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September 2020

ENGEOActions

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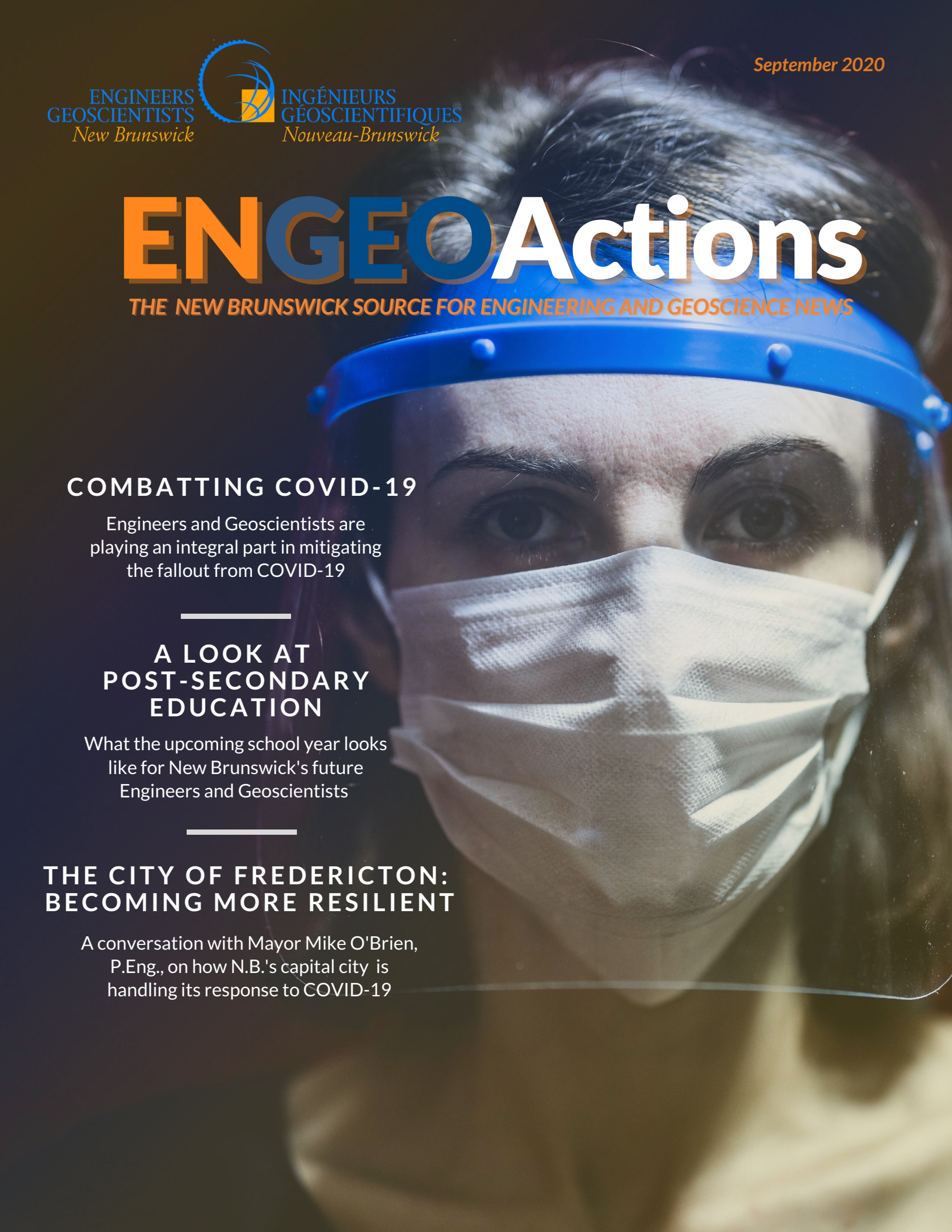

COMBATTING COVID-19

Engineers and Geoscientists are playing an integral part in mitigating the fallout from COVID-19

A LOOK AT POST-SECONDARY EDUCATION

What the upcoming school year looks like for New Brunswick's future Engineers and Geoscientists

THE CITY OF FREDERICTON: BECOMING MORE RESILIENT

A conversation with Mayor Mike O'Brien, P.Eng., on how N.B.'s capital city is handling its response to COVID-19

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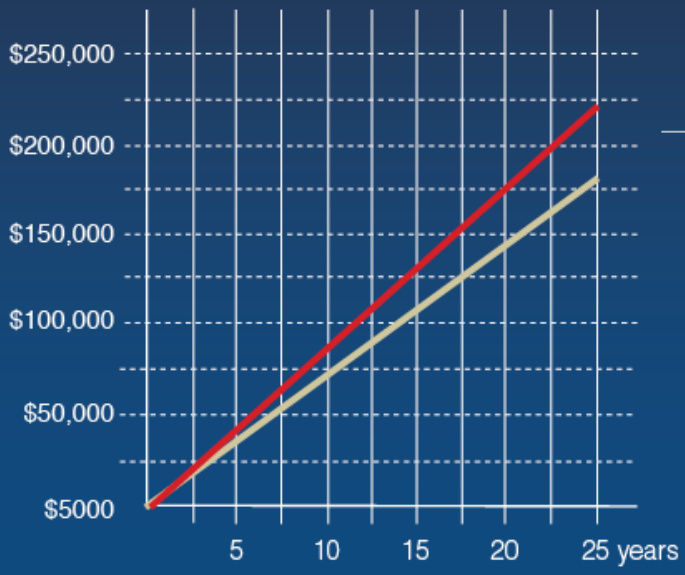

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ENGEOActions

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CONTENTS

OUR MISSION

To protect the public interest by regulating practice and to maintain public confidence in the professions.

OUR VISION

The Association of Professional Engineers and Geoscientists New Brunswick leads the professions as a trusted, integral resource in regulatory matters.

ENGEOActions is published by the Association of Professional Engineers and Geoscientists of New Brunswick (APEGNB).

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Editor's Note

The mandate of Engineers and Geoscientists is to fundamentally protect the public and despite being a relative newcomer to the world of Engineering and Geoscience, I am overwhelmed at the pride, passion and resilience that our registrants have when it comes to combating COVID-19.

This edition of ENGEOActions highlights how the engineering and geoscience professions give their time and energy to help mitigate the spread of COVD-19 and in doing so, uphold their Code of Ethics in protecting the public.

While I have only been part of APEGNB for a short while, I am amazed on a daily basis at just how much of a role that these professions play in not just working to curb a pandemic, but also in day-to-day life. It truly shows that the world needs Professional Engineers and Geoscientists to make it work.

As you will read, our registrants are actively working to ensure there are adequate amounts of PPE for essential workers, providing ethical leadership at all levels of the private and public sectors as well as working tirelessly in labs developing new technologies to help in the fight against COVID-19.

On that same topic, I have enjoyed creating the AN ENGINEER WAS HERE #SettingTheStandard campaign that was launched over the summer months.

It's important that people see the contributions engineers and geoscientists offer, recognize the value you bring, and include your voice in important conversations when it comes to planning, creating and protecting our natural and built environments.

You can see my son Ben (pictured) "helping mom" while visiting Miramichi over the summer.

It's been a pleasure learning and working with APEGNB staff, Council and registrants on various projects so far and I look forward to continuing to showcase the many talents of our registrants (and future registrants) to come.

As we continue to work to improve this magazine, feel free to let us know what type of content you would like to see on these pages.

We are always looking for ideas so please, drop us a line!

Stay safe. Stay healthy.

Lauren Nicholson

LAUREN NICHOLSON

Director of Communications, APEGNB
lauren@apegnb.com

Ben Nicholson,4
Future MIT

Message from the CEO

Within three weeks of assuming my position here at APEGNB last summer, I was thrown fully in a strategic planning session with Council.

During this process, the facilitator led Council through an exploration of the outstanding activities to determine whether they were still priorities.

Several of them remain so, but the discussion at the time evolved into a realization that with changes in staff and volunteer leadership, we needed to ensure that our vision for the organization was aligned, and to commit to organizational values that would help guide us in our work.

From there, a more long-term strategic plan was developed and with the aid of staff, a complete operational plan. The plan was ultimately adopted by Council in June 2020 and will guide our work for the coming months and years ahead. To accomplish this goal, the plan is based on four broad pillars.

1.Ensuring compliance with the Engineering and Geoscience Professions Act and By-laws. This section focuses on confirming that our complaints and enforcement procedures apply principles of fairness and demonstrate best practices in protecting the public interest. Additionally, we will work to ensure that all registrants clearly understand the requirements of registration, compliance, and ensuring the understanding of the purpose of all licenses and designations.

2. Enhancing Stakeholder Awareness. We will be working to establish a robust government relations plan and also work to increase public awareness of the professions and the meaning of the P.Eng. and P.Geo. designations. A public survey is planned for early fall to establish baseline information on this subject. Incorporating content into the public school curriculum is also key to increasing awareness and encouraging future engineers and geoscientists.

3. Modelling Good Governance. Self-regulation only works when members are engaged. Clearly defining the roles and responsibilities of Council and committees, along with appropriate policies and workplans, will ensure that the Association is governed well and working on issues that are important to registrants or stakeholders. The ultimate goal is to ensure that registrants are aware of the work that is being done for the professions.

4. Demonstrating Value to Registrants. Being a regulator whose role is protection of the public interest, APEGNB will focus on identifying opportunities for registrants, specifically supporting the branches and professional development needs, and improving the licensing process through the introduction of competency-based assessment.

A strategic plan is an evolving document that provides a path into the envisioned future for an organization and its members. Tactics have been developed for each area and are regularly evaluated by Council and staff to ensure they are appropriate and effective.

APEGNB Council meets annually in August to review the plan and focus on several key areas. This year, the conversation was directed at establishing an effective government relations plan, an examination of the purpose of certificates of authorization and considering a policy statement on diversity and inclusion.

I'm curious to know your thoughts. Do you feel Council working on items that you care about? What else should you expect from your regulatory body?

Your feedback is welcomed and can be directed either through your regional Council representative or directly to me at the APEGNB office.

LIA DABORN
CEO, APEGNB
lia@apegnb.com

Message from the President

I never thought that during my term as the 101st President of APEGNB, I would be in leading this organization amid a global pandemic.

During a time when the world is scrambling to contain the effects of COVID-19, the roles of Professional Engineers and Geoscientists have never been more defined. Our professions are at the forefront of guiding the change needed to combat the pandemic and lead our organizations through these unprecedented times.

When we think of Engineers and Geoscientists, we sometimes think of extensive and lengthy projects that take multiple years to come to fruition. COVID-19 has changed that. As you will read in this issue, New Brunswick Engineers and Geoscientists are pivoting from their regular "day-to-day" jobs and putting their education, expertise as well as passion for public safety to work to help flatten the curve.

Engineers and Geoscientists are attacking this problem on all fronts, from inventing new designs, to re-purposing and optimizing existing designs and processes to meet the new demands of the pandemic. In times of crisis, the only guarantee of public safety is to have secure, up to date, licensed professionals guiding companies through these changes.

During this crisis I am happy to see these professions standing up and driving society forward. Truly we are living through a period of history where we don't know what the immediate future holds but I hope, based on the evidence and passion that I have seen from our members and beyond, that our "new normal" is one of innovation and creativity.

Our association has spent 100 years advocating for Engineers as well as Geoscientists to be leaders in society, and I'm proud to see us stepping up during this difficult time. It has never been more evident that our professions are leading the response to this pandemic. Although APEGNB's 100th anniversary celebration will be muted this year, 2020 will still be a defining and memorable year for these professions.

The health and safety of our staff, registrants, clients, and communities are our top priority. At the office in Fredericton, the staff are working diligently to follow all government regulated guidelines to retain a safe working environment, while continuing to support the regulatory matters of the members.

I hope everyone is enjoying their summer and perhaps being a 'tourist' for the first time in New Brunswick and the Atlantic Region.

As always, if you have any questions or concerns, please do not hesitate to reach out to me directly.

MARLO ROSE
P.Eng., President, APEGNB 2020
president@apegnb.com

Hi.

The world needs Professional Engineers and Geoscientists.

HELP US SHOW THAT THESE PROFESSIONS MAKE LIFE WORK.

Professional Engineers and Geoscientists set the standards for how the world works.

As the voice of Professional Engineers and Geoscientists in New Brunswick it is our duty to regulate these professions in the province. It's important that people see the contributions engineers and geoscientists offer, recognize the value you bring, and include your voice in important conversations when it comes to planning, creating and protecting our natural and built environments.

Let's come together to share our successes, inspire the future, and create recognition around the work you do to make life better.

100 YEARS ENGINEERS GEOSCIENTISTS New Brunswick 2020 100 ANS INGÉNIEURS GÉOSCIENTIFIQUES Nouveau-Brunswick

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CITY OF FREDERICTON: BECOMING MORE RESILIENT THAN EVER

A CONVERSATION WITH MAYOR MIKE O'BRIEN, P.ENG.

ENGEOActions spoke with Mayor Mike O'Brien of the City of Fredericton (who also happens to hold the designation of being a Professional Engineer) about what it is like governing New Brunswick's Capital City during a pandemic.

Q: What effect has COVID-19 had on the City of Fredericton?

A: It has tested our resilience, and our resolve. Yet, we have highly effective staff at all levels of the organization, and our proven track record of innovation allowed us to quickly adapt and keep the organization functioning and effective.

Within days, we had several hundred staff able to work from home with proper connectivity and technical support, our public safety departments were on novel split shifts to protect the health of the larger units, our EMO operations were up and running; all with solid management and 24/7 oversight on procedures.

Mayor Mike, O'Brien, P.Eng.
City of Fredericton

Q: How has COVID-19 affected the way you do business?

A: One of our major objectives now and in the future, is to turn our municipal operations around to be even more open and transparent. Residents and businesses should be able to interact and engage with City Hall for all their service questions, to access open data, to assist us in refining how we do things and also improving access to city council meetings, committee meetings and the decision making process.

As we quickly adapted to having staff work at home, from having *Zoom* Council meetings open to the media and the public, to digitizing even more public services and processes, we realized we can move even more quickly to achieve this objective. We have no intention of returning to a new normal. We will return better, brighter and more resilient.

Q: What are some of the challenges you have been facing?

A: Sources of revenue have been impacted. By year end, we were facing a budget deficit of perhaps $2.5 million dollars. But to date, through our ever-present innovation processes and strong fiscal planning, we have been able to offset all but $150,000 of this deficit. Come year end, we will still achieve a balanced budget. Some of the savings are certainly due to the cancellation or scaling back of some recreational programs and the like, due to COVID requirements, which has been as disappointing to staff as to residents. We cherish delivering affordable recreational opportunities for all, and look forward to be able to have these back as soon as COVID regulations permit. Our staff have been working tirelessly on keeping things moving, during these disruptive times.

"We have no intention of returning to a new normal. We will return better, brighter and more resilient."

Q: How have the City's operational plans impacted the public?

A: Social distancing, disinfection regulations and budget implications. Some services had to be scaled back or outright cancelled. Transit was only permitted to carry nine passengers per bus for several months and even now cannot function at full capacity. Sports courts and arenas were closed, but now are slowly opening, with restrictions of course. All face-to-face meetings with staff and/or elected officials now had to be via *Zoom* or another platform. That said, municipal services such as building permits, parking permits, and recreational bookings can now be made online, Adapting to COVID forced us to implement these online services faster than anticipated, but despite that, I believe our implementation has been successful thus far.

Q: Prior to COVID-19 did you have a plan to deal with a pandemic?

A: Engineers love to plan, so yes, our City definitely had a plan in place well in advance. The City has a robust, tested and continually updated Emergency Response Plan. It is comprised of two parts – an overall basic plan, and individual plans, for all departments and partner agencies involved in emergency preparedness operations in the City. It addresses disaster preparedness and emergency preparedness, including public health outbreaks. The Emergency Measures Operations Centre was immediately activated, and the EMO team took charge. All City operations were subject to the EMO oversight and approval to ensure all efforts were focused on keeping the public and staff, safe and ensuring that all provincial and Chief Medical Officer directives were being implemented and/or adhered to.

The public can take great comfort in the professionalism of this plan, and the EMO team. We had the public's best interests, and their backs, at every turn.

Q: During this time, what have you needed to change/develop on the fly?

A: We had to respond to the ever-evolving public health directives. What was permissible one week may not have been the next. We had to continually adapt staff deployment to ensure the most crucial tasks were being done and always with proper oversight. We had to make difficult decisions daily on what facilities or programs had to be modified, or closed. As revenues slowed, we had to ensure that all expenditures were being focused on essential services, and make hard decisions to reallocate funds from one program or service to another. Communication internally and with the public was critical, and I am so very proud of how we delivered on both.

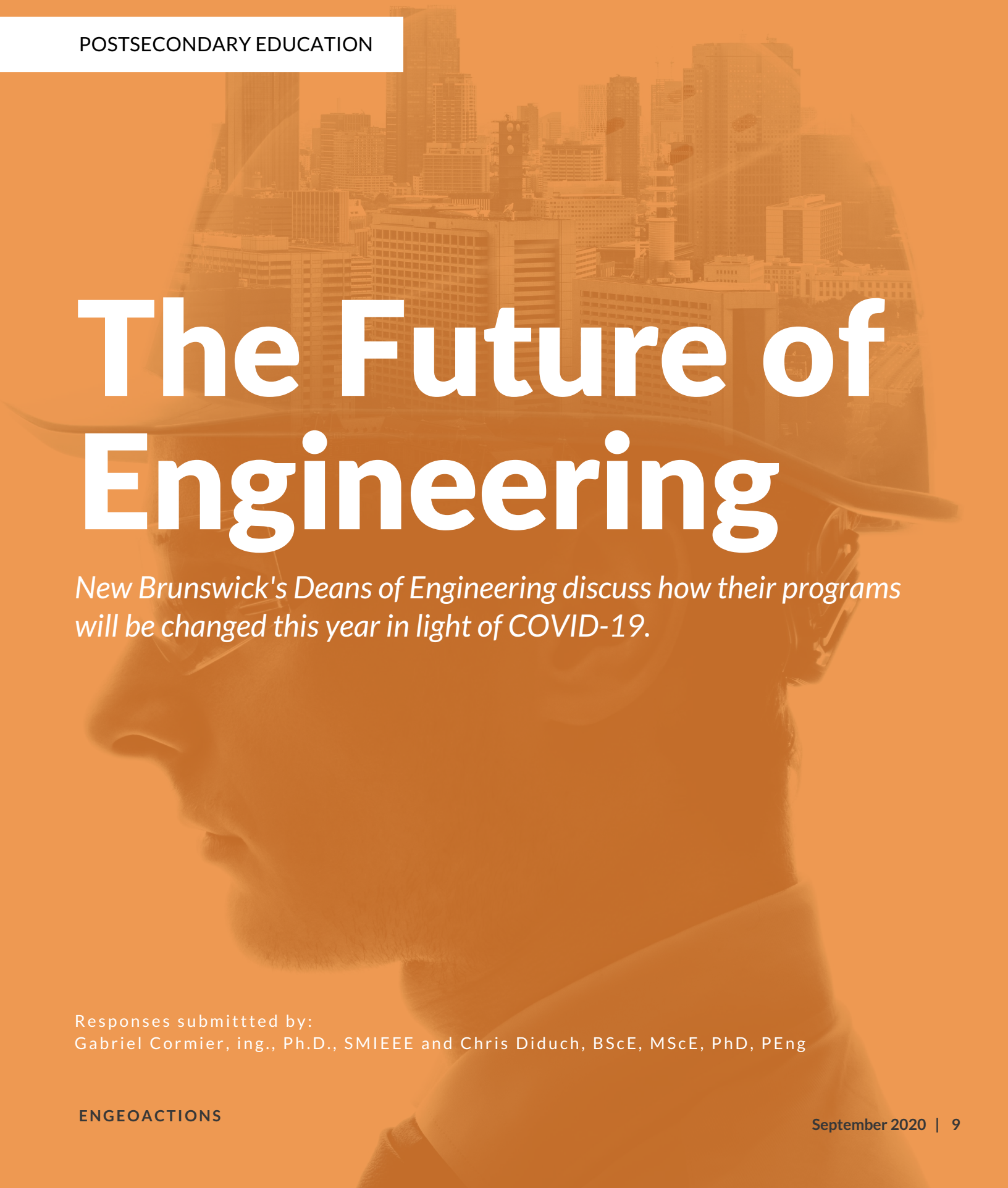
We were able to keep the development community moving forward (essential for the local economy) by switching building permitting to online. We had to keep the water and sewer systems operational and safe, and deliver on emergency road repairs; all while adhering to the COVID distancing and sanitation regulations. We had to immediately switch to online City Council meetings, which was met with its own technology and document challenges in doing so. These are but a few examples of the myriad of challenges thrown at our great staff, and they delivered in spades.

Q: How has your education/training prepared you to handle the complexity of COVID-19?

A: During my term as Mayor, there have been two major spring floods, the tragic shooting deaths of August 2018, and now, a pandemic. During such times and events, one has to maintain composure and provide leadership.

Engineers are adaptive and can maintain composure in times of chaos. We also know that chaos can be eliminated or at least controlled, if you have the proper people and processes in place. I like to think that my education, training and work experience all came into play during those times, as did my 19 years serving on City Council, the last four as Mayor. During times like these, I am so very thankful to the countless people who mentored and assisted me along the way.

"Engineers are adaptive and can maintain composure in times of chaos."



The Future of Engineering

New Brunswick's Deans of Engineering discuss how their programs will be changed this year in light of COVID-19.

Responses submittted by:
Gabriel Cormier, ing., Ph.D., SMIEEE and Chris Diduch, BScE, MScE, PhD, PEng

Université de Moncton's Dr. Gabriel Cormier, (ing., Ph.D., SMIEEE) and University of New Brunswick's Dr. Chris Diduch (BScE, MScE, PhD, PEng.) took time out of their busy schedules to connect with ENGEOActions about what the next semester (and the future) holds for Engineering students in light of COVID-19.

Prior to this upcoming Fall semester, what actions were taken to prepare students and professors for their "new normal"?

Dr. Diduch: Although all engineering schools across Canada were thrust into the reality of online programming for the last 3 weeks of the Winter 2020 term, it is uncharted territory for our students, instructors and our institutions, including our accreditation bodies, to continue in this mode for the entire Fall term of 2020 and perhaps beyond.

Our community of students, researchers, instructors, and staff have been quick to embrace change and meet new challenges. We have taken a thoughtful approach to re-opening and have developed operational plans in accordance with WorkSafeNB and New Brunswick Public Health guidelines that will ensure a safe environment for our community. September 2020 will certainly be different in many ways.

Dr. Cormier: At the University of Moncton, classes closed for two weeks in mid-March to help professors make the transition to online teaching, in order to be able to complete the Winter 2020 term. The lessons learned during those three weeks of online teaching helped to guide us in preparation for the Fall term. We did a survey of our students at the end of the term, and most were satisfied with the transition to online teaching, and few experienced technical difficulties connecting to class materials (live online courses, class materials, etc.).

To prepare for the upcoming term, the University of Moncton created a series of workshops over a three-week period (18 workshops in total) in June for professors to exchange their thoughts and experience during the Winter term and to share best practices for remote assessments.

What best practices have you learned from your colleagues across the country during this period?

Dr. Diduch: The COVID crisis has accelerated academic cultures across the country to consider how best practices in online learning will inform permanent changes to our traditional academic programs. This is a significant opportunity that will strengthen academic programs with enhanced learning, teamwork, and networking that is global in nature.

Dr. Cormier: On a national level, Engineering Deans Canada (EDC) has taken steps to coordinate efforts to share expertise on remote teaching. Weekly meetings of EDC were held from April to July, and through these discussions the E-CORE initiative was developed: Engineering Collaboration for Online and Remote Education. Workshops have been held in July on topics such as: holding online labs, remote assessments, shifting course design for online teaching, sharing Open educational resources, with more being planned. Short two-page handouts for professors and students have also been developed.

How has COVID-19 impacted the work on the educator side?

Dr. Cormier: Everyone in our faculty and staff is now very familiar with Microsoft TEAMS (the preferred tool at the University of Moncton) and holding online meetings. We've switched all our administrative work online; what professors and staff used to fill out and submit in paper form is now in electronic format. In a sense, this has forced us to complete the transition to a mostly paperless work environment.

Dr. Diduch: We are now busy getting ready to welcome our UNB community back for the new academic year. To ensure our incoming students are set up for success, we have invested in resourcing to support our professors as they transition to virtual teaching. Instructors have pursued training to help adapt teaching and learning strategies to include virtual formats and deliver the best learning experiences for students.

What will the 2020 Fall semester look like?

Dr. Diduch: We have made investments that range from student kits for hands-on projects to video production and studio spaces for recording and streaming lectures and virtual lab experiences, to new educational tools that support accurate simulation models of engineering systems. All focused on addressing student engagement and connecting students with the course, the instructor, and other students in a virtual paradigm.

The Engineering Undergraduate Society (EUS) has been instrumental in helping to connect new incoming students with peer mentors for weekly meetings over the first year and is planning online "drop-in" support groups for Fall courses.

Dr. Cormier: All classes and labs at the Faculty of Engineering (University of Moncton) will be taught remotely this Fall. This means labs will shift to simulations, or in some cases the experiments will be filmed by staff and data given to students for analysis. Evaluations will be different in some cases: more development questions will be given, whereby the student explains their reasoning; other examples would be timed exams with multiple choice questions (where random questions are picked from a pool of questions), or even oral exams to verify student learning.

What are your thoughts on virtual education?

Dr. Cormier: A fully online semester will have an impact on student engagement. But questions remain. How do we, as a faculty, maintain student engagement in the extra-curricular activities, volunteering, or the engineering profession? Will online meetings properly permit us to evaluate and guide students with difficulties? Regular online meetings will certainly help, but it is not the full answer. It is much better for student engagement to have in-person activities. Online teaching has its share of challenges, but it can also serve as a means of teaching different aspects of communication and collaboration, in an increasingly global workplace.

Dr. Diduch: There are many challenges including the design of assessment tools and proctoring protocols to ensure student work is authentic and not copied or plagiarized. At the same time there are many opportunities that include: increased class attendance and participation, a combination of synchronous and asynchronous learning that supports enhanced learning at *"any time, any place"*, more timely and formative feedback on assignments, quizzes, and tests, and development of teamwork skills at a distance.

How do the effects of COVID-19 impact the future of engineering education?

Dr. Diduch: The risk of predicting the future is that we always underestimate the rate of change in technology and overestimate the rate of social change. There exist 'predictions' that, in future, undergraduate students will master engineering fundamentals using cloud computing, then attend in-person schools where professors act as mentors and deliver experiential learning opportunities; and graduate school provides a focus on the frontiers of engineering where students assemble around local, regional, and global problems. The current virtual experience is a catalyst that serves as unintentional preparation for the 21st century professional workplace of our students and faculty.

Dr. Cormier: The COVID-19 pandemic has forced us to examine different methods of teaching engineering, with online courses, remote labs, different forms of evaluations, the use of online collaborative tools, and others. Teaching our students the use of online collaboration tools will probably remain in our programs when we return to in-person courses. However, our students will still need hands-on lab and project experience; this is very important for future engineers. It will be imperative to find the right balance between practical and online teaching, to ensure our engineers are ready for the challenges to come.

GEOSCIENCE STUDENTS: COPING WITH CHANGE DURING COVID-19

Submitted by Andrea Waldie, P.Geo., FGC
CEO, Geoscientists Canada

Geoscience university students, like all university students, are having to cope with many changes in their university setting and the way in which their courses are being delivered as a result of the COVID-19 pandemic. These course delivery changes not only affect a student's day-to-day activities but have raised questions about meeting the Canadian knowledge requirements for professional geoscientist licensure and registration.

Once graduated from university, to become a geoscientist / member-in-training (GIT/MIT) with their local geoscience regulator, or when applying for a practicing licence, the geoscience graduate must meet, among other regulator requirements, the Geoscience Knowledge Requirements found in the *Geoscience Knowledge and Experience Requirements for Professional Registration in Canada* booklet. Knowledge requirements such as Field Techniques and Mineralogy, among others, currently present particular challenges to both the student and the university educator as the courses are traditionally conducted in hands-on, in-person learning environments and do not readily lend themselves to online learning.

During the Spring term of 2020, most, if not all, university geoscience Field Techniques courses were cancelled. Although it is hoped that those geoscience courses that tend to require in-person learning environments will be able to take place at some time in the coming months, at this time that ability remains, for the most part, an unknown.

Geoscience students are advised to review the *Knowledge Requirements for Professional Registration* and to work with their university advisor to plan their course selections carefully to meet the licensure knowledge requirements. A helpful resource to track progress toward licensure knowledge requirements fulfillment is the Self-Assessment Tool found on the Geoscience in Canada website.

Recent graduates, or those who will be graduating in the near future, and who have concerns about meeting the knowledge requirements because of the current university environment due to the pandemic, are strongly encouraged to review the website of their local regulator for information on the appropriate course of action for your circumstance. Should no information be available on a website at this time, prospective applicants are encouraged to contact the applicable regulator for information.

Contact information for each professional geoscience regulator can be found on the Geoscience in Canada website.

Remember to plan carefully, ask questions, and be prepared. We're in this together, and we will get through this together.

VISIT HTTPS://GEOSCIENTISTSCANADA.CA/ TO FIND OUT MORE INFORMATION.

THE ART OF GIVING BACK

HOW ONE PROFESSIONAL ENGINEER AND HIS COMMUNITY PARTNERS ARE WORKING TO CURB THE SPREAD OF COVID-19

By Lauren Nicholson

Kevin Gallant, P.Eng.
NBCC Instructor, Miramichi

In response to the COVID-19 pandemic, Kevin Gallant (P.Eng., entrepreneur and instructor with NBCC Miramichi) knew he had to do something to help.

He knew that it was going to become more and more difficult for businesses to get proper personal protective equipment (PPE) like masks and face shields, especially in seniors homes and for community volunteers. The need for this equipment was real and so the work began with Bill Schenkles, P. Eng of Sunny Corner Entreprises, Peter Corbyn, P. Eng and Robert Moss, P. Eng. Together they began discussing design concepts using previously-created prototypes from a company called PRUSA.

Insert the magic of a 3D printer, and a solution was created.

“We came together as a team for COVID-19 very early,” explained Gallant. “Our team was organized through engineers, students and teachers with a bank of 3D printers with a goal of using them to print for public safety purposes.”

In the early stages, Kevin and his community partners served over 60 boxes of face shields to various volunteer organizations throughout Miramichi, along with bingo halls, dog groomers, home-care workers and more.

“The project wasn’t seamless in the beginning and there were a lot of lessons to learn,” explained Kevin. “The supply chain network ended up shifting from the clear plastic shields to the elastic backings, however, the whole team were instrumental in getting resources for this project.”

"I am thankful for all the volunteers who worked hard to maintain their 3D printers and especially ASD-N and NBCC for supporting the cause."

As the project gained momentum, companies like Mariner Partners stepped up to provide all the face shield materials.

Kevin credits the hard work and dedication of all partners that came together to meet the needs of the community during such an unprecedented time.

“It’s working with outstanding people such as students and teachers like Kathy MacDonald, Ashley Halihan and Troy Cabel who helped motivate our teams. It was important to keep the network together, especially since these volunteers were all working at home during this time,” he explained.

“Coming together to support our communities to battle COVID-19 was our objective and we knew we had to help.”

In fact, the City of Miramichi was so impressed by this project and the partners that supported it, they donated two 3D printers for students. These new 3D printers can print 16 stackable face shields at once.

“This Pandemic provided us innovation to help in the protection of the public as well as showcase the spirit of engineering and the need for giving back to the community."

Kevin would like to dedicate this project on behalf of a team member's husband who recently passed away. He was a healthcare worker that supported the Miramichi community and in Kevin’s opinion, it is families like theirs that make a difference here in New Brunswick.

PROJECT UPDATE *City of Miramichi*

By Darren Row, P.Eng.
Director of Engineering, City of Miramichi

Station Wharf redesign and replacement
Project Cost - $ 7,000,000

Station wharf, located in the Historic Chatham Business District, played a vital role in the history of the area. In the past, it has served as both a commercial fishing wharf and a marina and originally, the location consisted of a 90m marginal wharf and 46m pier.

In the past decades the wharf fell into disrepair and in 2015 the City began exploring options for a replacement. Harbourside Engineering Consultants completed a report summarizing a Phase 1 assessment and conceptual options. In June 2016, an RFP was awarded to CBCL Limited for design, inspection and project management of the removal and replacement of the facility.

A final design concept was chosen, and the work was to include the removal of the marginal wharf, replacing it with armour stone and the removal and replacement of the pier. The new pier would consist of 57 – 600mm diameter rock-socketed piles filled with concrete and topped with a concrete deck.

In January 2018, tenders were awarded to North Shore Construction Ltd. for the removal of the existing wharf and placement of armour stone. Greenfield Construction Ltd. was awarded the tender for the construction of the new pier. North Shore construction commenced wharf removal in May 2018 and it was completed by June 2018. Greenfield initiated the new wharf construction in September 2018 and that project was completed in September 2019.

Funding from the Federal and Provincial governments was secured in the amount of $ 1.9 million each, with the remainder of the funding for the project coming from the City of Miramichi.

In May 2019, a tender was awarded to North Shore Construction for the surface treatment of the surrounding area and work is scheduled to be completed by August 2020.

The original condition of the wharf.

The location with the new construction and design (above and below).

PROJECT UPDATE *City of Moncton*

Submitted by Sherry Trenholm, FCSCE, P.Eng., FEC
Director of Municipal Facilities, City of Moncton

Magnetic Hill Zoo Arctic Wolf Exhibit
Project Cost - $248,000

In March of 2018, the City of Moncton's' Magnetic Hill Zoo (MHZ) staff had closed the visitors' access to the Arctic Wolf exhibit. Concerns had been raised about the wolves' behavior with visitors during the previous season. A welfare assessment of the arctic wolves, Auril and Siku, confirmed that the existing exhibit could not meet the needs of the wolves.

Focusing on animal welfare, training, and education, the design commenced in the fall of 2018. Northland Design Studio and Ingénierie MATCH Engineering inc. worked with Jill Marvin, Director of the MHZ, and Robin Alcorn, Municipal Facilities Project Manager, to come up with a design that met the needs of the animal and the project budget. The project concept goals were to triple the exhibit space, provide two viewing areas for visitors, provide enrichment areas for the wolves and create a positive experience for the keepers, visitors and animals.

After a competitive bidding process, RCS Construction (Earthworks Excavation Ltd.) and Eastern Fence were engaged. The contractors worked with the MHZ staff to understand the challenges of building an exhibit for this species. During construction, it was very important to limit the disturbance of their existing enclosure located adjacent to the new site. The exhibit would have an existing manmade drainage ditch running through it, which also created an additional challenge.

The project began in the winter of 2018 with the installation of sections of the fencing. By late spring, the new visitor access path and the two visitor viewing areas, the cedar bridge and cedar stand-off fence to protect the visitors were completed. Interpretation signage was installed by Skyline Atlantic.

With the support and help of the MHZ keepers, maintenance staff and Director, the team worked together to remove the wall dividing the new space and the existing space. The wolves were watching intently from their Wolf House while the wall came down piece by piece and the fencing was attached, bridging the old with the new to make it one full enclosure.

The exhibit space was increased from 577 square meters to 1524 square meters; two distinct viewing areas were installed, including a new access path complete with a cedar bridge and resting spaces for visitors. A total of 185m of new fencing, 3m high and buried 900mm underground complete with 450mm angled top was installed on the perimeter of the enclosure.

Photo Submitted

The official opening of the exhibit was held on June 21, during the 2019 National Indigenous People's Day. The ceremony was led by Elder Peter Jadis of the Elsipogtog First Nations. It celebrated the culture, history and spiritual relationship that the First Nations have with wolves. The blessing of the exhibit provided a spiritual karma for the wolves, staff and visitor safety.

The new exhibit has provided the wolves with a significantly improved environmental enrichment space. Zoo employees were elated to see positive changes and increased natural behaviors rarely seen in the wolves previously.

Visitor feedback at the MHZ has been extremely positive and encouraging. Many have stated that the new exhibit has provided them with an opportunity to learn about wolves in an engaging environment.

Photo Submitted

MAKING A DIFFERENCE HERE AT HOME DURING A PANDEMIC

Interview by:

engineerscanada
ingénieurscanada

with files from Lauren Nicholson

As the Clinical Engineering Program Manager at Service New Brunswick, Natalie Boudreau, P.Eng., leads of team of six engineers and technologists whose role it is to ensure that clinical engineering operations in the province achieve their targets, such as the 100 per cent completion of preventive maintenance on hospitals' life-sustaining medical equipment like ventilators and defibrillators.

Before the COVID-19 pandemic hit, Boudreau would travel throughout New Brunswick multiple times a month to visit the 12 in-hospital clinical engineering departments, and for meetings with government and hospital staff. But since the pandemic began, her and her team have been working from home, diligently supporting the province's clinical engineering operations.

Her team's work has supported New Brunswick's response to COVID-19 in multiple ways, whether it be generating inventory reports on the province's fleet of medical equipment critical to the treatment of COVID-19, assisting with the procurement of medical equipment and technologies, or performing research and providing technical guidance to hospital staff on unique clinical challenges, like minimizing the use of personal protective equipment (PPE) by implementing technologies to check-in and communicate with patients without having to enter their rooms. Boudreau's team also has a role to play in researching and advising on standards and processes.

They've been reaching out to peers across Canada and beyond to ensure that their infection control policies and procedures for servicing medical equipment in New Brunswick were appropriate and up-to-standards.

They've provided education, training, and communications to clinical engineering staff across the province on the most up-to-date information and process changes coming out of hospital processes and Public Health Agency of New Brunswick recommendations.

Natalie Boudreau, P.Eng.
Clinical Engineering Program Manager, Service New Brunswick

"Engineers are uniquely trained in their areas of expertise to create innovative solutions."

As, well, they've gone through research and provided guidance to clinical engineering and hospital procurement staff on the many changes introduced by Health Canada to their medical device licencing process for COVID-19.

"My professional training also allowed me to be able to quickly absorb and interpret large amounts of data, question information, and validate sources to ensure I was not acting on false claims or propagating misinformation. A good decision based on poor or misleading evidence can have very serious consequences in a pandemic," she explained.

For Boudreau, the pandemic has presented the world with some of its most complex problems, but engineers are well-equipped to address them.

“Engineers are uniquely trained in their areas of expertise to create innovative solutions,” she says. “Engineers have the ability to analyze and solve complex problems while considering and weighing all aspects of the proposed solutions: cost, safety, environmental and sociological impacts, and others.”

Boudreau explains that engineering is an iterative process.

"Although my professional training provided me with the tools I needed to handle the COVID-19 crisis, there is one element that I would have been lost without: my earned confidence in my abilities," she says.

She explains that often she finds herself reflecting on her career and thinking about how important it is to trust those you are with and ask questions.

"There is a reason why it takes four years of professional practice under the mentorship of a senior engineer before we receive our P.Eng designation: granted, we need time to learn from our mistakes, but we also need time to build up our confidence so that we can one day fly solo."

That said, with a global situation such as the COVID-19 pandemic, it's the work of multiple people and teams, not just one individual, that creates the change needed to navigate such an unprecedented situation.

"I know that, looking back through time, the efforts of a single engineer were rarely ever approached with an end-goal to solve a world problem. Often it is a series of innovations from multiple different engineers over long periods of time that bring about worldwide change.”

"My professional training allowed me to be able to quickly absorb and interpret large amounts of data, question information, and validate sources to ensure I was not acting on false claims or propagating misinformation."

From the Desk of the DPA

CAROL MACQUARRIE, P.ENG.
DIRECTOR OF PROFESSIONAL AFFAIRS AND REGISTRAR

COVID has had a profound impact on the way we do business.

Within the engineering and geoscience professions, many offices have adopted work from home and other remote working arrangements. In these circumstances there are two areas of practice that may require specific attention to ensure professional obligations are met under the *Engineering and Geoscience Professions Act*.

- **Direct Supervision**

There are situations where a registrant assumes responsibility for an unlicensed person's engineering or geoscience work. For example, this could be the work of a member-in-training or certified engineering technician/technologist.

In all cases, the registrant is subject to the same standards of professional conduct and competence as if the registrant completed the services personally. Registrants should consider how direct supervision can continue in a remote or modified work environment.

- **Digital Seals**

All final drawings, specifications, plans, reports, and other documents pertaining to the practice of professional engineering/geoscience should be sealed by the person who prepared or directly supervised the work.

Only documents that are signed and dated by hand or that have been digitally signed/certified are considered authenticated originals.

In a remote situation, digital certificate technology allows documents to be sealed and transmitted electronically in a secure fashion. APEGNB has an agreement with Notarius to provide digital certificates to registrants. Please visit the Notarius website to find out more details.

APEGNB recognizes the significant impact that COVID is having on our registrants and their ability to practice. Work arrangements, whether in the office or field, continue to evolve.

During these unprecedented times, it's important to keep in mind that every situation is unique. It is the responsibility of each engineer and geoscientist to ensure that their professional obligations continue to be met, even during a global pandemic.

CAROL MACQUARRIE, P.ENG
MACQUARRIE@APEGNB.COM

100 YEARS ENGINEERS GEOSCIENTISTS New Brunswick 2020 100 ANS INGÉNIEURS GÉOSCIENTIFIQUES Nouveau-Brunswick

2020 UPDATE

The Association of Professional Engineers and Geoscientists 2020 planning committee has been working very hard to prepare for a successful 100th Anniversary event, scheduled to happen October 23, 2020.

The health and well-being of all who attend our events is our top priority.

Out of an abundance of caution, the Committee has made the difficult decision to cancel the 100th Centenary event at the Delta Fredericton Hotel.

We are deeply disheartened to have to make this difficult decision, but it is the only responsible action to take given the ongoing situation with Covid-19.

In the interim, there is still plenty of time to celebrate our 100th anniversary. Stay tuned to our social media pages and website for how you can celebrate this milestone safely. Thank you for your understanding and we look forward to seeing everyone in person soon. Stay safe and healthy.

– Michelle Paul-Elias, P.Eng. & Jeff Underhill, P. Eng., FEC
Co-Chairs, 2020 Planning Committee

NORTHEASTERN BRANCH- UPDATE

RAY RITCHIE, P.ENG., FEC, CHAIRPERSON

With COVID-19 precautions in full swing, our APEGNB Northeast Branch has decided at its most recent virtual TEAMS Meeting, to cancel the Annual Golf Tournament and postpone the Annual Branch Meeting until October at the earliest.

These are measures which we regret however it is even more of a challenge when it comes to our Annual Pumpkin Fling event.

The Northeast Branch of APEGNB has habitually held this signature event around September 26th each year. The obvious question we had to consider is how our Branch could hold such an event (which relies heavily on Student and Parent involvement) in this era of COVID-19 restrictions?

It certainly is not an easy task to configure the Pumpkin Fling Event without “hands-on” interaction of volunteers and participants. Above all, we know that in planning we will have to provide a safe and responsible alternative, which still captures the imagination in a STEM related fun event, if we were to hold it in 2020.

The current plan is to hold this Pumpkin Fling "virtually"; no crowds or patrons will gather at the normal venue of Waterford Green. Instead, the "venue" will be at a private, undisclosed site where errant trajectories of misfired pumpkins will create no significant risk or harm.

We will broadcast the event via social media (www.facebook.com/pumpkinfling2020) and allow for physical distancing when appropriate.

A scenario has been devised whereby approximately 10 individual corporate logo panels will be offered to prominent local businesses which will then be placed on a "Wheel of Fortune - type" water Wheel (like a "Ferris Wheel" but on a slightly smaller scale).

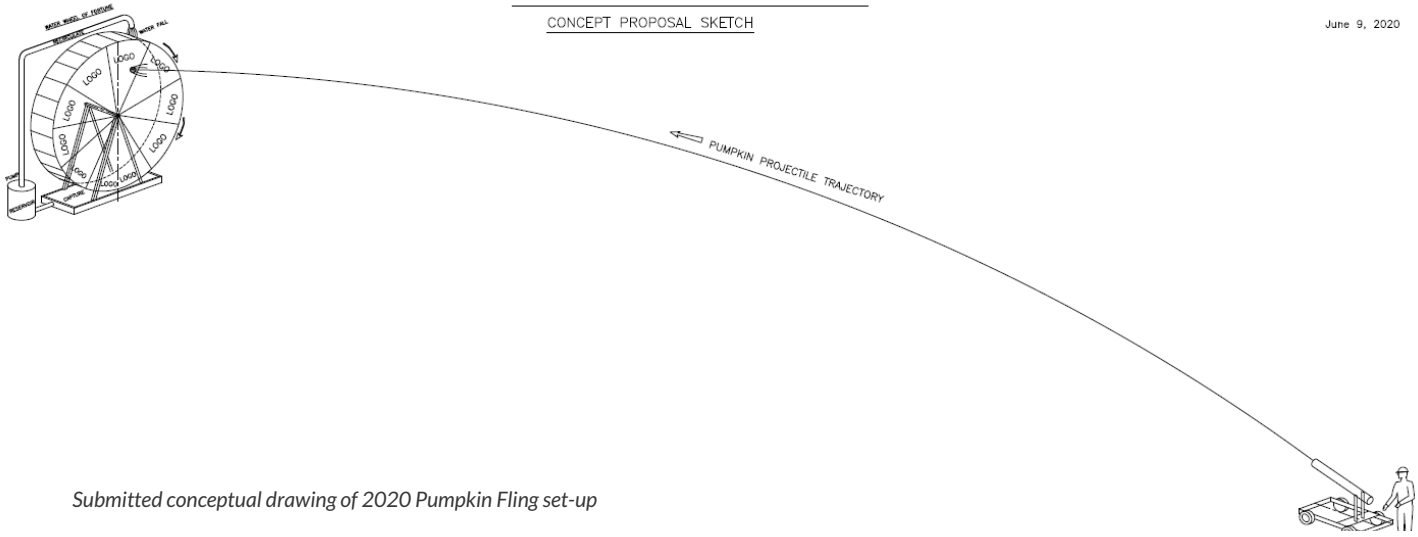
The traditional Compressed-Air powered 6” (150 mm) diameter Barrel Pumpkin Cannon will be located approximately 200 ft (60 meters) away. With this scenario, the firing of the pumpkins from the cannon (directed by pre-selected inclination and horizontal swing coordinates - specified by the individual corporation) toward the rotating wheel, will create a totally random probability of a successful contact with the logo panel of that organization's identity.

The most direct hits (blasts) will determine the winners. When a pumpkin hits one of the individual logo panels, there will be great noise and visual stimulus through the use of strategically placed cameras and microphones positioned within the structure.

We hope to include an interactive portion with the Anglophone North Schools District in order to continue the tradition of promoting STEM related activities in the schools.

The "Water Wheel of Fortune" will support our previous passion of Hydro Power. We will need to devise a water reservoir and recirculating pumping system, to elevate the water flow so that it will provide the motivation for our rotating wheel and then be re-captured for continuous use of the same water supply.

Stay tuned for more details to come!



Submitted conceptual drawing of 2020 Pumpkin Fling set-up

Photo Submitted

LuminUltra Technologies

A conversation with Patrick Whalen, P.Eng, CEO and Chairman LuminUltra Technologies- Fredericton, N.B.

For over 25 years, LuminUltra has been innovating in the environmental monitoring space, particularly focused on water applications. They have a long history of delivering essential microbial testing solutions to customers around the world, including dozens of Fortune 500 customers across a variety of sectors ranging from energy and industrial, to marine and municipal. Since their inception in 1995, they've built a reputation for advocating for a proactive, evidence-based approach to biosafety.

SETTING THE STANDARD

On March 20, 2020, the Prime Minister issued a call to action to Canadian businesses to step up in the fight against COVID-19. We were able to quickly identify our ability to produce reagents needed for clinical testing. This work is a natural extension of our know-how in reagent development and production in the industrial space and we were able to quickly expand our production.

Since that time, we have produced enough reagent for 8.5 million tests and counting to labs across Canada.

In addition to our work supporting the nation's reagent needs, we have developed and launched an environmental testing solution for the fight against COVID-19. These products identify the presence of SARS-CoV-2 (the virus that causes COVID-19) in environments including surfaces, air, and wastewater using our best-in-class GeneCount qPCR devices. We are also working to adapt these solutions for clinical testing needs.

UNPRECEDENTED TIMES

The global pandemic has resulted in many new and unexpected challenges and we've relied heavily on our company culture and core values to successfully navigate these new territories. One core value has been particularly relevant, which is to 'remain flexible at all times'. Global supply chains and logistics have changed dramatically since early March. We've had to pivot and respond to this shifting landscape without compromising our production capacity or quality.

We're also very aware that our customers themselves are all providing essential services and rely on our products to help get their job done. Our flexibility has allowed us to find new, innovative solutions to challenges while still ensuring we deliver our products where needed.

We've also been working hard to grow our team due to increasing demand. LuminUltra employs several engineers – not to mention many more scientists – and these leaders put their collective experience and training to work during these extraordinary times. We will soon be opening a new production facility in Fredericton to further increase production capacity.

RELYING ON EDUCATION AND EXPERTISE

The nature of an engineer is to be prepared. LuminUltra has traditionally been very conservative from a standpoint of inventory and capacity management, and was able to very quickly pivot with materials on hand and available capacity to meet Canada's reagent needs. Engineers have an affinity to processes and systems. LuminUltra is no exception.

We have a very strong set of ISO 9001 processes and world-class business management systems that enabled our team to maintain alignment during these times.

PROBLEM SOLVING

I find it helps to think of each initiative as a project: one wherein you have to identify the basis, determine the desired outcome, and iterate to get from point A to point B. This approach can be applied to just about any problem – staffing requirements, facility expansion, product development, sales, and so on.

THE ABILITY TO ADAPT

Our ability to respond as quickly as we did on the clinical testing needs was due to how aligned those products are with our core business.

What we had not expected was the speed and urgency at which these solutions would be required. It is due to some quick thinking and execution across the team that we've been able to figure out these solutions and actively participate in the fight against COVID-19.

"Engineers have an affinity to processes and systems. LuminUltra is no exception."

Photo Submitted

National Professional Practice Exam in the time of the Coronavirus

BY STAMATIA BAKER, PROGRAM COORDINATOR, APEGNB

The National Professional Practice Exam (NPPE) is a 110-question, multiple choice exam covering six subject areas: professionalism, ethics, professional practice, law for professional practice, professional law, and regulation of members & discipline processes. Candidates have 2 ½ hours to complete the exam.

The NPPE went digital in 2015, with candidates moving to computer-based testing locations in cities around the country. For candidates living in more remote locations, the first version of a "virtual remote proctor" option allowed an exam candidate to be proctored by a P.Eng. or P.Geo. in person, in conjunction with a 3rd-party proctor from a computer-based testing company (Yardstick) via webcam.

Despite being a vast improvement over the alternative (travelling hours by car or plane to sit an exam), virtual remote proctoring had its limitations. Candidates needed to find a suitable environment, which sometimes presented them with unfamiliar or undependable equipment. Some individuals, due to their location overseas or in remote communities, had trouble finding a registered P.Eng. or P.Geo. to proctor them.

As the technology and capacity continued to improve, the in-person proctor was seen as redundant. Just as plans were being made to drop the requirement for the in-person proctor, Covid-19 struck.

With no sense of when testing centres would re-open, candidates were permitted to delay their exam to a future date or to write from home with a virtual remote proctor.

There are obvious pros and cons to such an arrangement. Access is not universal: candidates must use a laptop or desktop computer with a webcam (phones or tablets are not permitted). High-speed, stable internet is a must (Wi-Fi is OK if it's at least 10 Mbps). Candidates need access to a quiet, private space where they will be uninterrupted.

So how does the virtual proctoring work? The remote proctor starts with a visual sweep of the area (desk has to be clear, no electronic devices, only one screen permitted, any others must be unplugged and turned around). The candidate's browser is locked down so they can't access anything else on their computer during the exam. The remote proctor intervenes if someone is doing something- whispering, looking down or off screen too often, etc.

If it continues, the testing company can terminate the candidate's exam. Collusion detection analysis and other measures are employed after the fact.

All that said, how should you prepare for this exam?

The study material or content has not changed, but your source may have: borrowing books from the university engineering library is out of the question for the time being.

The two recommended textbooks can be purchased from the APEGNB office and shipped at no additional charge (they can also be purchased online):

- *Canadian Professional Engineering and Geoscience: Practice & Ethics, Sixth Edition, 2018 by Gordon C. Andrews,*
- *Practical Law of Architecture, Engineering, and Geoscience, Third Canadian Edition, 2015 by Brian M. Samuels and Doug R. Sanders*

Make sure to read the syllabus for your exam and use that as your guide. Also, ensure you have a book about law and a book about ethics – only studying one topic will only get you halfway to your goal.

Two practice exams are available through Yardstick, in partnership with APEGA. Each consists of 50 retired NPPE exam questions. Purchase both versions at the same time to save $5 – trust me, you'll want all 100 questions!

Last but not least is the APEGNB review seminar. Presented by Université de Moncton professor Serge Dupuis, P.Eng., FEC. This session provides a good opportunity to review some dense texts in a more digestible format, as well as to ask questions of an instructor.

Traditionally offered in-person, this seminar will, like so many other gatherings these days, now be online (at least for the time being).

Of all the changes and adjustments we've had to make over the past months during the Covid-19 crisis, switching to remote virtual proctoring for the NPPE feels like a step forward, rather than a compromise, and I would argue that it is here to stay.

GeoConvention 2020 goes virtual

September 21-23, 2020

SUBMITTED BY DUSTIN MENGER, GEOCONVENTION EXECUTIVE DIRECTOR

This year has been a rollercoaster ride for events throughout the world and GeoConvention is no exception. Upon it becoming clear in early March that an in-person event would not be likely due to the Corona Virus spread, GeoConvention, together with our board of directors, partner societies and committee announced a transition of the conference to virtual format. While outright cancellation was contemplated, the move to virtual was seen as the only option - allowing our over 600 speakers and authors the opportunity to present the work that they had completed, allowing our members and attendees to connect and interact with one another while also providing our exhibitors with a platform to market their companies and latest advancements.

The virtual event space has developed rapidly within the last several months and after an extensive search for the best fit for the complexity of the GeoConvention program where we will host over 600 presentations through nearly 90 sessions, the committee elected to host with PheedLoop, a Canadian-based event platform.

While opportunities within the virtual platform are developing almost daily, attendees to GeoConvention 2020 can expect the following:

- Technical sessions available in real-time, with the opportunity to chat with presenters featuring content from CSPG, CSEG, CWLS, GAC, MAC, IAH-CNC and Geothermal Canada
- Recorded sessions and posters available on-demand following the conference so you don't have to miss a thing (approved talks only)
- Selected live panels and presentations from industry leaders
- Content accessible wherever or whenever you are: no travel expenses and no commuting
- Virtual exhibition, putting you a click away from connecting with industry experts and learning about the latest advances in technologies and workflows
- Chat rooms and networking, putting your existing contacts and a network of new contacts only a click away
- Virtual Networking Competitions: Monday Team Pursuit and Tuesday Code Break
- Affiliated workshops and course pricing that has been set at a fraction of an in-person conference to do our part in giving back to the earth science community and encouraging as much participation as possible

With a world-wide reach like never before and an expected attendance over 3500 attendees, Virtual GeoConvention will bring the full annual conference experience to the comfort of our attendees' home or office allowing them to network, learn and engage with the brightest minds in earth science.

The full technical program is now live at ww.geoconvention.com and provides a fantastic opportunity to earn CPD credits.

ENGINEERS GEOSCIENTISTS *New Brunswick*

INGÉNIEURS GÉOSCIENTIFIQUES *Nouveau-Brunswick*