

The deadline for finalizing the slate of talks in each session was March 14th 2019, one month after the abstract submission deadline (and about 2 months before the conference). Authors were notified of the decision for their abstracts (oral or poster) by March 31, 2019. In most cases, the authors' initial request for either oral or poster was respected. Program changes, including cancellations and late additions, continued during the last few weeks before the conference (so some flexibility had to be maintained in the scheduling even though some late changes could not be included in the Proceedings).

It was very important during this period to have enough time to work on this every week, and to have a well-organized plan for liaising with the session Chairs, updating the technical program schedule and corresponding web site.

A total of 427 talks and 118 posters were presented within 5 symposia, 30 special sessions and 6 general sessions.

A complete list of the technical sessions can be found below. The schedule of talks was organized to minimize the number of concurrent sessions on related themes. The intent was to ensure, to the extent possible, that delegates did not have to miss sessions of interest. With respect to room assignments, efforts were made to locate sessions with overlapping themes in close proximity to allow delegates to move between sessions efficiently. Anticipated attendance was also an important factor in assigning rooms with different seating capacity. Several special requests of session organizers also had to be considered (ex. to coordinate with related workshops or symposia, to accommodate travel plans, etc.).

The Publications committee, chaired by Louise Corriveau, provided invaluable assistance in final editing and formatting of the abstracts for the Proceedings.

Technical Posters were on display during each of the three days, while official poster sessions, with authors present, ran at the end of each day (usually around 4h30-6pm). Where possible, poster sessions were thematically aligned with the oral presentations. Session organizers were reminded to promote their poster sessions and identify their location and presentation times.

Efforts were made to attract delegates for designated poster times by offering hospitality between about 4:30 and 6:00 pm on Monday-Wednesday.

Beer and food succeeded in attracting delegates not only to the posters but also to the trade show, although traffic outside of those times was limited.

List of technical sessions / Liste des sessions techniques

SYMPOSIA / SYMPOSIUMS

Geosystems and hydrogeosystems / Géosystèmes et hydrogéosystèmes

The growth of Laurentia: recent advances in reconstructing metamorphosed, deformed and deeply eroded continental margins

Conveners: van Rooyen, D., Corrigan, D., Indares, A.

Resources, energy and environment / Ressources, énergie et environnement

Gold: Recent advances, and 20 years of research through GSC's Targeted Geoscience Initiative Program under Dr. Benoît Dubé's leadership

Conveners: Mercier-Langevin, P., de Souza, S., Malo, M., Archer, P., Galley, A., Bécu, V.

Golden magmas: Precambrian magmatism features and relationship to gold and base metals mineralisation

Conveners: Mathieu, L., Jébrak, M.

Greenstone belt architecture and metal endowment of the Superior craton

Conveners: Thurston, P., Ayer, J., Gibson, H., Lafrance, B., Sherlock, R.

Ore systems within IOA, IOCG, skarn and polymetallic albitite hosted deposit: A symposium in memory of Dr. Patrick Williams

Conveners: Corriveau, L., Montreuil, J.-F., Beaulieu, D., Zhao, X.-F.

SPECIAL SESSIONS / SESSIONS SPÉCIALES

Geosystems and hydrogeosystems / Géosystèmes et hydrogéosystèmes

Canadian volcanology, Archean to recent, depth to surface, at home and abroad

Conveners: Ross, P.-S., Kolzenburg, S., Berlo, K.

Challenges in measuring and modeling groundwater/surface water interactions

Conveners: Paniconi, C., Therrien, R., Paradis, D.

The construction and use of P-T-t-D paths in understanding orogenic systems

Conveners: Larson, K., Yakymchuk, C., Dyck, B.

Crustal melting, migration, and mineral-ization processes: Partial melting through fractionation to volatile saturation, from the micron to the continental scale

Conveners: Steele-MacInnis, M., Dyck, B., Azadbakht, K., Sawyer, E.

Deep groundwater circulation and its potential influence on shallow water resources and ecosystems

Conveners: Rivard, C., Molson, J., Lefebvre, R.

Diffusion in geoscience: A multidisciplinary perspective

Conveners: Al, T., Parker, B., Wanner, P.

Emerging contaminants in soil and groundwater

Conveners: McGregor, R., Carey, G.

Geochemical and isotopic tracers in groundwater studies

Conveners: Bordeleau, G., Ahad, J., Utting, N., Pinti, D., Zuo, E.

Groundwater and climate change

Conveners: Larocque, M., Allen, D.

Groundwater nutrients and contaminants affecting surface waters

Conveners: Roy, J., Robinson, C.E.

Hydrogeology of cold regions

Conveners: Lemieux, J.-M., Cey, E.

Marine geosciences

Conveners: Jamieson, J.W., Lajeunesse, P., Normandeau, A.

Melt, fluids and architecture of accretionary orogens

Conveners: Kellett, D., Barr, S., Layne, G., Archibald, D.

Pannotia to Pangea: Paleozoic orogenic cycles in the circum-North Atlantic region: a celebration of the career of Damian Nance

Conveners: Murphy, J.B., Strachan, R., Quesada, C.

Precambrian sedimentology: Open session on recent advancements in paleogeographic and paleoenvironmental reconstructions in deep time

Conveners: Ielpi, A., Halverson, G., Lechte, M.

Quantifying timing and rates of geologic processes

Conveners: Enkelmann, E.

Terrestrial analogues for comparative planetary geology and astrobiology

Conveners: Cloutis, E., Osinski, G.R.

Resources, energy and environment / Ressources, énergie et environnement

The cratonic mantle, its carbonate-rich melts, kimberlites and carbonatites

Conveners: Kopylova, M., Chakhmouradian, A.

Impact cratering in the solar system

Conveners: Osinski, G.R., Tornabene, L.L.

Fluid-rock interaction

Conveners: Lecumberri-Sanchez, P., Adlakha, E., Kontak, D., Ansdell, K.

Indicator minerals and exploration methods

Conveners: Makvandi, S., Beaudoin, G.

Integrating geophysics, petrophysics and geology: a session to honour the career of Dr. Bill Morris

Conveners: Ugalde, H., Enkin, R.

Submarine volcanism and marine minerals: Key resources for the future

Conveners: DeWolfe, M., Stewart, M.

Unifying international research forces to unlock geothermal resource

Conveners: Raymond, J., Blessent, D.

Uranium ore systems research: Fluid pathways, metal traps and expressions of the systems

Conveners: Potter, E., Chi, G., Thomas, D.

Recent advances on ore forming processes related to magmatic Ni-Cu-PGE, Cr-PGE, and Fe-Ti-V deposits and their implications for mineral exploration: A special session in memory of Dr. Thomas Lane

Conveners: Houlié, M., Smith, J., Sappin, A.-A.

Data Science for geosciences / Science des données pour les geoscience

Artificial intelligence in natural resources, algorithm development and applications

Conveners: Gloaguen, E., Gagné, O., Mercier, P. H.J.

Machine Learning as an interpretation tool for geologists

Conveners: Blouin, M., Girard, R., Claprood, M., Caté, A., Perozzi, L.

Geosciences and society / Géosciences et société

Geoheritage: From local to international

Conveners: Desrochers, A., Verpaelst, P., Malo, M.

Innovative and effective approaches to teaching geosciences: Ideas and strategies

Conveners: Bank, C., Ryan, A.-M., Bank, C., Daxberger, H.

GENERAL SESSIONS / SESSIONS GÉNÉRALES

General hydrogeology

Conveners: Lefebvre, R., Rivard, C.

Geophysics

Conveners: Gloaguen, E., Giroux, B.

Glacial geology and geomorphology in Canada

Conveners: Paulen, R., Ross, M., Gauthier, M.S.

Petrography, mineralogy and crystallography

Conveners: Constantin, M., Guilmette, C.

Sedimentology, stratigraphy and paleontology

Conveners: Larmagnat, S., Lavoie, D.

Structural geology and tectonics

Conveners: Castonguay, S., Konstantinovskaya, E.

Annexe 3. Report for the short courses / Rapport pour les cours intensifs

Anne-Aurélié Sappin (anne-aurelie.sappin@canada.ca) and Stéphanie Larmagnat (stephanie.larmagnat@canada.ca)

The GAC-MAC-IAH / CNC Conference held in Quebec City under the theme “Where geosciences converge” was enhanced by a rich program of well attended short courses/workshops. Nine distinct short courses/workshops were held prior to, during, or after the conference, and attracted a minimum of 112 participants (Table 1). All nine activities fell under at least one of the main Conference themes: Geosystems and hydrogeosystems, Resources, energy and environment, Data science for geosciences, and Geosciences and society. Eight activities were organized at the joint INRS and GSC-Québec building, located approximately a 15 min walk away from the Québec City Convention Center (QCCC) (<http://www.ete.inrs.ca/ete>). One workshop was held at the QCCC during the conference.

Each of the nine short courses/workshops is briefly described in the following paragraphs.

Table 1. Short course/Workshop registration summary

Short course/Workshop	Registrant Category	Number of Registrants	Cost
SC-01: Rates and dates: Geo- and thermochronology methods and applications	Professional	3	\$600.00
	Student	3	\$150.00
SC-02: Critical Thinking in Aquifer Test Interpretation	Professional	6	\$450.00
	Student	5	\$150.00
SC-04: Indicator mineral exploration methods	Professional	9	\$350.00
	Student	7	\$150.00
SC-05: Ore systems with IOA, IOCG, IOU and affiliated deposits	Professional	10	\$600.00
	Student	5	\$150.00
SC-06: Laser ablation applied to ore deposits	Professional	14	\$300.00
	Student	10	\$100.00
SC-07: Isotopes (including noble gases) applied to geothermal resources	Professional	3	\$450.00
	Student	6	\$150.00
SC-08: Scaling predictions of mine waste geochemistry with reactive transport modelling	Professional	7	\$800.00
	Student	13	\$200.00
SC-09: Introduction to data science for geologists	Professional	2	\$600.00
	Student	9	\$150.00
Workshop on geoheritage and geotourism in Canada	Unknown	Unknown	Free of charge with no registration
Total registrant		112	

SC-01: RATES AND DATES: GEO- AND THERMOCHRONOLOGY METHODS AND APPLICATIONS

E. Enkelmann and W. Matthews (University of Calgary)

Date: May 16th, 2019

Duration: 1 day

Description: Geo-and thermochronology are radiometric dating techniques that allow scientists to quantify the timing of geologic events and with this the duration and rates of geologic processes. These methods differ in their sensitivity to temperatures ranging from mineral crystallization at ~800°C to upper crustal heating and cooling at 50-100°C. This one-day short course provided the principles of radiometric dating and highlighted the similarities and differences between geochronology methods such as zircon U-Pb dating and thermochronology methods such as fission track and U-Th/He dating.

Associated theme: Geosystems and Hydrogeosystems

Associated special session/Field trip: Quantifying timing and rates of geologic processes (SS-GH20)

Sponsoring organisation: University of Calgary

SC-02: CRITICAL THINKING IN AQUIFER TEST INTERPRETATION

C.J. Neville (S.S. Papadopulos & Associates, Inc.)

Date: May 16th, 2019

Duration: 1 day

Description: The course was structured as a combination of formal lectures and discussion of case studies. The course took a rigorous yet practical approach towards the diagnosis of aquifer response and the estimation of representative aquifer properties from pumping tests. The lectures and discussion were designed to go beyond the nuts-and-bolts of aquifer test interpretation and addressed concepts of critical thinking in the interpretation of pumping tests. The course was not devoted to any particular computer-assisted interpretation package, but such methods were used to demonstrate some of the concepts. Dr. Silvain Rafini (UQAC) presented a lecture on conceptual models for pumping tests in fractured and faulted media. Attendees were provided with comprehensive, detailed course notes. These notes were intended to be formal technical documents that will serve for subsequent self-study. In addition, copies of the course slides and accompanying papers were made available for attendees.

Associated theme: Geosystems and Hydrogeosystems

Associated special session/Field trip: n/a

Sponsoring organisation: IAH Canadian National Chapter

SC-04: INDICATOR MINERAL EXPLORATION METHODS

G. Beaudoin and S. Makvandi (Université Laval)

Date: May 12th, 2019

Duration: 1 day

Description: Indicator minerals have become an important exploration method in the past 30 years and now are widely used to detect a variety of ore deposit types including diamond, Au, REE, Ni-Cu-PGE, porphyry, VMS, IOCG and IOA. This short course provided an overview of indicator mineral methods and their application in a variety of terrains, and presented new developments and discoveries in this field. This course was a combination of presentations by speakers from the Geological Survey of Canada (R. Paulen, A. Plouffe), Overburden Drilling Management Limited (ODM; world-class mineral processing laboratory), and NSERC-Agnico Eagle Industrial Research Chair in Mineral Exploration (G. Beaudoin, X. Huang, S. Makvandi, H. Liu).

Associated theme: Resources, Energy and Environment

Associated special session/Field trip: Indicator minerals and exploration methods (SS-RE6)

Sponsoring organisation: Overburden Drilling Management

SC-05: ORE SYSTEMS WITH IOA, IOCG, IOU AND AFFILIATED DEPOSITS

L. Corriveau (CGC-Québec), E. Potter (CGC-Ottawa), D. Harlov (GFZ), X.-F. Zhao (China University of Geosciences)

Date: May 11-12th, 2019

Duration: 2 days

Description: Iron oxide and alkali-calcic alteration systems host iron oxide-apatite (IOA), iron oxide copper-gold (IOCG), iron oxide-uranium (IOU) and polymetallic skarns and albitite-hosted deposits and their REE, Co, Bi, Mo, Re and U variants. They are characterized by unique fluids, melts and fluid-rock reactions that generate polymetallic ores and diagnostic metasomatic rocks. The course provided an overview of the geological, mineralogical, structural and geochemical attributes of these ore systems and their magmatic and tectonic contexts using the Great Bear magmatic zone (for its stunning exposures) and global reference settings (e.g., the Olympic Cu-Au province, Chinese examples and the Andes). Observations on the space-time relationships among deposits and alteration facies were reconciled with current understanding of fluids, melts (including iron oxide and salt melts) and metasomatic reactions to further knowledge on mineralization paths from depth to surface. The mineral potential of significantly under-explored North American and Chinese settings, such as those of the Great Bear magmatic zone, Central Mineral belt, Grenville Province, Kangdian and Xinjiang districts, and Middle-Lower Yangtze River metallogenic belt, was then addressed through comparison with mining districts of the Olympic Cu-Au province and the Andes. Finally the course reviewed the footprint of a Grenvillian case example metamorphosed to granulite facies to

optimize exploration of Precambrian terranes in Canada and globally. Sample collections from Canadian, Chinese and Chilean districts were available for hands-on activities.

Associated theme: Resources, Energy and Environment

Associated special session/Field trip: Ore systems within IOA, IOCG, skarn and polymetallic albitite-hosted deposit, a symposium in memory of Dr. Patrick Williams (SY-RE5)

Sponsoring organisation: Mineral Deposits Division (GAC)

SC-06: LASER ABLATION APPLIED TO ORE DEPOSITS

S.-J. Barnes and D. Savard (UQAC)

Date: May 16th, 2019

Duration: 1 day

Description: Laser ablation mass spectrometry analysis (LA-ICP-MS) offers numerous opportunities to improve our understanding of, and exploration for, ore deposits. This workshop outlined new developments in laser ablation instrumentation; LIBS, LAMIS, femtosecond-laser, time of flight (TOF) mass spectrometry and triple-quad (LA-ICP-QQQ-MS). In addition, practical examples on the use of laser ablation analysis of apatite, carbonates, Fe-oxides, sulfides and isotopes in ore deposit studies were presented. The course was suited to all, from beginner to more advanced LA-ICP-MS users. Participants were encouraged to bring 3-4 “PowerPoint” slides to present some of their own projects or challenges, in line with the workshop’s topic. Poster presentations were also welcome. This course comprised presentations from numerous speakers, including L. Danyushevsky (CODES Analytical Laboratories, University of Tasmania), R. Russo (Lawrence Berkeley National Laboratory), D. Savard (UQAC), S.-J. Barnes (UQAC), P. Bédard (UQAC), S. Dare (UQAC), R. Girard (IOS Services Géoscientifiques), Y. Lahaye (Geological Survey of Finland), D. McLeish (McGill University), D. Gaboury (UQAC), and B. Georg (Agilent Technologies).

Associated theme: Resources, Energy and Environment

Associated special session/Field trip: n/a

Sponsoring organisation: Applied Spectra, TOFWERK, IOS Services Géoscientifiques, Agilent technologies, Arianne Phosphate, LabMaTer (UQAC), Mineral Deposits Division (GAC)

SC-07: ISOTOPES (INCLUDING NOBLE GASES) APPLIED TO GEOTHERMAL RESOURCES

D. L. Pinti (GEOTOP, UQAM), O. Shouakar-Stash (IT2 Isotope Tracer Technologies Inc., University of Waterloo)

Date: May 12th, 2019

Duration: 1 day

Description: This course focused on deep conventional convective geothermal resources, and how isotopes, in particular noble gas isotopes, are useful tracers of fluid sources, transport, and residence times, as well as of the processes affecting reservoirs under exploitation (boiling, brine re-injection, etc.). Understanding fluid sources and estimating their residence times is critical to evaluate the lifetime of the exploited reservoirs.

Associated theme: Resources, Energy and Environment

Associated special session/Field trip: Applications of noble gases in hydrogeology (SS-GH1)

Sponsoring organisation: IT2 Isotope Tracer Technologies Inc.

SC-08: SCALING PREDICTIONS OF MINE WASTE GEOCHEMISTRY WITH REACTIVE TRANSPORT MODELLING

R. Amos (Carleton University), D. Blowes (University of Waterloo), D. Wilson (University of Waterloo)

Date: May 11-12th, 2019

Duration: 2 days

Description: The mining industry has worked diligently in the past decades to reduce the environmental impacts of mining to meet ever increasing regulation and heightened community awareness. An important aspect of a life-of-mine plan requires long-term planning of mining operations and waste-disposal facilities at early stages of operation to aid in the prediction of waste effluent quality. Specifically, the prediction of effluent quality from waste-rock is generally based on humidity cell leach tests on small scale (<1 kg) waste-rock samples that are scaled to large scale waste-rock stockpiles. This scaling is generally attempted using empirical scaling factors that can vary by orders of magnitude and have been shown to be highly site specific. The Diavik Waste Rock Research Project has been ongoing since 2004 with a primary goal of developing mechanistic scaling approaches for predicting waste-rock effluent water quality. Experiments at multiple scales, including humidity cell experiments, 2-m scale field lysimeters and 15-m test-scale waste-rock piles, have been studied in detail to characterize effluent quality and the relevant geochemical and physical parameters. Recent work has shown that at the Diavik site humidity cell leaching rates can be scaled to larger scale field experiments using a well-established mechanistic conceptual model and measured parameters at each scale. This method has been applied using reactive transport modelling to rigorously account for complex geochemical and physical interactions. This scaling method is shown to be successful at the Diavik site but is intended to provide industry with a tool that can be applied to any mining site where waste rock is a concern. The goal of this short course was to introduce industry and other researchers to the scaling method, and the tools used to employ the method, so that the method can be tested and put to use at other mine sites. The target audience was primarily practitioners in the mining community as well as other researchers.

Associated theme: Resources, Energy and Environment

Associated special session/Field trip: n/a

Sponsoring organisation: Global Academy (Carleton University)

SC-09: INTRODUCTION TO DATA SCIENCE FOR GEOLOGISTS

M. Blouin (Geolearn), L. Perozzi (Geolearn), J. Simon (Geolearn), M. Claprood (INRS)

Date: May 11th, 2019

Duration: 1 day

Description: Machine Learning is now everywhere in our lives. With some great applications in the Oil and Gas Industry and Mineral Exploration, it is now increasingly used in the geoscience industry. However, interpretability of the results it produces is a key point that generates apprehension with geoscientists. In this one-day course, speakers reviewed the basic theoretical concepts behind machine learning and outlined the history of its developments and the major algorithms relevant to the different applications in geoscience. They presented applications in geosciences, the upsides of these methods and the major pitfalls to avoid. Through practical exercises, participants were introduced to unsupervised clustering algorithms (e.g. K-Means), dimensionality reduction techniques (e.g. PCA) and supervised methods like random forest and neural networks. No prior coding or data science knowledge were required, but a strong interest in either statistics, modelling or data analysis were recommended. Exercises were completed using a user-friendly and intuitive interface for data mining and Machine Learning.

Associated theme: Data Science for Geosciences

Associated special session/Field trip: Machine learning as an interpretation tool for geologists (SS-DS4)

Sponsoring organisation: Geolearn

WORKSHOP ON GEOHERITAGE AND GEOTOURISM IN CANADA

A. Desrochers (University of Ottawa), P. Verpaelst (Canadian National Geoparks Committee), M. Malo (INRS)

Date: May 15th, 2019

Duration: ½ day

Description: The workshop was held after the special session SS-GS01 at the Quebec City Convention Centre on Wednesday afternoon. The workshop in the form of a panel has complemented the special session and focused on geotourism in Canada. The workshop brought together several interested stakeholders (i.e. geoscientists, decision makers, planners, conservation and tourism specialists, and the general public) from Canada and elsewhere who had different perceptions of geoheritage.

Associated theme: Geoscience and Society

Associated special session/Field trip: Geoheritage: from local to international (SS-GS01)

Sponsoring organisation: Canadian Commission for UNESCO

Annexe 4. Report for the field trips / Rapport pour les excursions

Sébastien Castonguay (sebastien.castonguay@canada.ca)

After calls for proposals, nine field trips were initially organized and offered, for both before and after the conference, from day-trips to multi-day far-reaching tours that covered a range of topics (see also, Castonguay, S., 2019. Québec 2019: GAC–MAC–IAH Joint Annual Meeting Field Trips. *Geoscience Canada*, 45(3-4), 163-165. <https://doi.org/10.12789/geocanj.2018.45.141>). Most trips were related to proposed special sessions and a few trips were sponsored by the scientific associations.

The original list of proposed fieldtrip and their proponents included:

- The Upper Ordovician succession in the Quebec City area: transition from carbonate to clastic forelands (Denis Lavoie, Geological Survey of Canada); 1 day
- Champlain Sea deltas and the St-Narcisse Moraine in the Portneuf and Mauricie regions of southern Quebec: 3-D stratigraphic modeling and regional aquifer systems (Michel Parent, Geological Survey of Canada); Sponsored by the International Association of Hydrogeologists (IAH-CNC); 1 day
- The Charlevoix impact structure and seismic zone (Léopold Nadeau, Geological Survey of Canada retired and Gordon Osinski, University of Western Ontario); sponsored by the GAC Planetary Science Division; 1 day
- Magnetite-apatite (MtAp) deposits and related rocks in the Adirondack Mountains, New York State (John M. Hanchar, Memorial University, et al.; 3 days
- Québec, fortified City: Geological and Historical Heritage (Sébastien Castonguay, Geological Survey of Canada); 1 day
- The Thetford Mines ophiolite and its orogenic context (Alain Tremblay, UQAM and Jean Bédard, Geological Survey of Canada); 2.5 days
- Impact of an irregular margin on the sedimentary evolution of a narrow shelf-slope environment (Quebec City area) (Pierre A Cousineau, UQAC and Hugues Longuépée, Champion Iron Ltd) ; 1 day
- Geohéritage of the Gaspé Peninsula: examples of the Percé UNESCO Global Geopark and the Miguasha World Heritage Site (André Desrochers, University of Ottawa; Michel Malo, INRS-ETE and Daniel Brisebois, MERN retired); Under the patronage of the Canadian Commission for UNESCO; 4 days
- Geohéritage in development: the Charlevoix Astrobleme Aspiring Geopark (Pierre Verpaelst, Canadian National Committee for Geoparks); Under the patronage of the Canadian Commission for UNESCO; 3 days

Organizers were asked to produce a budget for their trips and establish a cost per person, based on maximum and minimum participation, in order to break-even at 75% of the maximum capacity. Field trips were cancelled if they failed to reach 60% of the maximum

capacity by the early registration deadline, unless a sponsor formally agreed to compensate by providing funds to equilibrate the budget.

Unfortunately, only three trips reached the minimum number of registrants and were delivered as planned, returning balanced budgets (see budget table below). The successful trips were all one-day events, and relatively low-cost. For example the Charlevoix and Champlain Sea trips were offered at a cost of 125\$ for professionals, 50\$ for the first 5 student registrants, lunch, guidebook and bus transportation included.

High-quality field guides were produced, although no formal/mandatory formatting requirements were proposed. Only a common cover page was added to the main text of the guides in order to get a uniform presentation with the basic information and conference logos. To limit expenses, only the needed number (participants and leader-s) of hard copies were printed.

The field trip ‘Champlain Sea deltas and the St-Narcisse Moraine in the Portneuf and Mauricie regions of southern Québec: 3-D stratigraphic modeling and regional aquifer systems’ took place on May 12th, the nice and sunny Sunday preceding the joint GAC-MAC-IAH/CNC in Québec City. The field trip, led by Michel Parent and his colleagues from INRS-ETE (René Lefebvre, Jean-Marc Ballard, and Guillaume Légaré-Couture) and from the consulting industry (Yves Leblanc), was attended by a group of 18 participants, consisting mostly of hydrogeologists but also including a few Quaternary geologists. The group visited a series of 6 sites (Shannon-Valcartier, Pont-Rouge, St-Raymond, St-Léonard, St-Alban, and Charette) providing an overview of the Portneuf and Mauricie regions which host some of the largest, most productive and widely used granular aquifers in southern Québec.



Participants standing at the top the Jacques-Cartier River delta in Pont-Rouge.



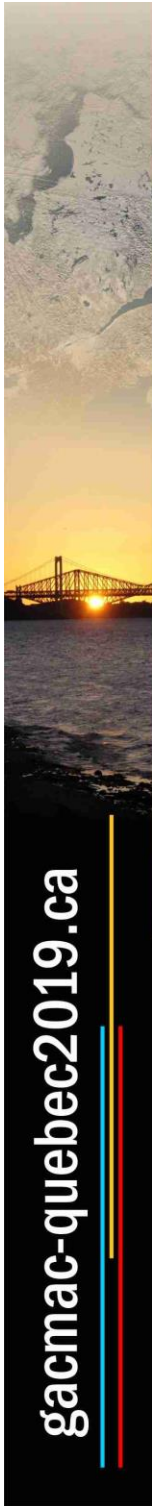
Dr. Leopold Nadeau of the GSC identifying shatter cone structures from the Charlevoix Impact Crater near Baie Saint-Paul, during the GAC-MAC-IAH 2019 field trip.

The Charlevoix impact structure and seismic zone (Léopold Nadeau, Geological Survey of Canada retired and Gordon Osinski, University of Western Ontario) field trip was sponsored by the GAC Planetary Science Division. Eighteen (18) participants attended the trip on Sunday May 12th. Located less than 125 km east of Quebec City, the Charlevoix impact structure is among the largest, ~54 km in diameter, and is the most accessible meteorite impact structure in eastern North America. The impact structure, at the heart of the Charlevoix Seismic Zone, overprints Iapetus rift faults and Logan's Line, which marks the edge of the Appalachian Orogen. The Charlevoix Seismic Zone is the locus of the highest seismic hazard in continental eastern Canada.

The Québec, fortified City: Geological and Historical Heritage (Sébastien Castonguay, Geological Survey of Canada accompanied by a Parks Canada guide) field trip was a relaxed walking urban tour through the streets of Old Quebec that combines geology and history with a multidisciplinary perspective. Twenty-one (21) participants attended the pre-meeting trip on Sunday May 12th. Quebec City is located at the junction of three geological provinces, bestowing upon it a unique geological panorama, which includes a historical district that dates back to the first days of the colony.

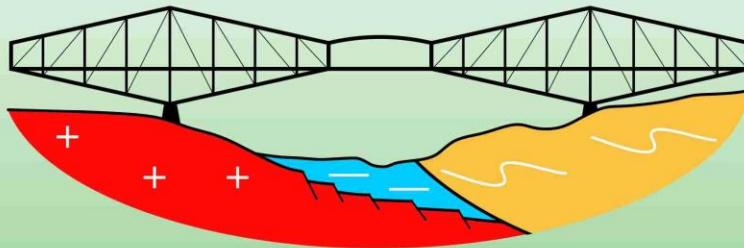
Budget Summary

The Charlevoix impact structure and seismic zone						
Léopold Nadeau (Geological Survey of Canada (retired)), Gordon Osinski (University of Western Ontario)						
Revenues	\$1,875.00					
Expenses:	\$1,287.01					
Profit:	\$587.99					
Total Professional	Total Students	Professional	Students	Total Prof	Total Student	Total Income
13	5	\$125.00	\$50.00	\$1,625.00	\$250.00	\$1,875.00
Description	Cost without taxes					
Transportation/Bus	\$625.00					
Guide/Notes - Printing	\$144.89					
Food for meals and snacks	\$366.97					
Pre-trip planning mileage	\$150.15					
Total Expenses:	\$1,287.01					
CHAMPLAIN SEA DELTAS AND THE ST-NARCISSE MORAINÉ IN THE PORTNEUF AND MAURICIE REGIONS OF SOUTHERN QUÉBEC						
Michel Parent (Geological Survey of Canada)						
Revenues	\$1,375.00					
Expenses:	\$1,383.97					
Deficit:	-\$8.97					
Total Professional	Total Students	Professional	Students	Total Prof	Total Student	Total Income
9	5	\$125.00	\$50.00	\$1,125.00	\$250.00	\$1,375.00
Description	Cost without taxes					
Lunch Boxes & Beverages/Ice pack	\$346.74					
Transportation/Bus	\$650.00					
Field Guide/Notes/Supplies	\$360.98					
Pre-trip planning mileage	\$26.25					
Total Expenses:	\$1,383.97					
Québec, fortified City: Geological and Historical Heritage						
Sébastien Castonguay (Geological Survey of Canada)						
Revenues	\$525.00					
Expenses:	\$401.75					
Profit:	\$123.25					
Total Professional	Total Students	Professional	Students	Total Prof	Total Student	Total Income
14	7	\$25.00	\$25.00	\$350.00	\$175.00	\$525.00
Total Professional	Total Students	Professional	Students	Total Prof	Total Student	Total Income
14	7	\$25.00	\$25.00	\$350.00	\$175.00	\$525.00
Description	Cost without taxes					
Lunch Boxes & Beverages	\$401.75					
Total Expenses:	\$401.75					



AGC-AMC-AIH GAC-MAC-IAH

Où les géosciences convergent



Where geosciences converge

QUÉBEC 2019

MAI 12 MAY

FIELDTRIP GUIDEBOOK FT-02

CHAMPLAIN SEA DELTAS AND THE ST-NARCISSE
MORaine IN THE PORTNEUF AND MAURICIE REGIONS
OF SOUTHERN QUEBEC: 3-D STRATIGRAPHIC MODELING
AND REGIONAL AQUIFER SYSTEMS

M. PARENT, R. LEFEBVRE, Y. LEBLANC, G. LÉGARÉ-COUTURE, J.-M. BALLARD



GEOLOGICAL
ASSOCIATION OF CANADA
ASSOCIATION
GÉOLOGIQUE DU CANADA

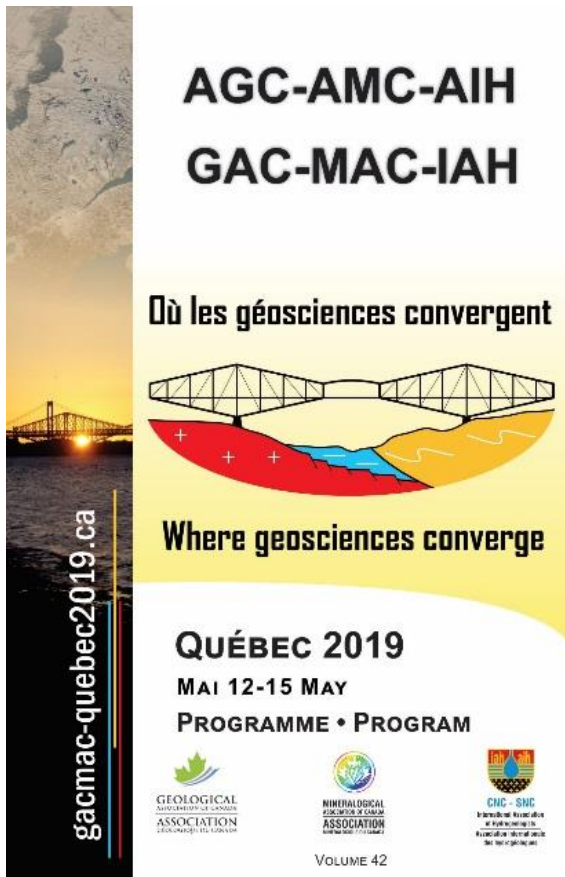


MINERALOGICAL
ASSOCIATION OF CANADA
ASSOCIATION
MINÉRALOGIQUE DU CANADA



CNC - SNC
International Association
of Hydrogeologists
Association internationale
des hydrogéologues

Annexe 5. Report for the publications / Rapport pour les publications



The publication committee contributed to the redaction and the publication of the first and second circulars and of the abstract volume and the program. It carefully edited the abstracts received from the scientific committee, refined the format of the abstract volume and the program based on best practices of previous meetings, added citations of medal and award winners, personalised the meeting with photos of the committee members, keynote speakers and award winners, and published a 204 page abstract volume and a 144 page program. Templates for both documents should be easy to reuse for future meetings (contact Louise Corriveau for the template: louise.corriveau@canada.ca).

The publication committee was chaired by Louise Corriveau, Geological Survey of Canada, and included Jean-Luc Pilote (Geological Survey of Canada), Crystal Laflamme (Laval University) and Aicha Achab (retired from INRS). The committee would like to thank James Conliffe (GSNL/GAC®), Karen Dawe (GAC®), Eleonor

Penney (GAC®), Étienne Girard (GSC), Marco Boutin, and Normand Tassé (retired INRS) for their help with publications.

Format and contents of abstract volume and program

The 144 page pocket-size program volume was printed and distributed at the meeting; it was also available on-line (via the website and mobile application) and on a memory stick. The 204 page abstract volume was not printed; it was available on-line and on a memory stick.

The program was written in French and English: the title page, the sponsors, the welcoming address and the themes of the GAC-MAC-IAH 2019 followed by an overview of the associations, the organizing committee, some delegate information, including maps, information for presenters, the exhibits, the business meetings, the awards luncheons, the social events and a page for the meeting hubs. This was followed by the scientific program, followed by information on the presidential address, the plenary talks, the GAC-MAC-IAH awards, the medallist addresses. Final sections included information on the mineral exposition, the social events for all, the short courses and workshops and the fieldtrips, a

program at a glance, the symposia and sessions, including poster session. An author index and a one page program were also provided.

The abstract volume was also in French and English. It included a welcome address, a description of the associations and the meeting themes, followed by the plenary sessions, GAC@-MAC-IAH awards and addresses, the CJES award, the symposia, the special sessions, the general sessions and the abstracts. Headshot photos of keynote speakers and organizing committee were included to help to showcase the increasingly inclusive nature of GAC-MAC meetings.

The format of both volumes was refined; they included the usual technical information for delegates and additional information was added: citations of medal and award winners, photos of keynote speakers and award winners, as well as those of the LOC. In addition, the publisher notes were expanded with keywords, a preferred citation for the abstracts, and the associations were briefly presented. French and English texts were provided side by side along 2 column pages with distinct colours, black and blue (which we tested on a color blind colleague to ensure readability).

The committee has put significant efforts on the information layout, page layout and in translating and editing texts throughout the volume to ensure that quality be optimized. The formatting required many iterations to ensure clarity throughout the volumes. Previous meeting LOCs generously provided examples to us to help finalize the layout of the program and the abstract volume, and the excellence of their work is sincerely acknowledged.

Editorial decisions were numerous, among them acquiring and formatting photos for the volumes was very time consuming but we found that it gave the meeting a look that attracted interest and highlighted the many successes of our scientific communities, especially with the breath of the meeting keynotes in terms of age, genders, diversity, and science and societal topics. For the committee, it was very rewarding to see the meeting unfold in front of our eyes as we were creating the publications.

In the abstract volume, authors for abstracts were listed below the abstract title with short addresses (name, main affiliation, country) in order for each author to fill a single line. We choose to have a single author per line to highlight how diverse and international collaborations are among our geosciences.

Edition of abstracts

To optimize uniformity of abstracts and ensure a nice layout for the abstract volume, abstracts received from the scientific committee required reedition through the following steps:

1. addresses to be shortened and made uniform,
2. references, contribution numbers, reference citations and acknowledgment removed, and
3. special characters to be changed (and their meaning to be identified).

In some cases, revisions to abstract text were still absolutely needed for publication. This has met a lot of additional work for some of the committee members and a clearer request

to sessions and symposia organizers and further revisions by the scientific committee may help avoid this additional work for the publication committee.

Annexe 6. Report for the social activities / Rapport pour les activités sociales

Félix-Antoine Comeau (felix-antoine.comeau@ete.inrs.ca)

Six social events were organized for conference delegates, each detailed below. Two events had to be cancelled.

1. The **Private walking tour of Old Québec** was held on the Sunday afternoon (May 12th) prior to the Ice Breaker, from 1-4 pm. Led by a professional guide of *Tours Voir Québec*, this walking tour showcased the Upper town and the Lower town of Old Quebec through its history, architecture and culture. The event just reached the minimum capacity of 10 participants, out of a maximum of 40. The participants first gathered at the meeting point (Quebec City Convention Center) and were returned to the same location at the end of the activity by the guide.
2. A **St-Roch Quebec Food Tour** was supposed to be held from 11 am to 2 pm on Monday (May 13th), the first day of the conference proper. This guided walking tour, led by *Local Québec Visites gourmandes*, offered 6 tasting locations showcasing the rich and vast Saint-Roch neighbourhood's foodscape, where each stop offered its own refined expertise and unique flavours. However, the event had to be cancelled, as the minimum number of participants of 10 was not reached.
3. A **Québec City Craft Breweries and Beer Tasting Tour** was held, following completion of the first day of the conference, on Monday (May 13th) from 6-9 pm. The participants first gathered at the meeting point (Quebec City Convention Center) and were then led on foot by a professional guide into the heart of Québec City's craft beer scene: the St-Roch neighborhood. The event just reached the minimum capacity of 10 participants, out of a maximum of 36.
4. A **Dinner cruise on the St. Lawrence River** on board the Louis-Joliet tourist boat with restaurant was organised on Tuesday night (May 14th) from 6 to 11 pm. The participants were accompanied by volunteers during the 20-minute walk from the meeting point (Quebec City Convention Center) to the boarding pier, crossing the heart of the Historic District of Old Québec. During the cruise, participants greatly appreciated the picturesque views of Old Quebec, Montmorency Falls, the Island of Orleans, as well as the trip under the Quebec and Pierre-Laporte bridges. The dinner included a 3-course Table d'Hôte (2 main course choices) and 2 drinks. This quantity was deemed satisfactory by all participants.
5. The field visit to the Thetford Mines region and museum "**The Thetford Mines region: Heritage and impact of a mining past**" was supposed to be held on Sunday May 12. This guided tour of the old mines and the mineralogical museum was cancelled because the minimum number of participants was not reached.
6. A **Student Networking Meeting** was successfully held at the Microbrasserie 3 Brasseurs on Monday night. There was no registration and it was free of charge. Participants had to pay for their own beers.

Annexe 7. Report for the Canadian Minerals Exhibit / Rapport pour l'exposition des Minéraux canadiens du musée de la Nature

Stéphanie Larmagnat (stephanie.larmagnat@canada.ca)

This year, and thanks to the financial support of the CGF, the Canadian Museum of Nature and the GAC-MAC-IAH/CNC 2019 local organizing committee, the meeting program was supplemented by the outstanding traveling Mineral Exhibit of the Canadian Museum of Nature. The mineral exhibit was set in the main hall at the Quebec City Convention Centre.

The minerals exhibit was accessible during the icebreaker party on Sunday night and throughout the following 3 days of scientific conferences. Having world-class minerals displayed on site generated a gathering point for Canadian geoscientists participating at the meeting and encouraged conversations amongst scientists. With beers and poster sessions as well as coffee breaks held in the Exhibition Hall, conference participants were passing through the Mineral Exhibit many times per day.

Outreach activities

In addition, the conference LOC organized a public Discovery Day with Earth Sciences educational activities for Québec City primary and secondary schools, and welcomed 75 students and their professors.

Three distinct groups had demonstrated their interest and attended the Minerals exhibit. The first group (18 students, Sacré-Coeur, Primary school, 4th year) spent an hour and an half on site. The group was split into two. Half of them had the tour of the Minerals exhibit while the other half engaged in educational activities with volunteers, around two main subjects: minerals in every day life, and the water cycle.

The second and third groups were both secondary school groups (30 students, 1st year Collège Saint-Charles Garnier, and 27 students, 2nd year, École Joseph-François-Perrault). For these older students, the groups were also divided into two sub-groups. One half attended the Mineral exhibit and the other part had the opportunity to meet with graduate students in Earth Sciences and discuss their academic pathway and research interests.

A total of 18 volunteers amongst the geoscientific community in Quebec City, including researchers from the Geological Survey of Canada, Research Associates from INRS University, graduate students, and volunteers from the Club minéralogique de Québec participated in public engagement activities during the conference and particularly on May 14th, for the Discovery Day. Volunteers were available all day, from Monday May 13th through to Wednesday May 15th, to present the Minerals exhibit and to answer questions on rocks and minerals. In parallel, a teacher fieldtrip was organised in collaboration with EdGEO. Three secondary school teachers joined the excursion entitled: *Québec, a fortified city: Geological and historical heritage*, on Sunday May 12th.

Promotion of the Minerals exhibit

The promotion of Discovery Day was first made by sending a flyer to Québec City schools located within a 10 km radius around the Québec City Convention Center. The event was

also promoted using several websites or webpages promoting sciences and scientific activities such as:

- <http://www.sciod.ca/event/1523/>
- <https://www.science24heures.com/programmation/les-mineraux-du-musee-canadien-de-la-nature-a-quebec/>
- <https://www.facebook.com/futursimpleckrl?sk=wall&filter=1>

A short article was also published in the online newsletters of La Toile Scientifique (950 readers) on April 30th 2019 (<https://mailchi.mp/40e878de599e/la-toile-scientifique-30-avril-2019>). For the promotion, the LOC received the generous support of GSC-Québec Director, Andrée Bolduc, and valuable help from Jean-Francois Bureau (Geoscience Dissemination Officer, NRCan) and Nathalie Chaperon (Communication Officer, NRCan).

Impact

Besides the immediate enthusiastic reaction from its numerous visitors, some even suggesting re-running the Mineral Day activity in the near future on its own, this time accessible to the public for a longer period; it is still too early to evaluate how the Exhibit has impacted the attendees, one of the primary objectives being to spark interest and questions about minerals and the Earth among elementary and high school students, who are just returning to school. According to the early feedback from teachers who attended the event with their classes, we might well have succeeded with several of their students, even fostering a vocation with some of them.

Activité gratuite

Les minéraux du Musée canadien de la nature
14 mai 2019, 10h-18h
Centre des congrès de Québec
 (1000 Boulevard René-Lévesque E., Québec, QC, G1R 5T8)

L'exposition sur les minéraux du musée canadien de la nature est une exposition de haut calibre qui comprend plus de 90 spécimens spectaculaires ainsi que des stations d'interprétation interactives.



Exposition produite par le Musée canadien de la nature avec le soutien généreux de la société Barrick Gold Corporation et le Temple de la renommée du secteur minier canadien.



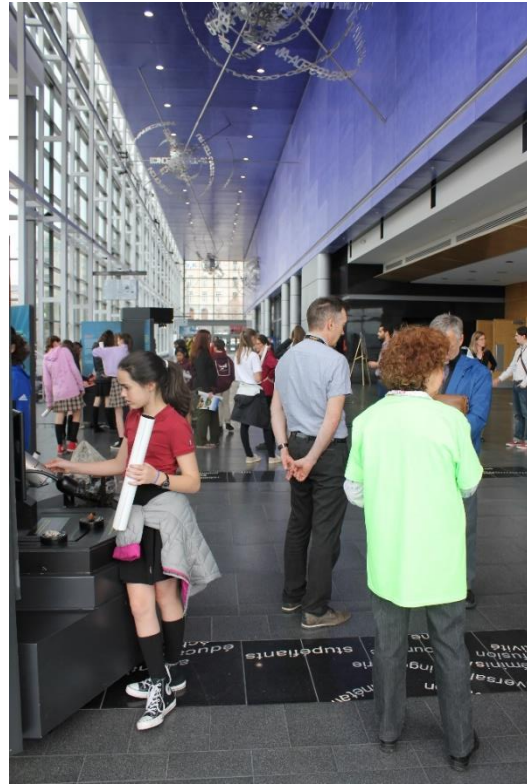
Une journée découverte destinée au grand public est organisée dans le cadre du congrès annuel des associations géologiques et minéralogiques canadiennes qui se tient à Québec en 2019.

Lors de cette journée, différentes activités pourront être offertes telles que des visites guidées de l'exposition ou des ateliers éducatifs sur les propriétés des minéraux. Les visites scolaires gratuites sont offertes, sur rendez-vous, aux élèves de 4^e, 5^e et 6^e année du primaire et à ceux du 1^{er} cycle du secondaire. Nous ne pouvons malheureusement pas payer les frais de déplacement des groupes scolaires.

Pour plus d'informations, contactez-nous : stephanie.larmagnat@canada.ca



Flyer promoting the Minerals exhibit to Quebec City schools



The Minerals exhibit located in a very convenient place, in the heart of the



High school students having a discussion around minerals and their application in everyday life



Primary school students using the interactive displays

Budget

The CGF grant (18-11) funds were used to pay the Circulation Fee of \$6,765 plus applicable taxes and fuel surcharge (\$726.61) for a total amount of \$8,613.48. A copy of the Travelling Exhibition loan agreement and invoice are attached to this report. Additional unforeseen and unfunded expenses to host the activity came up to \$1,300.94 for a final budget expense of \$9,914.42. All the details are presented below. The LOC covered the deficit of 2,514.42 \$.

Canadian Minerals Exhibit at the GAC-MAC-IAH/CNC 2019 joint meeting

Detailed Budget

Revenues	
CGF Grant	\$7,400.00
Expenses	
Circulation fee	\$8,613.48
Congress Centre Additional Fees generated by the Exhibit	
Lift Truck with operator to carry the Exhibit boxes from and to the dock and the Hall and Storage of the Empty Containers	\$540.00
	\$20.25
	\$316.25
	\$57.50
Total Lift charges:	\$934.00
Accessories loan (ladder)	\$37.50
Electrical Outlet access for 3 days	\$160.00
	Subtotal: \$1,131.50
	Total CC fees with taxes: \$1,300.94
	Total expenses: \$9,914.42
	Deficit: -\$2,514.42

Acknowledgements

From the logistics, setup and take down of the exhibit, to the scientific animations for school groups, the Mineral exhibit was a real success thanks to the time and commitment of several people. The LOC would like to warmly express its gratitude to Natalie Jacob, Valérie Bécu, François Létourneau, Jean-François Bureau and Christine Rivard (GSC-Québec), Emmanuelle Cecchi (INRS and Club minéralogique de Québec), André Laforce, Christelle Gagné, Josée Brisson, Michel Turcotte and Bruno Bissonnette (Club minéralogique de Québec), Cynthia Lee, Aymen Nefzi, Ronan Abherve, Thomas Foulon, Émile Boily-Auclair, Jean-Sébastien Gosselin and François Huchet (INRS), and Elyasse Elmrbet (UQAT).

Annexe 8. Report on the use of Facebook / Rapport sur l'utilisation de Facebook

Emmanuelle Cecchi (emmanuelle.cecchi@uqat.ca), Stéphanie Larmagnat (stephanie.larmagnat@canada.ca), Karine Bédard (Karine.Bedard@ete.inrs.ca), et Jean-Daniel Bourgault (Jean-Daniel.Bourgault@ete.inrs.ca)

Mandat de la page

Le but de la page Facebook était de transmettre les informations concernant le congrès : lien vers le programme, divers documents, informations pratiques, etc. Mais la page avait aussi un rôle de support pour les divers partenaires et commanditaires, afin d'afficher leur présence et engagement auprès du congrès.

Le but était également d'avoir un média capable d'annoncer presque simultanément les diverses activités/conférences pendant le congrès, de poster des images dans certains cas, et d'annoncer en direct des changements et des annulations.

Il s'agissait également de tester les capacités d'une page Facebook d'accéder à un public plus grand et de permettre ainsi au congrès d'être plus présent sur les médias sociaux.

Finalement, afin de maintenir l'intérêt des abonnés, des publications ont été créées de façon hebdomadaire dans les mois précédents le congrès.

Personnes participantes

La mise en place de la page, ainsi que les premières publications, a été faite par Karine Bédard, Stéphanie Larmagnat et Emmanuelle Cecchi, avec l'aide technique de Jean-Daniel Bourgault. Par la suite, Stéphanie Larmagnat et Emmanuelle Cecchi ont continué les publications régulières. Pendant le congrès, Emmanuelle Cecchi a assuré les publications quotidiennes.

Statistiques et Résultats

Statistiques générales

La page Facebook a été créée le 9 juillet 2018. Entre le mois d'août et le mois de novembre 2018, de 1 à 2 publications par semaine ont été créées. En décembre 2018, le nombre de publications passe de 2 à 3 par semaine puis de 4 à 5 entre janvier et mars 2019. En avril 2019, il y a plus de 7 publications par semaine. Finalement, pendant le congrès, plusieurs publications étaient publiées par jour.

Les publications ont atteint entre 20 et 40 utilisateurs en moyenne. Il y a 37 utilisateurs qui «Aime» la page Facebook et 44 abonnés.

Statistiques spécifique à la période du congrès

La durée d'analyse spécifique à la période du congrès a été limitée à la période du 1^{er} avril 2019 au 30 juin 2019.

Entre le 1^{er} avril et le 31 mai 2019, 105 publications ont été créés.

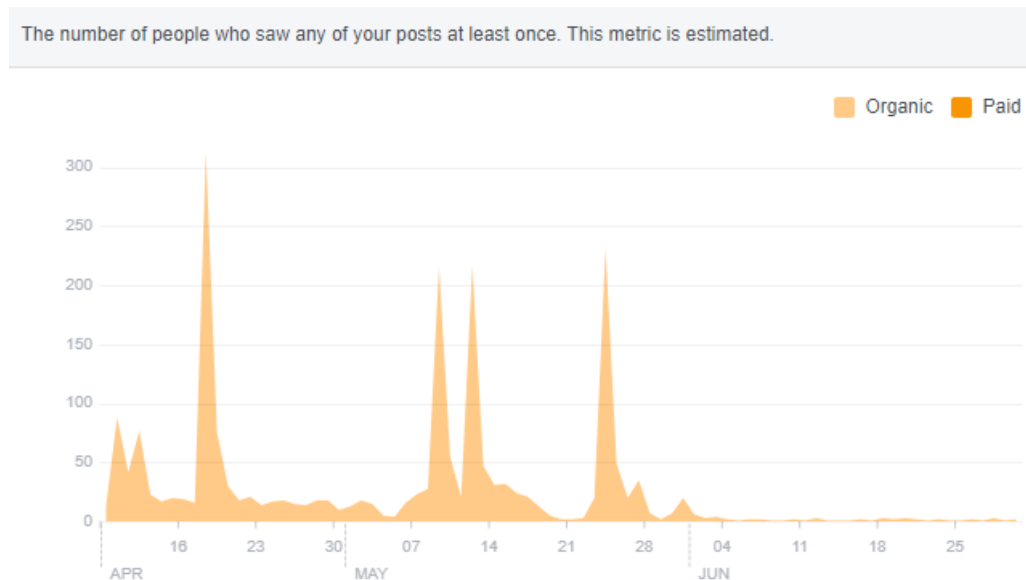
Le 31 mai marque le dernier jour de publication pour le site. Cependant, même 30 jours après la cessation d'activité du site, entre 1 à 10 personnes ont continué à interagir avec la page (i.e. clique, aime, commente).

Les publications avec lesquelles les gens ont eu le plus d'interaction sont :

- 10 avril : publication sur les dates limites d'inscription et les activités sociales (184 interactions)
- 12 avril : publication pour rappeler les dates limites et les inscriptions aux activités sociales (142 interactions)
- 18 avril : publications sur les possibilités pour les étudiants de faire du bénévolat (592 interactions))
- 9 mai : publication sur le congrès et les informations pratiques (403 interactions))
- 12 mai : Annonce de l'ouverture du congrès, résumé et lien vers le programme (333 interactions))
- 17 mai : photos du lunch de l'Association Minéralogique du Canada (469 interactions).

En général, par jour, une vingtaine de personnes ont aimé et/ou interagis avec la page entre le 1^{er} avril et le 31 mai 2019.

La figure suivante illustre le nombre de personne ayant vu la page au moins une fois.



Les publications avec plus de 100 vues correspondent majoritairement avec celles ayant eu le plus d'interaction :

- 18 avril (312 vues – bénévolat étudiant);
- 9 mai (215 vues – congrès/informations pratiques);
- 12 mai (216 – ouverture du congrès/programme) ;

- 24 mai (230 vues), cette date correspondant à la publication partagée du GEOTOP sur la remise du prix Jack Henderson du Canadian Tectonics Group pour la meilleure thèse en tectonique à Morgann Perrot.

Budget

Il n'y a pas eu de coûts associés à la création et l'utilisation de la page Facebook mis à part du temps/personne pour la création et l'entretien de la page Facebook.

Recommandations

Il serait intéressant d'être capable d'avoir une page Facebook stable, continue avec des publications régulières. Ceci assurerait de conserver le public d'une année à l'autre, et ainsi d'augmenter les chances d'être vue par un public plus large.

La maintenance d'une page Facebook, d'un congrès à l'autre, permettrait de faire des publications régulières sur : le(s) futur(s) congrès, les nouvelles en rapport avec le(s) futur(s) congrès, les nouvelles scientifiques de la communauté canadienne, etc.

Il faudrait également assurer un bon dialogue entre la page officielle du congrès de l'année et la page Facebook. Cela signifie notamment que les nouvelles doivent apparaître en même temps, surtout pour des informations importantes comme les changements de programme, les modifications et annulations de sortie de terrain, etc. Les pages Facebook envoient des notifications, en cas d'annulation par exemple, et cela aurait le potentiel de permettre une transmission plus rapide de l'information.

Conclusions

La page Facebook du congrès GACMACIAH 2019 à Québec a eu un certain impact sur le nombre de personnes intéressés et souhaitant être tenues informées du congrès. Les pages Facebook appartenant à d'autres conférences ont parfois republié certaines de nos publications, permettant à un plus grand public d'entendre parler du congrès. Les publications touchant les étudiants ont le plus d'impact, suivies par celles donnant des informations concrètes sur le congrès. La page Facebook permet également d'afficher les logos des partenaires et commanditaires impliqués dans le congrès.

Il serait intéressant de maintenir d'une année sur l'autre une page Facebook, transmise d'un comité organisateur à l'autre après la fin du congrès. Ceci aurait le potentiel d'augmenter la capacité de la page à joindre un public grandissant sur les médias sociaux. Le fait d'avoir à recommencer chaque année la création d'une page semble une perte de temps et un risque de perte d'audience. Le nombre de personne qui suit la page diminue dès que les activités s'arrêtent et aussi dès qu'une page plus intéressante apparaît. Il faudrait bien entendu déterminer les fréquences optimales ainsi qu'une politique de transfert entre les comités organisateurs de chaque année.

Annexe 9. Prospectus for the fund raising / Prospectus pour la campagne de financement



English-Partnership-Exhibition-Prospectus-



Français-Partnership-Exhibition-Prospectu

Annexe 10. List of sponsors and exhibitors/ Liste des commanditaires et exposants

SPONSORS - COMMANDITAIRES

Generic Sponsorships - Commandites génériques			
Sponsor's Name	Category	Theme - Session Sponsored	Amount
Natural Resources Canada	Platinum	Generic	\$10,000.00
Gouvernement du Québec /MELCC	Gold	Generic	\$5,000.00
Minière Osisko inc.	Gold	Name Badge Lanyards	\$5,000.00
Canadian Museum of Nature	Bronze	Session: Mineralogy and Crystallography	\$3,000.00
Mines Agnico Eagle Limitées	Bronze	Session: Gold: Recent Advances	\$3,000.00
Teck Resources Limited	Bronze	Session in honour of Tom Lane	\$3,000.00
INRS	Steel	Generic	\$1,000.00
Ressources Sirios Inc.	Steel	Generic	\$1,000.00
Troilus	Steel	Generic	\$1,000.00
Subtotal:			\$32,000.00
Activity Sponsorships - Commandites d'activités			
Sponsor's Name	Category	Theme - Activity Sponsored	Amount
Canadian Geological Foundation	Outreach Activity	Minerals Exposition	\$7,400.00
Canadian Museum of Nature	Outreach Activity	Minerals Exposition	\$5,000.00
Your Québec City – Business Destination	Plenary talks	Plenary talks	\$4,498.00
Canadian Commission for Unesco	Workshop	Geoheritage and Geotourism	\$3,000.00
Mineral Deposit Divisions (MDD)	Short Course	Ore Systems	\$2,000.00
DEMCo Ltd.	Short Course	Ore Systems	\$2,000.00
Overburden Drilling Management Ltd.	Short Course	Indicator Minerals	\$1,000.00
Applied Spectra	Short Course	LA-ICP-MS Workshop (1,000 US)	\$1,328.43
IOS Services Géoscientifiques inc	Short Course	LA-ICP-MS Workshop	\$1,000.00
Tofwerk USA, Inc.	Short Course	LA-ICP-MS Workshop	\$1,001.48
Municipalité Ile Anticosti	Workshop	Geoheritage and Geotourism	\$884.30
Agilent Technologies Canada, Inc.	Short Course	LA-ICP-MS Workshop	\$500.00
Arianne Phosphate Inc.	Short Course	LA-ICP-MS Workshop	\$500.00
EdGeo	Field Trip	The Thetford Mines region	\$300.85
Subtotal/Sous total:			\$30,413.06
Advertising in Program Book - Publicité dans le programme			
Sponsor's Name	Category	Item Sponsored	Amount
Beta Analytic, Inc.	Full page inside back cover	Program Book	\$2,000.00
Canadian Science Publishing (CSP)	Full page any location	Program Book	\$1,000.00
Subtotal/Sous total:			\$3,000.00
Total Sponsorships/Total des commandites:			\$65,413.06

Commercial Exhibition - Exposition Commerciale

EXHIBITORS - EXPOSANTS
Commercial
Hoskin Scientifique IOS Services Géoscientifiques Inc. Isomass Scientific Opti-Tech Scientific Inc. Proto Manufacturing Ltd. Ressources Mines et Industrie (RMI) SEMM Logging
Universités - Universités
A. E. Lalonde AMS Laboratory, University of Ottawa Laurentian University Memorial University The Institut national de la recherche scientifique (INRS) - L'Institut national de la recherche scientifique (INRS) Université du Québec en Abitibi-Témiscamingue Université Laval
Not-for-Profit Associations /Foundation - Associations/Fondation à but non lucratif
Elements Geological Association of Canada - Association Géologique du Canada Geological Society of America International Association of Hydrogeologist - Association internationale des hydrogéologues Mineralogical Association of Canada - Association minéralogique du Canada The CIM Foundation / La fondation de l'ICM
Government Agencies
Canadian Museum of Nature - Musée Canadien de la Nature Ministère de l'Énergie et des Ressources naturelles Quebec Geoscience Centre (QGC) - Centre géoscientifique de Québec (CGQ)
Others
GeoConvention 2020, Calgary Public Outreach activities - Activités grand public

24 Exhibitors spread throughout 30 booths participated to the commercial exhibition
24 exposants répartis sur une trentaine de kiosques ont participé à l'exposition commerciale

7 commercial vendors - 7 compagnies
6 universities - 6 universités
6 Not-for-profit Associations/Foundation - 6 Associations/Fondation à but non lucratif
3 Government Agencies - 3 Organismes Gouvernementaux
GeoConvention 2020, Calgary
Public Outreach activities - Activités grand public

Total exhibiting revenue - Revenu total de l'exposition commerciale: \$24,600

Annexe 11. Report on incomes and expenses / Rapport des revenus et dépenses

GAC-MAC-IAH Quebec 2019 Income Statement 2019-01-01 to 2019-12-31

REVENUE	
Technical Program	
Abstract Fees	11,082.16
Meeting Registrations	255,057.72
Exhibitor Registrations	24,618.13
Sponsorship Minerals Exhibit	12,400.00
Sponsorships Generic	32,000.00
Advertising in Program Book	3,000.00
Net Sales	<u>338,158.01</u>
Short Courses	
Registration	34,915.00
Sponsorships	9,630.74
Total Short Course Revenue	<u>44,545.74</u>
Field Trips	
Registration	3,633.00
Total Field Trips Revenue	<u>3,633.00</u>
Plenary/Workshop	
Sponsorships	8,382.30
Total Plenary/Workshop	<u>8,382.30</u>
Social Events	
Societies Luncheon Registration	11,515.00
Social Events Registration	8,542.13
Total Social Events Revenue	<u>20,057.13</u>
Transportation	
Bus Passes	399.00
Total Transportation Revenue	<u>399.00</u>
TOTAL REVENUE	<u>415,175.18</u>

EXPENSE**Technical Program**

Venue Rental	49,704.24
Audio-Visual Services	51,481.20
Catering	29,042.34
Minerals Exhibit	13,656.61
Publications (Program Printing, USB Key – Program/Abstracts)	8,059.94
Technical Services – Registration, Website & Conference app (JAC, Confex)	8,736.75
Posters (Furniture)	3,360.00
Exhibiting (Floor plan, Furniture & Carpets)	6,776.00
Total Programs Cost	170,817.08

Field Trips

Accommodation	0.00
Transportation	1,275.00
Catering	1,129.44
Printing	491.89
Supplies	137.97
Planning	176.40
Total Field Trips Expenses	3,210.70

Short Courses

Catering	5,506.19
Printing/Courses Notes	1,416.79
Speakers Registration - Complimentary	5,050.00
Speakers Travelling Expenses	10,068.93
Sponsors Profit	7,396.14
Total Short Course Expenses	29,438.05

Plenary/Workshop

Speakers Registration - Complimentary	2,125.00
Speakers Travelling Expenses	5,416.19
Total Plenary/Workshop Expenses	7,541.19

Social Events

Societies Luncheons	9,862.90
Cruise	11,632.41
Tours	1,106.73
Total Social Events	22,602.04

Transportation

Bus Passes	934.50
Total Transportation Expenses	934.50

General & Administrative Expenses

Auditing – <i>Estimated</i>	3,000.00
Advertising & Promotions (RFG 2018 Booth furniture, Volunteers T-Shirt, Lanyard)	1,593.42
GAC HQ Contracted Staff Fees	28,080.02
GAC HQ Staff Traveling Expenses	2,359.64
Office Equipment	562.48
Business Fees & Licences	51.00
Interest & Bank Charges	464.26
GAC HQ Office Supplies (Toner, badges printing, blank cheques)	2,715.14
LOC Miscellaneous Expenses (Dinner and Taxis)	702.14
Total Credit Card Payment Processing Fees	15,281.75
Total General & Admin. Expenses	54,809.85

TOTAL EXPENSE	289,353.81
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NET INCOME	125,821.77
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CONFERENCE REVENUE	\$125,821.77
Distribution to LOC - 20%	\$25,164.35
REMAINING REVENUE	\$100,657.42
Distribution to GAC - 65%	\$65,427.32
Distribution to MAC - 22.5%	\$22,647.92
Distribution to IAH-CNC - 12.5%	\$12,582.18