

Ontario Professional Surveyor



on the cover ...

**Ontario 150
"Yours to Discover"**

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Geomatics Science Begins this Fall
at York University
NRCan's Compliance Program for
Commercial RTK Services
The Hard Road Ahead: A History
of the Addington Road

plus our regular features

Educational Foundation
News from 1043
Book Reviews

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Volume 60, No. 4
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ONTARIO PROFESSIONAL SURVEYOR



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ON THE COVER ...

This year we have been celebrating Canada’s 150th birthday but we must not forget that it is Ontario’s 150th birthday as well. See the article on how Ontario’s boundaries have evolved since confederation in The Last Word on page 40. The cover photo is a typical image of an Ontario autumn taken at Lake of Two Rivers on Hwy 60 in Algonquin Park. Credit: ©Ontario Tourism Marketing Partnership Corporation. The “Yours to Discover” slogan has been embossed on Ontario licence plates since 1982.

*Professional
Surveying
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Ontario*

*encompasses
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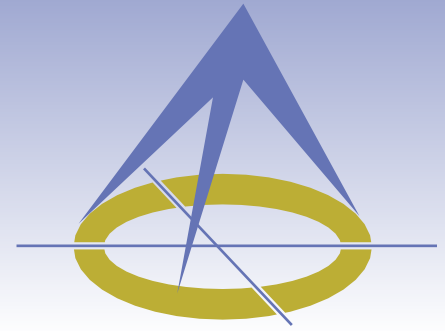
*Cadastral,
Geodetic,
Hydrographic,
Photogrammetric
Surveying
&
Geographic
Information
Management*





President's Page

By Russ Hogan, O.L.S.



Since the last edition of the Ontario Professional Surveyor I have attended meetings in PEI and Manitoba and there continues to be a real desire with the other associations across the country to collaborate on issues that have a national scope. One of the initiatives of interest is the development of a national marketing strategy, so on July 7 the AOLS organized and hosted a one-day workshop lead by Ken Wong, Distinguished Professor in Marketing at Queen's University, School of Business. The workshop was attended by representatives from British Columbia, Alberta, Saskatchewan, Quebec, New Brunswick, Nova Scotia, the Association of Canada Lands Surveyors, Professional Surveyors Canada and of course, Ontario.

The day started with Ken Wong describing how marketing and marketing communications can be used to help advance the priorities of an organization and included a tutorial on branding, public relations and marketing. This led to a lively group discussion of the need for a coordinated communications effort to raise awareness of the profession and generate greater engagement with government, industry and members of the public. Many participants cited recent television ads produced by the accounting profession and the real estate industry as the ideal solution but it was clear that marketing of that nature would take a lot more money than the survey profession as a whole in Canada can afford. At the end of the morning Ken emphasized that "wide audience" marketing with media ads is not only expensive but it may not achieve what we want or need. He felt that a "Public Relations" approach would be a better fit for us.

Public Relations is a form of marketing communications in which you build relationships with news or social media journalists so that they seek out your opinion, present you as an expert and relay positive stories about your products and services to the public. Public relations can be more effective at establishing credibility and brand, be less expensive, and provide greater reach than direct marketing.

At the end of the day all of the representatives in attendance agreed that improving our communications with government, industry and the public is a strategic priority and recommended that our land surveying associations form a national working group tasked with the goal of developing a joint public relations strategy for the land surveying profession.

I want to emphasize that a public relations strategy isn't something to be dealt with only by the Council or a Committee of the

Association, it is something that every member can carry out every day. Surveyors themselves have the best opportunities to influence the public's perception of our profession. We and our staff are what the public see and our attitude and appearance are what shape the public's opinion of the profession as a whole.

The Association receives calls from the public for many reasons but most often it is because they don't understand something that a surveyor has done. Sometimes the caller is concerned because they feel that the surveyor has erred in establishing their boundary. Sometimes they are upset because they found a technician in their yard unannounced. Other times they have seen a survey crew working in their neighborhood and want to know what is going on. Although it does take time, knocking on doors to explain that you are undertaking a survey in the neighborhood and what the work entails helps to improve the image of the profession and is one of the best public relations strategies available.

With the fall season upon us, the nominating Committee is once again in the process of identifying members to run for AOLS Council. I can testify from my own experience that participation is very rewarding and the time commitment is relatively small when compared to the immense benefits you will receive. Being a part of Council provides an opportunity to develop and demonstrate your leadership skills, improve your problem solving, communications and strategic planning skills and be a part of a high performance team. You will learn first-hand how the AOLS functions and be a part of Council's decision making process.

It is said often, but can never be stressed enough, that the success of our Association is dependent upon the involvement of all of its members. Please consider putting your name forward to run for Council – it is very rewarding and your time commitment counts towards your CPD hours. I highly recommend it.

Planning for the 2018 AGM in Niagara Falls is well underway and it is shaping up to be a great event. The theme is "125 + 1, Building on the Cornerstone" and it runs from February 28 through March 2. The program for the meeting will return to our traditional format with plenary sessions on Wednesday, concurrent education sessions on Thursday and our business session on Friday morning. Council is very interested in receiving input from the membership and the agenda will be designed to generate discussion about the Association's strategic priorities and to solicit ideas for the coming year. Please plan to attend and join in the discussions. I look forward to hearing your thoughts and ideas for the future of our profession.



Executive Director's Notes

By Blain Martin



In this column I would like to share my thoughts on the surveying profession in general and more specifically why I think that the members of all survey associations are engaged. In some ways, compared to other professions ours is very unique. I was thinking that perhaps this level of member engagement is new but as I read through *Great Lengths* I realized that our members have been engaged in the profession right from incorporation 125 years ago and even before that.

That being said, I have seen indications that our members are participating in Association activities at record levels. In the past the AOLS has always made other professions envious with our Annual Meeting participation of 50% but at the National Surveyors Conference last March we had 422 members registered which is 83% of our membership. That is an amazing number and I believe that it is something we should all be proud of. Another indicator of an engaged profession is the number of members who participate in Committees and Council. We often ask for volunteers and each time we do we get a few more. Our new committee tracking system has let me easily count how many participate in at least one committee. I calculated the percentage and found that 33% of the membership is involved with at least one committee and some are engaged in three or four. To me, that is an amazingly high percentage for any profession.

As I said earlier, the engagement of our members historically is very high and I wondered what the reason for this could be. I have reflected on the findings in Charlie's wonderful book, *Great Lengths* and I realize that he came to the conclusion that surveyors are very different than members of other professions. For us it is more than a job, more than a career and even more than a profession, it is a way of life that we live and participate in constantly. Our training is broadly based in mathematics, law, history, communication and ethics. No other profession has such a broad scope of training. I believe that makes us unique and that uniqueness is one of the primary factors that drives our engagement.

Another part of our uniqueness is our understanding of Public Protection and our ability to ensure that when things do go wrong we take corrective action. Our complaints and discipline processes reflect this clearly. Most firms treat a complaint from the public or from another surveyor with a seriousness that reflects positively on our profession. I am amazed at the number of members who are willing to serve on both the Complaints Committee and the Discipline Committee. This is hard and necessary work and in rare cases it can be disturbing. I want to thank those members who help in this way.

AOLS Council is another important area that members participate in. In the past it has been hard to find volunteers to take up Council positions but that seems to be changing. The Chair of the Nominating Committee sent out a notice in "In Sight" looking for candidates just a week or so ago and several people replied saying that they were considering it.

The benefits of serving on Council were well articulated in the notice and if you are interested please contact Travis Hartwick, the Chair of the Nominating Committee.

So, that is the historical engagement. More recently I have observed that our members' participation in professional activities has increased even more. The Continuing Professional Development program of the AOLS can take some credit for this as it has forced the few "non-engaged" members to start participating. I have had more than a few of those "non-engaged" people say to me, "I was forced to do this and now I realize what I have been missing." To me that is a true indication of the success of our Educational Program.

The other catalyst that has helped promote engagement has been the level of communication from the AOLS Office. The Ontario Professional Surveyor magazine was historically our main form of communication for many years. Now we have added the e-newsletter "In Sight" and our monthly Webinars to the mix. We receive many comments about how well information about the "issues of the day" are delivered to the members.

However, one area that this high level of communication has impacted was evident during the Open Forum of our recent Annual General Meeting (AGM). Very few members raised issues or asked questions during this session. Perhaps a better use of the forum for next year would be for members to bring forward some ideas on what they think might improve our association even further.

I would like to conclude with a couple of thoughts about how members can help us. Russ mentioned about the "Marketing Day" in his President's Report earlier in this issue and how you as members could really help influence the public's perception of our profession by getting involved at a local level. This could take the form of you contacting your own MPP, visiting your own High Schools, historical societies or even your own local media. If you do want to help by making contacts like this, please get in touch with me and I will assist you with presentations and marketing material.

I would also like to add a bit more detail on the historical societies. Our book is being widely promoted by many of these organizations and Charlie has been booking speaking engagements that promote both the book and more importantly our profession. If you are involved in an historical society that you think should be added to our program, please let me know.

While writing this article, I also took a few moments to reflect on my position as AOLS Executive Director. I have been here for 8 years now and I must say that I enjoy the position immensely. I have worked with some great people over those years and I appreciate that everyone has shared the same commitment to making the profession better. Thank you!!!



NRCan's Compliance Program for Commercial RTK Services: Ensuring Compatibility with the National Reference System

By Brian Donahue

Introduction

Global Navigation Satellite Systems (GNSS), Real-Time Kinematic (RTK) surveying is now commonly used for both cadastral and engineering surveys in Canada. During the past decade, commercial Real-Time Networks (RTNs) have been increasing in both number and extent, and these services can allow almost instantaneous access to centimetre (cm) level relative positioning where available. As early as 2009, the Federal, Provincial, and Territorial members of the Canadian Council on Geomatics (CCOG) asked its Canadian Geodetic Reference System Committee (CGRSC) to develop a plan to describe, validate and provide certification of these commercial RTK providers. This was intended to ensure the compatibility of these RTNs with NAD83(CSRS), the national reference frame used as the standard for spatial referencing throughout Canada.

In 2011, the CGRSC, in consultation with major commercial RTK providers, developed a strategy to respond to the CCOG request. The approach included integrating the commercial RTK reference stations into the official NAD83(CSRS) reference frame, monitoring the long-term stability of these RTK reference stations, and providing a set of guidelines which would allow users to validate their survey results. In 2014, the Canadian Geodetic Survey (CGS) of Natural Resources Canada (NRCan) began entering into formal relationships with interested commercial RTK providers to help ensure that the integration and monitoring of their reference stations were compliant with national standards. This article summarizes this "RTK compliance program", and describes how it can benefit professional surveyors across Canada with a specific focus on Ontario.

The need for compliant RTK networks in Canada

CGS is responsible for the definition, maintenance, and access to the Canadian Spatial Reference System (CSRS). To allow access to the CSRS, CGS maintains a national network of monumented active and passive geodetic control stations. Public access to coordinates of these stations, as well as to raw GNSS observations enables the integration of surveys into NAD83(CSRS). The increased use of commer-

cial RTNs for accessing the CSRS has necessitated a means to ensure their compatibility with the national geodetic infrastructure. This requires applying a common methodology to compute NAD83(CSRS) coordinates of RTK reference stations operated by different service providers. These coordinates can then be used to integrate the RTK reference stations and subsequently user surveys into NAD83(CSRS).

NRCan's compliance program takes advantage of CGS's existing coordinate estimation strategy to provide this common methodology for computing and integrating commercial RTK reference stations into NAD83(CSRS). The availability of "official" coordinates at RTK reference stations, independently and consistently derived by CGS, ensures that RTK services are compatible with the national reference frame.

The next step for the RTK compliance program will be to encourage the professional surveying associations in Canada to promote the use of compliant RTK services in their standards of practice. This will acknowledge the providers that are currently compliant and add incentive for others to become compliant. And, most importantly, it would ensure that the commercial RTK networks that surveyors rely upon are compatible with NAD83(CSRS), the national spatial referencing standard.

Compliance Program Details

In order for a commercial RTK network to become compliant, it is required that NRCan and the service provider enter into a formal agreement. Through the agreement, NRCan agrees to:

1. Provide "official" RTK reference station coordinates integrated into NAD83(CSRS);
2. Maintain a public record of these "official" RTK reference station coordinates; and
3. Monitor and display publicly the differences between the current (weekly) coordinates and the "official" published coordinates.

At the same time, the RTK service provider agrees to:

1. Provide continuous access to RTK reference station observation data using open Internet protocols;
2. Maintain station metadata in the International GNSS Service's (IGS) site log (or other mutually agreed

upon) format; and

3. Adopt the official NRCAN supplied coordinates for their reference stations.

Once the parties have entered into the agreement, NRCAN will provide an official coordinate solution for the service provider's reference stations in the NAD83(CSRs) reference frame. Finally, once the provider confirms that they have adopted these official coordinates their network will be added to the CGS RTN monitoring website.

CGS Coordinate Estimation Strategy

CGS routinely processes all stations from each commercial RTK network providing data. The networks are processed separately along with a global set of reference frame stations for network alignment, including most Canadian Active Control Stations (CACS). Daily data files for each network are processed using the Bernese GNSS Software v5.2 following the IGS's processing standards, absolute antenna calibrations, and Final IGS precise ephemerides. Each daily solution is integrated directly into the NAD83(CSRs) v6 reference frame using the global reference frame stations. These daily Bernese coordinate solutions are then combined into a weekly solution which is used for monitoring the stability of the RTK reference stations.

Each month, all of the weekly solutions to date (coordinates and full covariance matrices) are combined into a "cumulative" solution where coordinates at epoch 2010 and their velocities are estimated. Station velocities are estimated only for stations that have more than one year of data. For a station with less than one year of data, coordinates are estimated at the mean epoch of the weekly solutions in which the station is included and then propagated to epoch 2010 using the NAD83(CSRs) velocity model. These epoch 2010 coordinates are supplied to the RTK network operators for adoption at their reference base stations. The cumulative solution at the end of each year is considered the latest "official" or published solution for adoption. However, RTK providers are only required to update their base station coordinates to the new official solution if they have changed more than 2cm horizontally or 3cm vertically.

When new stations are added or existing stations are relocated, new coordinates are needed quickly. In these cases, NRCAN will provide preliminary coordinates from the latest monthly cumulative solution where the new or relocated stations have more than 2 or 3 weeks of data. Because NRCAN uses IGS Final ephemerides, with an approximate 14-day latency after the end of the week, and because it takes approximately 1 week to estimate the new weekly coordinate solutions and combine it into an updated cumulative solution, preliminary coordi-

nates from the monthly cumulative solutions are not usually available until 3-4 weeks after the end of the month.

RTN Monitor Web Site

Commercial RTK networks that are part of the NRCAN compliance program are now monitored on the NRCAN website at <http://webapp.geod.nrcan.gc.ca/geod/data-donnees/rtk.php>. Each network is shown separately and overlaid on a map of Canada. The web page displays each station in green, yellow, or red depending on the station's status. A station's status is considered "compliant" and displayed in green if both their RINEX data has been made available to NRCAN for coordinate estimation and the latest weekly estimated position propagated to epoch 2010 is within the agreed tolerance level (2cm horizontal and 3cm vertical) from the official published coordinate. A station's status is considered "unknown" and displayed in yellow if there are no coordinate estimates in the previous two weekly solutions, (which normally indicates there is no RINEX data available for those weeks). Finally, a station is considered "non-compliant" and displayed in red if either there are no coordinate estimates in the previous three weekly solutions, or the latest weekly coordinate estimate at epoch 2010 is outside the tolerance level.

Weekly station positions which differ from the official coordinate by more than 2cm horizontally or 3cm vertically could be caused by a variety of reasons including:

1. Coordinate changes (discontinuities) caused by unreported antenna changes, monument changes, or changes to the physical structure hosting the antenna. Figure 1 gives an example of such a coordinate discontinuity, where it is often necessary to treat the station as a new one at the time of the displacement and estimate a new coordinate.



Figure 1 – Example of a non-compliant station exhibiting a horizontal coordinate discontinuity

2. Large seasonal coordinate variations, as shown in Figure 2, can cause a station to be non-compliant during specific times of year (often during the winter months). Such variations can be due to a

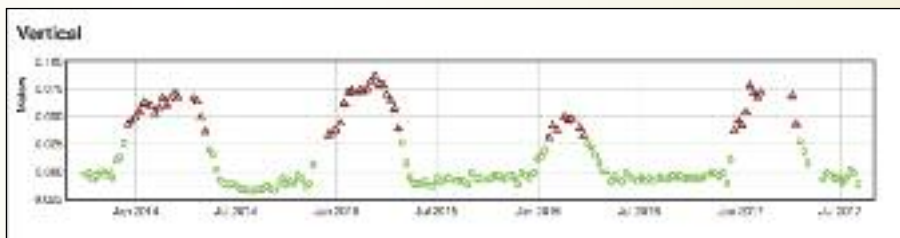


Figure 2 – Example of a station exhibiting large season variations in the vertical

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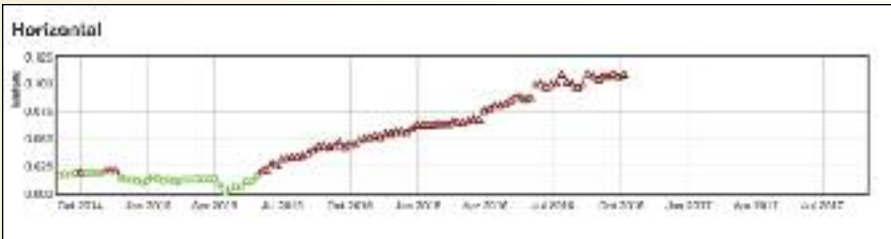


Figure 3 – Example of a station exhibiting an unexpected change in horizontal velocity

variety of effects including thermal expansion of the antenna mast, thermal expansion of the building on which the antenna mast is mounted, snow and ice on the antenna, and other environmental effects. In such cases, it is advisable to find and mitigate the source of the variation, which may involve moving to another site.

- Changes to the station velocity caused by unstable monumentation or geophysical effects can cause stations to become non-compliant. For example, the change in velocity in Figure 3 can appear initially to be a seasonal signal but the station continues to drift off from the “official” coordinate. In this case, the station will continue to be non-compliant until a new velocity is adopted, the cause of the anomalous motion is removed, or the station is relocated to a more stable site.

Although there are occasionally examples of commercial RTK reference stations that become non-compliant due to coordinate discontinuities, velocity changes, or large

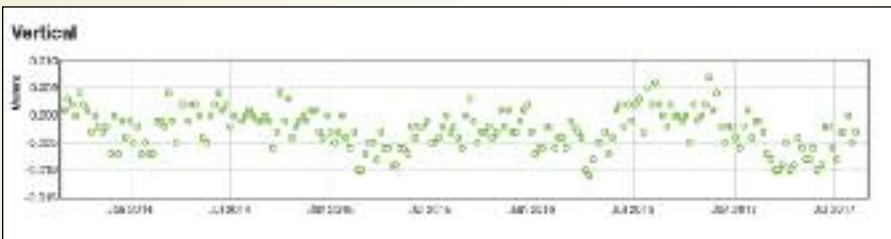


Figure 4 – Example of a good quality commercial RTK station (small seasonal vertical signal)

seasonal variations, it needs to be stressed that these cases are rare. The vast majority of reference stations in the three participating Ontario RTK networks are of good quality and typically exhibit behaviour similar to that shown in Figure 4.

Current Status of Compliant RTK Networks in Ontario

There are currently (as of August 2017) three RTK networks operating commercially in Ontario that are partic-

RTK Network	Commercial Provider	# Stations Compliant (Ontario)
Can-Net	Cansel	54
SmartNet	Leica GeoSystems	66
TopNET	Topcon Positioning Systems	64

Table 1 - Summary of Compliant RTK Networks in Ontario

ipating in the NRCan compliance program. These networks are summarized in Table 1.

All three participating RTK networks primarily cover Southern and Eastern Ontario, with a few stations in the North. Figures 5, 6, and 7 show the distribution of stations in Ontario for each of the participating networks. The majority (>85%) of



Figure 5 – Can-Net stations in Ontario

the Ontario stations are compliant and the vast majority of the non-compliant stations are caused by data outages. The RTN monitor site is a useful tool for diagnosing long-term station instability, and since it went live in 2016 many of the stations showing displacements or seasonal variations (outside the tolerance of 2cm horizontal and 3cm vertical) have been replaced or discontinued.




Figure 6 – SmartNet stations in Ontario



Figure 7 – TopNET stations in Ontario

Conclusion

Since 2011, CGRSC, NRCAN, and the major commercial RTK providers operating in Canada have been collaborating to integrate commercial RTK networks into the official NAD83(CSRS) reference frame in a consistent manner, and to monitor the stability of these RTK reference

stations. Three RTK providers in Ontario (Can-Net, SmartNet, and TopNET) are now participating in the NRCAN compliance program where their reference station coordinates are estimated, distributed, and monitored by CGS. The RTK compliance program has been demonstrated to be a reliable means to ensure the commercial RTK networks are compatible with NAD83(CSRS), the national spatial referencing standard. The CGRSC and NRCAN now anticipate that professional surveyors and their provincial associations will see the benefit of working with and encouraging the use of compliant networks  where possible.

Brian Donahue is the team leader of the Geodetic Integrated Services Unit at the Canadian Geodetic Survey, Surveyor General Branch, Natural Resources Canada. He is also currently the chair of the Canadian Geodetic Reference System Committee (CGRSC) and is leading the CGRSC RTK compliance project. He has a BSc. Eng. in Surveying Engineering from the University of New Brunswick. Brian.Donahue@canada.ca

Further Reading

Guidelines for RTK/RTN GNSS Surveying in Canada available for download from the NRCAN website at: <http://www.nrcan.gc.ca/earth-sciences/geomatics/geodetic-reference-systems/9056>

Geomatics Science Begins this Fall at York University

By Costas Armenakis, PhD, PEng, ISPRS Fellow

Introduction

The Geomatics Science stream of the Earth and Atmospheric Science (EATS) program at York University is being introduced in September for the 2017-18 academic year. This new Geomatics Science stream (BSc) complements the Geomatics Engineering program (BEng), which was established in 2001. Both Geomatics programs reside within the Department of Earth and Space Science and Engineering (ESSE), within the Lassonde School of Engineering. The Geomatics Science stream was introduced under the Earth and Atmospheric Science Program (EATS) by modifying its existing Earth Science stream. It was a strategic development within ESSE to combine the strengths of Geomatics Engineering and EATS, to grow its geomatics student base, enhance the student experience in both programs, and provide career paths and opportunities in both science and engineering. In addition, the GIS and Remote Sensing Certificate is also offered by ESSE.

Currently, the Department of Earth and Space Science and Engineering consists of almost 30 faculty members, and is a home to approximately 300 undergraduate and 100 graduate students. ESSE began in 1972 as an Earth and Environmental Science Program housed within the Department of Physics (now Physics and Astronomy). The Program evolved into a separate department in 1981, then changed again in 1992 to the Department of Earth and Atmospheric Science. ESSE, with its three programs Geomatics Engineering, Space Engineering, and Earth and Atmospheric Science, is one of the founding departments of the Lassonde School of Engineering at York University.

Geomatics Science stream

The Geomatics Science stream offers students solid knowledge in mathematics, computer science and fundamental science. It provides fundamental knowledge and understanding of many key concepts in earth and geomatics



Field surveys 2017, York University

science. Its objective is to provide students with the ability to combine physics, mathematics and information technology for the collection, analysis, display/visualization and interpretation of spatial data along with an understanding of the Earth and the space environments.

The students are expected to develop knowledge and critical understanding of the key concepts, methodologies, current advances, theoretical approaches and assumptions in geomatics science and its specialized areas. The students will be able to combine physics and data analyses methodologies to extract useful information from measurements from a variety of sensors and techniques, and use tools to analyze and interpret data.

The program promotes the ability to accurately and reliably communicate information, arguments, and analyses, both orally and in writing, to a range of audiences. As well, students are taught an appreciation of the legal parameters of their work, and develop an ability to take legal and ethical implications into account, demonstrate professionalism, manage both independent and team projects effectively, and learn independently through research and other means.

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Table 1: Core and elective geomatics courses

Core geomatics courses

- Fundamentals of surveying
- Field surveys
- Fundamentals of geomatics engineering
- Adjustment calculus
- Geodetic concepts
- Global Navigation Satellite Systems
- Photogrammetry
- Remote sensing of the Earth’s surface
- GIS and spatial analysis
- GIS and data integration

Elective geomatics courses

- Cadastral surveys and land registration systems
- Survey law
- Hydrography
- Geodetic surveys
- Advanced field surveys
- Analysis of overdetermined systems
- Digital terrain modelling
- Image processing for photogrammetry and remote sensing
- Physical and space geodesy
- Advanced 3D geospatial techniques
- Advanced topics in remote sensing
- Mobile GIS and location-based services
- Geomatics multi-sensor systems

The curriculum is flexible, with a significant number of elective courses in the 3rd and 4th years of the program. Specifically, the Geomatics Science program offers 10 core and 13 technical elective geomatics courses (Table 1).

Table 2: Differences between Geomatics Science and Geomatics Engineering programs at York University

Areas of differences	Geomatics Science	Geomatics Engineering
Admission requirements	English, Advanced Functions, Calculus & Vectors, Physics (no Chemistry). Recommended average: High 70s. Average is calculated using six grade 12 U/M courses, including program-specific prerequisites.	English, Advanced Functions, Calculus & Vectors, Physics, Chemistry. Recommended average: mid 80s, no prerequisite grade below 70%. Average is calculated using six grade 12 U/M courses, including program-specific prerequisites.
Credits	120	150
Curriculum	Flexible, large number of elective courses.	Structured.
Tuition fees	3 credit course is about \$350 cheaper than a Geomatics Engineering course. 36 credits is about \$5,740 cheaper.	3 credit course is about \$350 more expensive than a Geomatics Science course. 36 credits is about \$5,740 more expensive.
Degree	BSc (Specialized Honours)	BEng
Professional Accreditations	AOLS (application to be submitted to AOLS at the end of the completion of the first 4 th year cycle of the program).	CEAB, AOLS, CBEPS.
Career paths	Scientist, practitioner, developer, applications, spatial analyst, licensed land surveyor, research.	Engineer, practitioner, developer, applications, spatial analyst, licensed land surveyor, professional engineer, research.

Cadastral surveys, survey law and land registration systems are part of the knowledge base of this program.

The curriculum also emphasizes practical and professional experience through projects and field courses. Experiential education is integrated into the curriculum in a wide variety of ways – laboratories, team and individual projects and research projects. Many of the course lectures, as in Geomatics Engineering, are offered in “blended” format: both in class and in on-line remote participation. Additionally, Geomatics Science supplements student experience with two field survey courses, which include professional exercises such as instrument familiarization, topographic mapping, control surveys, highway surveys, construction surveys and precise geodetic surveys work. Students enrolled in the Geomatics Science program are eligible to participate in the co-op program of the Lassonde School of Engineering.

Differences between Geomatics Science and Geomatics Engineering programs

While the Geomatics Science and Geomatics Engineering share common courses, they also have significant differences as highlighted in Table 2.

Concluding remarks

Professional geomatics-related work does not always require an engineering degree, nor does it require someone to be a professional engineer. By offering a Geomatics Science program, together with our Geomatics Engineering program, York University is creating a nexus of geomatics education studies in science and engineering, and giving additional choices to our students as they pursue their career aspirations. The curriculum of the Geomatics Science program has been designed to meet the academic requirements set by the Association of Ontario Land Surveyors (AOLS) and the AOLS’ Academic and Experience Requirements Committee, and graduates of this program will be eligible to become Ontario Land Surveyors once accreditation is granted by AOLS. The required course path to meet the current AOLS academic requirements has been identified and includes courses in mathematics, science, computing, project management and economics, effective communication, professional practice, core and elective geomatics courses, and research projects. Following the first 4 years of the program, York University will seek AOLS accreditation of its Geomatics Science program.

The domestic and global geomatics sectors are experiencing a paradigm shift—from the production of base geospatial data and information to value-added products and location-based services, and heading towards user application-based geospatial information. These changes are reshaping traditional geomatics industrial activities with a shift towards ubiquitous geospatial information and communication technologies, where location is becoming a commodity.

The main objective of the Geomatics Science program is to provide a world-class geo-spatial / geo-information science program in the geomatics disciplines, and to respond to the substantial growing demand in Canada. The program aims to deliver a breadth of knowledge in geomatics science, while giving students the key skills required for practitioners (e.g., land surveyors, GIS specialists, etc.) and promoting research in geomatics science.

The Geomatics Science program at York University is committed to excellence in teaching, research and student experience. The Geomatics Science program, along with the Geomatics Engineering program, plans to continue building strong relationships with the community, engage local and national employers for its co-op program; involve members of the geomatics profession in student projects; invite land surveyors’ associations and other professional organizations to speak to, and work with the students; and work with industry to continuously improve its curriculum. It aims to produce graduates that will have successful careers in the geomatics/land surveying sector, and who will meet the needs of and advance this growing area.



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GIS layers, Keele Campus, York University

Recruiting the Best and the Brightest – Henriette Verhoef Shares Some Thoughts on her Career as a Land Surveyor

Henri Verhoef was commissioned as an Ontario Land Surveyor twenty years ago and as a Canada Lands Surveyor in 2001. Her father, Nicolaas Verhoef, OLS #1134 passed away this past July at the age of 85. In the following interview Henri reflects on her career as a land surveyor.

Why did you become a land surveyor?

My path to becoming a land surveyor started with a summer job working outdoors for Parks and Recreation in Campbellford, Ontario. I realized I liked working outdoors and it was through this job that I got the opportunity to learn to drive a dump truck! When this summer job ended, I was hired by the County of Northumberland on a survey crew.

Now I had always vowed I would never work for my father (too proud!) - if I were going to survey I wanted to do it myself and make it on my own (no patronage). But when the County job contract ended, I found myself out of work. At the same time, one of Dad's employees got sick. The company needed help, and I needed a job, so I got hired to start at the bottom. Despite my earlier misgivings about working for and with Dad, it was the best thing that could have happened. I found that I really liked the job. It was outdoor work and I absolutely loved that. I gained a lot of respect for Dad and what he did.

But after a time, the work ran out, we had to go on work share and I got laid off. But I decided I liked this work. I might as well go to school for it, to pursue it.

How did you become a land surveyor?

I applied to Erindale College at the University of Toronto (THE school for surveying at the time), but I didn't get accepted because I didn't have the courses I needed to qualify for Erindale, so then I went to Queen's and did the qualifying courses, plus a couple I knew I would need at Erindale.

I still didn't get accepted on my second attempt, so I went to Erindale and met with Professor Bob Gunn (who was well known and loved!) to find out what I needed to do to qualify for the survey program. And I learned that not being accepted was a mistake. Bob told me I shouldn't have been refused, but there was something about the way the system worked at that time wherein he did not see my results because they didn't get submitted to him from U of T. Bob stood up to bat for me and gave me the opportunity to get in the survey program.



I graduated in 1993, and articulated with Ron Smith in Kingston. I remember being worried that I might not get permission to write my final exams, but my monitor Bruce McKay assured me that I would get the chance. I passed my exams, and was commissioned as an OLS in 1997.

Why did you stay working as a land surveyor?

Because I loved it! And I liked and respected the people I worked with - they gave me the opportunity to be good at

surveying. As my knowledge increased, I liked being able to explain to clients how the process worked and I enjoyed helping them. I loved getting to know and work with all the municipal contacts - people you need to help you along the way. I like to be helpful, and everybody here has been so helpful - that's what nice about a northern town. (Fort Frances, Ontario)

What did you already know about land surveying from your father? Did he encourage you to take it up as a career?

I knew the difference between the dumb end and the smart end of the tape! I also knew something about types of plans and geographic fabric and he taught me how to interline!

Dad discouraged me from going into business for myself because of the uncertainty of getting steady work. But when I got my OLS he was very proud of me. Dad was never one to give out compliments, like saying "good job" to a crew. So I made a point of encouraging my own staff.

Did you have people who you considered to be mentors? What did they teach you?

Ken Whiteman was my first crew chief when I worked for Dad. I remember I felt sorry for him because not only did he have to work with a female, but a female who was the boss' daughter! But Ken made me do EVERYTHING - line cutting, setting bars, hauling gear, etc. He said, "If you're going to work on my crew you're going to work." And that was great. I loved it. I loved learning and I loved the physical work.

Jack Keat (who was articling with Dad at the time), was another mentor. He took the time to teach trigonometry to me and the other field staff. (This was before I went to school for surveying.)

I had a professor at Waterloo who took time to tutor me in calculus. And while articling in Kingston, Margo Wirsig taught me a lot about CAD.

After Jim Bowman hired me, I received a lot of help from Deb Cornell and Murray Bullied, who both worked in the Fort Frances office. They introduced me to the area - its geography and people. And Jim Bowman himself, of course, was a very important mentor as I got started in my surveying career.

What are the things you like about land surveying as a career?

Working outside. It's nice work because we get to go where sometimes no one has gone before - or very few have gone before! And then you have to figure out a way to get there. Or we go where no one in a right mind would go - like through a swamp, or stump walking, or a garbage dump. And you have the oppor-

tunity for some interesting commutes to job sites - flying or boating in, for example.

I like the challenge of figuring out how to do a job from the theoretical to the practical. A lot of credit has to go to the field crews who do the work. Nothing replaces experience and I like learning practical things from the people on my field crews. They were always so generous in sharing their knowledge; e.g. setting a picket on rock, or plumbing a snow picket. A good crew person has a huge amount of know-how. They need to operate, maintain and sometimes repair all kinds of equipment - snow machines, saws and power equipment, rock drills. In the north they need boating skills. Back when I worked with Ken Whiteman, we were doing a job in a barnyard and it was getting dark. We still had to tie in the barn, so Ken held up a lighter to show me where to aim the instrument. That comes from experience and I appreciated their knowledge.

I find research interesting too, even though it's time-consuming.

What are the things you dislike about land surveying as a career?

Paperwork is less appealing! Even then, there is lots of help available. People in the north are so friendly and accommodating.

Filing and indexing - essential, but tedious!

Having to spend too much time at the computer emailing.

Since you grew up in Southern Ontario how did you decide to stay in North Western Ontario for your surveying career?

Because I was offered a job! And Fort Frances had a similar feel to Campbellford, where I had worked for Dad. I was used to life in a small town. I enjoy that. And as I've mentioned, the people here are friendly and helpful.

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Any good field or client stories you would like to tell?

I remember surveying a garbage dump in Belmont Township with Ken. We sloshed through garbage water because we knew we must get the job done. At the end of the day we just looked at each other and said, "That was gross!"

I recall a fly-in job. Our snow machine wouldn't fit in the plane, so the pilot and owner of the aircraft let us use his, which he proceeded to cram into the back of the plane, all by himself, with a cracked rib! He flew us in, and even helped us to unload. There's nothing like a "real" excellent bush pilot! Especially when you're using "finger on map" navigation.

On one job we stayed at a fish camp - and worried about bears. Another job found us sleeping on picnic tables in a cabin in minus 30 degree temperatures, because the lodge where we were supposed to sleep wasn't open!

You first became an Ontario Land Surveyor, why did you decide to become a Canada Lands Surveyor too?

There was lots of potential. I was hired to replace Steve Minnie (of Minnie Bowman) to run the Fort Frances office. He had his CLS so I figured I might as well get mine. I

thought it could be beneficial in dealing with First Nations work, and I believe it has been. We ended up hiring some First Nations people to work at our offices. One of them went on to take some surveying courses on his own initiative. I hope that it brought greater opportunities for understanding and growth for both the First Nations and our company.

Is there anything you want to say on the topic of women in land surveying?

Women can do it. We can do all the heavy lifting, both mentally and physically. Some women want to do it all, some don't. And some male crew members might not want to be seen letting a woman do all the same work, although hopefully this attitude is changing. Dad always said, "*There are women who can't survey, but there are lots of men who can't either. I know, because I've hired some of those men!*"

Anything else you want to add on the general topic of land surveying?

I have found the surveying community to be very supportive in general - people like Anne Cole, Michael Marlatt, Alison and Bill Parsons, Anita Lemmetty and Lloyd Taylor. It's like another type of family, because we have a very special connection to the land.



The Hard Road Ahead: A History of the Addington Road

By Linda Corupe, B.A., U.E.

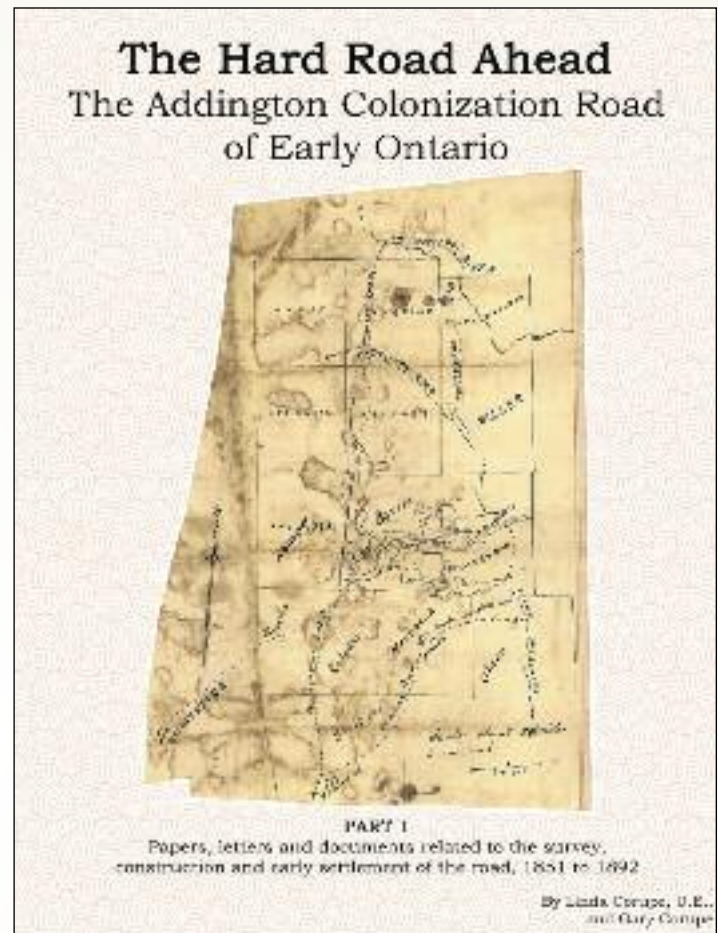
Among the first of more than 400 colonization routes built in the mid to late 19th century, the Addington Road played a vital role in drawing new settlers to the once-pristine wilderness of central and northern Ontario. The Addington Road, along with the Opeongo Road and the Hastings Road, was originally constructed to launch a scheme to bring settlers and agriculture farther north by the promise of free grants of land. Built in two phases over 12 years (1853-1864), at a cost of approximately \$54,000, this 73 mile-long route was surveyed by Provincial Land Surveyor Aylesworth Bowen Perry and administrated by his brother, Ebenezer. Stretching from the Clare River in Sheffield Twp. to the Peterson Road in Brudenell Twp., parts of Addington Road, along with other colonization roads, now form the backbone of Ontario's modern provincial highway network.

Under the Public Lands Act, passed in 1853, the result of a resolution put forward by William Lyon Mackenzie the previous year, the government was empowered to grant lots of 100 acres of Crown-owned land in the vicinity of new public roads to bona fide settlers. These roads started out as “winter roads”, since a layer of deep snow helped smooth out the often irregular surface, but ultimately became “summer roads” that could be used year-round.

In surveying the Addington Road, A.B. Perry followed a rough plan worked out by a previous surveyor, Richard Birdsall, with a few alterations. The actual route of the road began approximately 40 km. north of Napanee. From there, it ran northward through Kaladar Twp., straddled the boundary between Anglesea and Barrie Twps., and then passed through the Twps. of Abinger and Denbigh. A short run of line was also laid out in the southern part of Lyndoch Twp. in Renfrew Co., just past the banks of the Madawaska River. At first called the Camden-Madawaska Road, the name had been changed to the Addington Road by the time of its completion.

The second phase of the Road continued northward through Lyndoch Twp., incorporating some previously laid out roads, and traversing Brudenell Twp., until it met the Peterson Road, which provided a connection to the Opeongo Road. Free grant lots were not offered along this section.

Historical documents reveal some of the many difficulties that A.B. Perry dealt with while completing his surveying work. In one letter, he recalls escaping a hurricane in Effingham Twp. in August, 1855. After hearing the storm's “hoarse grumbly sound,” Perry and his crew ran into a swamp to avoid being struck by the falling pine trees that were



crashing to the ground around them. In another, he tells of a fruitless search for a lost explorer, a search later abandoned in the hope that the missing man had found his way to a nearby lumber camp. He noted that Kaladar Twp. had no posts to mark concession or boundary lines, while those in Denbigh Twp. had to be moved, since they clashed with the placement of the road. Occasionally, farmers and business owners in the area complained about the route Perry had chosen. Archibald McDonald of Sheffield was unhappy with the placement of the Clare River Bridge. Billa Flint wanted the road to come nearer to the Town of Flinton, where he had numerous business interests. And John S.J. Watson was upset at the distance from the road to the fledgling community of Watson's Mills (now called Rockingham), falsely accusing the Perry brothers of “jobbery” by using established road lines while charging the government for constructing new ones.

The Survey Accounts Files of the Crown Lands Department have also preserved such information as the names of the men who worked on the surveying crews, and the tasks assigned to each. These range from explorer,

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axeman, packman and chain bearer, to cook, and include the wages paid for each position.

The construction of the colonization roads was discussed in *The Globe* newspaper of July 7, 1881. While some were created simply by moving around soil to form a track and ditches, at other locations “corduroy” roads were constructed by laying logs along the surface and then covering them with earth. The writer observed that, in these cases, “a ride over its irregular surface [would bump a rider] up and down in a manner which threatens to dislocate his bones, heart, liver and stomach, and produce concussion of the brain.” As a result, the practice of using fascines (bundles of tree twigs and branches) was adopted for use. These bundles, laid several feet thick and then covered by soil, ultimately produced a smoother and more durable road. Gravel, unless found in the vicinity of the road, was rarely used, as it was expensive.

Some of the other challenges of early road construction also noted in the article included the need for detours around lakes and rocky bluffs and the use of zigzag routes on steep hills to avoid potential landslides. If boulders blocked the way, fires would be set around them, followed by a dousing with cool water that would crack the rock into more manageable pieces.

For A.B. Perry, the Addington Road was a family affair, and locals called it the Perry Road. While one brother, Daniel W. Perry, often worked on the construction and repairs, or transported supplies to work camps, it was his brother, Ebenezer Perry, who was appointed to be the road agent by the Crown Lands Department. This job, for which he collected a salary and commissions of almost \$8,400 from 1856 to 1861, entailed making inspection trips along the road, keeping an up-to-date register of lots located or still available, taking a census of the settlers each year, and recording their agricultural progress. He had to resolve any disputes that arose, including, on occasion, evicting squatters and settling quarrels with the local lumbering interests. He also ran into professional rivalries. Allan Macpherson, the local Crown Land agent, tried to influence new settlers away from the free grant lots to land for which he would receive a seller’s commission.

To encourage new settlers, details of the colonization roads were laid out in glowing terms in newspaper ads, posters and booklets, listing the conditions of obtaining a free deed. These conditions included being at least 18 years of age,



Addington Road Historical Plaque in Kaladar from the collection of the author.

residing on the lot, building a house measuring at least 20 by 18 feet, cultivating 12 acres of farmland over the course of four years and keeping the road adjacent to the property in good repair. If these conditions were not met, the lot would be reassigned to another settler.

Settlers for the new townships came not only from Canada West and Canada East, but also from the United States and overseas. In welcoming these new residents, Ebenezer Perry saw himself as a fatherly figure. Because Europeans were

less proficient at clearing land and enduring the hardships of living in remote areas, Perry made arrangements to procure copies of Catharine Parr Traill’s *The Emigrant’s Handbook*. He did, however, admit to having an ulterior motive, noting that he hoped his Reform Party politics would rub off on the new populace.

At first, settlement was brisk, with Perry reporting in 1856 that 170 settlers had taken up 118 lots. By 1860, that number rose to a high of 774 settlers on 195 lots, with almost 1,500 acres of land cleared. The total population along the road fluctuated, with lots being abandoned or forfeited, and then claimed by new families. The agent encountered resistance to settling on the stretches of land known as the “rocky ranges.” In suggesting that 200 acres (instead of the standard 100) be awarded to any settler willing to locate there, Ebenezer commented that, if a settler died on his lot, “all the available soil [...] would be required to bury him decently.”

One of Ebenezer Perry’s most important jobs was to inspect road damage and recommend necessary repairs to avoid isolating settlers by impassible routes. Frequently, inadequate drainage caused road damage, particularly through the rocky ranges, and, at times, sections of the route had to be re-surveyed and re-aligned to bypass a problem area.

Each year, overseers for the reconstruction and repairs of the road were chosen, who would then hire labourers for their crews. Although the work was demanding and the days were long (10-11 hours), the new settlers were eager to be on these crews, as the meagre pay provided relief from frequent crop failures. Though many only made \$1 per day or even less, board was often included, with the Crown Lands Department contributing barrels of flour and pork and paying for other supplies or services, such as basic groceries, tools, transportation, and provisions for the horses. Although they were often reluctant to pay for more expensive and permanent repairs, more than \$20,000 was spent on the Addington Road between 1868 and 1883.

Settlers faced other problems including frequent forest fires, adverse weather and voracious insects that contributed to poor crops. Loggers in the area also caused persistent issues, at times stealing timber from the residents, and causing log jams on the waterways, which twice resulted in the destruction of the Madawaska River Bridge. As a result, by the end of 1862, Ebenezer Perry was surely disappointed to report to the Assistant Commissioner of Crown Lands that no new settlers had taken up lots. By 1864, the population dipped slightly to 717, with 180 lots located.

The Canadian government ultimately deemed the entire scheme to be a failure, at least in terms of creating new agricultural lands. Yet today, it's clear there's more to the story. Thanks in part to documents preserved by the Archives of Ontario, Library & Archives Canada, local libraries and historical societies, the Addington Road and other colonization routes have much to tell us about life on the fledgling settlements that sprung up around this time. Although the communities that eventually grew out of the Perry brothers' hard work on Addington Road were often connected by pathways of little more than corduroy and twigs, they also fostered important connections between the new settlers as they struggled together to overcome hardships in the sometimes harsh conditions of backwoods Ontario.



A stretch of the route of the original Addington Road, which was bypassed when Hwy #41 was constructed. It's official name is "Addington Road #1" from the collection of the author.



"Bringing out the Logs by Team" - Credit: Petzold Family, Lennox and Addington County Museum and Archives, Napanee.

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Calendar of Events

October 23 to 26, 2017

GIS-Pro 2017 – URISA's 55th Annual Conference

Jacksonville, Florida

www.urisa.org

November 15, 2017

GIS Day

Discovering the World Through GIS

www.gisday.com

November 23 to 24, 2017

Geomatics Atlantic 2017

St. John's, Newfoundland & Labrador

<https://www.geomaticsatlantic2017.com>

February 28 to March 2, 2018

126th AOLS Annual General Meeting

Niagara Falls, Ontario

www.aols.org

March 25 to 29, 2018

2018 Joint Canadian Hydrographic and National Surveyors' Conference

Victoria, British Columbia

<https://www.eiseverywhere.com/ehome/chc-nsc2018/home>

May 6 to 11, 2018

FIG Congress 2018

Istanbul, Turkey

<https://www.fig.net/fig2018>

York University Partners with AOLS to Launch a High School Summer Mentorship Program to Promote Women in Engineering Research

By Marisa Sterling P.Eng, FEC

To celebrate Canada's 150th anniversary of Confederation, York University's Lassonde School of Engineering launched a new paid summer mentorship program in partnership with the Association of Ontario Land Surveyors (AOLS) to engage youth in how science, technology, engineering and math (STEM) are economic drivers for Canada. Aimed to cultivate much-needed gender diversity in the fields of engineering and science, young women completing grade 11 were invited into the program's inaugural year.

With women representing only 12% of licensed engineers across Canada, the need for gender diversity in this field is significant. To meet and exceed this need, the Lassonde School of Engineering launched in 2015 the \$1.5-million 50:50 Challenge, to become the first engineering school in Canada to reach a gender balance.

"Our goal is not simply to have diversity but to do something with that diversity – to innovate and to lead" says Marisa Sterling, P.Eng., Assistant Dean of Inclusivity and Diversity and creator of the summer mentorship program. "This experiential learning opportunity is part of a broader inclusion initiative that focuses on encouraging, empowering and valuing women's voices."

The 6-week program was both a job and a learning opportunity in one. During July to August 2017, students were actively engaged in exciting research projects and introduced to important career networks. The students worked directly with Lassonde's accomplished professors to find ways to reduce Toronto's water footprint, prevent flooding and make the city safe and accessible to people with physical, visual or mental impairments. Through lunches, seminars and field trips, the students also met with women in industry, teaching and research to expand their professional networks.

"This whole initiative in general has really moved me to try my absolute best to go into the engineering field and I just wanted to say thank you for being a part of something so incredible, it has definitely made me even more determined to become an engineer!" said the program's first student applicant.

Twenty young women applied for 3 spots in the program's inaugural year. With the help of the Ontario Physics Teachers Association, special efforts were made to invite students from across Ontario. To apply, students had to have completed grade 11 physics with a minimum average of 80%, submit a resume and reference letter from their physics teacher and write an



Grade 11 student Sejal Sahni with Maureen Mountjoy, AOLS Deputy Registrar and Editor at Lassonde School of Engineering's Undergraduate Students Summer Research Conference 2017.

essay about what being a woman interested in science and engineering means to them.

Sejal Sahni from North Park Secondary School in Brampton was selected to work with geomatics engineering professor Mojgan Jadidi to measure accessibility to urban infrastructure for people with disabilities. Sejal collected geospatial data to evaluate how accessible York University's campus is to people with physical, visual or mental impairments. Her position and a portion of this geomatics engineering research were generously funded by AOLS, the program's inaugural industry partner. When asked why Sejal delayed signing up for technology classes until grade 11, she explains, "I did not explore technology, which has been my passion since grade 7. I was nervous about joining a class with all boys. But in grade 11, I took a big risk and decided to take Computer Science and Computer engineering. Those 2 courses were my favourites and I have enjoyed them. At the beginning of the course, I was very close to dropping out, but there was no other course I could switch too. My average was 94% in both tech courses which is extremely high."

Nicole Valkova from Rosedale Heights School of the Arts in Toronto was selected to work with civil engineering professor Usman Khan in water conservation. Through researching water systems in Israel and the Netherlands, her project was to find ways to reduce Toronto's water footprint. When asked about women in science she wrote, "STEM fields must be made less demeaning to women by encouraging more of them to join ... and letting them know that they are allowed to make mistakes; that it all comes with hard work. It is in this way that women will consider these academic fields to be more accessible and welcoming to them and will be more likely to apply for them. Girls are brought up with a disadvantage through the culture they are raised in and must know that it can all be learned, so as

to make them feel more valued when joining these fields of work. Engineers work for people, so shouldn't they be people?"

Hasma Habibiy from David and Mary Thompson Collegiate Institute in Scarborough was selected to also work with Dr. Khan to research how potable water is being used on York University's campus. Hasma and Nicole's research goal was to help develop forecasting methods to help prevent floods in megacities like Toronto. Hasma told a personal story of her path to discovering engineering, "In the incessant world, inequitable wages and gender disparities are some of the many that account for restrictions on career availability for women. As a Middle Eastern female, my family has always imposed stereotypical career labels such as doctor or nurse on myself. Later in high school, I realized my strengths situate in mathematics, leadership and science related fields. I realized that these careers are often pursued by males which made me even more passionate about pursuing a career in a male-dominated field like engineering. I have managed to academically thrive in math and science allowing me to receive awards of those respective subjects. I received the highest physics mark among the first-semester grade 11 classes."

The students worked in the Bergeron Centre for Engineering Excellence, home of the school's renaissance engineering philosophy. The new building, at 16,000 square metres, is a hub of collaboration, creativity and entrepreneurship with no lecture halls, social spaces and active learning areas. The architectural design permits students the freedom to think differently, image solutions that defy conventional wisdom and help the transition from the structure of high school to post-secondary life.

All applicants of the program were invited to a personal mentorship session with Assistant Dean Sterling as well as networking sessions with; engineering graduates working at the design and engineering firm, ARUP; Vanessa Raponi, engineering student and founder of EngiQueers Canada; math teacher and inspirational speaker The Math Guru; Mina Dezz, engineering intern and founder of the Instagram account @IronRingGirls, and even Ontario's Premier Kathleen Wynne.

"Having the opportunity to meet and speak with other like-minded women at the lunch was amazing, and I particularly enjoyed having an open discussion about competition and lacking confidence in engineering" said participant Olivia Pitschner from Glenview Park Secondary School in Cambridge, Ontario.

The program concluded with a poster session at Lassonde's second annual *Undergraduate Students Summer Research Conference 2017*, attended by Maureen Mountjoy, Deputy Registrar and Editor at AOLS. The students presented their posters to professors, undergraduate and graduate student peers, their high school teachers and family members, demonstrating their skills in teamwork, communication, critical thinking, problem solving and working effectively with diverse colleagues. In fact, the high school students fit in so well that they were mistaken for undergraduates and two of them received the student choice award.

Hasma and Nicole completed the program with enriched research skills, a better understanding of the threats to the country's fresh water bodies, and a desire to educate others and

suggest practices for water preservation. Sejal ended the summer having completed an accessibility assessment of the York University Keele campus, with the confidence that she can put her knowledge of coding languages to use to help people, and an awareness to consider people with disabilities more in the design of buildings and communities.

The summer program was successful because it directly outreached to young women in secondary schools and let them experience the possibilities to make a difference in the world and be social innovators through engineering. As well, the program empowered the young women as they saw the value of their voice in society.

"I think that engineering is the perfect way for me to connect my love for discovery and critical thinking with the chance to



Nicole Valkova, Sejal Sahni, Kathleen Wynne - Premier of Ontario, Hasma Habibiy, Valerie Sterling - President of the University Women's Club North York, and Marisa Sterling - Assistant Dean, Lassonde School of Engineering at the CNE Innovation Garage launch.

create and design." - Nicole Valkova, grade 11 student

The Lassonde School plans to expand this program next summer to more students. The school is grateful for the leadership of the AOLS and hopes to be able to continue to work together on this goal to make engineering and science more inclusive of all peoples.



Tamanna Noor – summer program coordinator, Nicole Valkova & Hasma Habibiy – winners of the student choice award, Sejal Sahni, Marisa Sterling – Assistant Dean, and Dr. Usman Khan – civil engineering professor.

Marisa Sterling, P.Eng, FEC, serves as the Assistant Dean, Inclusivity and Diversity, of the Lassonde School of Engineering at York University. She leads the strategy and implementation of the initiative to achieve 50:50 gender balance at the school. Marisa speaks regularly on topics affecting women in engineering. Contact Marisa at marisa.sterling@lassonde.yorku.ca

Update on Canada Day Celebrations at Reveley Lodge

As reported in the article “Canadian Pioneer – William Chewitt (1757- 1849)”, published in the Summer 2017 issue of the Ontario Professional Surveyor; a Canada Day exhibit was opened on Sunday, July 2nd at Reveley Lodge www.reveleylodge.org and run for the month of July. Katharine Whitaker has provided some highlights from the event.

Canada Day at Reveley Lodge, in Bushey Heath, Hertfordshire, England, was very successful. There were over 800 visitors (adults and children, including many Canadians) and there was much interest in the Chewett exhibition on the day. The exhibition continued all through the month of July.

We had a private viewing for interested local people and our volunteers on Saturday, July 1st and that was very well attended. It included a visit from Humphrey Gilbert, great-great-grandson of William Chewett, who lives in North London. He was fascinated to learn about William Chewett whom he knew nothing about. His memories are of Albert Ranney Chewett and his wife at Reveley. He often stayed there on school holidays as his parents (his mother was Jocelyn Chewett, daughter of James Chewett, brother of Albert) were artists living in France (he was born in

France). He came again one Friday afternoon to view the exhibition again and stayed for over 2 hours.

We also had a small display about Canada’s involvement in the First World War in this 100th anniversary year of important events for Canadian history (Vimy Ridge and Passchendale - Third Battle of Ypres) in the Conservatory at Reveley. To support this little exhibition, Scott McCracken, Canadian archaeologist gave a talk on Tuesday, September 26, 2017 titled *WWI Archaeology and Commemoration* where he outlined recent work in the field. He used many examples from Canadian forces involvement on the Western Front.

The Chewett exhibition will go to the Bushey Museum in the week beginning November 20th till the end of the year and will be displayed in the Jubilee Room.

<http://www.busheymuseum.org>



“How Accessible is the York University Keele Campus for People with Disabilities?”

The Lassonde School of Engineering invited a high school student Sejal Sahni to help answer this question over the summer.

By Mojgan Jadidi, PEng, PhD with input from Sejal Sahni, Grade 11 student

The Lassonde School of Engineering at York University piloted a Women in Engineering Student Mentorship Program this summer as part of their Lassonde 50:50 Challenge - to be the first engineering school in Canada to achieve an equal number of male and female students. The program inspired young women towards careers in engineering through hands-on experience, field trips and networking events with accomplished undergraduate, graduate and professional engineers. The Association of Ontario Land Surveyors (AOLS) became the inaugural partner of the program to promote the Geomatics Engineering/Science program and provided funding for one student over the summer.

Sejal Sahni, a Grade 11 student from North Park Secondary School in Brampton, was honored to be accepted into the program and explore the Geomatics discipline. She participated in research that used geospatial data collection and analysis to answer the question, *How accessible is the York University Keele Campus for people with disabilities?* Sejal became involved with the *Accessibility Routing System Development* project and Dr. Mojgan Jadidi’s team to try to come up with the answer.

About 2% of the York University (YorkU) Keele campus population has a physical disability. With a population of 60,000 people including professors, students, and staff members, this means that there are more than 500 people who require extra support and/or assistance to get from one area to another. Sejal played a major role to identify key accessibility features inside and outside of buildings and parking lots by developing a system based on an experimental checklist¹.

The main components of the research were based on identifying the key accessibility indicators, collecting data, analyzing the data, and preparing the dataset. The best way to collect data and have the most accurate information was to start with the available primary source. However, the available data was very inefficient in terms

of considering the accessibility criteria from the perspective of people with disabilities. To overcome this deficiency, more than 90 features were identified both inside and outside of the buildings and parking lots using the experimental checklist¹.

A 3D sensor structure embedded on an iPad was used to scan these features. Then, a 3D model of all the features was generated using the software MAYA Autodesk. The software allows the different mesh collected from the scanner to come together and make a 3D model. Using these 3D models, it was possible to make accurate measurements of the features and compare them to the specific measurement requirements of the checklist to best meet the needs of people in wheelchairs¹.

There are many factors to consider when assessing a building. The experimental checklist included for example measurements of the height and width of doors, the length of the ramps and accessibility of parking areas, elevators, classrooms and cafeterias. Some buildings were found to have ample width of doors but the elevators would be too small, whereas, it would be the complete opposite in another building. It was concluded that the most reasonable way to

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Figure 1: York University Keele Campus Accessibility Map: Highly Accessible (Darker Red) to Lower Accessibility (Lighter Red).

estimate an environment's accessibility was to give each feature an accessibility percentage based on both the area of the space as well as each geometrical dimension of depth, length and width. Instead of comparing a single feature, like classroom doors or elevator sizes within each building, an overall accessibility scale was created that included these factors.

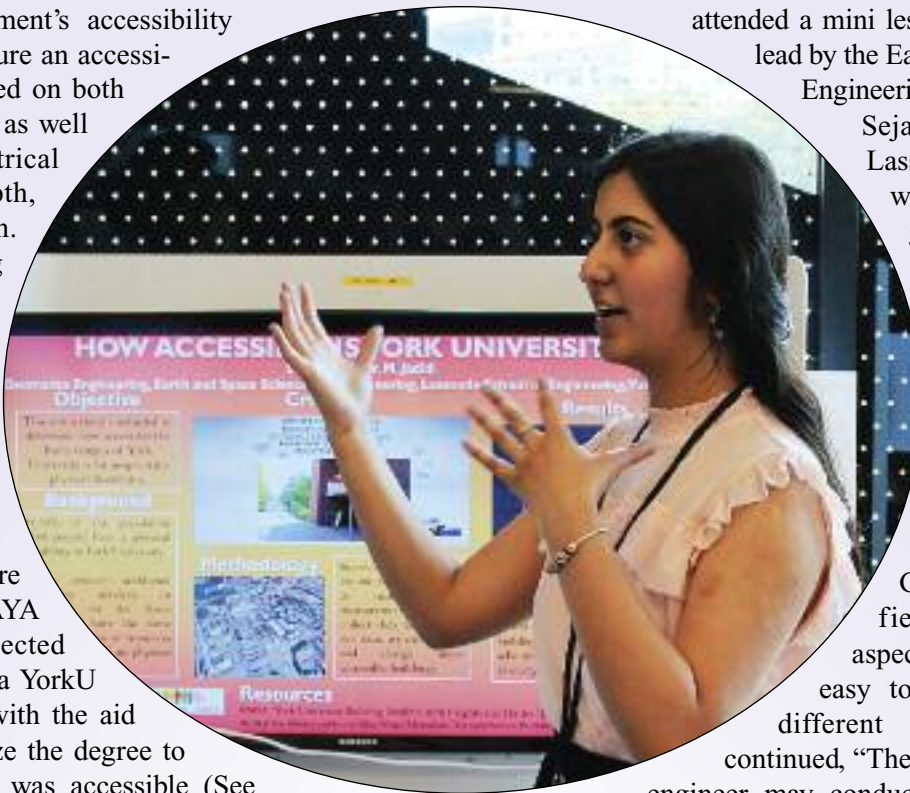
All calculations were performed with MAYA Autodesk. The collected data was plotted on a YorkU Campus CAD map with the aid of ArcGIS to visualize the degree to which each building was accessible (See Figure 1).

The conclusion was that the YorkU Keele campus is 78% accessible for individuals in wheelchairs. For example, the ramps around the buildings were found to be well designed for mobility of people in wheelchairs. The variation in building accessibility could be due to the advancements in technology at the time that each building was constructed or the goals of the design team when planning the building's architecture.

The ongoing goal of this research is to develop an application, with the most filters, to guide individuals through accessible indoor and outdoor routes that best meet their needs. For example, a "best elevator" filter would provide the best route and best elevator to reach their destination if the individual needed to go to the top floor of a particular building.

Sejal presented her research results on August 15 in the form of a poster at the *Undergraduate Students Summer Research Conference 2017* held at the Lassonde School of Engineering. She embraced her communication skills and took advantage of the opportunity to network with undergraduate, graduate and faculty researchers.

During the Women in Engineering Student Mentorship Program, Sejal also participated in regular professional development training and workshops designed by Marisa Sterling, P.Eng., Assistant Dean, Inclusivity and Diversity. Sejal met Geomatics graduate students who were working on research projects such as geospatial data analytics and visualization, photogrammetry and computer vision, 3D model generation, UAVs and mobile mapping, GNSS and navigation, remote sensing and object detection. She also




attended a mini lesson in field surveying lead by the Earth & Space Science & Engineering (ESSE) department.

Sejal arrived at the Lassonde School in July with no idea of what geomatics was and six-weeks later she said, "Since I had never learned or had any experience in the field of geomatics engineering, this was a huge responsibility I had taken on over the summer.

Geomatics is a broad field with so many aspects to explore; it can be easy to work on something different every day". Sejal continued, "The work that a geomatics engineer may conduct on a regular basis,

could vary from surveying to data analytics and visualization. The two jobs are quite different, which is what makes geomatics unique. In geomatics, everything revolves around the data, the collection, accuracy, analysis visualization and interpretation of the data. Since the data can vary from UFO landings in the world to tracking and monitoring vehicles that use remote sensors, this allows for the field to very broad and open to all ideas."

On August 25, her last day of work, Sejal reflected, "Geomatics Engineering blends the knowledge of science and engineering with information technologies to solve complex, real-world problems. Since I love to code, I could use my knowledge and apply it to many applications and understand different sets of data. Geomatics is a mixture of computer science, computer engineering, space & earth science and combines all of them into one major field. This allows for the diversity of jobs that are available within geomatics."

Working with Sejal over the summer was a great pleasure for Dr. Jadidi, Assistant Dean Sterling and the Women in Engineering Mentorship Program. The Lassonde School looks forward to continuing to partner with AOLS and introduce more young women to a future in  Geomatics.

Dr. Mojgan Jadidi is an Assistant Lecturer and Professional Engineer in Geomatics Engineering in the Department of Earth & Space Science Engineering at the Lassonde School of Engineering, York University. She can be reached by email at mjadidi@yorku.ca for further information.

References

¹ S. Gamache, C. Vincent, B. McFadyen, F. Routier, L. Beauregard, and D. Fiset, "Measure of Accessibility To Urban Infrastructures," 2016.

The Future Starts Now

By Justin Collett

This article also appears in GIM International Magazine: October 2017, Volume 31, Issue 10

The discussions in recent years regarding one of the oldest professions, land surveying, have centered on the aging professional membership and how new technology has dramatically altered the way work now is performed. This forecasts a future which has recently been summarized at the FIG working weekend as a 'change or die' environment. Geomatics engineering has been on the forefront of this change, though a problem persists which I, as a representative of Geomatics Engineering students through my roles of Geomatics Undergraduate Engineering Student Society (GUESS) President and Engineering Undergraduate Society (EUS) Sr. Advisor at the University of New Brunswick, would like to discuss:

Students entering university are not commonly exposed to geomatics nor do they envision it as a possible career option.

In the Canadian perspective, this can be explained by the fact that there are only three English speaking and one French speaking certified Geomatics engineering degrees, mostly

hidden behind larger engineering faculties. Though enrolment is on the rise, what a dream it would be to attract the brightest minds to our departments, and eventually to the profession!

Some have argued that we do not need to flood the job market of professional surveying, which inherently is true. But today we see that Geomatics Engineers have more avenues for employment than ever before, from GIS to Hydrographic Surveying, Data Management to Remote Sensing - there are many diverse opportunities for students to pursue.

The question remains: how can we encourage students to study Geomatics Engineering? Obviously, this is a tall order, and one that a student society president cannot tackle on his own. What I do offer is this:

The National Geomatics Competition (NGC)

The weekend competition based in Fredericton, New Brunswick, Canada, will see teams of 3 students from under-

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Be a part of history, support the FIRST EVER

National Geomatics Competition



What: A weekend Geomatics based consulting competition giving teams 6 hours to create a solution for a problem dealing with the various aspects of geomatics. Each team will present their solution to a panel of judges, with an awards gala to follow.

Who: Undergraduate Geomatics students

Where: University of New Brunswick Fredericton

When: February 16 – 19, 2018

Why: Promote the profession, inspire future professionals and network!

**For more information, visit our website: nationalgeomaticscamp.ca
or contact the Competition Chair: Justin Collett at jcollett@unb.ca**

graduate Geomatics university and college programs be presented with a problem dealing with the various aspects of geomatics. The teams will be given six hours in which to devise a solution to be presented the following day. Social events will be planned throughout the weekend, as well as an awards gala.

The goal in creating this event is threefold:

1. To increase the visibility of the profession of Geomatics and the respective university programs.
2. To give students the opportunity to showcase their knowledge and talent while networking with their future colleagues.
3. To inspire the next generation of Geomatics Engineers to participate in future events, work hard, and think big.

Speaking of my own department at UNB, we are commonly known as the folks who keep to themselves on the top floor of the engineering building. Few know what we do, or what we are capable of. I believe that it is time for that to change.

Currently, the NGC is being planned as a Canadian event and will be held February 16-19, 2018, with the vision of opening it up to international institutions in the future. If you or your school have any interest in attending, please contact me. For the professional members, if your firm is interested in supporting the competition do not hesitate to reach out to me.



Justin Collett, GGE IV – University of New Brunswick, GUESS President – NGC Chairman – EUS Sr. Advisor. Email: jcollett@unb.ca

NEWS FROM 1043

Changes to the Register

MEMBERS DECEASED

Nicolaas H. Verhoef	1134	July 11, 2017
Ronald G. Theyers	924	July 15, 2017
Lawrence P. Tomkins	867	Aug. 20, 2017
Donald McGeorge	985	Aug. 30, 2017

REINSTATEMENT

Stephen M. Vollick	1765	Sept. 6, 2017
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COFA REVISED

Was: Young & Young Surveying Inc.
 Now: Young & Young Surveying Inc. (a subsidiary of Mauro Group Inc.)
 Bolton, Ontario, July 18, 2017

CORRECTION

Was: MMM Geomatics Ontario Limited
 Now: WSP Geomatics (Ontario) Limited
 Markham, Ontario, May 10, 2017

Surveyors in Transit

Holstead & Redmond Limited has been acquired by **MTE Consultants Inc.** and will continue to operate as Holstead & Redmond Limited until October 2017.

Frank Mauro is now the managing OLS at **Young & Young Surveying Inc. (a subsidiary of Mauro Group Inc.)** in Bolton, ON.

Stephen M. Vollick is now with the **Ministry of Transportation of Ontario** located at 447 McKewon Ave., Suite 301, North Bay, ON, P1B 9S9.

Perry A. Molloy is now with the **Ministry of Natural Resources & Forestry** located at 300 Water St., 2nd Flr. N., Peterborough, ON, K9J 8M5. Phone: 705-755-2100.

Craig Leslie is now with **AECON** located at 761 Bayview Drive, Barrie, ON, L4N 9A5. Phone: 416-459-3002.

Paul M. Quesnel and **Fernando de Luca** are now with **Tulloch Geomatics Inc.** located at 690 River Park Road, Suite 402, Timmins, ON, P4P 1B4. **Fernando de Luca** is the Managing OLS.

Kerry Ferguson is now the Manager, Land & Property Surveys with the **City of Toronto**. Phone: 416-392-7757.

David J. Wylie is now with **Public Works and Government Services Canada** located at 1010 Somerset Street West, Ottawa, ON, K1A 0S5.

McKechnie Surveying Ltd. has moved their office to 24 McIntyre Place, Unit B, Kitchener, ON, N2R 1H7. Phone: 519-578-5570.

Barich Grenkie Surveying Ltd. (A division of Geomape Canada Inc.) has moved their Stoney Creek office to 297 Highway 8, Unit 101, Stoney Creek, ON, L8G 1E5. Phone: 905-662-6767.

Guido Consoli is now with **Barich Grenkie Surveying Ltd. (A division of Geomape Canada Inc.)** in the Stoney Creek office.

Field Notes and Records for **Duncan Ashworth Surveying Ltd.** are now with **Krcmar Surveyors Ltd.** in Thornhill, ON.

Steven Davidson is now with **exp Geomatics Inc.** located at 885 Regent Street, Sudbury, Ontario P3E 5M4. Phone: 705-524-3131.

exp Geomatics Inc. located at 690 River Park Road, Suite 401, Timmins, ON, P4P 1B4 is now a Consultation Office.

Blake van der Veen is no longer with **Kim Husted Surveying Ltd.**

The Bowmanville office of **Ivan B. Wallace Ontario Land Surveyor Ltd.** is now located at 71 Mearns Court, Unit 16, Bowmanville, ON, L1C 4N4. All other information remains the same.

THE AOLS IS PLEASED TO ANNOUNCE THAT THE FOLLOWING ONTARIO LAND SURVEYORS WERE SWORN IN:

Justyna Marzena Ziemlewska	2013	July 24, 2017
Andrew Wade Kayuk	2014	July 24, 2017
Maaz Malek	2015	Aug. 1, 2017
Juzer Noman	2016	Aug. 15, 2017
Athi Kanaganayagam	2017	Sept. 8, 2017

Esri Canada Centres of Excellence App Challenge Winners Attend the 2017 Esri User Conference

By Team Sweet e-Motion

*This year, Team Sweet e-Motion, composed of three Geomatics Engineering students from York University (Justine Abdelshahid, Benjamin Brunson and Stephen Kosmachuk) were the winners of the annual Esri Canada Centres of Excellence (ECCE) App Challenge. The ECCE App Challenge is a coding competition held by Esri Canada to help promote innovation and creativity within the Centres of Excellence. Each year, teams of students at ECCE schools across Canada are tasked to create new and unique apps powered by Esri technology and open data to help address a problem related to a specific theme. The theme chosen for this year's challenge was **Sustainable Transportation**. Their entry to the competition was a web application that crowd-sourced traffic hazard information (e.g. potholes, chronic poor traffic conditions, etc.), and provided an interface for city planning officials to assess this information and plan for infrastructure maintenance and improvements. As winners of the ECCE App Challenge, these three students were given the opportunity to attend the Esri User Conference in July in San Diego, California as guests of Esri Canada. Following are some of their experiences from the conference.*

We were very honoured to be selected by Esri Canada for this exciting opportunity. The conference allowed us to meet with professionals from a wide variety of disciplines, showing the breadth of applications that Esri's spatial analysis tools can be applied to. Throughout the User Conference, we were exposed to new ways of conceptualizing spatial analysis, and we look forward to using much of what we have learned in our future work.

The User Conference had many parallel sessions, and it was difficult to choose which events to attend as there were so many intriguing topics. Esri Canada staff were extremely helpful and supportive, making sure that we were able to optimize our time and draw our attention to events that were of particular interest or relevant to our work.

Although we were initially overwhelmed by the number of people at the conference, the Plenary Sessions provided an excellent introduction and overview of what to expect. We were told about several new and updated Esri products, including ArcGIS Pro (a desktop application that combines computationally-intense spatial analysis with web mapping), Survey123 (an application that allows for streamlined data collection in the field), and CityEngine (software that facilitates detailed urban planning).

At the Plenary Sessions, there were also presentations from industry professionals who regularly use Esri products. We were struck by the variety of disciplines that have spatial analysis at their core. Presentation topics ranged from using GIS to facilitate profitable and



Team Sweet e-Motion in San Diego. Seated from back left are Justine Abdelshahid and Benjamin Brunson. Stephen Kosmachuk is seated in front.

sustainable shellfish farming, to modeling a realistic city for use in a CG animated film. We were excited to see these new and unexpected applications of GIS software, which broadened our perspectives on applying spatial analysis and

helped to further contextualize a lot of the GIS work we have done as part of our undergraduate studies.

The Map Gallery was a particular point of interest for us. It was fascinating to see the projects people have been working on using GIS products over the past year, and it was very informative to be able to engage with the researchers about their work.

The Expo provided us with an opportunity to see state-of-the-art developments in spatial technologies from both established companies and relatively new start-ups. During the Expo, there were many small presentations detailing ways in which Esri products can be applied. This allowed for a much more focused and in-depth discussion of a single topic (again, the breadth of available topics was impressive), as well as allowing for more one-on-one discussion with presenters after the presentations.

We would like to thank Michael Leahy and Dr. Brent Hall for the support and guidance they provided in both planning our trip and helping us to navigate the conference. Alex Miller, the president of Esri Canada, was kind enough to host us for dinner one night, and it was a pleasure meeting with him, Esri Canada staff, and other award winners. San Diego was a beautiful setting

for the conference, and we were lucky to have such perfect weather for its duration. The Party at Balboa Park was a wonderful culminating experience. We all learned so much from the conference, and we are very grateful to Esri Canada for this opportunity.



The students pose with Alex Miller, far left and Jack Dangermond, centre as they receive their awards at the Esri User Conference in San Diego.

Survey Review Department Forum

RESEARCH

By Doug Reitsma, Survey Review Department Examiner

Previous articles from the Survey Review Department (SRD) have defined the processes involved in SRD's review of firms' surveys, and have outlined the implementation of a system that would provide a standard valuation of individual deficiencies relative to the Regulations, Guidelines and Standards for Surveys. It would seem appropriate that we now provide some background regarding definitions of compliance and what type of actions or non-actions are worthy of notation and valuation.

To properly broach the subject of deficiencies one must give serious consideration to ensuring there is fairness and consistency in the interpretation of any matters deemed worthy of a valuation. To that end, SRD has established certain standards as a guide to use in establishing whether a firm's actions are giving adequate consideration to their obligations and responsibilities. In determining the existence of an 'issue', the Survey Review Department begins with the application of the rules that emanate from the common law, the statutory law and the regulatory requirements. As well, consideration is given to any guideline interpretations or relevant articles that may provide further clarification in the interpretation and application of any pertinent rule. To establish a standard guide for the review process, the Department has created the COMPREHENSIVE REVIEW PREPARATION GUIDE (CRPG), which provides an interpretation and application of regulatory requirements, with reference to the specific actions and information required to provide a confirmation of compliance.

The CRPG lays out these definitions in the same fashion as might be applied to the process of preparing a survey (i.e. Research, Field Notes/Work, Plans, Reports), so our next set of articles will follow the items identified in the CRPG. We begin with 'RESEARCH'.

Section 8(a) of O. Reg. 216/10 under the Surveyors Act states that it is our responsibility to "refer to the documentary evidence related to the land under survey and the land adjoining the land under survey". This statement represents our obligation to serve the public by giving equal consideration to the (official) documentation that might exist on either side of the limit that is being re-established.

The Interpretive Guide gives further definition of this regulation by identifying that it requires a "land registry office search" and a search of the member's own files, the files of other licensed members and any other sources that reasonably might be expected to contain applicable material.

In some cases, further information may be required to confirm that consideration has been given to specific circumstances of the project. For the title search, this may involve a confirmation of the priority of title, details of descriptions for the subject and abutting lands, copies of by-laws (for the status of abutting streets), confirmation of the absence of registrations, etc., as required to satisfy certain common law principles. For survey record information, the file should contain evidence of the search for the existence of prior surveys in the offices of local surveyors, the reviewing of relevant field notes, obtaining required evidence to satisfy regulatory requirements (i.e. evidence-either-side rule), etc. For a water boundary, the file should have very specific information related to its existence and location to be able to support any decisions regarding its definition. In all matters related to the determination of compliance for any specific project, the information provided in the submission must be sufficient to support the survey decisions and information shown on the plan.

What often supports a determination of compliance related to research is the summary documentation that proves the existence of a process that reflects the consideration given by the surveyor to the regulatory and project requirements. The Survey Review Department has identified that a higher rate of compliance is exhibited by firms who have a process that involves the use of "cover sheets" for the title and survey notes and records searches. These cover sheets provide for the recording of information that is pertinent to the processes that reflect compliance. Think of a cover sheet as having the same relevance as a field note in recording what was found, observed and done in the course of researching the project. If prepared in a professional manner, properly formatted and consistently applied in the recording of relevant details, the information contributes to confirming a compliant process. Consideration should be given (but not limited) to recording who is doing the research (as competence is a consideration), the scope and/or extent of the search for information (confirming consideration is given to common law or regulatory requirements), the results (and the documents produced), including interpretations, decisions, dates, updates, etc.

It is important to note that consistently documenting the confirmation of the actions related to the breadth and depth of the research, and the results, provides a better representation of compliance in any professional review.



Memories of Anthony Owen Stickings - OLS #1071

By Reverend Catharine House

Editor's note: When Anthony Stickings' family was contacted regarding material for his biography, our Administrative Assistant, Joyce Tenefrancia thought that Anthony's life was so interesting that she recommended to his daughter that she write an article about her father for publication; and here it is.

Anthony Owen Stickings or “Tony” was my father. He was and continues to be one of the greatest influences on my life.

Tony was born in 1923 in England in Mitcham, Surrey, now Southwest London, and moved when he was a young boy to Brentwood in Essex County, just Northeast of London. He was the youngest of the boys in a family that also included a younger sister. A family that valued education, his father was a chemical engineer, mother was a qualified teacher and accomplished musician, and eldest brother Brian had plans to be an architect, but died at age 22, a Commando in the Royal Marines in World War II. Brother Ewart was a biochemist, and Margaret, the youngest, was a multilingual journalist who in later years attended Medical School in France.

The Stickings family also stressed moral and ethical values. Married in the United Methodist church in Mitcham, Dad's parents, Ralph and Dora, later joined the Congregational church in Brentwood where Ralph was a deacon and lay preacher. The dinner table in the family home was a place to gather for conversation on topics of importance, both sacred and secular. It was where they would discuss their differences in response to the call to join the British war effort in the Second World War. The family of six were split three and three as they tried to apply the church's teachings to the news from Europe.

Ralph and Brian both enlisted – Ralph seconded to the medical corps where he had served twenty five years earlier, and Brian into the Royal Marines. Ewart was in university, Margaret was too young, Dora too old, but Tony was just the right age to be eligible for conscription. He registered as a conscientious objector and went to court to defend his convictions. He joined the FAU – Friends' Ambulance Unit – China Division, which decision and experience determined much of the future direction of his life.

Dad's work in the FAU involved procuring, storing and distributing medical supplies, in an area where the invading forces had cut off normal supply routes and continued to be a threat to safe travel. In addition, Tony was trained as an emergency ‘midwife’ and was called upon to deliver a baby (successfully!) in one of the villages.

When he could, he travelled through the hills of China to see as much of the country as possible. On one trip he contracted malaria, but in spite of this he fell in love with the

land and its people, as did many of his fellow workers. As the war ended and he looked at the possibilities for the future, he seriously considered ordained ministry, but, maybe because of the different landscapes he had seen in his time abroad, he finally opted for studying geography back in England at Cambridge University, where he received his MA.

Dad rekindled his friendship with my mother through their connection in “Young Peoples” at the church in Cambridge. In March of 1949 they were married and settled briefly in a very old cottage with wavy stone floors, until Dad found a new adventure.

This one took them to British North Borneo with the Colonial Service, and it would be his first foray into surveying. In Borneo, Mum, who had some nursing training, was given a first aid kit to tend to the villagers, while Dad headed a team of surveyors made up of local Dayak people. They travelled inland by river and mapped out areas of the jungle as they hacked and hewed paths to travel by foot. This meant being away for months at a time. Dad loved the work and the people, but Mum, who faced the birth and raising of her first child with no one around who spoke her language, was less impressed.

The tropical rainforest was challenging with variation of only one degree in temperature when the rains fell every day at four in the afternoon, with the army ants that marched relentlessly through anything in their path, and the lizards that fell off the ceiling onto the table...as I say, “Not impressed”. But Dad would have stayed on if he could have persuaded Mum to stay with him, along with their daughter – me – who complicated things.

We went back to England when the three year tour was over, and Tony and Jean had a house built according to Jean's own design. Dad worked as a cartographer and we lived in Ashted in Surrey. Mum planted an English cottage garden and with the addition of an adopted son, James, followed quickly by the birth of another son, Tim, life began to be settled...until Dad found another new adventure.

This one brought us finally to Canada – to North Bay in 1957.

Dad had gone ahead on a reconnaissance mission to find work and a home before he wrote to Mum to join him. It was the AOLS that beckoned to him and he found employment with the Ontario Department of Highways, working between

Sudbury and Sault Ste Marie. He was not away for months, but for two weeks at a time, coming home on a Friday evening and returning on the Sunday. The neighbours did speak English, but not quite the same vocabulary or accent that we were used to. It was a learning curve for them and us.

North Bay at that time was still quite wild around the edges, and we lived on the edge of town. I, at the age of almost seven, thought it was wonderful. Mum, now with three children, away from home and family, felt isolated. Dad, despite having almost lost a toe (or more) to an axe that bounced off an Ironwood tree, loved the outdoor life in the Canadian winter just as much as he had loved the jungles of Borneo, and the hill country of China.

But the die was cast, and in 1959, Tony took an office position in Kingston, still with Highways. This time, when he felt adventurous, he looked for something new that would keep him closer to home. He went into teaching and because of his university education, secured a position as a high school geography teacher. We lived in Kingston for six years, the longest I was ever in one place while I was growing up.

But Dad did stay with teaching, moving next to Amherstburg to be Head of Department of Geography there. It was while there that Dad and Mum adopted my sisters, Marlene, eight years old and Valerie, six, from Rainy River Reservation. An adventure of a different kind, and one which Mum also embraced.

The advantage to teaching, though the pay when Tony first started was a pittance, was that you had two months off in the summer. Dad, who planned field trips for his students during the school year, also planned incredible trips for the family in the summer. On a shoestring budget which meant nothing could go wrong, we went from one side of Canada to the other. Of course, things did go wrong – especially when you

didn't have the best car to begin with. One thing Tony did not excel in was auto mechanics.


The last move as a teacher was to Port Elgin in 1970, and this time I stayed behind, and not long after, started a family of my own. There were several more moves for Tony and Jean – who, after Dad took an early retirement from teaching, decided to become church organists and choir directors. They moved to Paisley and then to Kincardine, and finally went to British Columbia to Victoria, and on to Sidney, BC when it was time to go to an assisted living facility. Dad died not long after that move, on February 20th, 2005.

I began by saying that my father was a great influence on my life. I inherited, whether by nature or by nurture, the same ability to see a grand adventure in new places and people. My Dad taught me a love of landscapes. I remember him studying the sample collection of fifty rocks and minerals that would be part of his exam to become an Ontario Land Surveyor.

I still look for the beautiful granite rock-cuts along highways as we go north in Ontario, and the unusual one

near Gananoque where the limestone changes to granite abruptly, as though someone had drawn a line through the rock. Dad taught me never to go to and from a place on the same route if I could travel a different one to see something new.

He taught his children respect for all people and an absolute regard for life in all its forms. Dad taught us to question, and to learn by questioning. From him, I learned the importance of standing up for my convictions, especially when it would not be easy. He was a strong ethical influence, contributing to me eventually becoming a congregational minister.

Thank you for this opportunity to spend time with my memories, and to share my father's life with you. 



Friends Ambulance Unit "China Convoy". The photo was taken at Chungking South Bank Garage. Anthony Stickings is in the front row, far left.

Sites to See

Yours to Discover: **Tourism in Ontario through Time**

www.archives.gov.on.ca/en/explore/online/tourism/index.aspx

The Government of Ontario has long recognized the importance of the province's wilderness and recreational areas for tourism. Today visitors come to enjoy the natural beauty of the province's parks and countryside and to partake of the vibrant life of its cities.

This exhibit looks back on tourism in Ontario through time, from the early settlers in Upper Canada to the travellers of the current day, using documents and images from the Archives' collection.

EDUCATIONAL FOUNDATION

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EDUCATIONAL FOUNDATION NEWS

Congratulations to more of our Educational Foundation Award Winners

University of Waterloo Awards – In June we received thank you notes from all four of the following award winners: **Kin Chau** and **Anton Yu** who received **Geomatics Awards** as the top two students in the Geomatics Program who have completed course Geog 310 (Geodesy) and **Anthony Stefanuk** and **Daniel Zhou** recipients of **Academic Excellence in Geomatics Awards** for their overall academic excellence in the Geomatics Program.

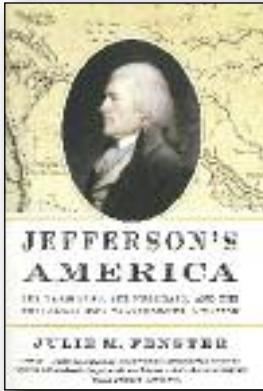
Richmond Green Secondary School – Jason Jeong and Shirley Lin each received an **Award of Excellence in Technological Design and Geomatics**, as the top male and female students in the **Introduction to Surveying** course taught by John Negru.

November 1st – Time to join or renew your membership

As fall begins so does the new academic year for students enrolled in post-secondary Geomatics programs. With the high cost of tuition and living expenses, students are fortunate if they can supplement their income with a monetary award. In 1975 the Educational Foundation presented its first awards valued at \$500 each to 2 students in the Survey Science program at Erindale College. They both became Ontario Land Surveyors. Over the years, through the generosity of our members, suppliers and others who have made donations, the Educational Foundation capital fund has grown substantially to allow the number and value of the awards to be increased. In 2016 alone, \$34,850 was awarded to 36 students. This year the Board of Directors has allocated \$39,700. For the last few years, the number of award winners who have become Ontario Land Surveyors has also increased. Currently 20 of our 87 articling students are Foundation award winners, that is almost 25%. To continue to attract promising students like these to our association, we need your support. Donations to the Educational Foundation can be made online at <http://www.aols.org/students/efdonation>

The Educational Foundation would like to recognize with thanks donations made in the memory of Nick Verhoef, Don Walton and Max Berman.

BOOK REVIEWS



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Jefferson's America The President, the Purchase, and the Explorers who Transformed a Nation

By Julie M. Fenster

At the dawn of the nineteenth century, as Britain, France, Spain, and the United States all jockeyed for control of the vast expanses west of the Mississippi River, war between any of these four powers was expected at any moment. To preserve America's foothold in the West, Jefferson played a game of strategy – putting into the field the only Americans he could: an eccentric cadre of explorers who finally annexed the land through courageous investigation.

Jefferson most famously recruited Meriwether Lewis and William Clark, but there were others

who did the same work in places where it was even more crucial. William Dunbar, George Hunter, Thomas Freeman, Peter Custis, and the dauntless Zebulon Pike – all were dispatched on urgent missions to map the frontier, and each helped to unite the fast-growing nation.

Told with great narrative verve, *Jefferson's America* rediscovers these seminal expeditions and illuminates the president's vision for a continental America.

Information taken from the back cover.

Conflict & Compromise, Volume 1 Pre-Confederation Canada

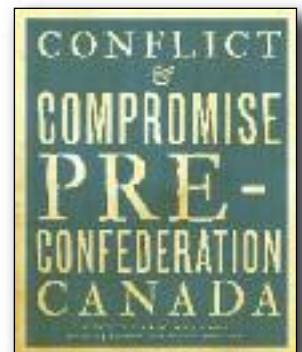
By Raymond B. Blake, Jeffrey A. Keshen, Norman J. Knowles, and Barbara J. Messamore

Driven by its strong narrative, *Conflict and Compromise* presents Canadian history chronologically, allowing a better understanding of the interrelationships between events. Its main objective is to demonstrate that although Canadian history has been marked by cleavages and conflicts, there has been a continual process of negotiation and a need for compromise which has enabled Canada to develop into arguably one of the most successful and pluralistic countries in the world. The authors have drawn from all genres characterizing the present state of Canadian historiography, including social, military, cultural,

political, and economic approaches. In doing so their aim is to challenge readers to engage with debates and interpretations about the past rather than simply to study for an exam.

The first volume begins with the history of Canada's Indigenous inhabitants prior to the arrival of Europeans and ends with the nation-building project that got underway in 1864. The book is illustrated with over 50 images, maps, and figures, all designed to support its mission to provoke intellectual curiosity.

Information taken from the back cover.



Published by University of
Toronto Press

ISBN 978-1-4426-3553-1

Conflict & Compromise, Volume 2 Post-Confederation Canada

By Raymond B. Blake, Jeffrey A. Keshen, Norman J. Knowles, and Barbara J. Messamore

Driven by its strong narrative, *Conflict and Compromise* presents Canadian history chronologically, allowing a better understanding of the interrelationships between events. Its main objective is to demonstrate that although Canadian history has been marked by cleavages and conflicts, there has been a continual process of negotiation and a need for compromise which has enabled Canada to develop into arguably one of the most successful and pluralistic countries in the world. The authors have drawn from all genres characterizing the present state of Canadian histo-

riography, including social, military, cultural, political, and economic approaches. In doing so their aim is to challenge readers to engage with debates and interpretations about the past rather than simply to study for an exam.

This second volume begins with the nation-building project that got underway in 1864 and ends in the present. The book is illustrated with over 60 images, maps, and figures, all designed to support its mission to provoke intellectual curiosity.

Information taken from the back cover.



Published by University of
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The Last Word

The Changing Shape of Ontario's Boundaries Since Confederation

In 1867 the *British North America Act* merged the Province of Canada (made up of Canada West and Canada East), New Brunswick and Nova Scotia to form the Dominion of Canada. Canada West (formerly Upper Canada) became the Province of Ontario and Canada East (formerly Lower Canada) became the Province of Québec. In 1870 Manitoba became Canada's 5th province. As Manitoba and Ontario's populations grew, so did the question of their boundaries.

"When the Province of Ontario was established in 1867, no defined boundary separated it from the Hudson's Bay Company lands to the north and west. Canada's acquisition of these lands in 1869 raised the issue of provincial and federal jurisdictions and the ensuing dispute was submitted to arbitration. In 1878 a decision favourable to Ontario placed the western boundary at its present location and the northern at the English and Albany Rivers. The federal government rejected the award and in 1881 involved Manitoba by ruling that its eastern limit would be Ontario's still undetermined western boundary. The dispute was settled in 1884 when the Privy Council in Britain upheld the 1878 award."¹

While this settlement was largely brought about in a friendly manner there were some lively disputes over the problem as to whether Rat Portage, now Kenora, was situated in Manitoba or in Ontario. "The federal government awarded the Kenora area to Ontario in 1889. At the same time, the Albany River became the

province's northern boundary. In 1912, Ontario's boundaries were pushed north to Hudson Bay, completing the province's extension to its current borders."²



Map of Canada West in Counties (1860) by Samuel Augustus Mitchell. Credit: Library and Archives Canada, Mikan No. 3724054.

References:

- ¹ Ontario Boundary Dispute Historical Plaque located in the City of Kenora.
² www.archives.gov.on.ca

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