

Ontario Professional Surveyor



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on the cover ...

**Sergeant-at-Arms
Graham Bowden
presided over the
128th AGM in
Huntsville, ON**

also in this issue ...

**Know your History - Part 4
007 Weapon for Surveyors
Rethinking Professional
Regulation
Business Communications –
Best Practices**

plus our regular features

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ONTARIO PROFESSIONAL SURVEYOR



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Sergeant-at-Arms Graham Bowden chose to portray an exploration guide. See his article in The Last Word on page 44.

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President's Page

By Andrew S. Mantha, O.L.S.



The 2020 AGM is over and while it would be nice to reflect on what being sworn in as the 129th President of this Association means to me, the demands of the position, as well as my other professional, social and family obligations, give me little time to pause and put into words the meaning of this great honour. I am humbled to hold the position and hope that I can measure up to the fine work of the people that proceeded me. It probably won't be until I pass the chain of office on next year that I will really have the time to appreciate this milestone in my life.

I do however need to acknowledge with much gratitude the good wishes I received from all of my fellow surveyors, especially those with whom I work at my new employer J.D. Barnes Limited. We are a small Association but we always seem to punch above our weight class.

The staff at 1043 McNicoll also need to be recognized for the outstanding efforts they put forward to make this AGM so memorable. I was handed a book at the start of the Convention and told to "just be where it said to be and do what it said to do and everything would take care of itself" and ...it did! I really could use a similar book to handle the rest of my life.

I also need to thank my wife Carol and the rest of my family for their support. My son, Alec, surprised me with a very nice introduction at my swearing-in ceremony. I'm already putting his name forward for President in 2040.

So, now that our 2020 AGM is complete and we have installed the new Council, I'm thinking it's time to take stock of where we sit as an Association.

Council has long term goals, as outlined from our last Strategic Planning workshop, but we are surveyors. We know that while it's important to know what we are measuring to, it's just as important to know where the other end of the tape is held so we know what we are measuring from.

The four years that I have spent as a Councilor and Vice-President have allowed me to see how Council works. Every year we have different people with different goals working on different issues to different ends BUT just as important, and as different as they have been, I have seen how every Council has operated in a manner to best fulfill

our mandate to protect the people of Ontario, build on our initiatives to be at the forefront of the profession, both nationally and internationally, and to best represent our profession to the public.

As a Council over the last few years:

1. We instituted a policy of transparency so that the public and our members would be able to see what we are doing as the regulators of our profession;
2. Incorporated the concept of "Risk Management" into our business and professional practices;
3. Signed a Memorandum of Understanding with our fellow professional organizations to try and work on areas of common concerns and share our limited resources;
4. Worked with our many Task Forces and Committees to keep them supported and engaged as they worked on the business of this Association;
5. Developed new initiatives and options for the training of our future surveyors;
6. Updated our website and office technology to better deal with cybercrime and hacking, and
7. Managed the successful succession of key AOLS staff to fill many important positions.

This year's Council has a lot of work to do but it's not new things. We are just building on a solid base prepared by the many Councils that preceded us. As I write this, I am preparing to embark on a tour of the other Provinces to attend their scheduled AGM's as your representative. Unfortunately, the shadow of Covid-19 hangs over everything and I am in a bit of a "limbo" as we await word on whether some will be cancelled or rescheduled according to recommendations from their various provincial Health Units.

The Executive Committee of this Association is already working on addressing this by looking into more ways to use teleconferencing and "GoToMeeting" technology to limit travel and personal contact while still taking care of the day to day business of this Association.

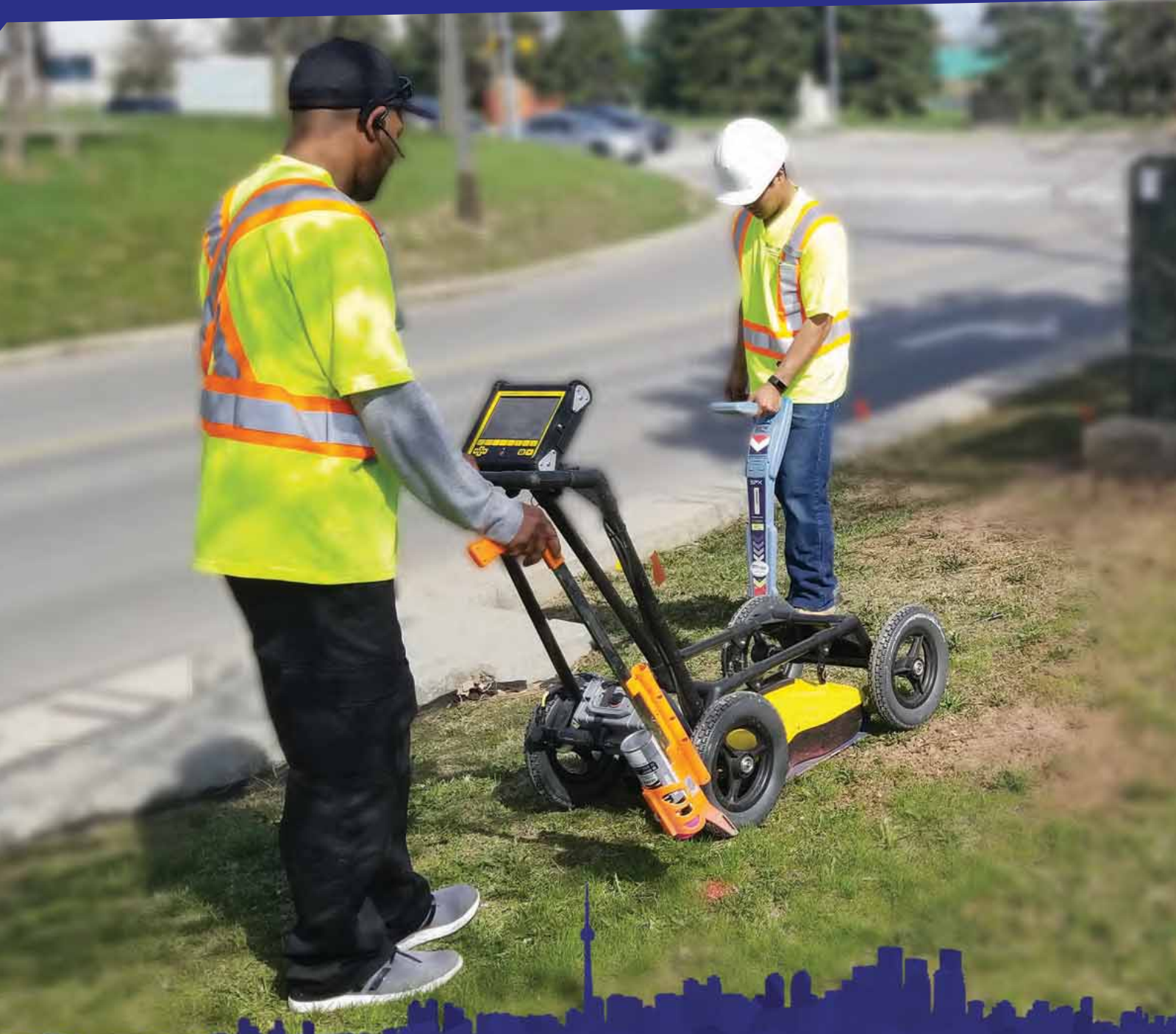
I have always felt that the one constant about this Association is "change". Sometimes it's good change and sometimes it's not. I'm hoping that by the time this report gets to you, this emergency will have passed and we will all be headed for sunnier days.



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Executive Director's Notes

By Brian Maloney



It's hard to believe that I have now been in the Executive Director role for a year now. This has been a real learning opportunity. As I mentioned at the Annual General Meeting, I have forced myself to learn what it means to be a regulator as opposed to a surveyor. That does not mean that I didn't understand ethics and professional responsibility, but it did mean I had to approach my thinking process from a different direction.

The world of self-regulation continues to change. Just this week I read the Grey Areas article on the importance of teamwork. Grey Areas is a free online publication generated regularly by Steinecke Maciura LeBlanc Barristers & Solicitors and is a great source to see the evolving common law and changes associated with self-regulation. The article analyzed a case, *Al-Ghamdi v College of Physicians and Surgeons of Alberta* and noted that Dr. Mohammed Al-Ghamdi was suspended for three years for persistently disruptive behaviour. He was unable or unwilling to work by consensus with the other surgeons and would not follow established protocols. He believed that he had superior qualifications to the other staff.

Although a slightly different set of circumstances, I could not help but think of those surveyors that always believe they are correct and know more than their counterparts. They refuse to discuss differences or consider arguments from their colleagues. The result is often determining a different location of a boundary without the courtesy of a conversation to consider the other professional's work and opinion. Is that type of action serving the public, who are now launched into disagreements and potentially costly legal disputes? Should these types of occurrences be the subject of complaints and discipline? On reading this case, I could not help myself thinking at the very least, perhaps?

The other item this case highlighted was how the individual fought the regulator. His actions generated a lengthy discipline hearing with motions with little merit, unduly long cross-examination and many witnesses with little relevant information. The practitioner was ordered to pay 60% of the cost of the disciplinary hearing (\$700,000). It made me think of the need for cooperation and seeking common ground. I cannot believe that this practitioner would not have reached a better outcome with a little contrition and understanding.

I raise these issues not to suggest that we want to proceed with more discipline cases and look for higher recoveries on discipline hearings. Discipline is the final means that we have to ensure our members act reasonably and in the public interest. I would much rather work with members through continuing education, personal mentoring through SRD, and open dialogue, etc. This must be a two-way street. If members believe they know more than everyone else and practice in a fashion that is negatively impacting the public, there will be no choice other than to escalate disciplinary actions. The Association (us) must continue to think about how we protect the public, while lowering our regulatory footprint. This will not happen by unilateral action by Council or the staff at 1043 McNicoll. It will require all of us to consider our actions and raise the bar. I still dream of a day when there is no disciplinary action required.

We have been given the privilege of self-governance. We need to hold ourselves to the higher, ever-evolving standards and expectations of the public. Failure to do so will only result in our own challenges and costs to correct unacceptable behaviour and ultimately risk government intervention.



Innovative Bird Feeders

By Bruce Baker, O.L.S. (Ret)

The day has finally arrived and you are retiring. You fill banker boxes with books and mementos and put your feet up on your desk and reflect on a long and rewarding career. The boxes are stored in your basement and left for another day. Years later you go looking for a certain memento and the first item you pull out of the box is your hard hat and then you find your vintage Leroy Lettering Set.

So what do you do with your hard hat and your lettering set? Here are my ideas.





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Rethinking Professional Regulation – What is really important?



By Darrel Pink, LLM, LLB, BA

Introduction

This article is based on a keynote presentation made at the 2020 AOLS AGM in Huntsville, Ontario.

Professional Regulation under Threat

Professional regulation in Canada is under threat. Never before have regulators seen governments complain about the quality and independence of regulation as we have seen in the last few years. Nor have we previously witnessed the spate of outside reviews of organizational performance that have found many regulators' performance to be sub-par. Boards are dysfunctional; regulation is inconsistent; the interests of 'members' are allowed to dominate. These are some findings.

In response, governments have asserted control over regulators. They have virtually eliminated self-regulation in some areas or they expect and demand regulators to demonstrate their value and to show that their work does make a difference.

There are common themes found in the reviews. An objective observer would query whether many regulatory bodies 'are fit for purpose'. Across Canada professional regulation, which has often been carried out with professional association work, has a legacy of self-interest, a failure to clearly identify the public interest, and a predominant approach that sacrifices concerns of the public on the altar of 'the good reputation of the profession'.

It is not uncommon to hear regulators say "I know her and she could not possibly have done that" or when investigating allegations of misconduct to be governed by The Grace Rule - 'There but for the grace of God go I'. These attitudes are not surprising when it is recognized that leadership comes from a political election process; public or lay representation on Boards is minimal; training is minimal and senior staff usually come from the ranks of the profession itself. Add to this the absence of a culture of critical reflection on what is required to be an effective regulator almost anywhere in Canada, no independent evaluation or auditing of regulators' work and a dearth of academic research on the value or importance of professional regulation. Collectively these facts do not create an environment conducive to independent professional regulation, operating to promote the public interest and to

challenge the profession to do better.

The why, what, who and where?

In this context all professional regulators should be asking themselves – why do we regulate (what are our objectives?); what work/activities are we regulating; who (professionals/para-professionals) do we regulate; do we regulate both individuals and the entities in which they practice; do we have authority over practitioners in all areas of their work and lives; and how well do we do what we do?

Answering these fundamental questions requires a radically different approach to professional oversight than most regulators are used to or even capable of. It requires information or data about their work. It demands carefully articulated processes that support clear reasoning. Governance must be reformed so the Board or Council plays a policy-setting role that drives improvements in how regulation is done. There must be meaningful public participation in all decision-making so that the perspective of the community regulators to protect is evident in all decision-making, and the promotion or protection of the public interest must permeate all regulatory discussions and decisions.

Risk-focused Regulation

Regulators should focus their efforts and work on behaviours that present real risks of harm to the public. Most professional oversight requires compliance with rules, codes and standards without regard to the impact that arises if those requirements are not followed. They often fail to address matters differently if the risk of harm is greater for one breach than for another. By focusing on risk as a basis for regulatory activities, a body can clearly explain to the profession and the public why it expends resources as it does. Challenging unauthorized practice is a common example of when a risk lens is not applied, as not all work by unlicensed individuals is harmful. In some professions the scope of regulated practice is wide or imprecise. Technology may have evolved so what once required skilled individuals is now done by a computer. So it may not be risky for some work, once done by a professional, to be carried out by one not regulated.

Proactive Regulation

Most regulation happens 'after the fact' – it is reactive to

behaviour rather than anticipatory of things that can go wrong. It is akin to closing the door after the horse has bolted. Most regulators know what causes bad behaviour, misconduct or mistakes. The factors causing complaints are well known. Yet most regulation does not anticipate and prevent the bad or erroneous conduct. Rather regulators wait for it to happen and then they pounce. They react to what they could have anticipated would go wrong by sanctioning and then suggesting the punishment will serve as deterrence for others. What most do not do is try to identify risks, predict when errors will be made and then work with the profession's performance so they avoid making the mistake. By becoming proactive as a regulator, the door is opened to changing the relationship with the profession because the regulator is less of a 'cop' and more of a 'paramedic', committed to helping rather than whacking.

Outcomes Measurement

Modern professional regulation requires a collection and analysis of information about the profession, practice, the environment and economy in which practitioners operate, the demographics of the profession and a ream of other information relevant to understanding the world in which professional services are provided. Most regulators rely

excessively on anecdotes and almost ignore data. Only with reliable information can a regulator understand what is happening to the profession. Unless a regulator has solid data about the present, it is almost impossible to identify trends and predict the future. And without solid empirical measurement, a regulator cannot demonstrate that its efforts actually make a difference. A regulator should be able to say what the intended outcomes of its regulation will be and then demonstrate whether those outcomes have been achieved.

To achieve a state of being, a modern and professional regulator requires a radical overhaul of much of what regulators currently do. There are many examples of those who have understood this and committed resources and energy to transforming themselves. Most have not. For them it is likely only a matter of time before a crisis will result in a loss of public trust. With that will come government action to assert its authority or to take away much that regulators enjoy. Reform is difficult, but is essential. Failure to heed the warnings and to learn from others comes with significant consequences.



Darrel Pink practises in association with Steineke Maciura LeBlanc, Barristers & Solicitors.

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Business Communications – Best Practices



By Julia Meldrum Smith, O.L.S.

This article is based on the Business Communications – Best Practices Concurrent Learning Session that was held at the AGM.

Why do we need to talk about business communication? We all know about communicating. We communicate all the time. We talk on the phone, we text, we email. We communicate a lot.

But do we do it well?

Failure to communicate effectively is a major source of Insurance Claims and Complaints in this Association - and it costs you. The goal of this article is to help make your day-to-day business communication better *and easier*, to keep you out of trouble with the Complaints Committee and the Insurance Company.

According to our insurer, many of our insurance claims are a result of poor communication. For example, recent claims that involve communication issues are: confusion with contractors about layout plans; misconceptions with developers about where fences and buildings can go; and misunderstandings with architects.

Our former registrar, Bill Buck, did a study of 14 years' worth of Complaints Committee files¹. He found that, no matter what the complaint was about, most often it could be traced back to poor communication. Many of the complaints could have been avoided completely if the surveyor had adopted better communication practices.

We can do better

How much does it cost to respond to a Complaint? Or an Insurance Claim? Figure out the time needed to gather your information, question your staff, write a defense, and respond to all the phone calls and emails.

Let's avoid those nightmares. Here are the top 5 Best Practices for Business Communication.

Best Practice #1: Mutual Understanding - Understanding the client's needs and making sure the client understands our work and our fees.

Take a typical survey project. Somebody calls the office and says they need a survey. What do we do first?

First, we need to talk to them. We need to understand what they really need. That means asking a bunch of questions and listening. But wait a minute, don't most people just tell you what they need?

We should not assume that the client can communicate exactly what they need. Remember, the client is not the expert – we are.

Consider these typical exchanges:

"I need my property lines marked." Translation: "It's Monday morning and I spent the weekend fighting with my neighbour about who owns the tree. I'm expecting a plan showing this tree. That's what I think I am asking for."

"I need a plan showing where my house is." Translation: "I want to add 1000 square feet to my waterfront house, and I'll need a building permit...and a lot drainage plan... that shows the 100-year flood line and a benchmark."

We need to make sure that we have the whole story, so we know what's prompting the need for a survey. We also need to understand what the client is expecting to get for their money.

Not everyone understands what we do. Some people don't realize surveyors are impartial - they may think we will put the line where they want it to go. Some people think that we're like Boundary Police, and we can somehow keep their neighbour in line.

We need to make sure that the client understands what we will be doing, and just as important, what we will *NOT* be doing. For example, if you've been hired to re-establish certain boundaries and your work will not include the preparation of a plan of survey, you need to make sure your client understands that. If you've ascertained that your client is concerned about trees, you will need to ensure that they understand how you are addressing that concern. Will you be locating specific trees, or just a general treed area, or simply marking the boundary near the trees for their own visual assessment? Will you be reporting on the tree situation or illustrating the tree on a plan?

We also need to make sure that the client understands the cost of the survey and the terms of payment. If you are expecting to collect interest on overdue accounts, you must state that in writing to your client before you start the project and include the interest rate.

According to our Professional Standards regulation O. Reg. 216/10, Section 3, we are required to go over a proposed project with our client and describe what we have to do to meet our professional obligations. Our Code of Ethics says so too - we have to make sure that our clients understand the scope of work, and the nature of the associated fees.

Best Practice #2: Written Confirmation

Create a "Letter of Authorization" or "Confirmation Letter". Include everything you talked about with the client - scope of work, timelines, price, terms, final deliverables, how requests for changes are handled. If someone else in your

office spoke to the client, have them read this letter to make sure any promises they made are also included.

Then present this letter to your client to confirm the agreement. Go over it with them, make sure they read it, and have them sign it. You sign it too. Your client will then have a commitment to the timeline and the price. You will have proof of their authorization to proceed.

The goal of a Letter of Authorization or a Confirmation Letter is to ensure that there are no misunderstandings. Often, after someone carefully reads the letter of authorization, they will realize they have forgotten to tell you something, or they realize they need clarification of some detail.

You may be thinking, "What about my regular clients that I do work for all the time? Do I really need to go through all that?" You may be worried that your regular clients are going to be insulted if they're asked to suddenly start signing contracts. Unfortunately, there are examples of insurance claims where this type of relaxed communication has led to assumptions, with disastrous results.

Demonstrate to your client that you respect them enough to pay attention to what they need. You respect them enough to ask their permission before going ahead. And you respect them enough to make sure there will be no unwelcome surprises at the end of the project. What client wouldn't like that?

If you're still not convinced, I encourage you to re-read Tom Packowski's article in last summer's quarterly² - the horror stories will change your mind!

Best Practice #3: Staff Awareness

This agreement now needs to be shared with staff. The field crew and office staff need to be made aware - before every job. Make sure everyone knows what's going on, every time, before every job.

We need to ask ourselves: How does my staff communicate with each other? Does field staff tell the office staff about on-site discussions with contractors, the client, or a neighbour? Speaking of neighbours, how well do field staff communicate with the public? When faced with an angry or suspicious neighbour, do they know what to say? Are they good at keeping their cool? Can they answer questions and still maintain client confidentiality?

The answers to these questions will help determine if your staff would benefit from additional training and if there are additional protocols that should be put in place.

Best Practice #4: Document Everything

There needs to be a record of what's been done throughout the project.

Most surveyors use a job sheet or form where everyone who works on a project records when they've worked on the file and what they've done. Some other aspects of the project that need to be documented are:

- When approvals from the client and Registry Office are received
- phone calls
- emails

cont'd on page 10

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- memos to the file, if there's an unusual occurrence

What about changes to the original scope of work?

If there's a change or addition to the work, you're going to want to go back to step one, and make sure you understand what the client is asking for, and that they understand what the repercussions are to price and timelines. It all needs to be explained and authorized - *in writing*.

"You may not do anything wrong. But can you prove you did it right?"³

If you end up with a complaint to the Complaints Committee, remember, it's in our Standards of Practice that it's our duty to cooperate. You have to respond, even if the complaint seems unfounded or frivolous. The best way to handle a complaint is to provide an organized, detailed, chronological account of the work, with a written explanation of your position.

As professionals, we are expected to be able to back up what we say. Let me refer you to a recent appeal to a Discipline Decision 2020 ONSC 863 from February 10, 2020, which is posted on the AOLS website.

In Section 67 (paraphrased with names removed):

...There was disputed evidence between the parties as to whether the Client's agent requested further work be performed on the sketch and about the content of a meeting between the surveyor and the Client. No confirmatory documentary evidence or contemporaneous notes were provided by the surveyor.

In Section 62, the Decision stated that the Discipline Committee made the following findings:

"It is the duty and responsibility of the surveyor as a professional to prepare detailed estimates and provide accurate and complete disclosure so that a client is aware and understands the nature and associated costs of the survey work to be undertaken on their behalf. Should the nature and cost of the survey change once the work is underway it is the responsibility of the managing surveyor to be aware of the impact of the changes and advise his client at the first opportunity."

Sadly, even if you do everything right, things can still go wrong on a project, especially if there are other parties working on the same project. If things go sideways, that's when the finger pointing starts. You could be included as a third party in an insurance claim.

There's an old adage that goes "one dull pencil is better than six sharp minds". Don't leave your hard work to memory.

Best Practice #5: Project Close Report

Under Section 4 of O. Reg. 216/10, we are required to give

a final report to our client at the end of the project. Lucky for you, if you've taken care of the other four Best Practices, this is no big deal. In your confirmation letter you've already written up what you were going to do. Now you just need to change it up to list what you did, any changes that occurred, and any recommendations that you have.

So that's it! The 5 Best Practices for your Business Communication:

1. Mutual understanding with your client about what's needed and what's happening.
2. Written confirmation of the scope of work, price, timelines and how changes are handled.
3. Crew and staff awareness of the agreement.
4. Recorded commentary of what was done, when, and by whom.
5. A Project Close Report at the end to sum it all up.

Easy ways to quickly make some changes to your Business Communication: Manual of Business Communication

There is now a Manual of Business Communication in PDF format and sample Business Communications documents saved in Word format in the Professional Standards section on the AOLS website. The jewel of this manual is in the Appendix. The Appendix has templates of confirmation letters that you can use right away - you can edit the main details, add your letterhead, and you're good to go.

If you've never used a letter of confirmation or contract before, this is a quick way to start. If you're already using them, there may be something in these templates that you want to add to yours.

The manual has sections on sharing your digital data (and a disclaimer form that you should be using), information about communicating with staff, change orders, project close reports, dealing with complaints and complications, and a page of suggestions for caveats, warnings, and limitations that you may need to add to some of your confirmation letters.

By incorporating the tools in the manual and these 5 Best Practices for Business Communication we can make the needed changes to reduce the risks of disputes, insurance claims, and professional complaints.



¹ Complaints and How to Avoid Them, Ontario Professional Surveyor, Vol. 58, No. 2, Spring 2015

² Insurance Claims and How to Avoid Them, Ontario Professional Surveyor, Vol. 62, No. 3, Summer 2019

³ Brian Maloney, AOLS Executive Director

Sites to See

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<https://open.canada.ca/en/open-maps>

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Convocation Address Charge to the New Surveyors

By Julia Meldrum Smith, O.L.S., C.L.S.



Esteemed colleagues, special guests - what an exciting occasion!! These new surveyors have taken different roads to arrive at this day, but every road involved a lot of hard work and dedication, and support from family and colleagues. Congratulations to all of you.

It was almost a year ago, at the Canada Lands Surveyors' conference, when Mel Truchon first asked me to give the *Charge to the New Surveyors*. I was pretty excited and I went home and told my kids about it. I have 19 year old twin boys. They asked me what I was going to talk about.

I said, "Oh, I have so much I want to tell them!" I told them that I wanted to tell you to plan for the future, because you never know what's around the corner - you may have to deal with a serious illness, or someone in your family may get sick or your spouse may lose their job. That I wanted to remind you to take care of your mental health, and to pay attention to the mental health of your staff and co-workers. Life has lots of challenges and people are far more fragile than we realize. I said that I wanted to tell you to make time for fun and family, because before you know it, your kids are off to college... to spend less than you earn... to give away 10 per cent of what of you make...to remember the Golden Rule...

My boys rolled their eyes and said, "You can't say that stuff!! That's a total MOM lecture!" And they're right. So I promise I'm not going to say any of that. Besides, I've read your profiles - you're an accomplished, experienced bunch.

So I thought to myself: "What do I wish someone had told me?"

In my career as the ACLS Practice Review manager, I get to meet lots of surveyors, here in Ontario and across Canada. I decided I'd ask some of them for input. I asked them: "If you could go back in time and tell your newly-licensed self one thing, what would you say?"

Here's what they said:

- "Be confident that you're joining a professional, ethical group, whose influence will grow only if you yourself are proactive about enhancing it."
- "Believe in yourself, and remember - learning is forever."
- "Be open-minded about learning from your peers and from your experienced party chiefs."
- "Get Critical Illness Insurance." (okay that was me)
- "Managing the expectations of your clients will be key to your happiness at work. Learn this skill, you will lose less money, have great relationships and lower blood pressure!"

- Start volunteering with the Association and your regional group as soon as you can. It's a great way to learn from other professionals and to earn your CPD hours."
- "Don't be afraid of new technology or opportunities - embrace them!"
- "You will learn a lot by being on the Complaints Committee."
- "Never lose sight of where you want to be and what you want to be doing."
- "Stand your ground, be true to yourself, and be patient with yourself."
- "The right opportunity is out there - have the courage to chase it!"
- "Don't blink - before you know you will be 51! Stay in contact with the people you graduated with."
- "Get some training in Effective Communication - it's worth the time and money."

I'd like to conclude with the wise words of Bill Snell. Bill was the AOLS Registrar for 6 years, and he was also my monitor when I was articling. Bill took the time to write a little more in his answer. Bill said:

"Relationships are critically important - relationships with our clients, staff, fellow professionals, friends and family. It may sound trite, but simple acts of caring, understanding and kindness can make what might otherwise be challenging situations far easier to deal with and resolve.

As professionals, we are all technically strong and we're required to abide by our Code of Ethics. But we also need to ensure that we are good human beings. This means treating all of the people we engage with daily with respect and thoughtfulness; even those (perhaps more so!) with whom we disagree, or don't have a shared background with."

Bill reminds us: "When you first meet someone, you don't know what challenging situations they have dealt with in their life, or even that day. It seems easy enough to say, but at times when we encounter a difficult client, or are having a bad day ourselves, it's important to remember to treat everyone the way you would want someone to treat your mother."

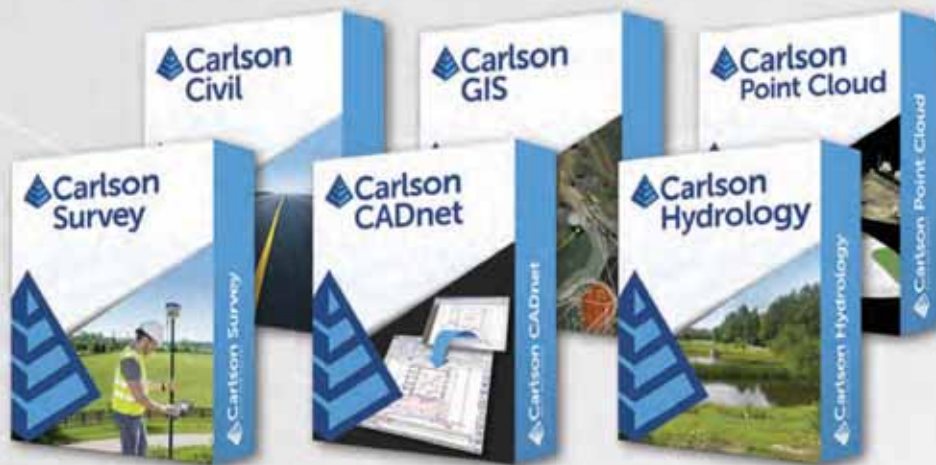
Wise words from a very kind man.

Yifan, Tyler, Dmitri, Tyler, Amir, Shawn, Mojtaba, Vinujan, Tim, Fereidoon, Stephen, Ricardo, and Colin: Welcome!



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Manage your Risk by Preventing Errors and Utilizing Best Practices... So you can enjoy Retirement!



By Mark Sampson, BBA, FCIP

I had the pleasure of attending the AOLS AGM this past February at Deerhurst Resort in Huntsville, Ontario. The theme of the meeting was “Manage Your Risk” which applies not only to the AOLS as a regulator, but also to the individual members.

One way to manage your risk is to prevent professional-related errors from happening. During the Plenary Session on Wednesday, February 26th, I co-presented a seminar which discussed 5 common claim scenarios. We outlined lessons learned from these losses and provided some suggestions on best practices to implement in your firm in order to avoid experiencing similar losses.

The co-presenters were members of the AOLS Insurance Advisory Committee: Joseph Young, O.L.S., Dan Dzaldov, O.L.S., and John Breese and Graeme Holland from Maltman Adjusters.

For those surveyors who did not have a chance to attend the seminar, here is a summary of our presentation. The five most common errors committed by OLSs are:

1. Office Checking

Office checking (or lack thereof) is the number one reason why OLSs experience a “construction” related claim. A significant portion of errors would have been caught before a claim occurs if the work was checked by a second set of eyes prior to being given to the field crew. Any layout by a field crew should be checked by the office by the NEXT MORNING.

Best Practices Suggestion:

- Checking your work (often ignored as a redundant chore) is the most effective risk management tool that enables you to detect or minimize the exposure to mistakes and errors that can result in a costly financial burden or tarnish your reputation.
- A sound checking process also supports the achievement of quality to maintain or enhance service quality and your professional reputation as a land surveyor.
- Every surveying business should incorporate adequate checking (and audit) procedures into its quality improvement process.
- A properly developed checking process may identify potential risks, provide quality assurance and improvement of your system, and demonstrate your commitment to protecting public confidence and interest.
- A Field Work check followed by an Office check;
 - Completing redundant field checks, including hand measuring with a tape (if possible), and taking check measurements with an instrument on redundant set points.
 - Completing office checks as soon as possible and reporting to the client any issues.
 - Advising the client not to use set points until the office check is complete and the layout verified (this may be difficult to enforce).
 - Keep duplicate copies of any paperwork (cut/fill sheets, etc.) given to the client on site.
- Use of a “Checklist” as a quality assurance and error prevention procedure. Checklists cannot replace

Sites to See

High-Resolution Digital Elevation Model (HRDEM) generated from LiDAR New data available!

<https://bit.ly/2QE1n8I>

Natural Resources Canada announced a new publication of High-Resolution Digital Elevation Model (HRDEM). This 100 000 km² release includes ~55,000 km² of new HRDEM coverage distributed over five provinces (SK, MB, ON, QC and NB). It also includes coverage of 22 of Canada’s largest cities, including those in the Greater Toronto Area. This new highly detailed 3D information is an essential baseline for many government projects and priorities, such as flood mapping, forest inventories, climate change monitoring and urban management.

common sense, but they will help compensate for our limited memory and attention. The Professional Standards Committee recently uploaded cadastral checklist templates to the AOLS website and advised me that construction checklist templates will soon be available as well.

2. Change Management

There are many parties involved with every construction project... engineers, architects, lawyers, general contractors, sub-contractors, and sometimes, other surveyors. As such, there can be many different iterations or versions of plans/drawings. It is very important to have a regimented work flow to receive, document, and notify key internal personnel of the revisions. The process should highlight the date of the site plan used for calculations and have the site super / client sign off on the version of site plan being used for layout for excavation. The same process should apply for pinning the footings (sometimes there may be a revision to the house model or type between when you stake out for excavation and return to pin the footings).

Best Practices Suggestion:

- Have a document process for any change orders that acknowledge the change with the client (and the Site Superintendent). Ask the client to clarify if the change involves any impact to the survey scope.
- If yes, develop a process:

- To notify the office and field crew of the change.
- For the project manager to archive an out of date plan, then remove it from the working project file (so no one else uses the wrong plan by mistake).
- For the field crew to remove old outdated data from their field computers / data collectors.
- To inform the site supervisor of the change... You will be a hero!

3. Onsite Discrepancies

We have come across a few recent claim situations where surveyors are provided with project drawings that include a grading drawing, which allude to a site benchmark. If you are unable to find this benchmark on site, the field crew should not simply use another elevation shown on the grading design plan. Always communicate with the client ANY discrepancies or variations from the project scope. Get written instructions from the client on how to proceed... they must make the decision. This common error also falls within claim example #1 Office Checking.

Best Practices Suggestion:

- The field crew should NOT make any decisions on site without notifying the office.
- The project manager in the office must be aware of what is happening on the site.
- No changes should be executed until written confirma-

cont'd on page 16

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tion is received from the Site super/client.

- Develop a policy: if any field crew makes a decision on site, outline what the decision was on a different piece of coloured paper to highlight the decision and for the office to make sure they double-check it first thing in the morning.

4. Use of a Different Datum

There are different vertical datums and horizontal projections in Ontario... especially in the Greater Toronto Area. We have seen an increasing trend of losses caused by different datums being used on projects. The main cause of the errors are different parties on a project (surveyors, engineers, contractors, etc.) using different project control points.

Best Practices Suggestion:


- When working in an area with multiple control networks or multiple generations of adjustments, always independently verify some existing features that you can match with the existing/pre-existing control network (work done by others).
- Always confirm in writing (proposals and deliverables cover letter) which control systems are being used and which actual control points were used.
- Notify the client that multiple systems exist and that they should ensure all other parties use the same.

5. Additions to Existing Structures

Doing layout work for an addition to an existing building can be problematic because there could be hidden factors. A recent claim occurred when the contractor failed to advise the surveyor of the fact that a layer of concrete brick covered the foundation for the existing building. This caused the gridlines provided by the surveyor at the start of the project to be incorrect.

Best Practices Suggestion:

- Always independently confirm dimensions on architectural plans.
- On any additions, unless you have written communication/direction from your client waiving you from any and all liabilities, insist you must measure all pertinent information on site.
- If any discrepancies are found, notify the client and obtain written direction on how to proceed.
- Insist they send you back the revised plan with the corrected addition details.
- Do not site adjust, do not proceed until you have written resolution to the discrepancies (9/10 times there is something wrong with the architectural drawing).
- Do not give in to pressure to "proceed ASAP".

Mark Sampson, BBA, FCIP is the Senior Vice President of Arthur J. Gallagher Canada Limited. 



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007 Weapon for Surveyors

The curious saga of the emergence of persistent scatter InSAR, and why you should be using it.



By Carl Pucci

It all began with the unknown. What is beyond the horizon, and once we find out - how can we record it, map it and study it? Surveying began in the dawn of exploration, well before we had precision optics, let alone lasers and long before radar arrays. It is a profession that has always been at the cutting edge with the latest tools to bring precise measurement to clients, from the empires of old to the infrastructure operators of today.

The story of synthetic aperture radar (SAR) – Radar-based imaging technology - began in much the same fashion. It was the mid-twentieth century and the World had entered the Cold War, a war in which weapons that could end the planet were not going to wait for daylight to appear, or for optical scanning aircraft or satellites to take a picture. Both sides were, first and foremost, in a sprint for information.

Enter the space race, and an eccentric American genius named Carl Wiley. Working for the Goodyear Aircraft Corporation, his team had the contract to develop a radar system for the new F-4 Phantom fighter jet. Wiley's radar team faced the challenge that identifying objects at high resolution would require a physical radar beam or a swath the size of a football field, or larger. He noticed that as objects moved toward, or away from that beam, there was a slight (Doppler) shift in the sound frequency of the signal. Extrapolated out, this would allow the system to identify objects with arrays 1/100th the original size, at night, and through clouds. It was a major breakthrough. Before long, this system was spiking great interest in every corner of the government.

First, the platform was successfully attached to test aircraft, and later, to a Corona-twin spy satellite known as Quill. Corona and Quill used optical imaging, but then they were equipped with radar. The satellites were mounted atop ballistic missiles. They would record imagery to film, jettisoned from space with a parachute, which were then caught in midair by a passing retrieval aircraft. After all, it was the time of James Bond! The mission for Quill, and its SAR sensor, was envisioned as a way to image an impassable city for disaster assessments after a nuclear strike. However, a more peaceful need quickly arose. Man was going to the Moon, and he had no way to survey its surface deformations. Soon, SAR systems were mounted to the lunar lander,



Sentinel InSAR Satellite Fairing Opening at Launch

orbiting the Moon's surface and collecting data that was used to map where the missions would land.

Let's get technical... What Wiley discovered in the Doppler shift of targets was a huge data set that was technically impossible to process automatically to high precision with any degree of speed – until recent time. With its initial limitation the *radar race* was on the surface of future amazing capability. At that time, though, it was literally working to simply see a synthetic optical image.

Interferometric SAR (InSAR) is the technology that puts two SAR images acquired at different times atop one another to look for the differences. This was first referred to as DinSAR, and it created a barely interpretable oil slick-looking image. However, if you know what you are doing, you can count the color bands in that image and rapidly, as well as accurately, determine changes in land movements after a catastrophic event. This is used to determine how much motion has occurred over wide areas, such as after an earthquake. When you locate a persistent scatter – multiple images of the same object, it is possible to build a stack of these images and observe the slight phase shifts over a time series. This produces an image of points which can be colour-coded for their Doppler shift toward, or away from, the spacecraft.

This PS-InSAR approach allows a professional to survey land and waterscapes from space. The platform identifies persistent radar scatters and evaluates their statistical signal

coherence or relationship over time. Accuracy for the technique can be impressive, with the ability to recognize movements with up to 1mm accuracy. Should an operator wish to observe a non-reflective surface, or one beneath snow, for example, with much accuracy and without a need to visit the site, a passive capped radar reflector can be installed on the site and observed by every SAR spacecraft overflight from there on. These may be affixed to traditional survey monuments, giving continuity of measurement of specific points.

InSar provides significant measurement opportunities and advantages:

- Historic motion determination – satellite data can be obtained for short time intervals over a period of several years
- Deformation Trend monitoring – short interval time series changes can be monitored
- Rate of change alerts – for certain magnitudes of deformation, alerts can be established to undertake more study or detailed analysis
- Wide area monitoring – satellites can cover virtually every location in the globe in short interval repeat periods
- Reflectors atop survey monuments – greater precision can be obtained through adverse climates, e.g. snow or ice, or difficult terrain, e.g. muskeg or vulnerable steep slopes
- Areas with radar reflective surfaces – many natural or infrastructural materials are reflective enough to provide movement conditions

InSAR provides the surveying community with next generation management possibilities or adjunct services to offer clients:

- Mitigate risks - It can be used before assembling extensive proposals to provide deformation insights and potential competitive advantage at relatively low cost, before you bid

- Providing clients with previously invisible data – It offers the ability to observe deformation changes at regular short-term intervals over historic periods covering several years
- More work opportunities - After undertaking satellite analysis, sufficient deformation warning can be identified from data analysis to require follow up field results to be undertaken. Greater accuracy can also be obtained by placing reflectors in the field

So, where do we go from here? A little more on the good, the bad and the bizarre... and, of course, Estonia to illustrate the potential for hard working and adaptive surveyors to embrace InSar.

The Good. The European Space Agency, to which Canada is an associate party, sparked a global interest making SAR data available at low cost to the general public. The Canadian Space Agency has recognized this development in policy statements related to its recent launch of the Radar-SAT Constellation Mission (RCM). While RCM will initially be available to government departments and related clients, data will be available for commercial usage in the near future. RCM promises temporal resolution (revisit frequency) of Canada every day. This temporal resolution topic is key to civilian users of InSAR as it takes a minimum of 40 revisits in satellite systems to reach millimeter accuracy. This is needed for diffusing the effects of noise on the target and the Earth's various weather interference patterns, which are not solely atmospheric but magnetic. The Sentinel-1 ESA/Copernicus mission provides 6-day revisit on the target, with 12-day revisit data storage available globally. This is ideal for generating highly accurate InSAR data with planet-wide coverage going back to December 2014.

The Bad. In a few short years, Wiley's invention had revolutionized remote sensing and intelligence gathering. However, it wasn't only in America that these advancements were racing to the forefront. The Soviet Union essentially took the idea of SAR to the next level. They had their own SAR spy satellites known as RORSAT, which were nuclear powered. This led to a number of notable nuclear debris falling from space incidents, including the failure of Kosmos 954, which polluted 124,000 square kilometers of Canada. As SAR was advancing, it was launched aboard the American space shuttle, and not surprisingly, the Soviet Braun shuttle test flights. It was mounted to MIR, Sky Lab, and certainly a share of still undisclosed programs.

The Bizarre. One of the most interesting, and wonderfully absurd radar imaging stories related to the ALMAZ-T series manned military space stations. The *drop and retrieve* radar processing technique was clearly too slow for the USSR and the computers of the time weren't up to speed to handle the task. So, they simply placed three



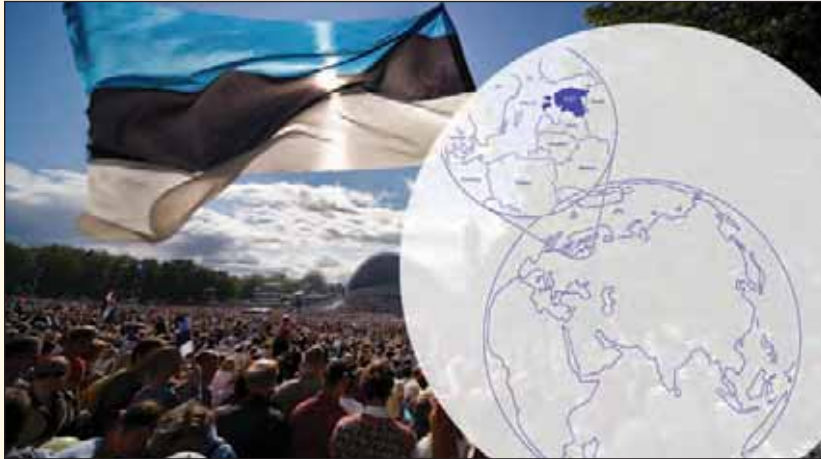
An original full scale survey map of Palmse, Estonia

cont'd on page 20

cosmonauts inside an orbiting SAR space station to process the data manually and relay the findings to Earth. A space cannon was also added to the side of the space station to, theoretically, defend it from American anti-satellite systems. To aim the cannon, they had to use fuel to both maneuver the entire station and counter the recoil. Needless to say, it was unpleasant to be inside it at the time, and it is the only publicly known case of a giant cannon in space.

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A key part of that story is land reform, GIS and surveying. How do you justly return land to people who had it stolen from them by the Soviet Union? In 1991 Estonia didn't have the global GIS technology of today. So, Estonia invented it themselves. Surveyors were entering data into digital GIS systems to return land assets transparently nationwide from the moment the country was free again. The ingredients were coming together for a revolution in remote sensing data accessibility and InSAR.



The largest choir gathering in the world, Estonia's singing revolution and subsequent song festival

Estonia. A Northern European nation, now free for nearly 30 years after eons of occupation, that found itself under Soviet control at the end of the Second World War. Following the wholesale deportation and murder of Estonia's people, a dark and bizarre twist of fate found Estonia with the Soviet cybernetics' institutes. It was there, where the Soviet space communications command would be routed and where radar processing systems for these platforms were refined. The small country would endure the vast militarization of its territory. From submarine bases hidden in underwater caves, to a nuclear fighter strike airfield in nearly every town, it was a unique and challenging place to live. While American radar processing was done largely in hubs such as Rochester, Silicon Valley, MIT, and Northern Virginia, that of the Soviet Union was mostly done in Tallinn and Tartu, Estonia.

In 1991 the darkness was lifted, the Soviet Union dissolved in a matter of days. However, the Soviet military and space complex did not simply disappear. Over the following three years, equipment was torn out of underground facilities to return to Moscow, at best. At worst, entire platforms were stolen or simply destroyed on site. The people who developed SAR, however, didn't disappear, but were now free.

Joining the European Union (EU), and NATO, Estonia found itself in a unique position. Its constitution requires it to be essentially a zero-debt government. At that time, the country had few people, no money, and little natural resources. So, Estonians turned to technology, investing not in systems from the West, but inventing something better. Soon Estonia would invent Skype, Hotmail, and the world's

With a demand not to go into debt, and only a handful of infrastructure inspectors in the nation, how was Estonia able to monitor its bridges, tailings dams, and port facilities for deformation? As the newest member of the European Space Agency, they learned of the largest investment in European Union history – Copernicus. An ambitious plan to fund the launch of a series of SAR satellites that would have their data stored and distributed without cost to EU member states. Through artificial intelligence (AI), GIS wizardry, and SAR expertise, Estonia and its partners developed a generation leap in SAR processing. One which is low cost, fast, and distributed in a web-GIS form.

This application gave the nation a way to keep an eye on assets it was not able to in person, rather from space instead.

We at Ovela59.com were part of the first IT group in Estonia. Our teams built the most digital nation on Earth, and we are here with the most accessible, affordable, and accurate global InSAR data platform covering the entire planet from a web browser.



The Ovela InSar distribution platform view of Toronto

And we have 60 years of history to thank for where we are today. Decades of massive investments by governments has led to this moment, where you are able to determine years of millimeter-by-millimeter motion of a naturally reflective surface from a spacecraft in orbit, while sitting on your couch, looking at a smartphone.

Fused together with LiDAR, photogrammetry offerings, and traditional techniques, a surveyor has tools that would seem to have only been a dream a generation ago. Canadians

have a monumental role in the advancement of SAR spacecraft starting with RadarSAT-1, one of the world's first publicly known SAR instruments. Canada has long been a front runner in radar instrumentation from orbit, and now it's the members of the Association of Ontario Land Surveyors who have the proverbial torch to carry forward.

InSAR is nuanced, subtle, and anything but magical. That is why it needs your experience to bring it to life. Together, eight generations of spy satellites and an absurd number of spacecraft are rooting for you.

Astronomically less costly than ground instruments, accurate and packed full of measurements, this tool is the perfect add-on to the OLS business model. That is, if you dare to get into the work of martinis shaken, not stirred. InSAR has been there watching over every site you've ever worked on without you even knowing, laughing maniacally, with orbital cannons, at robotic total stations spinning around so quaintly in their little boxes.

Launch and orbit-to-ground communication costs are falling. This is leading to an increase in the number of SAR sensors in orbit. This isn't a cure-all new science, but an opportunity to build upon a newly accessible, highly refined technology platform.



A parabolic antenna of Tartu Observatory, Estonia, a receiving station of the Copernicus EO systems

The question is no longer how the surveying community could use this invisible data all around us, but rather who will begin. This time, you don't have to worry about an orbital space cannon stopping you.



Carl Pucci is a Principal of Ovela59.com. Go to www.ovela59.com/aols to learn about surveying from space.

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128th Annual G

Darrel Pink was the keynote speaker at the Opening Ceremonies. See his article on Rethinking Professional Regulation on page 6.



Julia Meldrum Smith, O.L.S. delivered the Charge to the New Surveyors at the Convocation Lunch. A copy of her speech can be found on page 12.



The 128th Annual General Meeting was called to order as the Sergeant-at-Arms Graham Bowden laid down the Standard Measure, which historically was used to control the accuracy of surveys in Upper Canada.



Incoming President Andrew Mantha (right) presented the Past President's gavel to Al Jeraj.

Members Commissioned in the Last Year

Front left:

- Tyler Renaud,
- Colin Vanderwoerd,
- Yifan Zhang,
- Shawn Leroux,
- Tyler Allison,
- Vinujan Aravinthan



Former Executive Director Blain Martin (left) was presented with a Fellowship Award for his substantial contributions to the Association and the surveying profession from Al Jeraj.



Professor Michael Chapman was not able to attend the luncheon to accept his Fellowship Award for his substantial contribution to the surveying profession. At Mike's request, it was presented on his behalf to Aziz Abdelshahid (center) by Al Jeraj (left) and Al Buckle (right).

General Meeting



Dan Shilling, Chief Administrative Officer for the Chippewas of Rama First Nation, presented some history on the traditional territory of the Anishinaabeg, the site of the AGM.



Back left:
Dmitri Elmov,
Tim Bunker,
Stephen Kosmachuk,
Ricardo Pineros,
Mojtaba Tavallae,
Amir Keshavarz,
Fereidoon Khosravirad

Missing from photo:
Tareyn Gardner,
Lauren Dawe, and
Michael Masciotra



Samra Hashim-Jeraj (left) presented the AOLS medallion to Carol Mantha who then presented Samra with a gift.



From left:
Robert Halliday, Association of Canada Lands Surveyors,
Al Jeraj, Ontario,
Chris Cryderman, British Columbia,
Steve Yanish, Alberta,
Daniel Gautron, Manitoba,
Murdock MacAllister, New Brunswick,
Aubrey Burt, Newfoundland,
Kevin Lombard, Nova Scotia

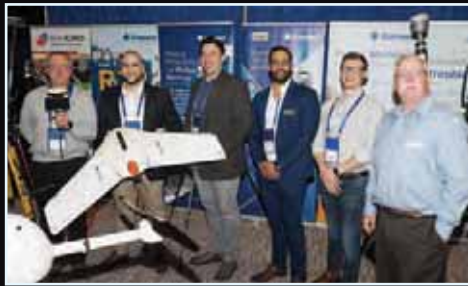
Missing from photo:
Courtney Tripp, Saskatchewan,
Orlando Rodriguez, Quebec,
Bob Wakelin, Prince Edward Island

A Memorandum of Understanding to formalize commitment to work on national issues was signed by representatives of the other provincial surveying associations and the Association of Canada Lands Surveyors (ACLS).

Event Sponsor



Gallagher represented by Mark Sampson (left) and Laura Stewart



Cansel represented by Bruce Davies, Moathe El-Rabbany, Adam Tyler, Said Lama, Colin Gaudet and John Currie



GeoShack represented by Thad King



Protect your Boundaries represented by Maja Krcmar, Saša Krcmar and Tom Krcmar



Sokkia represented by David Janssen, Dilip Lal and Cameron Galbraith



The Connectors Insurance Group represented by Bob and Leslie Morrow



The Welcoming Party provided the perfect setting for friends and colleagues to mingle with each other and visit with the exhibitors.



Thanks to Mel Truchon, Penny Anderson, Lena Kassabian and Julia Savitch for selling the tickets for the Exhibitors' Draw at the Welcoming Party.



The Archival and Historical Committee held a "Photography Challenge". Photo entries were judged at the AGM. The winner was "The Chickadee", submitted by Nathan Loucks of E.J. Williams Surveying Limited.



The President's Dinner and Dance featured FLATHEAD FORD, a dedicated group of three musicians who have immersed themselves in the "golden era" of Rock n' Roll. From left: Bill "The Big Bopper" Webb on guitar and vocals, Jack "The Freight Train" Stubbington on the drums and Scotty "The Hot Rod Kid" Kennedy on bass and vocals.



No Hockey Game this Year

By Pat Hills

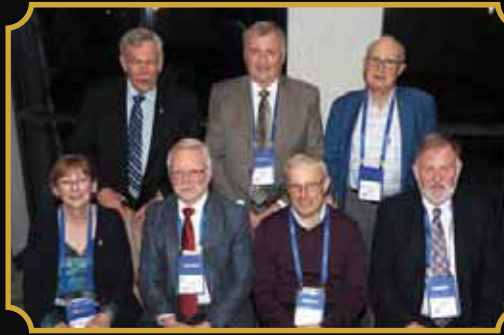
Well, we had a good run. After sixteen years, it is with a heavy heart that I submit this year's hockey write-up without a hockey picture. The winter warming and thawing conditions rendered the ice unusable at Deerhurst this year. Not to be thwarted from outdoor activities however, I am pictured here, on the left, cross-country skiing with Robert McLaren at Arrowhead Provincial Park and, on the right, out for a walkabout with Pat Haramis (center) and Mike Matthews. Rest assured we will return to the rink next year in London. In the meantime, keep your sticks on the ice... Cheers!



Veterans' Dinner



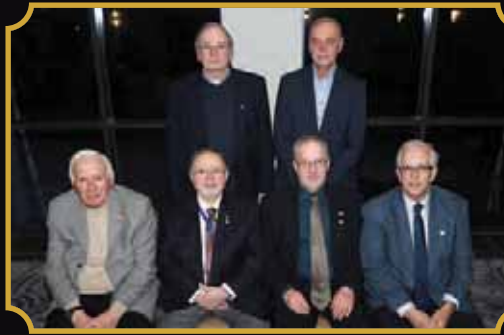
Eric Ansell was the Master of Ceremonies at the Veterans' Dinner.



Front left: Maureen Mountjoy, Steve Gossling, Paul Torrance, Brian Maloney
Back left: Bob Mountjoy, Robert Hawkins, David Dorland



Front left: Ross Clarke, Doug Culbert, Richard Emode, Norm Sutherland
Back left: Drew Annable, Pat Haramis, Bruce Clark



Front left: John Jackson, Al Roccaforte, Chester Stanton, Leslie Higginson
Back left: Tom Glassford, Frank Mauro



Front left: Gary Auer, Susan MacGregor, Martha Burchat, Kim Husted
Back left: Adam Kasprzak, Greg Hartwick, Eric Ansell, Doug Jemmett



Front left: Ron Dore, Tim Hartley, Denis Dutrisac, Graham Bowden
Back left: Normans Taurins, Doug Hunt, Bob Clipsham, Tom Bunker, Blain Martin



Front left: Rod Reynolds, John Vinklers, Gordon McElravy
Back left: André Barrette, Mart Himma, Hugh O'Donnell



Front left: Gerald Hickson, Andrew Mantha, Martin Knisley, Ted Williams
Back left: Brent Collett, Al Worobec, Richard Preiss, James Ferguson



Front left: John Hiley, Dan Vollebakk, Andy Shelp, Kerry Hillis, Paul Wyman
Back left: John Goltz, Robb McGibbon, Murray Purcell, Russ Hogan



Front left: Ralph Grander, Helmut Grander, Ivan Wallace, Tom Packowski

Know your History — Part 4

By Tom Bunker, O.L.S., C.L.S., P.Eng., C.P.A. (Ret)

The following article is Part 4 in a series of historical articles written by Tom Bunker. Part 1 appeared in Volume 62, No. 3, Summer 2019, Part 2 appeared in Volume 62, No. 4, Fall 2019 and Part 3 appeared in Volume 63, No. 1, Winter 2020.

Historical Records and a Modern Digital Cadastre

The Surveying Profession and Plans of Survey

The e-conversion of the Ontario Land Registration system was designed to facilitate rapid access to ownership information and transactions. Simultaneously, the statutory conversion of Registry Act ownership to Land Titles through a statistical process was seen as a critical step to ensure the curtain principle of land titles applied and there would be few title issues requiring a laborious review of historical title records.

Under the *Land Titles Act* there is effectively a guarantee of “title”, i.e. you own something, but there is no guarantee of extent, i.e. the size of the physical thing (real property) that you own.

How land to be described

140. (1) Registered land shall be described in such manner as the land registrar considers is best calculated to secure accuracy. R.S.O. 1990, c. L.5, s. 140 (1).

Description not conclusive

(2) *The description of registered land is not conclusive as to the boundaries or extent of the land.* R.S.O. 1990, c. L.5, s. 140 (2).

Indeed, it is our role as professional surveyors to determine that extent, taking into consideration a potentially inaccurate description that may be displayed in the PIN thumbnail¹, illustrated on Block Mapping or included in any registered transactional documents. Professional standardsⁱⁱ require that this task includes an assessment of undefined documentary records in concert with a field investigation.

FIELD SURVEY STANDARDS

Evidence used

- 8.** When undertaking a survey, a licensed member shall,
- refer to the documentary evidence related to the land under survey and the land adjoining the land under survey;**
 - carry out a thorough field investigation for the best available evidence of all lines, boundaries, and corners of the land under survey; and
 - give priority to the evidence in accordance with common law and statute law. O. Reg. 216/10, s.8.

The Land Registration system was never specifically designed to facilitate research of historical survey or boundary records, nor is it the sole source of these records and surveyors have always had to create their own research methods.

Know your Local History

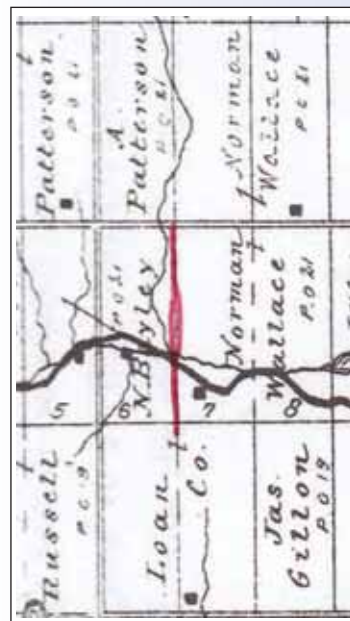
Our training as professional land surveyors goes beyond the study of technical measurement and calculation exercises by including knowledge of a broad range of statutory and common law matters. It should also include an understanding of the specific land development processes in our geographic area, including who was involved, what records were made and where they might be archived. The recent move to a province-wide survey record portal will assist in accessing other surveyors’ records. You need to be inquisitive and aware of other sources of information that could guide your investigation where observable facts on the ground appear in conflict with title documents and mathematical solutions. The following scenarios illustrate some issues.

Norman Wallace v John Patterson, et al.

For having, on the 3rd July, 1895, at the Township of Stephenson, willfully damaged and injured a certain fence, the property of the complainant.

This case was heard by Justice of the Peace James Boyerⁱⁱⁱ where it was learned that conflicting surveys by P.L.S. Pope of 1880 and W.G. Galbraith of 1894 had resulted in fences being taken down, moved, re-established, etc. A ruling of adverse possession was made. What was the modern consequence? In 1960, MTO surveyed the travelled township road passing through the Lots for assumption as a secondary highway, and re-established the Lot 6/7 line by Surveys Act methods^{iv} showing the established fence significantly off line. They later returned to adopt the fence^v as evidence of the lot line, perhaps after the descendant owner Patterson complained.

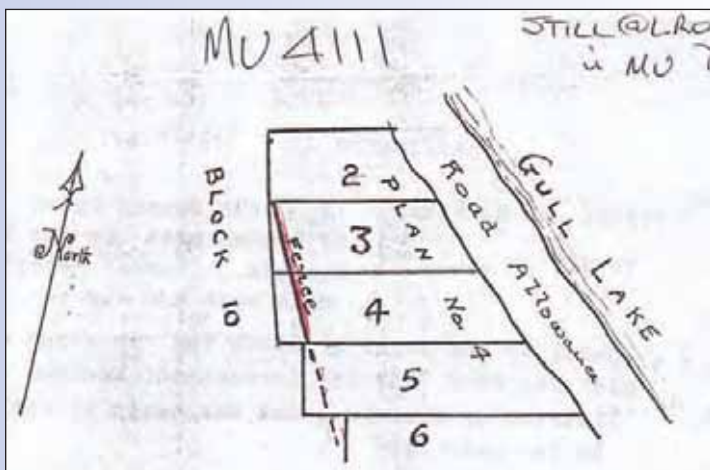
A real issue for local surveyors is that P.L.S. Pope operated in Muskoka from 1875 to 1895 yet apparently left us with no field notes or other records when he retired and returned to Ireland^{vi}. What other lines were established by



this surveyor (and others) in the 20 year period? From 1872 – 1891 there were 206 Provincial Land Surveyor licences granted of which 159 became Ontario Land Surveyors in 1892. There are 143 of the Provincial Land Surveyors for whom we have no records placement listed^{vii}. What is the consideration to be given when we are aware that there are lost records?

Lots 3 and 4, and Block 10, Registered Plan 4, Muskoka – non-transactional record

James Hewitt, James Scott and P.J. Trainor engaged OLS Fitton to lay out 9 cottage lots along the west shore of Gull Lake at Gravenhurst. The lots **were all posted** according to Registered Plan 4, registered in 1906. In 1933, James Scott (one of the subdividers) and neighbour John Duncan Brown registered an agreement against Lots 3, 4 and Block 10 and with a sketch indicated that “about the year 1906 the said John Duncan Brown and myself erected a fence between our respective lands and we mutually agreed that the said fence would be accepted as the limit between our properties”^{viii}.



By the 1980's the fence had effectively disappeared and an access lane lay across the rear of lots 3 & 4. Did this agreement alter the limits of the posted lots 3 & 4? Was the lane now part of Block 10 or did Brown own part of Lots 3 & 4? What was the affect on the dimensions of adjoining Lots 2 and 5? These types of records are not brought forward on e-conversion.

Reconstructing street lines in the Town's commercial core

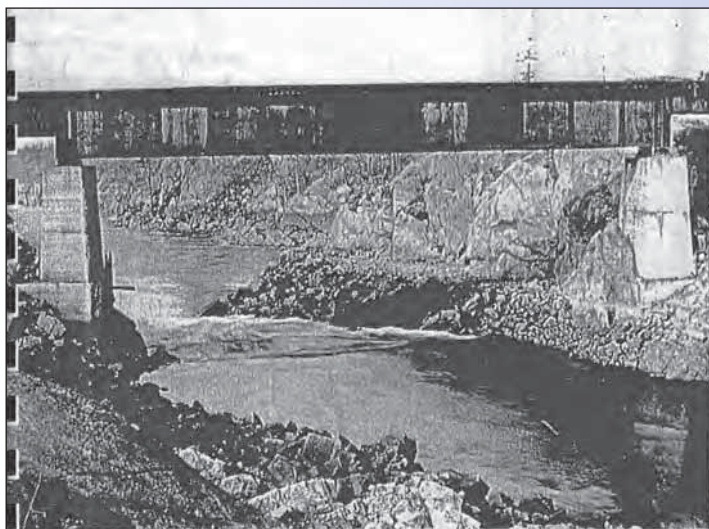
A fire in an upstairs apartment effectively destroyed a brick building that had stood for decades at the southeast corner of Muskoka Road and Brock Street at the downtown four corners of Gravenhurst. Part of the structure collapsed and for safety reasons the remaining shell was pulled down. I was engaged by the insurance company to determine the structure's placement to deal with potential liability based on encroachments, if any, and to assist in the re-build expecting the new building to lie within the boundaries of the lot.

Field note records of the downtown area were available from the 1890's to present day, with many having ties to buildings' brick faces and corners. As in most urban

settings, reference points had been lost when sidewalks were replaced, actual monuments were few as buildings were erected to street lines and building facades had been “updated and modernized” from time to time. Google Maps Street View gave a glimpse of conditions of the subject building before the fire and measurements confirmed the recent facade did not reflect older survey records. The local historical society collection of photographs uncovered a street view that revealed the building configuration that related to old survey records so the original street lines could be recovered.

Manmade alterations to natural boundaries

- The Severn River flows westerly from Lake Couchiching to Georgian Bay through particularly rugged terrain. In 1902, Orillia Power completed Hydro Glen generating plant where the water cascaded down 11 metres through a narrow chute of rock. In 1915 the Federal Public Works began to build a new control dam as part of the Trent-Severn Waterway further downstream and designed it to hold back the water to a level higher than the Orillia Power structure. Once the new structure was completed, including a new power house, the Hydro Glen dam was removed by dynamite in 1917. The modern task was to prepare a description reference plan of the federally owned lands including those that had been flooded.



Photographs and dam engineering plans in a local history publication revealed data that could be applied to determine pre-flood water boundary locations.

This 1917 photo^x is of the CPR bridge still existing and showing conditions when Hydro Glen dam was removed. Scaling between the piers and from the rail deck gave an elevation for the pre-flood water.

- Thomas Burgess occupied land at the outlet falls of Lake Muskoka at the time of the original 1869 survey of Medora Township. He subsequently obtained patents and in about 1872 erected a waterwheel driven sawmill on “Mill Creek”.

cont'd on page 28



The creek fell from Lake Muskoka through a narrow crevice. When Lake Muskoka was raised by a control dam on the lake outfall Musquash River in 1874, Burgess erected a wooden dam^x to control flow in the Mill Creek.



Properties abutting Mill Creek were described referencing a 1916 plan of survey, and when a small hydro-electric dam and power house were built downstream from the lake in 1917 the owners of abutting properties granted flooding rights.

Local family photos and postcards were used to confirm a visual representation of the pre-flood creek and hydrologic analysis and water soundings were used to determine the best evidence of the creek's original boundary.

Conclusions

As professional surveyors we regularly rely on documents on file at the Land Registry Office, other surveyors' records, field investigation, measurements and mathematics to re-establish boundaries.

Our objective is always to replace the boundary where it was originally established, based on the best evidence that the case presents, not where it might have been with superior technologies or better surveying conditions. Surveyors need to be aware of other sources of local historical information, especially when the observed facts on the ground are in conflict with expected results.

The local library, family histories and terrestrial and aerial^{xi} photographic collections can be invaluable resources that we should be aware of.



ⁱ Warning on PIN sheets: "ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY"

ⁱⁱ O. Reg 216/10

ⁱⁱⁱ Page 546, Raw Life, J. Patrick Boyer, Dundurn Press, 2012

^{iv} MTO Assumption Plan P-2997-2

^v MTO Plan P-2997-7

^{vi} "Lines carefully adjusted", the lost survey records of Parry Sound/Muskoka, Tom Bunker, Nov 2018

^{vii} Presentation to NERG April 2019, "Lost Muskoka Surveyors and their Records"

^{viii} Registered as MU4111

^{ix} Page 188, CHIONKIARA, a history of the Severn River and area, John E. Dean, Washago, 1995

^x Photo of dam above roadway about 1907, Library and Archives Canada, PA-158548

^{xi} Example: par [82], Collingham, et al v. Township of Algonquin Highlands, O.S.C. 05-0013, Jan 23, 2007

Sites to See

Mining Act Awareness Program

<https://bit.ly/2JgLBN3>

The Mining Act Awareness Program (MAAP) is an online training course offered by the Ministry of Energy, Northern Development and Mines, which provides information on the basics of the Mining Act and its provisions and regulations.

Topics Covered by the MAAP

The MAAP covers a wide range of important topics such as:

- The purpose of the Mining Act and its regulations, including the operational policies that outline how early exploration activities are to be carried out in Ontario.
- Aboriginal and treaty rights.
- The rights of private land owners, and other users of the land when planning for early exploration activities.
- The requirements for carrying out early exploration activities.
- Resources available to assist in preparing for online mining claim registration and early exploration activities.

NEWS FROM 1043

Changes to the Register

MEMBERS DECEASED

Norman W. Babbs	1097	Mar. 20, 2020
Christopher Peat	680	Mar. 8, 2020
John R. Hiley	818	Dec. 28, 2019
John R. Webster	1052	Dec. 19, 2019
John S. Duncan	1242	Dec. 17, 2019

RETIREMENTS/RESIGNATIONS

John F.G. Young	1493	Jan. 1, 2020
Pat Galati	1644	Jan. 1, 2020
Blain Martin	CR149	Jan. 1, 2020
Adam Stephen	1948	Jan. 1, 2020
Ron Denis	1692	Jan. 1, 2020
Kerry Johnston	1688	Jan. 1, 2020
Doug Jordens	1619	Jan. 1, 2020
Colin Bogue	1651	Jan. 1, 2020
Line Delorme	1630	Jan. 1, 2020
Juzer Noman	2016	Jan. 1, 2020
Ian Robinson	1472	Oct. 12, 2019

REINSTATEMENT

Marvin D. McNabb	1558	Mar. 2, 2020
Murray R. Shantz	1686	Jan. 1, 2020

COFA RELINQUISHED

Valard Geomatics (Ontario) Ltd.
Ottawa, Ontario
January 1, 2020

Tom A. Senkus, O.L.S.
Islington, Ontario
January 1, 2020

Surveyors in Transit

Ron Bridges is no longer with **Valard Geomatics (Ontario) Ltd.**

MacDonald Tamblyn Lord Surveying Ltd. (A Division of J.D. Barnes Limited) and **ACI Survey Consultants (a division of J.D. Barnes Limited)** have joined offices and the company is now officially known as **J.D. Barnes Limited.**

Tulloch Geomatics Inc. has opened an office at 102 - 91 Cumberland St. S., Thunder Bay, ON, P7B 6A7. Phone: 807-333-8404. **Marvin McNabb** is the Managing OLS.

Tulloch Geomatics Inc. has opened an office at 80 Atlantic

Ave., Suite 438 Toronto, ON, M6K 3E4. Phone: 905-481-1678. **Murray Shantz** is the Managing OLS.

Roy Mayo is now the CofA holder for **MacKay, Mackay & Peters Limited.**

Adam Kasprzak Surveying Ltd. has moved to 29 Bridge St., PO Box 633, Renfrew, ON, K7V 4E7.

Rodney Geyer is now the CofA Holder for **Greg Bishop Surveying and Consulting Ltd.**

Arie Lise is now the managing OLS at **Brooks & Muir Surveying (Division of Macaulay White & Muir Ltd.)**

Metz & Lorentz Limited (a division of Van Harten Surveying Inc.) has moved to 572 Weber Street North, Unit 7, Waterloo, ON, N2L 5C6.

Barich Grenkie Surveying Ltd. (A division of Geomaple Canada Inc.) has moved its Toronto office to 134 Doncaster Ave. Unit 1 Thornhill, ON, L3T 1L3., The phone number is the same.

The Field Notes and Records for **Tom A. Senkus, O.L.S.** are now available from **Ertl Surveyors** in Richmond Hill, ON.

Spiro Sinnis is now with **Ivan B. Wallace Ontario Land Surveyor Ltd.** located at 71 Mearns Court, Unit 16, Box 2, Bowmanville, ON, L1C 4N4.

Michael J. Masciotra is now with **Callon Dietz Incorporated Ontario Land Surveyors** located at 41 Adelaide Str. N., Unit # 1, London, ON, N6B 3P4.

Tyler Allison is now with **Annis O'Sullivan Vollebakk Ltd.** located at P.O. Box 579, 225 Rue Industriel, Embrun, ON, K0A 1W0.

Gregory C.P. Bishop is now with the **Ontario Municipal Board** located at 655 Bay St., Toronto, ON, M5G 2K4.

Donald Holstead is no longer with **Archibald Gray & McKay Ltd.**

Navid Najjarbashi is now with the **City of Toronto, Engineering and Construction Services, Land & Property Surveys** located at 18 Dyas Road, 2nd floor, Toronto, ON, M3B 1V5.

Saeid Sedaghat is no longer with **McIntosh Perry Surveying Inc.** He is now working at the **City of Ottawa.**

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

Vinujan Aravinthan	2061	January 21, 2020	Ricardo A. Pineros	2065	January 21, 2020
Tim Bunker	2062	January 21, 2020	Colin Vanderwoerd	2066	January 21, 2020
Fereidoon Khosravirad	2063	January 21, 2020	Michael J. Masciotra	2067	January 29, 2020
Stephen Kosmachuk	2064	January 21, 2020			

Every Plan Has Roadblocks

By David Coombs

This is David Coombs' sixth article for the Ontario Professional Surveyor.

Let me be clear. I love to plan. I know, “the best laid plans...” However this has never stopped me from looking ahead, laying a few pontoons to get ready to bridge the gap between today’s dream and tomorrow’s reality.

The current project on the home front is challenging, significant in scope and bristling with details. It may be strewn with pitfalls, however the possibility of success keeps me awake each day. Considering I am known for my afternoon nap, this is quite a declaration. We are going to go where no man has gone before. We are going to build a road.

A loyal reader might well ask how this can be. Mr. Coombs may have a Ph. D. in history. He may in fact be a fine fellow, but by his own many admissions, he is no surveyor. True.

In my excitement I have perhaps overstepped the bounds of truthfulness. We currently have a deteriorated track that meanders 2.6 kms over the south east quadrant of our property. I know its precise location as our friend, Wally Simpson (OLS # 1518) has, as readers are aware, retraced, cut and marked numerous boundary lines that delineate our bush lot.

An improved bush road is important for two reasons. First, I have been able to drive the route in my 2001 Toyota Tacoma

without fear of notable damage to the truck or my ego. However, the tense of the verb relating to the word drive is key. While the truck is in good condition I am not growing younger. My nerves are not frayed but caution is enveloping my hallmark and legendary driving prowess. I am not comfortable barreling along the rutted, overgrown, rock strewn road. For my peace of mind and to keep the peace at home, the circuit must be improved.

This leads to the second and not the least reason for the project. My wife Sarah, who is often glad to see me disappear into the bush, is, I know, pleased to see me and the truck return. I am quite certain it is me and not the truck, she is most keen to see emerge after a lengthy absence. She has mentioned casually and more recently adamantly, that she would not be able to take the Subaru on such a rough search and rescue mission. Walking such a distance in order to discover my fate on a rainy or even a sunny day is also out of the question. Therefore, we shall proceed with road improvements once the April snow, May runoff and June black flies have run their course. The latter variable could push the project into the dog days of summer but I remain hopeful that

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we can celebrate Canada Day by driving the loop together and in comfort.

It is difficult to assess the project with several feet of snow on the ground. For this precise reason I engaged the services of a reputable contractor last December. I talked and he observed. I felt he needed to know about the alder, poplar, and balsam growth, not along, but on the road. He should appreciate the ruts, the numerous drainage patterns across the road and the special attributes of the stretch across a flattened beaver dam.

By km 1.5, I realized he had remained silent while I poured forth a steady stream of information. I put the truck in park, turned to him and meekly mentioned that I appreciated that he had eyes and had more road building experience than I. He smiled, glanced at his neat notes and said, “David, you have made good points. I have also noted the slope of the runoff shoulder, the depth of the hillside ditches and the size of the red pines that periodically converge on the trail.”

For some reason I realized at that moment I had a passenger who was the right guy in the driver’s seat for the project. We continued on our journey and I pointed out several potential turnaround areas. He nodded and mentioned he had added a third back at the beaver dam. I bit my lip and maintained a respectful silence for the balance of the tour.

Twenty four hours after shaking hands, I received an email. Our contractor provided a quote, outlined the equipment and number of men required, the amount and types of gravel to be spread, the need for some trenching, the location of a few culverts and specific tree removals. He explained when and how the project would unfold. He did ask to see the recent

survey notes as he wished to keep a reasonable distance from the boundaries. Finally, he asked if I had any questions.

I could not sleep that night. I was and am prepared to have him shoulder the responsibility for the project. I am confident his professional qualifications are first rate. My concern is the workforce. I am not mentioned.

How do I modestly yet successfully raise the issue of my involvement? I believe I am inquisitive. A few say I am meddlesome. Certainly I will be allowed to open the gate to our property. I imagine I will be able to walk around the parked equipment, hopefully be permitted to climb a mound of gravel and even closely examine the hefty chainsaws. Tagging along is the problem. I cannot drive as at least the truck will get in the way. If I walk I will miss some aspect of the project as I cannot be everywhere at once. If I stick with the tree cutters my presence and pithy comments will be missed at the beaver dam.

There are roadblocks to this project. I shall continue to plan. Sarah has announced she is considering a visit to the grandchildren in May or June or July. I think this is poor planning. She will miss my daily reports.



David Coombs has a Ph.D. in Canadian history. After his retirement as a stockbroker in 2004, he began to write. His articles have appeared in *The Country Connection*, the *Toronto Star* and the *Globe and Mail*. He is also the author of “*The Beckoning Land*” which is an historical novel set in his home town of Barry’s Bay during the Depression and WWII. A copy of his book is available for purchase at www.lulu.com (<https://bit.ly/2IpjDkl>)

Sites to See

A Heritage Moment – Hudson’s Bay Company (HBC) Celebrates 350 Years

<http://www.hbcheritage.ca/history>

Two centuries before Confederation, a pair of resourceful French traders, Pierre-Esprit Radisson and Médard Chouart, Sieur des Groseilliers, discovered a wealth of fur in the interior of the continent, accessible through the great inland sea of Hudson Bay. After gaining the interest of Prince Rupert, cousin of King Charles II of England, the first ships set sail from England in 1668. On **May 2, 1670**, the Royal Charter granted exclusive trading rights of the Hudson Bay watershed to “the Governor and Company of Adventurers of England trading into Hudson Bay.”

Its first century of operation found HBC firmly anchored in a few forts and posts around the shores of James and Hudson bays. Annually, trappers brought furs to barter for manufactured goods such as knives, kettles, beads, needles, and blankets. By the late 18th century, competition forced HBC to expand into the interior of the continent. A string of posts grew up along the great river networks of the west, foreshadowing the modern cities that would succeed them, like Winnipeg, Calgary, and Edmonton.

In 1821, HBC merged with its most successful rival, the Montreal-based North West Company. The resulting commercial enterprise now spanned the continent — all the way to the Pacific Northwest (modern-day Oregon, Washington, and British Columbia) and the North (Alaska, the Yukon, Northwest Territories and Nunavut).

By the end of the 19th century, changing fashion trends contributed to the fur trade losing importance. Western settlement and the Gold Rush quickly introduced a new type of client to HBC — one that shopped with cash. With the Deed of Surrender in 1870 between HBC and Canada, HBC relinquished its territories to the new country. The Company’s focus began to shift to retail, as it concentrated on transforming trading posts into sales shops, stocked with a wider variety of goods than ever before. A British company since its founding in 1670, it wasn’t until 1970 during its 300th anniversary year that HBC became a Canadian corporation.

Insurance and your Business: Myths and Misconceptions

By Graham Bowden, O.L.S. (Ret)

Over the years I have marked exam questions on business situations that revealed articling students' lack of understanding of insurance. The purpose of this article is to share some of the myths and misconceptions to encourage a conversation with the students in your office.

This information bulletin addresses the typical insurance that is required by a professional Land Surveying business. As a disclaimer, this is not insurance advice but general information to help you form the questions you need to discuss.

Your business likely has policies for Commercial General Liability, Vehicles, and Professional Liability (also commonly referred to as Errors and Omissions insurance). Since the insurance industry is a provincial responsibility, the policy names may vary by province.

Each policy has many sub-categories that detail the coverage.

Read the details of your existing policies provided by your Insurance Broker or Professional Association. It might be dull reading, but do it at least once in your career - the sooner the better. At a minimum, read the Table of Contents.

Some students seem to think of insurance as a "Parent". If something goes wrong at work my insurance (parent) will bail me out. Sorry but insurance doesn't work like that.

Here are a few items that are **NOT** covered by insurance. Of course there are exceptions to the rule, but these are general practices.

As a Licensed or Registered Professional Land Surveyor (depending on jurisdiction) your business will hold Professional Liability Insurance (PLI) coverage. The policy will most likely be issued to the Named Business with coverage of the employed professionals therein. The policy will **not** be issued to an individual unless that person is a sole proprietor.

Unpaid invoices are not covered by insurance. Your

insurance does not reimburse you if a client does **not** pay an invoice.

If a field employee is hurt at work your insurance does **not** pay your business for "lost time". Special "Key Person" insurance can be purchased but this typically only applies to very senior partners who, due to illness, will be absent for extended periods.

If an employee leaves your business and sets up as a competitor, your insurance does **not** cover the value of lost clients or business opportunities.

If you are unsuccessful in submitting a "proposal/bid/tender" your insurance does **not** reimburse the money you spent writing the proposal.

On a fixed price survey contract, insurance does **not** cover the cost of overruns, whatever the reason. Whether you underestimated the time required to perform the work, or the material costs, or the work just took longer than you expected, your insurance typically does not cover the excess costs.

If you decide to move your office, your insurer does **not** cover the cost of downtime.

Your insurance does **not** cover failed work performed by third party suppliers or subcontractors. For example, a professional land surveyor hired a concrete company to provide concrete for control markers. Within a year, the markers collapsed requiring new markers and re-survey. PLI does not cover the cost of the re-survey or the concrete. You may consider suing the concrete company, though the "Fine Print" that you didn't read on the back of the Purchase Order limits their liability to the value of the concrete provided.

If your seven-year-old survey instrument is stolen do **not** expect your insurer to give you a brand new one.

If you place a deposit for materials or service and the third party does not deliver the service or return the deposit, do **not** expect the insurer to cover your loss.

Finally, insurance does **not** replace Common Sense.



Sites to See

Earth Day 2020 – Climate Action

<https://www.earthday.org>

April 22nd marks the 50th anniversary of Earth Day. The first Earth Day was a unified response to an environment in crisis - oil spills, smog, rivers so polluted they literally caught fire. Earth Day is credited with launching the modern environmental movement and is now recognized as the planet's largest civic event. It continues to hold major international significance: In 2016, the United Nations chose Earth Day as the day when the historic Paris Agreement on climate change was signed into force.



Does your employee benefits agent/broker/consultant think surveyors are the same as plumbers or the same as roofers?

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The 128th Annual General Meeting – the results are in!



By Tom Packowski, O.L.S., Survey Review Department Manager

As I write this article, it's hard to believe that it has been only three short weeks since the AOLS Annual General Meeting (AGM) wrapped up. Since those few days in Huntsville, the COVID-19 virus has taken over everyone's attention and rendered our world almost unrecognizable. While at Deerhurst, we spent time together in professional camaraderie to discuss matters of common interest. We gathered at the Eclipse Lounge and shared a table, exchanged handshakes and joined in close contact with good friends who we hadn't seen in months. We went to meetings with hundreds of our colleagues and listened to entertaining and informative presentations on many topics of current interest. In small groups we spoke confidently about our futures and those of us, of a certain age, discussed our plans for retirement and travel.

Since then, COVID-19 has been declared an international pandemic by the World Health Organization. Huntsville, along with the rest of Ontario's towns and cities with their resorts, restaurants and bars, has been closed.

And so, it is against this backdrop and with a spirit of hope and optimism for the future that I reflect on the 128th AGM. The theme for the meeting was "Manage your Risk", as it applied to the AOLS as a regulator and to individual members. By now, you will all have received an invitation to review the results of the Survey Monkey, which was sent out to all who attended the meeting, and I hope you find the comments interesting and informative.

The first observation that I found in the survey's results, which was consistent from many comments, and which also happened to be the response to question number 7, was the great work that was done by the AOLS staff to ensure that the AGM was successful. These comments were well deserved, and I add my kudos as well.

The AGM had plenty of opportunities for Continuing Professional Development (CPD). We had a dynamic keynote speaker, two plenary sessions, and five concurrent learning sessions.

Our keynote speaker this year was Darrel Pink of the Nova Scotia Bar and formerly Executive Director of the Nova Scotia Barristers' Society. Mr. Pink provided the keynote address on "Rethinking Professional Regulation – What is really important?". This topic fits in well with our role as a regulator and with the 'right touch' approach which Council was looking at implementing last year, and which will be discussed again at this year's upcoming strategic planning session.

The two plenary sessions dealt with "Minimize your Risks – Lessons from our Insurance Program" and "Canada's RADARSAT Constellation Mission: Opportunities for Monitoring". During the insurance program presentation, many scenarios were presented that were based on actual claims and how these claims could have been avoided. The second plenary session dealt with The RADARSAT Constellation Mission (RCM), launched on June 12, 2019. This presentation focused on satellite radar interferometry techniques that are used for monitoring rates of land movement triggered by geohazards, floods, and climate change, etc. It also dealt with selective case studies that demonstrated the potential of using interferometric radar techniques (InSAR) for monitoring critical energy and transportation corridors and infrastructure as well as other uses of RCM.

The five concurrent learning sessions included the following topics.

1. Canadian Geodetic Survey – Supporting Accurate Positioning in Ontario, presented by Brian Donahue, Team Leader, Surveyor General Branch, Natural Resources Canada. The Canadian Geodetic Survey (CGS) of Natural Resources Canada (NRCan) is responsible for defining, maintaining, and providing access to the Canadian Spatial Reference System (CSRS). The CSRS provides a consistent reference for mapping, navigation, boundary demarcation, and other georeferenced applications in Canada. In recent years, the evolution of precise GNSS services such as CSRS-PPP and commercial RTK has provided surveyors with efficient techniques to access the CSRS. As these services evolve it is still essential that the users continue to validate their observations.

2. Business Communications – Best Practices. This session was presented by Julia Meldrum Smith, OLS, of Meldrum Surveying Limited and focused on business and client communications from a risk management perspective. The presentation was thoughtful, clear and provided ample reasons on why good business communication is an important and necessary means to minimize risk in the undertaking of a survey or project for a client.

3. Minimize Your Risk in Boundary Evidence Research. This session was co-presented by Anne Cole, OLS, CLS and Izaak de Rijcke, LL.M., OLS. The presentation briefly outlined the recent transition of the land registration system from the *Registry Act* to the *Land Titles Act*. In doing so it dealt with 'PINs', 'PIN maps' and 'PIN abstracts'. It reviewed what was in the 'thumbnail' of the PIN, as well as

what was not available from merely reading the thumbnail. In the words of the presenters, “A land surveyor’s role in connecting “title” to the real world lies at the heart of our work. The Ontario land registration system is a treasure trove of evidence about boundaries. How do you know if you have found it all? How far back in history do you need to go? This session will tell tales of lost and found evidence. It will shine a light on some valuable tools and research approaches to support your decision-making on the location of a boundary. It will challenge you to consider when you have done “enough” and can form an opinion.”

4. “Automated Deformation Monitoring” and “Hybrid Positioning – combined GNSS and Robotic Total Station, workflow”. This presentation, by Alan Jones and Dilip Lal, both from Sokkia, provided a ‘how to’ for automated deformation modeling. Often clients will require constant monitoring of structures, such as the position of railway tracks along a busy transportation corridor, while construction continues in the nearby vicinity. The presentation answered the question “How does a Surveyor fulfill the specification of 24/7/365 monitoring in a practical, professional manner” while providing a powerful and complete hybrid survey system which integrates robotic total stations and GPS technologies and transforms their data to Grid System Coordinates.

5. UESI Updates on the ASCE 38 and SUE for

Municipalities Recent Release. This presentation by Blaine Hunt of T2 Utility Engineers dealt with the new standard guidelines for the collection of data depicting existing subsurface utilities. As any practicing land information professional knows, the absolute worst time, both from a financial and safety perspective, to suddenly become aware of an unknown underground structure is in the middle of a ‘project’. Subsurface Utility Engineering (SUE) and the standard guidelines in ASCE 38-02 provide a uniform way of depicting underground utility structures. This presentation tied in nicely with the business communications seminar. You, the professional, will need to describe to your client such things as the scope of the SUE project, the quality of the information, the ‘Quality Level’, the method of data acquisition, the deliverables and perhaps most importantly, the limitations of the information provided. The limitations may include a scenario where an existing utility is not identified on the plans compiled during your research. You will not be looking for it specifically during the fieldwork and it will remain unknown unless it can be detected by the equipment and the search procedures you are using.

In conclusion, the presentations, the keynote address and the seminars all had content pertaining to the theme of the AGM, “Manage your risk”. We hope that the topics covered have allowed you to better understand your own risks and will help strengthen your own practices.



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Registrar's Review

By Kevin Wahba, B.Eng., LL.B., O.L.S., Barrister & Solicitor



It has now been over a year since I assumed the role of Registrar for the Association of Ontario Land Surveyors. The unique nature of this position has come with a steep learning curve for me, and my experiences have ranged from typical to uncharacteristic and challenging. The issues that I am exposed to are, for the most part, concerns from members of the public regarding surveyors and their property lines. I am dealing with conflicts between professional surveyors and the individuals who are affected by their services. I have heard from clients, and at times their neighbours, about a variety of concerns that arise during the delivery of a survey. Sometimes, they are due to issues which could be attributed to one of the stakeholders, but occasionally, issues arise even though all parties have been seen to act in a reasonable fashion. This could be attributed to unconventional survey fabric, mistaken beliefs on the part of landowners and sometimes underlying disputes between neighbours that are beyond a boundary location.

There certainly are instances when situations are beyond the scope of professional land surveying, and often times, as surely most of the members have experienced, even when the utmost due diligence is taken, clients and their neighbours may still have issues due to a lack of understanding or disappointment with the outcome. With that in mind, it is important to recognize that the people who are affected by the professional opinions of surveyors are often those who are not well versed in survey principles, and may not understand why their boundaries are not located where they originally believed they ought to be with reference to their deed. It is critical for surveyors to keep this knowledge at the forefront of their minds when dealing with a particular individual who may appear to be a "difficult client". Often these allegedly difficult clients are people who have what they believe to be reasonable assumptions based on some "colour of right" which comes from what they have read in their deeds when they purchased their land. Other times, property owners come to a seemingly logical understanding of where they think their boundaries should be (i.e. a fence).

Cadastral surveyors understand that boundary retrace-ment is not as simple as finding a fence or measuring distances to metal bars. I have heard on many occasions that the general public is not well informed on the extent of investigation and the amount of work that goes into the rendering of professional surveying services. In my opinion, that calls into question whether or not surveyors are attempting to explain to their clients from the outset, in laymen's terms, what in fact is required to provide them

with a survey. Over time, if they did this, it would create a greater understanding of what surveying professionals do, and the rationale behind survey opinions.

There have been situations where surveyors have spent many hours trying to explain to their clients what they did, and the rationale for their opinions, but even then some clients may not agree, and some may even ask for an additional review or confirmation from another surveyor. In these difficult situations, there needs to be a balance between discharging one's professional responsibility and recognizing that there is a point when nothing more can be done. Being a professional requires assessing complex issues on a case by case basis, however it is paramount that surveyors recognize that their clients have differing levels of understanding and knowledge and may find it difficult to understand the scope of the work that is required. It is your responsibility to ensure that the final services provided are fully explained and dutifully discharged.



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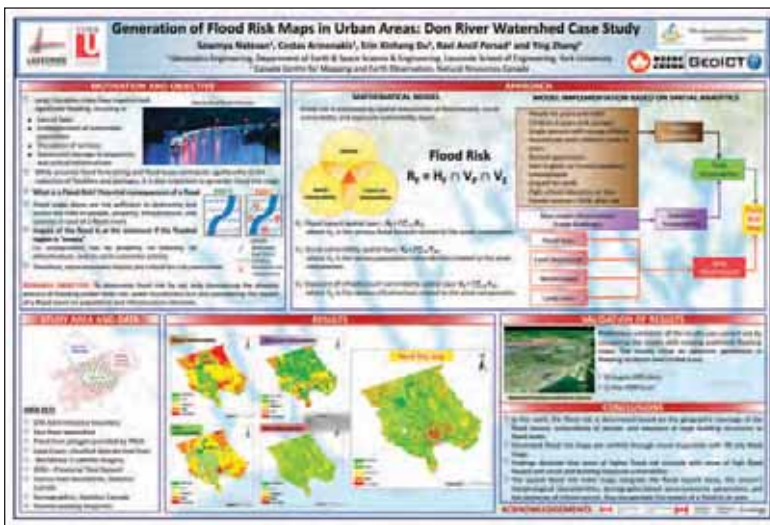
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FOURTEENTH Annual AOLS Graduate Student Geomatics Poster Session Award Winners



FIRST PLACE: **Sowmya Natesan, Ph.D.** Student, Geomatics Engineering, Department of Earth & Space Science & Engineering, Lassonde School of Engineering, York University, supervised by Dr. Costas Armenakis.

Generation of Flood Risk Maps in Urban Areas: Don River Watershed Case Study

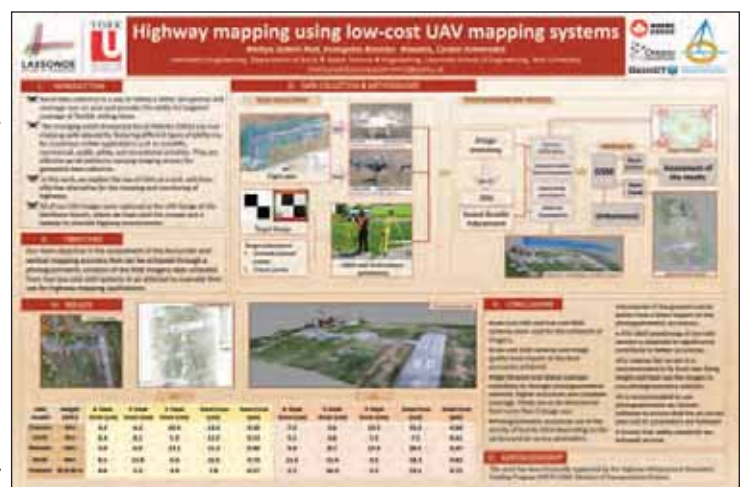
ABSTRACT — In recent years, large Canadian cities have experienced significant flooding, resulting in the loss of lives, the endangerment of vulnerable populations, the disruption of services, and substantial damage to properties and critical infrastructure. Flood maps alone are not sufficient to determine and assess the risks to people, property, infrastructure, and services due to a flood event. High spatial resolution Earth

Observation (EO) data can contribute to the generation and updating of flood risk maps based on several aspects including population, economic development, and critical infrastructure, which can enhance a city's flood mitigation and preparedness planning. We will be presenting a case study for the Don River Watershed where the flood risk is determined and flood risk index maps are generated by implementing a methodology for estimating risk based on the geographic coverage of the flood hazard, vulnerability of people, and the exposure of large building structures to flood water. The spatial flood risk index maps have been generated through analytical spatial modeling which takes into account the areas in which a flood hazard is expected to occur, the terrain's morphological characteristics, socio-economic parameters based on demographic data, and the density of large building complexes. The methodology and the results obtained will be presented. Email: sowmy@yorku.ca

SECOND PLACE: **Mahya Jodeiri Rad,** Masters Student and **Evangelos Bousias-Alexakis, Ph.D.** Student, Geomatics Engineering, Department of Earth & Space Science & Engineering, Lassonde School of Engineering, York University, supervised by Dr. Costas Armenakis.

Highway Mapping using Low-cost UAV Mapping Systems

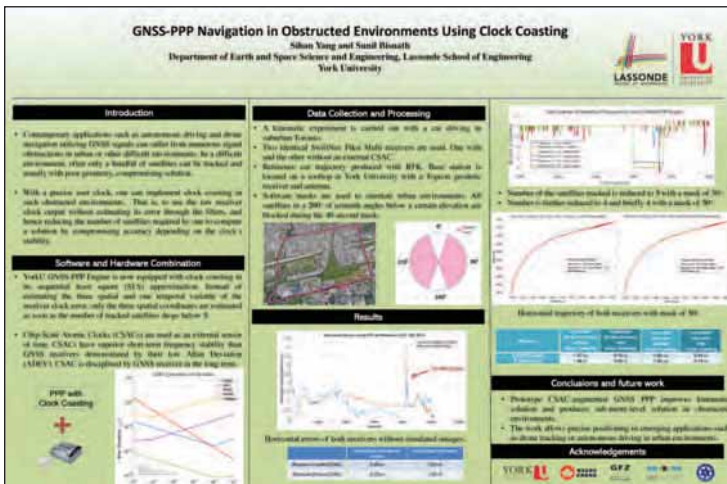
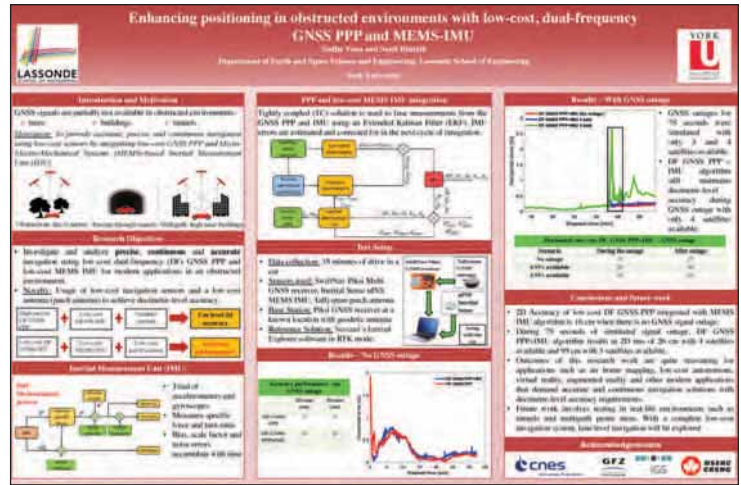
ABSTRACT — Aerial data collection is a way to obtain a better perspective and coverage over an area and provides the ability for targeted coverage at flexible visiting times. The emerging small Unmanned Aerial Vehicles (UAVs) are now enjoying wide popularity, featuring different types of platforms, for numerous civilian applications such as scientific, commercial, public safety, and recreational activities. They are effective aerial platforms carrying imaging sensors for geospatial data collection. UAV images were captured at the UAV Range of the Markham Airport to simulate highway environments. We will be presenting the overall UAV-based photogrammetric mapping approach with respect to planning of the UAV flight mission, the field work, the determination of the position and orientation of the camera sensor, the determination of the point ground coordinates, and the generation of a digital surface model and orthoimage. The overall workflow, systems and design steps will be described including the various photogrammetric configurations used, the results, and the obtained horizontal and vertical accuracies. Email: mahyarad@yorku.ca or bousias.alexakis@gmail.com



THIRD PLACE: **Sudha Vana**, Ph.D. Student, Department of Earth and Space Science and Engineering, Lassonde School of Engineering, York University, supervised by Dr. Sunil Bisnath.

Enhancing Positioning in Obstructed Environments with Low-cost, Dual-frequency GNSS PPP and MEMS-IMU

ABSTRACT — The Global Navigation Satellite System (GNSS) Precise Point positioning (PPP) technology benefits from not needing local ground infrastructure, such as reference stations, and accuracy attained is at the decimetre-level, which approaches real-time-kinematic (RTK) performance. However, due to its long position solution initialization period and complete dependence on the receiver measurements, PPP finds limited utility in urban and obstructed environments. The emergence of low-cost, high-performance micro-electromechanical sensor (MEMS) inertial measurement units (IMUs) has prompted research in integrated navigation solutions with PPP processing technique. This sensor fusion aids to achieve continuous positioning and navigation solution availability when there are insufficient numbers of navigation satellites. In the past, research has been conducted to integrate high-end (geodetic) GNSS receivers with PPP processing and MEMS IMUs, or low-cost, single frequency GNSS receivers with point positioning processing and MEMS-IMUs. The objective of this research is to investigate and analyse position solution availability and continuity by integrating next-generation, low-cost, dual-frequency GNSS receivers using PPP processing with the latest low-cost, MEMS-IMUs to offer a complete, low-cost solution that will enable continuously available positioning and navigation solutions, even in urban and obstructed environments. Using a dual- frequency GNSS receiver removes ionosphere refraction error and solution accuracy improves by a great extent. The integrated solution offers 0.4m accuracy for half a minute of significantly obstructed environment, as opposed to no GNSS position solution at all. A low-cost, dual-frequency GNSS receiver-PPP solution integrated with a MEMS-IMU forms a unique combination of a total low-cost solution, that will open a significant new market window for modern day applications such as autonomous vehicles, drones and augmented reality. Email: sudhav@yorku.ca



FOURTH PLACE: **Sihan Yang**, Masters Student, Department of Earth and Space Science and Engineering, Lassonde School of Engineering, York University, supervised by Dr. Sunil Bisnath.

GNSS-PPP Navigation in Obstructed Environments using Clock Coasting

ABSTRACT — The Precise Point Positioning (PPP) technique for Global Navigation Satellite Systems (GNSS) is applied widely for commercial and scientific applications that require sub-decimeter-level accuracy with few obstructions. Emerging applications such as autonomous vehicles could make use of the technique as it provides a self-contained positioning, navigation and timing (PNT) solution, expanding PPP into mass-market applications at the consumer level. However, the technique suffers from inherent disadvantages of GNSS-based technology. Environmental obstructions due to urban canyons or complex road intersections hamper solutions due to stronger signal obstruction, higher multipath errors and poorer satellite geometry. Current GNSS-PPP algorithms cannot produce a solution at all in the presence of significant sky obstruction. Our research presents a solution to reduce the number of satellites required in such environmental scenarios and to improve the navigation solution given poor geometry by implementing a clock coasting method to PPP and using a GNSS receiver aided by a chip-scale atomic clock (CSAC). Results show an improvement of 0.16 m of rms error in suburban driving scenarios using the CSAC-aided receiver. Through simulation of signal obstructions with software masks, the CSAC-aided receiver with clock-coasting produces kinematic solutions at sub-metre level of errors. In a more extreme case, it produces a solution of sub-metre level accuracy where traditionally the method fails to produce a converged solution at all. Email: syang551@yorku.ca

the consumer level. However, the technique suffers from inherent disadvantages of GNSS-based technology. Environmental obstructions due to urban canyons or complex road intersections hamper solutions due to stronger signal obstruction, higher multipath errors and poorer satellite geometry. Current GNSS-PPP algorithms cannot produce a solution at all in the presence of significant sky obstruction.

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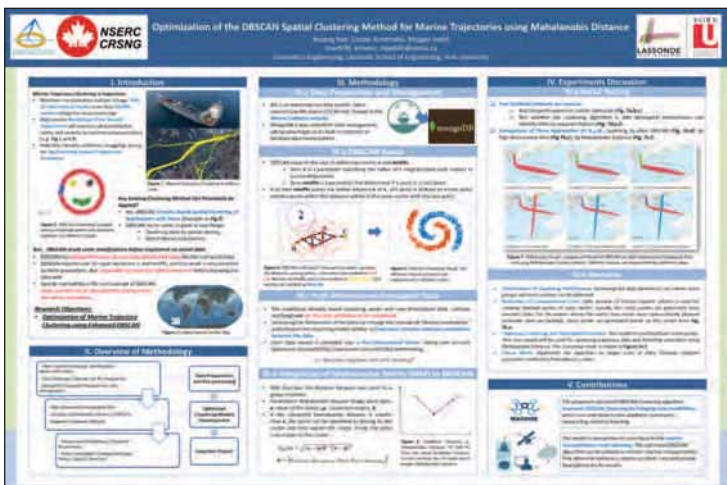
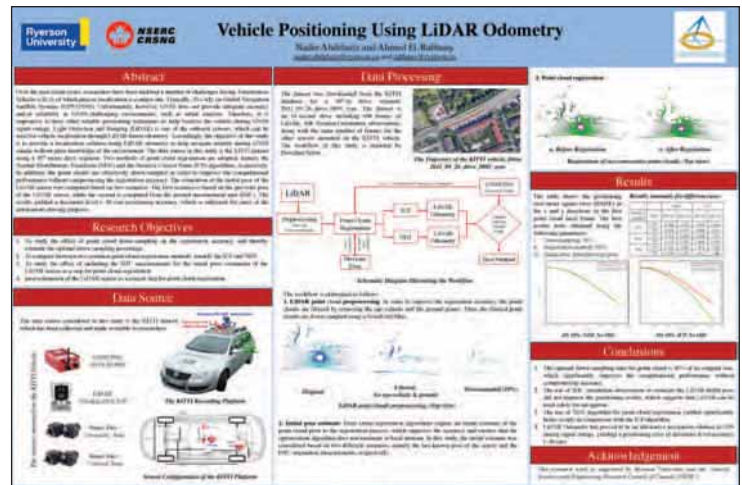
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FIFTH PLACE (TIE):

Nader Abdelaziz, Ph.D. Student, Department of Civil Engineering, Ryerson University, supervised by Dr. Ahmed El-Rabbany.

Vehicle Positioning using LiDAR Odometry

ABSTRACT — Over the past recent years, researchers have been tackling a number of challenges facing Autonomous Vehicles (AVs), of which precise localization is a major one. Typically, AVs rely on Global Navigation Satellite Systems (GPS/GNSS). Unfortunately, however, GNSS does not provide adequate accuracy and/or reliability in GNSS-challenging environments, such as urban canyons. Therefore, it is imperative to have other reliable positioning techniques to help localize the vehicle during GNSS signal outage. Light Detection and Ranging (LiDAR) is one of the onboard sensors, which can be used for vehicle localization through LiDAR-based odometry. Accordingly, the objective of this study is to provide a localization solution using LiDAR odometry to help navigate reliably during GNSS outage without prior knowledge of the environment. The data source in this study is the KITTI dataset using a 107-meter drive segment. Two methods of point cloud registration are adopted, namely the Normal-Distributions Transform (NDT) and the Iterative Closest Point (ICP) algorithms, respectively. In addition, the point clouds are effectively down sampled in order to improve the computational performance without compromising the registration accuracy. The estimation of the initial pose of the LiDAR sensor was computed based on two scenarios. The first scenario is based on the previous pose of the LiDAR sensor, while the second is computed from the Inertial Measurement Unit (IMU). The results yielded decimeter-level (0.30 m) positioning accuracy, which is sufficient for most of autonomous driving purposes. Email: nader.abdelaziz@ryerson.ca



FIFTH PLACE (TIE): Xuyang Han,

Masters Student, Geomatics Engineering, Lassonde School of Engineering, York University, supervised by Dr. Costas Armenakis and Dr. Mojgan Jadidi.

Optimization of the DBSCAN Spatial Clustering Method for Marine Trajectories using Mahalanobis Distance

ABSTRACT — Ship behavior modeling will not only help improve transportation security, but also provide foundations on AI-vessels. Today, maritime transportation represents as huge as 90% of international trade volume. Although challenging, it is important to ensure the transportation security in the maritime domain. Detecting

abnormal vessel behaviors, such as unexpected stops, deviations or speed can be helpful on detecting risks like collisions, smuggling, piracy, etc. Using AI techniques to analyze historical transportation data will help generate patterns, identify safety routes and avoid anomalies.

Density-based spatial clustering of applications with noise (DBSCAN) is a widely used unsupervised clustering method, which is effective for determining clusters as well as identifying outliers. DBSCAN shows huge potentials to be utilized on marine transportation modeling by clustering marine trajectories. However, applying the traditional DBSCAN clustering method has difficulties with the real-world unevenly distributed data, such as Automatic Identification System (AIS) data. Thus, it would be inapplicable to apply DBSCAN on marine trajectory clustering without optimization.

In this research, it is proposed to utilize the Mahalanobis Distance, to optimize the performance of DBSCAN on the trajectory clustering, and also an adaptive radius method to solve the problems of choosing a suitable distance threshold. In this poster presentation the following will be discussed: a) DBSCAN basis and marine data mining basis; b) DBCAMM, DBSCAN using Mahalanobis Metric, c) how this novel distance metric performs better than traditional geospatial Euclidean metric, by considering more attributes such as velocity and direction, and d) discussion on the obtained results. Email: han978@yorku.ca

AOLS Sponsors the 2020 National Geomatics Competition



The National Geomatics Competition (NGC) is a student-led consulting engineering competition based in the field of Geomatics.

The National Geomatics Competition (NGC) was held at the University of Waterloo from February 22 to 23, 2020. The AOLS was a Gold Sponsor. Teams of undergraduate students from post-secondary schools across Canada were presented with a problem dealing with the various aspects of Geomatics and were given a few hours to create a solution to the problem. Shortly after, the teams presented their solutions in front of a panel of judges, consisting of professionals in the industry.

Innovation Award for their idea which incorporated an existing, abandoned rail right-of-way through the downtown core, in order to minimize impact on the existing city while providing a more scenic yet efficient route upon completion.



AOLS Judge, Laura Kingston had a few thoughts about the competition. “There were approximately 16 teams of three students from UNB, Laval, BCIT, SAIT, U of Waterloo (the host), York, University of Calgary and McMaster. Some schools supplied 2 teams. The teams were tasked with outlining their approach to determine an optimum route for Light Rail Transit in the City of Guelph. They had 5 hours to research and find information about the City of Guelph, develop a procedure for identifying the optimal route, and to prepare a 5-minute presentation and two-page submission for judging. The judges were given 5 minutes to ask questions. Many teams created maps to show a proposed route along with supporting rationale of why they chose that route. For the first round, the teams were split into two groups and the judges had to select the top four in each group. The top 4 teams from each group moved on to the final round. The sponsors judged the finals and had to select a first, second and third place as well as an innovation award, and sustainable development goal award. It was hard enough to pick the top four, so I was glad not to have to rank the winners at the end!”

Four of the six York University students are AOLS Educational Foundation Award winners. Team 2 won the



York University Team 1: Fourth-year students Andrew Robertson, Prabhnoor Singh Chhabra and Evan Rueb



York University Team 2: Third-year students Nathan Stachow, Felipe Gonzalez and Daniela Krmar

The Winners of the Competition were:

1st Place: Laval University Team 2

2nd Place: University of New Brunswick Team 1

3rd Place: University of Calgary

Environment Sustainable Development Goal

Award: McMaster University Team 1

Innovation Award: York University Team 2

Student Choice Award: University of Waterloo Team 1

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EDUCATIONAL FOUNDATION NEWS

Congratulations to our Fall 2019 Award Winners

York University – Lassonde School of Engineering student **Krystel Reyes** was the 2019 recipient of the *Henriette Verhoef Award* for her good academic standing and her commitment to helping her fellow students. **Andrew Robertson** was the recipient of the *David W. Lambden Award* for achieving the highest grade in LE/ESSE 4660 Cadastral Surveys and Land Registration Systems and **Evan Rueb** received the award for the second highest grade in the course.

Report from the 2020 Annual General Meeting

The Foundation's Board of Directors would like to thank the Exhibitors, who donated prizes for the *Exhibitors' Draw* at the

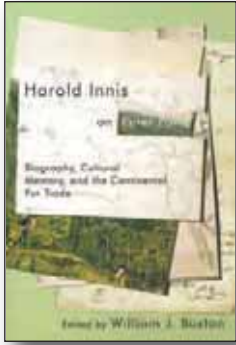
Welcoming Party, and all of the members and guests who purchased tickets. Thanks also go to Penny Anderson, Lena Kassabian, Julia Savitch, Mel Truchon and Darren Walker for selling tickets and Master of Ceremonies, Bill Webb. The event would not have been such a success without all of your help.

The 14th Annual Graduate Student Geomatics Poster Session featured 15 poster entries from graduate students from Ryerson and York Universities. The students expressed their thanks for the opportunity to share their research projects and compete for prizes ranging from \$2000 for 1st place to \$500 for 5th place. Thank you to our judges: Boney Cherian, Brian Coad and Reuben Mc Rae, who worked tirelessly to evaluate the posters. There was a tie for 5th place; the six winning posters can be found on page 38.

The Educational Foundation would like to recognize with thanks donations made in the memory of Henriette Verhoef, Fernando De Luca, Larry Monaghan and Norm Babbs.

BOOK REVIEWS

Harold Innis on Peter Pond Biography, Cultural Memory, and the Continental Fur Trade



Published by
McGill-Queen's University
Press
ISBN 978-0-7735-5861-8

Edited by William J. Buxton

Best known for his writings on economic history and communications, Harold Innis also produced a body of biographical work that paid particular attention to cultural memory and how it is enriched by the study of neglected historical figures. In this compelling volume, William Buxton addresses Innis's engagement with the legacy of the fur trader and adventurer Peter Pond.

Harold Innis on Peter Pond comprises eight texts by Innis, including his 1930 biography of Pond as well as his writings on the explorer's myriad activities. The book also features a collection of eight letters exchanged between Innis and Florence Cannon, a descendent of Pond with a strong interest in her ancestor's life and times, and an

unpublished 1932 article on Pond's 1773-75 activities as a fur trader on the upper Mississippi, written by Innis's former student R. Harvey Fleming. Situating Innis's writings on Pond in relation to his broader body of biographical work, Buxton interprets what these texts tell us about Innis's intellectual practice, historiography, and the writing of biography. The book explores how Innis's perspectives shifted with changing intellectual and political circumstances and shows that his advocacy of Pond as an unrecognized "father of confederation" challenged conventional views of Canadian nation-building.

Information taken from the back cover.

Friends, Foes, and Furs George Nelson's Lake Winnipeg Journals, 1804-1822

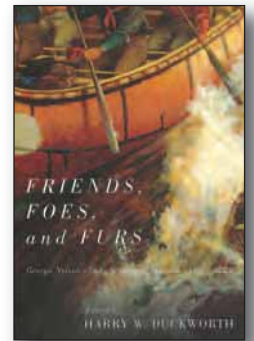
Edited by Harry W. Duckworth

George Nelson (1786-1859) was a clerk for the North West Company whose unusually detailed and personal writings provide a compelling portrait of the people engaged in the golden age of the Canadian fur trade.

Friends, Foes, and Furs is a critical edition of Nelson's daily journals, supplemented with exciting anecdotes from his *Reminiscences*, which were written after his retirement to Lower Canada. An introduction and annotations by Harry Duckworth place Nelson's material securely within the established body of fur-trade history. This series of journals gives readers a first-person account of Nelson's life and career, from his arrival at the age of

eighteen in Lake Winnipeg, where he was stationed as an apprentice clerk from 1804-1813, to his second service from 1818 to 1819 and an 1822 canoe journey through the region. A keen and respectful observer, Nelson recorded in his daily journals not only the minutiae of his work, but also details about the lives of voyageurs, the Ojibwe and Swampy Cree communities, and others involved in the fur trade. His insights uncover an extraordinary view of the Lake Winnipeg region in the period just prior to European settlement.

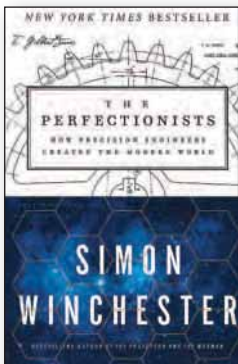
Information taken from the back cover.



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The Perfectionists How Precision Engineers Created the Modern World

By Simon Winchester



Published by Harper
Perennial, an Imprint of
HarperCollins Publishers
ISBN 978-0-06-265256-0

Precision is so essential a component of contemporary human life and existence that we seldom stop to think about it. Simon Winchester's *The Perfectionists* examines the relatively recent development of the notion of precision – the people who developed it and the ways in which it has shaped the modern world – and the challenges posed and losses risked by our veneration and pursuit of increasingly precise tools and methods.

The history of precision as a concept and in practice begins in England with its originators: John Wilkinson, Henry Maudslay, Joseph Bramah, Jesse Ramsden, and Joseph Whitworth. It was Thomas Jefferson who first exported their discoveries to the fledgling United States, setting the nation on its course to become a manufacturing titan. At the dawn of the Industrial Revolution,

standards of measurement were established, giving way to the development of machine tools – machines that make machines. Eventually, the application of precision tools and methods in the development of guns, glass, mirrors, lenses, and cameras gave way to further advancements, including gene splicing, microchips, and the Hadron Collider.

The fundamental questions at the heart of *The Perfectionists* are these: Why is precision so important? Has the pursuit of the ultraprecise in so many facets of human life blinded us to other things of equal value, such as an appreciation for the age-old traditions of craftsmanship, art, and high culture? Are we missing something that reflects the world as it is, rather than the world as we think we would wish it to be?

Information taken from the back cover.

The Last Word

EXPLORATION GUIDE

by Graham Bowden, O.L.S. (Ret)

I chose to be an Exploration Guide as the Sergeant-at-Arms character because, as an avid reader of history, I realized that most successful explorations were because the explorers were accompanied by skilled and faithful guides.

My Guide character is a composite of the famous and not so famous, many of whom gave their lives in the exploration and mapping of our planet.

Here are a few names you may know or may not know:

Matthew Henson traveled with Rear Admiral Robert Peary to the North Pole in 1909.

Cancre guided Alexander Mackenzie across western Canada to the Arctic and the Pacific Oceans in the 1790s.

Tenzing Norgay teamed with Edmund Hillary to climb Everest in 1953.

Susi, Chuma and Jacob Wainwright supported Dr. David Livingstone when he explored Africa. Upon Livingstone's death in 1873 these three, and nameless others, buried his heart under a tree in Chitambo Village and then carried his sun-dried cadaver 1500 miles to the west coast and thence by ship back to England for burial in Westminster Abbey.

No doubt on some days a few of your faithful employees wanted to bury your heart under a tree but I doubt they would carry your sun-dried carcass from here to Halifax.



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