

# Ontario Professional Surveyor



*on the cover ...*

**The New AOLS Website  
is Coming Soon**

**also in this issue ...**

**Cloud Computing - Benefits  
and Pitfalls**

**The Research Debate –  
A Common Sense Alternative**

**Some Recent Advances in  
GPS Precise Point Positioning  
Spatial Cloud Computing (SC2) –  
Revisited Enterprise GIS as a Service  
Survey Law Education: Introduction to  
Canadian Law and Legal Systems  
for Land Surveyors**



**plus our regular features:**

**Educational Foundation**

**News from 1043**

**Industry News**

**Book Reviews**



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## ON THE COVER ...

The AOLS website ([www.aols.org](http://www.aols.org)) is being updated and modernized to improve on-line service to both AOLS members and the public. Ken Wilkinson, O.L.S. has been leading the project. Read more about the new website in Ken’s article on page 4.

*Professional  
Surveying  
in  
Ontario*

*encompasses  
the  
Disciplines of*

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





## President's Page

By David Brubacher, O.L.S., O.L.I.P.



In this issue I would like to bring your attention to a very important issue; LightSquared. Have you ever heard of it? Well, you will. According to their website, "LightSquared will unleash the boundless opportunity of wireless

broadband for all ... with limitless and unimaginable opportunities". They plan to use a combination of a satellite and cell towers to push 4<sup>th</sup> generation Wi-Fi signals everywhere. More than 40,000 cell towers in the United States (U.S.) will broadcast a 1500 watt signal that will have a range of many, many kilometres.

The biggest problem with this future endeavour is that their signal is immediately adjacent to the L1 GPS signal and is 100 times stronger (some are saying a billion times stronger), turning every one of those 40,000 towers into a GPS jammer. This is an entirely new development in the assignment of frequency spectrum, since LightSquared has requested land-based bandwidth that, up until now, has been restricted to low power satellite communications.

Imagine yourself out walking at night. Your eyes are accustomed to the dark and the stars are brilliant. Suddenly, your companion turns on a bright flashlight and blinds you. The LightSquared signal will do exactly the same thing to your expensive, sensitive and highly accurate GPS.

In fact, physics dictates that the more sensitive the GPS, the more it will be affected, because modern, high precision receivers use a wideband filter to receive MSS, GPS and GLONAS. Wideband filters pass a broad spectrum of energy into the receiver, making them just like your dark-sensitized eyes. Tests conducted by the United States Air Force and emergency responders indicate that there are serious adverse effects in navigation grade GPS receivers too.

John Deere recently released a study on the expected effects in the precision agriculture industry, where they concluded that "permitting LightSquared to operate its network as proposed, or any variant of its currently proposed network, will create massive interference ... risking serious harm to the U.S. agriculture industry".

What do the terms "serious adverse effects" and "massive interference" mean in real terms? We honestly don't know. Perhaps it means that we need to occupy stations for a longer period, perhaps it means centimeter accuracy will no longer be possible or perhaps our expensive receivers will no longer work at all.

LightSquared was born in the United States and so was its opposition. The 'Coalition to Save Our GPS' (<http://www.saveourgps.org>) is a resource for interested parties to speak with one voice, to gain an understanding of the value of GPS and its economic value and to obtain knowledge about the threat posed by LightSquared. The coalition boasts a wide array of members, such as the Air Transport Association, the American Congress on Surveying and Mapping, the Canadian Owners and Pilots Association, Caterpillar, ESRI,

FedEx, Garmin, Leica, Magellan, Topcon, Trimble and many individual survey and engineering firms. There is a wealth of information on the website and I encourage you to educate yourself.

If you thought that LightSquared was a problem only for the United States, then think again. LightSquared is already in Canada and their business plan clearly indicates their goal is to have coverage across North America. For example, until CDGPS was decommissioned on March 31<sup>st</sup> 2011, all Canadian GPS corrections were made possible by the LightSquared MSAT service. CDGPS is expected to resume later this year on SkyTerra1, LightSquared's new satellite, which was successfully launched last November. We have also seen Rogers Communications putting out tenders for surveyors in Ontario to "work in a big wireless contract". This is LightSquared.

Many people in the U.S. Government want the LightSquared technology from both a public safety perspective and to create an improved and competitive telecommunications industry. The 9/11 Commission recommended an allotment of bandwidth dedicated to emergency communication and the LightSquared bandwidth could satisfy this yet-to-be implemented recommendation.

It's natural to assume the U.S. military will have a say on the issue, but it's difficult to determine which way they will lean. The GPS network is considered a strategic military asset and the military will defend it if it comes under attack, *except that the military doesn't use the L1 band!* They have their own bands and use 'code' data, not 'phase' data, thus are not likely to suffer similar ill effects while gaining the previously mentioned dedicated emergency bandwidth.

From a purely monetary standpoint, the users of highly accurate GPS are insignificant compared to the telecommunications industry. What remains to be seen is whether the effects can be mitigated for lower accuracy uses. If so, that means as a constituency we will be seen to be less important and therefore will not win this fight alone. A much more insidious interpretation is that the CEO of LightSquared, Sanjiv Ahuja, is known in the technology sector as a 'monetizer' – one who creates a problem and then monetizes a fix. In this case by possibly licensing filters to GPS manufacturers or competing in the GPS field with the only technology that overcomes the 'problem'.

During the Presidents' Forum at the Saskatchewan AGM in early June, we discussed LightSquared and its impact in Canada. We came to the conclusion that there is every reason to expect similar impacts, though, unfortunately we here in Canada will have very little influence on the outcome. We identified the confusion and contradictory information as a major stumbling block and therefore tasked Professional Surveyors Canada (PSC) to consult with our government, keep PSC members informed and act as our advocate.

I am happy to say that PSC has taken up the challenge. If ever there was a question about what PSC can do for the community of professional surveyors across the country, this is it. Whatever PSC can do on our behalf to ensure GPS remains useful means my membership money is well spent.





# The New AOLS Website

By Ken Wilkinson, O.L.S., O.L.I.P. on behalf of the AOLS Website Committee

**O**ur website now has a new more modern look. That being said, the really important news is that the entire site is being updated and modernized to allow for greatly improved on-line service to both members and the public.

So what is changing? The answer is - basically everything. Our website now employs an entirely new back end system that supports many really useful web features such as easy site administration, video, blogs, collaboration and news feeds. The new system also supports a new robust membership database with many new self serve options. This means that members will soon be able to update their profile, sign up for courses and pay their fees directly online through the website. Other new features include:

- improved ability for the public to find a surveyor through a mapping service
- support for the new AOLS learning site
- production of a yearly printed directory and
- a new document collaboration area for committee and Council members

The revamped aols.org will also provide the public with improved accessibility to the many educational and informational materials that have always been on our website but were previously very difficult to find.

One thing that will not change is that members will continue to be able to access website content and documents based on their current roles and responsibilities. For example, committee members will continue to have exclusive access to their committee documents.

## The New Design

Although the new website back end features are vital to supporting our association, it is the new design that will really stand out.

The design was developed based on three principles:

1. AOLS is the definitive professional body for the practice of land surveying, providing information, and serving the public interest.

The design had to reflect a professional association that has had a long history of governing the practice of land surveying in Ontario. The new site also had to demonstrate that the practice of land surveying continues to be relevant and vital to the people of Ontario and around the world. The fonts, colours and look and feel throughout the site were chosen to provide a feeling of both stability and openness.

2. The AOLS site is a dynamic resource for a wide audience, not a static source for a few.

The site was required to be a resource to clients, students, other professionals and especially the membership. The website is made to be as open as possible to the public without sacrificing the requirement for a strongly protected members' side. The new site was designed for maximum flexibility and ease of use for the content updates by AOLS staff without the need for assistance from the website developers. The new site will continue to offer and support key resources such as items for sale and job postings.

3. Privilege the search.

The main reason members and others come to aols.org is to get authoritative information not available anywhere else. The 'privilege the search' design means that the entire site is driven by the requirement for visitors be able find exactly what they need with as few 'clicks' as possible. This design reduces visitor frustration by reducing the amount of time spent browsing the site looking for a document which is buried deep within the website.

Please visit the new site when it is launched and let us know what you think. The site will continue to be improved and developed so your constructive comments and suggestions will be greatly appreciated!



## Sites to See

**GoGeomatics Canada**

<http://gogeomatics.ca>

GoGeomatics is the largest and most popular job board in the Canadian Geospatial industry. The job board allows you to search for jobs in GIS, remote sensing, surveying, geodesy and engineering. You can also post jobs and resumes for free.



# Cloud Computing - Benefits and Pitfalls

By Eugene Gierczak, P.Eng, LL.B.

There has been a great deal of interest generated through Cloud Computing.

Cloud Computing Business Strategies have become a popular way for a company or organization to reduce costs and grow their bottom line. Rather than purchasing their own hardware and software, a company may enter into an agreement with a Cloud provider that allows access to a Cloud provider's infrastructure in software applications and data storage through the Internet on an as-needed basis. Therefore rather than purchasing equipment or software, or upgrading hardware and software systems and rectifying any inconsistencies, one may simply enter into a licensing arrangement and pay on an as needed basis.

Although there are many benefits that can be realized through the use of Cloud Computing, one should also consider some of its drawbacks.

## Benefits of Cloud Computing:

### Simple to Move to the Cloud:

The transfer of business data into the Cloud is easy as everything is run by the Cloud provider. There is no need to install hardware or software. The Cloud provider takes care of all of the details, monitors and upgrades the off site computer hardware and software and obtains and maintains all software updates and security procedures.

### Cost Effectiveness:

Businesses that move to the Cloud generally experience cost savings as IT hardware and software expenditures are substantially reduced, and generally fewer staff or resources are required for IT maintenance as it is the responsibility of the Cloud provider to purchase and maintain the Cloud hardware and software.

### Flexibility of Business:

It is relatively straightforward to increase the use of Cloud services as the business grows or to decrease costs without incurring large capital costs. Most Cloud service allows for this flexibility. There is no need to expend large capital cost to purchase additional hardware or as the business grows. Furthermore many organizations do not utilize the full capacity of the systems that they have in place.

### Enhanced Productivity:

Since a company's data and required software applications are located off-site in a Cloud, this information can be

accessed from anywhere in the world through the Internet, which generally leads to increased productivity. The user is no longer tied to the office and can work according to their schedule at any time or place.

### Improved Security:

Cloud service providers generally commit large resources to securing their facilities from attack and develop security systems which are well beyond the means of any small business.

It is critical to the Cloud provider to have the very best security software as their business depends on it. Moreover, since the company's data is in a Cloud, there is less likelihood of accidentally losing information from a misplaced laptop or computer as there is no need for the data to reside in the laptop.

### Less Downtime:

Cloud Computing service providers generally offer 24/7 service through multiple data centres with less downtime than that of a company maintaining their own IT system. It is not unusual for companies or organizations to experience down time especially when they have multiple offices in different jurisdictions.

### More Choice:

It is generally easier and less costly to change Cloud providers than it is to terminate traditional IT contracts requiring expensive software licence and long-term equipment leases. Many Cloud providers have inexpensive monthly plans, while large capital costs for computer systems need to be amortized over several years.

### Better Cultural Adjustment:

Many businesses hire employees from different countries, and a large segment of employees work from their homes. Cloud Computing has made business and a professional working environment more accessible, inexpensive, and user friendly.

### Simple Purchasing:

Many Cloud services can be purchased over the Internet with a credit card and service becomes available instantly. There is no need to issue a complicated Request for Proposal, or negotiate the complicated agreements that typically accompany large capital computer hardware and software acquisitions.

## Collaboration:

Groups of users at multiple sites may access a common document quickly, easily and in real time from the Cloud, which facilitates collaboration amongst the group, enhances the prospect of creativity and speeds up the process of completing a task.

**Cloud Computing has many benefits but comes with some pitfalls that must be considered before jumping into the Clouds; they include:**

## Intellectual Property:

Intellectual Property rights are generally jurisdictional. In other words a Canadian patent only extends protection in Canada and nowhere else. There is growing concern whether intellectual property owners will be in a position to enforce their proprietary rights when computing resources result in unauthorized distribution of video, music and other rights, and the location of the infringing activity may be difficult to determine.

## Protection of Privacy:

Cloud Computing architecture provides that vendors may process resources in and through a number of jurisdictions at any time. Concerns have been expressed as to whether business or personal information may be accessed by foreign law enforcement bodies, through anti-terrorism legislation or the like. Antiterrorism is a growing concern in today's society. Users also need to consider the risks that their data may be disclosed to foreign governments in which their data is held, possibly without their knowledge or consent. Relevant Canadian legislation such as the *Personal Information Protection and Electronics Documents Act* needs to be considered when a company thinks about outsourcing their processing or storage of personal information to a Cloud provider.

## Jurisdiction:

There is always the issue of which court will have juris-

diction to resolve disputes based on activity in one jurisdiction causing harm in another jurisdiction. Moreover the intellectual property may not extend to where harm is caused.

## Foreign Exports:

Compliance with foreign federal export controls may be difficult to determine or control especially where software encryption technologies are developed in the Cloud, particularly where the Cloud services may be provided in a multitude of locations.

## Loss of Data:


Since the data is held in the Cloud, there are concerns about losing this data. It is critical that all of one's data is in a format that can be imported into another application at any time and in different locations.

## Ownership:

Care must be given to ensure that the intellectual property rights of users and Cloud providers are clearly delineated so as to minimize any future disputes. It is always better to spell out these rights in writing before entering into the arrangement, since it is not unusual for one party to have a different view from that of another.

## Contractual Issues:

The terms of a Cloud provider's contracts must be carefully reviewed and if unreasonable or unwarranted, other Cloud service providers should be sought out, particularly if the negotiation is protracted over unreasonable terms.

While corporations or organizations may obtain significant benefits from the Cloud, they must also understand the full implications of these new arrangements. 

**Eugene Gierczak** is a partner at Miller Thompson. He is the national chair of the firm's Intellectual Property and Information Technology Group. He provides advice on all aspects on intellectual property law including litigation. He can be reached by email at: [egierczak@millerthomson.com](mailto:egierczak@millerthomson.com).

# NEWS FROM 1043

## Changes to the Register

### MEMBERS DECEASED

Murray Ellins	820	May 3, 2011
Kenneth S. Hulme	955	May 14, 2011

### MEMBERS CANCELLED

Ralph Bode	1738	May 17, 2011
David Maughan	1884	May 17, 2011
David Pesce	1776	May 17, 2011
William Plaxton	1161	May 17, 2011

Steve Ruttan	1671	May 17, 2011
Eric Salzer	1894	May 17, 2011
Lawrence Woods	1135	May 17, 2011
Sayed Yadollahi	1866	May 17, 2011
John Young	1493	May 17, 2011

### MEMBERS REINSTATED

David Maughan	1884	May 20, 2011
Eric Salzer	1894	May 20, 2011
Sayed Yadollahi	1866	May 20, 2011



# NEWS FROM 1043

## Changes to the Register

William Plaxton	1161	May 24, 2011
Steven Ruttan	1671	May 24, 2011
Lawrence Woods	1135	May 24, 2011
David Pesce	1776	May 25, 2011
John Young	1493	May 31, 2011

### RETIREMENTS/RESIGNATIONS

Robert Riley	1732	Dec. 31, 2010
Meredith Strong	1796	Dec. 31, 2010
William Zizek	1736	Dec. 31, 2010
Murray Fraser	1238	April 11, 2011
Robert D. Heggie	1415	April 13, 2011
Paul Coyne	1703	April 14, 2011

### COFA'S CANCELLED

David U. Maughan	May 17, 2011
L.G. Woods Surveying Inc.	May 17, 2011
David J. Pesce Surveying	May 17, 2011
Young & Young Surveying Inc.	May 17, 2011

### COFA'S REINSTATED

David U. Maughan	May 20, 2011
L.G. Woods Surveying Inc.	May 24, 2011
David J. Pesce Surveying	May 25, 2011
Young & Young Surveying Inc.	May 31, 2011

### COFA'S REVISED

Was: Trow Geomatics Inc.  
Is: exp Geomatics Inc., April 4, 2011

Was: Goodridge Walker Ltd.  
Is: Goodridge Planning & Surveying Ltd.,  
April 18, 2011

Was: Paul F. Forth Surveying Ltd.  
Is: Tulloch Geomatics Inc., April 18, 2011

Was: H. Piller Corporation Ltd.  
Is: Aksan Piller Corporation Ltd., June 6, 2011

### COFA'S ISSUED

WDB Consulting, Petersburg, March 29, 2011.

### COFA'S RELINQUISHED

S.M. Yadollahi Surveying  
Toronto, May 25, 2011

Robert D. Heggie, OLS  
Port Sydney, April 13, 2011

David Horwood Limited  
Markham, July 1, 2011

Anton Kikas Limited  
Toronto, July 1, 2011

## Surveyors in Transit

**Ivan B. Wallace Ontario Land Surveyor Ltd.** has a new branch office at 344 Rubidge Street, Peterborough, ON, K9H 4L8. Phone number is 705-874-2886 and fax is 705-874-6122. **Dwayne Cummings** is the managing surveyor.

**Goodridge Walker Ltd.** (as of April 18, 2011 **Goodridge Planning & Surveying Ltd.**) has moved to 116 Byers Road, Callander, ON, P0H 1H0. Phone number is 705-752-4025. Fax number remains the same.

**Alexander Maleszyk** has retired as Director from **Suda & Maleszyk Surveying Inc.** He has retained his licence and will now be a consultant to the corporation until the end of 2011. **Philip S. Suda** is now the Director of the corporation.

**Coote, Hiley, Jemmett Limited** has moved to 127 Keith Road, Bracebridge, ON, P1L 0A1. Phone and fax numbers remain the same.

**Michael Griffiths** is now working at the **Ministry of Natural Resources** (Office of the Surveyor General) in Peterborough.

**Izaak de Rijcke** has been awarded a LL.M. in Real Property Law from Osgoode Hall Law School at York University.

**Seyed Yadollahi** is now working for **Ertl Surveyors** in Richmond Hill.

**Wayne Brubacher** is the surveyor in charge of the new company, **WDB Consulting**. The company is located at 4 Cloverdale Crescent, R.R. 2, Petersburg, ON, N0B 2H0. Phone number and fax is 519-576-7646.

**Robert Heggie** has retired and relinquished his CofA. He will retain his notes.

**Tudor Nisoiu** now works for the **Ministry of Transportation Ontario** in Thunder Bay.

**Spiro Sinnis** is now working for **Stantec Geomatics Ltd.** as the OLS in charge of their new branch office at 300-675 Cochrane Drive, Markham, ON, L3R 0B8. Phone number is 905-944-7777 and fax is 905-474-9889.

**Sperling Surveying Inc.** has a new address: P.O. Box 632, 2235 Canal Road, Bradford, ON, L3Z 2B2. Phone number has changed to 905-954-5553. There is no longer a fax number.

**Jamie Leslie** now works for **Stantec Geomatics Ltd.** in Ottawa.

**Ivan B. Wallace OLS Ltd.** has a new branch office at 199 Front St., Suite 105, Belleville, ON. Phone number is 613-966-9898. **Ivan Wallace** is the surveyor in charge.

**Henry Tomaszewski** is no longer working with **Schaeffer Dzaldov Bennett Ltd.** He is now a Project Surveyor with the **Ministry of Transportation Ontario** in Downsview.



**Hugh Goebelle** is now an Assistant Examiner of Surveys. His office is located in the Land Registry Office of Middlesex in London. He can be reached at 519-675-7600. Effective June 6, 2011 **Ontario Realty Corporation** has changed its name to **Infrastructure Ontario**. Address, telephone and fax remain the same.

Effective June 13, 2011, **Joe Young** is the new President and CEO of **J.D. Barnes Limited** and its subsidiaries (First

Base Solutions Inc. and Sexton McKay Limited). **Frank Mauro** will remain as Chairman of the Board, working on a part-time basis for J.D. Barnes Limited. Joe Young is now the OLS in charge in the Markham office.

**Mike Fisher** no longer works for the **City of St. Catharines**. He is now employed by **Sexton McKay Ltd.** (a division of J.D. Barnes Ltd.) in Markham.

THE AOLS IS PLEASED TO ANNOUNCE THAT THE FOLLOWING WAS SWORN IN AS AN ONTARIO LAND SURVEYOR:

David G. Green      1945      April 7, 2011      4DM Inc.

## Sites to See

### Ontario GeoPortal

[www.ontariogeportal.com](http://www.ontariogeportal.com)

**Ontario GeoPortal**, from Infrastructure Ontario, provides government programs, affordable and intuitive services and technologies to integrate, access, and better understand their information.

Ontario GeoPortal is a location intelligence service that enables you to integrate tabular data and business content through geography. It significantly improves access to business databases, documents, and other relevant information enabling you to streamline decision-making, improve communications, and support new ways of doing business. It also includes a wide range of geomatics and mapping services, as well as business systems development services - all of which can be easily acquired.

# Spatial Cloud Computing (SC2) – Revisited Enterprise GIS as a Service

By Hugh Williams and Darko Poletto, O.L.I.P.

**T**wo years ago, this magazine ran an article<sup>1</sup> authored by us that discussed cloud computing and how geographic information services and spatial data could be provided in the “cloud” as a service. We call this “Spatial Cloud Computing”. Today, the spatial cloud computing concepts have become a viable option for many organizations looking to map-enable their data and/or improve their overall business intelligence and information access capabilities.

To recap, Spatial Cloud Computing (SC2) is the array of services associated with the online provision of:

- a) computing, network, and security infrastructure;
- b) applications; and,
- c) spatial data.

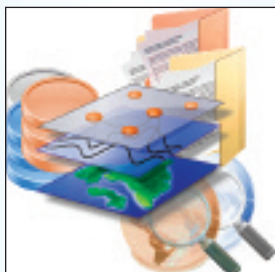
The benefits associated with SC2 are like any map-based solution:

- the ability to better visualize and understand information through geographic relationships; and,
- the ability to more easily find, access, and integrate information.

Plus, the benefits associated with *cloud computing*:

- Lower overall costs to implement a solution and operate it;
- Faster implementation;
- More opportunity for innovation; and,
- Higher reliability.

The 2009 article also highlighted how SC2 could significantly expand the overall market for GIS, because



something that had been expensive and time consuming to implement could now be done more quickly, with less expertise, and with fewer risks. This also means almost any organization can take advantage of the use of maps and the inherent benefits associated with this.

In the intervening two years, the landscape for the use, acceptance and understanding of map-based applications has changed significantly. In fact, the appearance of spatial data and services within online applications is becoming so common that the whole distinction of “GIS” and map-based capabilities as being a separate or unique technology is being lost. GIS is becoming “mainstream” in both the IT sector and among the broad user community.

## Our Ontario Experience

In November 2010 we launched a hosted cloud solution within the Ontario Government for 1300 users in several ministries and agencies.

Implementing this solution meant we needed to de-couple the services, data, and infrastructure that already existed at the primary client location; and, re-establish the data and services in a secure, hosted environment outside the client’s firewall. The implementation went off smoothly without any service disruptions. The solution has over 1600 named user accounts, using business solutions dealing with real property management, facilities management, asset management, land use, aboriginal consultation, emergency management, mining title verification, and customer service management. The aboriginal consultation solution is also available to all Ontario government staff on the government’s Intranet, and will soon be available to the public with an Internet-facing site to be launched this summer.

This solution recently won the 2011 “Best Public Sector GIS” gold award from URISA-OC.

The whole process has taught us a lot about working in the cloud and delivering on those “promises” of the cloud that the clients expect. We believe that the movement towards cloud-based GIS

*cont'd on page 12*





applications, data, and technology services will grow rapidly over the next several years. And although you probably won't see this on Letterman any time soon, here's our "Top 10" list "Why..."

## Top 10 List - Why GIS Will Succeed in the Cloud

### Reason 1. Maps Make Business Information Better

Those of us in GIS have long understood that maps can help communicate and build understanding of business information. Maps are also a natural platform for analysis and they help us integrate information – because they provide a common spatial reference.

So, given the choice of using maps or not in support of business information access, integration and intelligence (if cost / usability are not an issue) then it makes sense to adopt GIS capabilities within a business system solution.

### Reason 2. No More Maintenance

With cloud-based applications there's no longer any software maintenance and licensing. Not only are costs kept in check, but the migration of one version to the next, and the installations on multiple machines throughout an organization are a thing of the past.

In the cloud, applications are updated and maintained as part of the service subscription. And, since everyone's using a web browser or a common mobile device – the application changes for everyone at the same time, and usually in incremental stages.

### Reason 3. Data

This could be reasons 3 to 10! Google and Bing each provide a base that is for the most part current and well maintained; and a programming interface that makes these data available. Hundreds of data providers are on board with their own data services and interfaces. What used to be the most difficult and costly aspect of a GIS, is now, in many cases, easily accessible.

So, for surveyors, who produce some important and valuable spatial data, this is a great example of what is possible, and reason to explore opportunities.

### Reason 4. Lower Costs and Faster to Deploy

Many of the aspects that made a GIS expensive to implement in the past are dealt with through spatial cloud computing, such as: the initial upfront software; the hosting of the web server; training; and specialized development requirements.

From a software / data perspective, cloud providers offer multiple solutions with varying levels of functionality. The applications in the cloud don't necessarily have all the functionality specifically required for each business solution, but they do offer commonly-required capabilities to make them worthwhile. For example, our SC2-GeoPortal solution has basic "GIS" capabilities, but its strength and focus is on making it easy to access and integrate data.

From a hardware / infrastructure perspective, cloud providers offer immediate access and scalability. Building a similar or custom infrastructure environment takes a lot

more time and effort.

### Reason 5. User Expectation

Your cell phone likely has GPS built in it and you use applications on it that support location awareness. In other words, GIS is everywhere now. So, business users increasingly expect their applications to have maps to support data input and reporting. If yours doesn't, they'll find one that does. It's a challenge to meet ever changing needs, but also an opportunity.

### Reason 6. The "Pie" is Bigger

Ten years ago any GIS software vendor could describe their market as a few key sectors / industries: local/provincial/federal government; utilities; resource industry; and large businesses. The market *today* is anyone conducting business with a browser or cell phone. Most clients do not need the functionality of a large GIS system offered by the traditional software vendors, and certainly do not want to pay the cost. They want functionality that is easily delivered through the cloud for multiple uses and users in virtually any market.

A corollary to that – the traditional GIS markets are also making the pie bigger, because GIS is being liberated from the specialists and being put into the hands of program and policy and frontline service. And, this is NOT a threat to GIS professionals. What it typically means is that they are freed up to dedicate resources to areas that matter more – such as more advanced spatial analysis, creation of cartographic products, and data maintenance.

### Reason 7. The Term "GIS" is No Longer Required

Just as there is a huge new market, spatial applications are being developed by non-GIS companies. The gory technical details have been abstracted and therefore made more straightforward to deal with, the data are available, and the application development interfaces and standards are published and understood. So, instead of a few dozen companies developing spatial solutions, there are literally thousands around the world, which means that there is significantly more innovation and more choices for the consumer.

### Reason 8. Security

Developing, testing, and implementing appropriate security can be expensive and time consuming and it requires expertise. Therefore, this has been a barrier to organizations that want to get on the web with their information, especially for governments that need to protect specific types of data. However, cloud application providers offer security within their solutions.

Some security concerns do need to be addressed. With our SC2-GeoPortal solution, we have done the following:

a) **Hosting Sensitive Data.** Some clients will never feel comfortable having sensitive data hosted outside their "firewall". In architecting the SC2-GeoPortal solution we enable clients to keep data hosted on their servers, while still using the GeoPortal services and 3<sup>rd</sup> party data that we host. While some applications require the data to be hosted in the cloud, this "hybrid cloud" or "distributed model" solution gives clients an alternative option. Other solutions are adopting



similar approaches.

b) **Data in Canada.** Because of international law and jurisdiction, our Canadian clients often need assurance that their data will physically reside on servers in Canada.

c) **User Access.** All user access is done over a secure encrypted channel. As well there are a number of other layers of security to ensure that the user is properly authenticated, that all requests are coming from valid users, and that each user's account dictates what functionality they have and what data they are able to "see".

d) **Reliability and Threat Tested.** It's vital that the solution have enough redundancy and fail-over capability that it stays running even if one or more components fail. The solution must also be hardened to withstand hacking and denial of service type threats.

### **Reason 9. The Spatial Cloud Computing Community**

One advantage of today's connected world is that new trends and concepts can be discussed, challenged, and refuted in blogs, forums and other open online services. LinkedIn®, for example, has a few independent discussion groups that focus on GIS and cloud solutions. One group that we helped start – Spatial Cloud Computing – continues to attract new members from around the world. Ideas are varied and the subjects deal with everything from applications, to infrastructure, to the spatial data. For everyone, the focus is on how to do it, and how to do it right. So mistakes

made by someone are less likely to be repeated, while more collaboration and sharing is leading to more informed decision-making and new ideas.

### **Reason 10. Money**

Billions of dollars are being invested by the technology sector putting the cloud infrastructure in place. Billions more are being spent developing solutions. If the financial picture is telling us anything, the cloud is here and growing.



<sup>1</sup> Ontario Professional Surveyor, Vol.52, No.3, Summer 2009, pg. 11.

**Darko Poletto** is President of SKE Inc. He has been involved with enterprise GIS implementations for over twenty years both with the Ontario government and for the past 14 years in the private sector. Darko is an Ontario Land Information Professional and member of AOLS. He can be reached by email at: [dpoletto@skeinc.com](mailto:dpoletto@skeinc.com).

**Hugh Williams** is VP of Business Development at SKE Inc. Hugh's varied career and experience over the past twenty-something years both in government and the private sector have focussed on the implementation and marketing of information management solutions, and those using GIS in particular. He can be reached by email at: [hwilliams@skeinc.com](mailto:hwilliams@skeinc.com).

If you are interested in finding out more, please contact us or join the Spatial Cloud Computing discussion group on the "LinkedIn" web site ([www.linkedin.com](http://www.linkedin.com)).



# Survey Law Education: Introduction to Canadian Law and Legal Systems for Land Surveyors

By Izaak de Rijcke, LL.M., O.L.S.

In contrast with the scientific method, the learning of law<sup>1</sup> draws on different suppositions and paradigms. The subject itself is not amenable to study in the same manner as the maths and sciences. Accordingly, learners in survey law – the legal principles and processes by which property rights on the ground are defined as parcels with boundaries – deserved some preparatory work as to the nature of law itself. It was feared that a consequence of not exposing students to this subject as a forerunner to survey law would simply lead to frustration when first exposed to the boundary law topics. This was an apprehension that had formed during the design stage of the courses in survey law for IEP learners<sup>2</sup> who were seeking licensure as professional surveyors in Ontario. The design was based on a statement of competencies that defined the expected abilities of a qualified professional surveyor in Ontario today. Included in this statement was the implicit expectation that learners were proficient in English. However, by definition, English was not necessarily the first language of IEP learners. The structure of the course and its delivery therefore had to take into account the special accommodation needed for IEPs in order to make the experience useful.

An initial delivery of the introductory course took place between January and April, 2011. The majority of students in the “beta”<sup>3</sup> version of the course were IEPs. The goal and expectation for students who had completed this course would be an ability to embark on the learning of boundary law principles. In particular, competencies would include:

- knowledge of Canadian government and the creation of legislation
- a working familiarity with the constitutional division of powers and how this has progressed to this day over history
- awareness of the court structure and the hierarchy of different divisions, as well as concepts of jurisdiction, appeal, and remedies
- familiarity with sources of law, especially common law, and the process of common law evolution and adaptation
- reading legislation, case law and understanding *ratio*; hierarchy of decisions, and the operation of precedent
- role of tribunals and other dispute resolution methods

- the concept of “proof” and the use of evidence to establish facts
- gain familiarity with the legal subjects and an ability to read and write in an appropriate and topical fashion

Although a number of introductory books to Canadian law are available, it seemed that over half of any one such work was irrelevant. The preferred resource became a compilation of readings totaling about 20 or 25 separate items, together with annotations to guide the student. The resources assembled in this fashion served best to highlight the topics of special interest to learners of survey law.

The use of a variety of resources was also supported by the fact that topical and relevant materials were available through the Internet and already in the public domain. A digital licence would not be necessary if the annotations were authored as part of an integrated set of readings. Reported cases from the CanLII<sup>4</sup> service added a variety of initial readings which became necessary components of the course material.

Access to these resources was made available to participants several weeks before the first meeting with the learners. During this initial period use of the material and readings was facilitated through a LMS<sup>5</sup> that was hosted through a portal associated with the Association of Ontario Land Surveyors’ own website. As the course unfolded, the LMS also made possible the communication between the instructor and the learners, the holding of on-line “office hours” and the completion of assignments. The LMS was also used to facilitate a collaborative assignment in which learners were asked to compose and write an explanatory letter to a client by engaging a “wiki” tool for the task. All learners were employed in full time jobs but most appeared in person during the classroom sessions. Some participants lived or were on projects that took them far away from the Toronto area. By using distance learning software and an Internet connection, learners were able to be virtually present in class and participate in discussions from home or a hotel room. That same Internet connection allowed for access to the resources available through the LMS.

The total course was first divided into three teaching sessions of about three hours each, but was augmented with a fourth session about half-way through the planned




program. This still allowed for completion in about three months, with sessions about three weeks apart. The class sessions were scheduled during evenings so as to avoid a conflict with other commitments that were already in place for learners.

Readings from the annotated material amounted to about 50 pages for each session, plus other resources available on line. Each class addressed the assigned readings and reviewed the topics, but all with an emphasis on why land surveyors need to know the material.

There were some interesting insights and realizations that were reached when it came time to consider an appropriate method of evaluation of the students' success. At first it was presumed that the attainment of competency in this subject could be measured best by the learner "showing" what he or she can do. This was thought to be a logical result from having done the readings and completed the assignments. Likewise, the evaluation of a learner's mastery of the competencies was thought to be best assessed by a combination of traditional tools such as a short test for each one of the classes, a writing assignment, and participation. The use of a "final exam" could have been a consideration as well but, perhaps only as exposure to working with a final examination tool for evaluation in the survey law courses to follow. As the course progressed it was realized that a very real benefit of the course to IEP learners was its potential function as a tool for learners to self-assess their competency in order to be better informed in making the choice to seek licensure as a professional surveyor in Ontario. During the beta teaching version of this course in its first cycle, evaluation shifted away from a "pass/fail" consideration to more emphasis being placed on learners' own insights to their preparedness to proceed on with further courses. This included an opportunity to meet and have an interview with each student after the course was finished and an attempt to reach a consensus with each learner on his or her readiness to proceed.

The further benefits from the design and delivery of the course on a LMS platform and designed for distance learning delivery are many. The lessons learned by the team of persons involved in the overall building of this introduc-

tory course will be adopted in the design and delivery of courses to follow. Students need not take time away from work to take the course. Components of the course can be incorporated as video vignettes on the LMS for future students taking this program. The intensity of instructor involvement can be accordingly reduced over time. The resources created for any particular course will have potential value and demand for continuing professional development.

The ability to structure a series of courses in survey law is not of much benefit if their continued delivery is not sustainable. Using a LMS, taking advantage of Internet-based video conferencing and taking a team approach to the structure ensures ease of maintenance and delivery into the future. The platform will make topical relevance, currency and delivery a sustainable and fresh experience for years to come. 

**Izaak de Rijcke** is a licensed surveyor based in Guelph, Ontario. He is a practicing lawyer, focusing on boundary and land title related issues. He has written numerous articles, co-authored books and taught seminars and courses for lawyers and land surveyors. He can be reached by email at: [Izaak@izaak.ca](mailto:Izaak@izaak.ca).

<sup>1</sup> The purpose of education in legal subjects for land surveyors is of course not to educate or train lawyers. Instead, a familiarity with the legal process, as it is learned by law students and applied by courts and tribunals in Ontario, is an important precursor to the substantive topics of boundary law and the retracement of boundaries on the ground.

<sup>2</sup> IEP learners are Internationally Educated Professionals. Many present candidates for articles and licensing in professional land surveying have been welcomed to Canada as permanent residents as part of an immigration screening process that recognizes foreign education and credentials. It is up to the provincial licensing bodies to evaluate and provide education to such candidates for admission to the professions.

<sup>3</sup> "beta" refers to tentative or provisional. There was much to be learned from the initial delivery experience that would inform the design and delivery of subsequent course offerings.

<sup>4</sup> Canadian Legal Information Institute at [www.canlii.org](http://www.canlii.org).

<sup>5</sup> Learning Management System. In this case, the LMS used was known as "Moodle" at [www.moodle.org](http://www.moodle.org).

## ALLEGATIONS OF PROFESSIONAL MISCONDUCT

CANADA )  
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IN THE MATTER OF the *Surveyors Act*  
R.S.O. 1990, Chapter S.29, as revised.

AND IN THE MATTER OF Peter Allen, O.L.S.

AND IN THE MATTER OF a Disciplinary Hearing of the  
Discipline Committee of the Association of the Ontario Land  
Surveyors held in accordance with the sections 26 and 27 of  
the said Act.

I, WILLIAM D. BUCK, O.L.S., C.L.S., P. ENG., of the Town of Markham, in the Region of York, am the Registrar of the Association of Ontario Land Surveyors.

1. On February 13, 2010 the Complaints Committee of the AOLS received an official complaint against Mr. Allen. The substance of this complaint, referred to as File Number C-10-02, was that Mr. Allen had failed to fulfill his professional obligation to follow and maintain the Performance Standards for the Practice of Cadastral Surveying by failing to conduct proper research, failing to properly catalogue field notes and failing to respond to a request from a fellow surveyor. The Complaints Committee issued a Final Decision regarding this complaint on May 17, 2010, which, pursuant to Section 22 (4.3)(a) of the *Surveyors Act*, R.S.O. 1990 Chapter S.29, as revised, referred Mr. Allen to AOLS Council with a recommendation for further disciplinary action.
2. The Council of the Association of Ontario Land Surveyors (AOLS) pursuant to Section 26(1) of the *said Act*, by a Motion dated October 25, 2010, directed the Discipline Committee to hold a hearing in respect of allegations of professional misconduct against Mr. Allen.
3. The Decision in Complaints Committee file C-10-02 referred to a previous complaint against Mr. Allen, File C-07-07, which resulted in Mr. Allen submitting to the Complaints Committee a proposed Quality Control process by which he agreed to structure his survey practice. This process included commitments to ensure that all work was properly researched, all plans were mathematically closed and all field notes would be reviewed by an O.L.S. Further, Mr. Allen submitted a Letter of Undertaking to the Complaints Committee on July 2, 2008 in which he agreed to conduct his survey practice within the terms of this Quality Control process.
4. It is alleged that Peter Allen, O.L.S. (herein referred to as "Mr. Allen"), in his personal capacity, and as the official representative for the firm Grange W. Elliott Ltd., is guilty of professional misconduct within the meaning of Section 35 of Regulation 1026, R.R.O. 1990, as amended, all on the following grounds:
  - a) In 1994 Mr. Allen prepared a draft Reference Plan, file number LO'H 14-26 C7015, which was not deposited in the Land Registry Office;
  - b) On September 24, 2009 Mr. Allen deposited Plan 13R-19658, which appears to be an updated version of his 1994 undeposited plan, contrary to:
    - (i) O. Reg. 42/96 S.3(a) and Interpretive Guide Section 1 which requires that 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 in that the said plan 13R-19658 failed to consider and illustrate plan 13R-18431, which plan included a portion of the lands included in the said plan 13R-19658 and which had been deposited in the Land Registry Office on July 18, 2006, prior to the said plan 13R-19658.
    - (ii) Section 4 of The *Surveys Act*, RSO 1990 Chapter S.30, as amended, O. Reg. 42/96 S.9, and Interpretive Guide S.7 to S.10, in that for each survey, exact and accurate field notes shall be prepared and shall contain a clear and detailed account of everything found, observed, and done in the field in the course of and relevant to the survey. The notes shall clearly indicate the method and progression of the survey. No field notes exist.
    - (iii) O. Reg. 42/96 S.3(b) and S.19 in that proper quality control procedures were not followed during the preparation of the said plan 13R-19658. The said plan 13R-19658 contains

several instances wherein existing survey monuments are either not indicated or are indicated incorrectly, including a discrepancy between the monument shown at the northerly end of Part 6 on the said plan and the monument shown in the corresponding Inset "A" for that same location, illustration of a Rock Bar on the northerly limit of Part 5 on the said plan which in fact does not exist, failure to illustrate a monument on the south side of Part 5 on the said plan that was planted during the survey for plan 13R-18431, failure to illustrate an existing monument on the easterly side of Part 7 on the said plan 13R-19658 where it meets with Part 12 on the said plan.

c) Mr. Allen prepared and deposited plan 13R-19781 on January 28, 2010, contrary to:

- (i) O. Reg. 42/96 S.3(b) and S.19 in that the said plan contains several instances wherein existing survey monuments are either not indicated or are indicated incorrectly, including a discrepancy between the monument shown at the northerly end of Part 6 on the said plan and the monument shown in Inset "A" for that same location, illustration of a Rock Bar on the northerly limit of Part 5 on the said plan which in fact does not exist, failure to illustrate a monument on the south side of Part 5 on the said plan that was planted during the survey for plan 13R-18431, failure to illustrate an existing monument on the easterly side of Part 7 on the said plan 13R-19781 where it meets with Part 12 on the said plan, all of which are indications that proper quality control procedures were not followed during the preparation of the said plan 13R-19781;

- (ii) O. Reg. 42/96 S. 9 and Interpretive Guide S. 20 in that the said plan 13R-19781 states a date of completion of survey that is identical to that shown on plan 13R-19658, suggesting that the said plan 13R-19781 may not have been prepared from a current survey;

- (iii) Interpretive Guide S.33 and AOLS Bulletin 2007-01 in that Mr. Allen was unable to produce any field notes relating to the preparation of the said plan 13R-19781 when requested repeatedly to do so by a fellow surveyor;

- c) Plans 13R-19658 and 13R-19781, both prepared by Mr. Allen and both having the same date of completion, each indicate different fencing along or near the easterly limits of Parts 1 and 4 of the said plans and neither plan correctly illustrates the conditions as of the date of the said surveys, contrary to O. Reg. 42/96 S. 21 (1) and Interpretive Guide S. 16;

- d) The Surveyor's Certificates on Mr. Allen's 1994 draft Reference Plan and on plans 13R-19658 and 13R-19781 are all incorrect and do not comply with Form 1 of O. Reg. 42/96;

- e) The number of errors on the said plans 13R-19781 and 13R-19658 suggest that Mr. Allen has not maintained the level of quality expected from a professional surveyor and that he has failed to comply with his July 2, 2008 undertaking to the Complaints Committee;

all of which are breaches of sections 35(1), (2), (3), (18) and (21) of Regulation 1026, R.R.O. 1990, as amended, and the Code of Ethics at sections 33(2)(a) and (f) of the said Regulation 1026;

Dated at Toronto, Ontario, this 13<sup>th</sup> day of December, 2010.

## **DISCIPLINE DECISION**

**IN THE MATTER OF** the Surveyors Act, R.S.O. 1990,  
Chapter S.29

**AND IN THE MATTER OF** Peter Allen, O.L.S.

**AND IN THE MATTER OF** a Disciplinary Hearing  
Of the Discipline Committee of the Association of  
Ontario Land Surveyors held in accordance with  
Sections 26 and 27 of the said Act

### **Order and Reasons**

This panel of the Discipline Committee convened as scheduled on March 23<sup>rd</sup>, 2011. Panel member Richard Dixon, O.L.S. was unable to attend in person due to a winter storm. All other Panel members were present in person. With the consent of both parties, it was agreed that the Panel would proceed with Mr. Dixon participating by speaker phone. The Hearing then proceeded on this basis.

The Panel was presented with a Joint Submission by Counsel for the Association, Izaak de Rijcke, and by the member, Peter Allen, who was unrepresented.

The Joint Submission was marked as Exhibit 8, and a copy is attached as Exhibit A.

The Panel took some time in order to understand the basis of the allegations against Mr. Allen, in order to assess



whether the proposed penalty as agreed between the parties and as set out in the Joint Submission was appropriate and adequately dealt with any concerns of the Panel in protecting the public interest.

The Panel is satisfied that the proposed Joint Submission is an acceptable resolution to the charges, and has therefore accepted it.

The Panel hereby issues its Order adopting the terms of the Joint Submission.

This Order may be signed in counterparts. Signatures delivered as an attachment to an email are deemed to be original for purposes of this Decision and Order.

Oral Decision given March 23<sup>rd</sup>, 2011.

Gary Auer, O.L.S.

Wayne Brubacher, O.L.S.

Robert F. Sevigny, O.L.S.

Richard C. Dixon, O.L.S.

Mark Spraggett, Lieutenant-Governor Appointee

## EXHIBIT A

### JOINT SUBMISSION TO DISCIPLINE COMMITTEE

#### ON CONSENT OF ALL PARTIES

The Association of Ontario Land Surveyors (the "Association") and the Member, Peter Allen, O.L.S. (the "Member"), make joint submission to the Discipline Committee under the *Surveyors Act* in respect of this matter by asking the Discipline Committee to issue a consent Order on the following terms:

1. The Member pleads guilty to the charges and allegations of professional misconduct against the Member (the "Charges") as alleged.
2. The Member's Licence and Certificate of Authorization shall be suspended for a period of 16 months from March 23, 2011, such suspension to be deferred for a period of 16 months.
3. The Association will appoint a monitor, as a representative of the Registrar, who will meet with Mr. Allen as often as s/he considers necessary to effectively review and monitor the whole of Mr. Allen's practice during the 16 months of deferred suspension;
4. Mr. Allen will develop a detailed quality control process and will have it approved by the Registrar, and the member will use the approved process on all future projects which he or his firm undertakes, supervises or manages.
5. Although the appointed monitor will be directed to monitor the whole of Mr. Allen's practice, particular attention will be given by the monitor to the adequacy of research, field notes, calculations, supervision and the use of the said quality control process by the member.
6. The appointed monitor will prepare and provide to the Registrar quarterly reports of his/her observations and conclusions regarding the manner in which Mr. Allen is conducting his practice with particular emphasis on the matters referred to in Paragraph 5 above.
7. The Registrar will in turn provide quarterly reports to Council of the Association as to whether all of the conditions set out in the Discipline Committee decision in this matter are being met, including the payment obligation set out in paragraph 12 below.
8. The Association will invoice Mr. Allen for the cost of

- the monitor and Mr. Allen will be responsible for payment of these costs within 30 days of being invoiced.
9. Mr. Allen will attend at least two regional group meetings during the 16 month period of the deferred suspension and will provide evidence of attendance to the Registrar, the monitor or both;
10. Mr. Allen will attend at least one seminar offered by the Association during the 16 months of the deferred suspension and will provide evidence of attendance to the Registrar, the monitor or both.
11. Mr. Allen shall be reprimanded and the reprimand will be recorded on the Register of the Association.
12. Mr. Allen will pay to the Association, for its costs, fixed in the sum of \$7,500.00, including HST, payable by five post-dated cheques of \$1500.00 each, due monthly, beginning on April 2, 2011.
13. The Member shall be required to comply with the terms of this Joint Submission in all respects, failing which, the deferral of the suspension referred to above shall be revoked.
14. The allegations forming the Charges, as well as the Order or Decision of the Discipline Committee, shall be published in the next issue of The Ontario Professional Surveyor magazine and shall be posted on the public side of the Association website.
15. The terms of this Joint Submission are fair and reasonable and protect the public interest.
16. The Member acknowledges having been advised to obtain and has had the benefit of independent legal advice, or, has voluntarily declined to obtain same.
17. This Joint Submission and agreement thereto by the Member may be set up as a complete bar and answer by the Association to any appeal or judicial review of the Order or Decision of the Discipline Committee resulting there from.

DATED at Toronto, Ontario, this 23<sup>rd</sup> day of March, 2011.

# The Research Debate – A Common Sense Alternative

By Crystal Cranch, O.L.S. *Inspired through conversations with Gord Wallace*

It seems that the cadastral industry has been discussing pretty much forever the need to properly research projects.

A debate has been taking over at the offices of Ivan B. Wallace Ltd., and it is time to take this discussion to the people.

As Ontario Land Surveyors, we often have to rely upon the work of others as we prepare ourselves to sign a plan. It may have been that the CAD operator, who took in the project and prepared the file for searching, missed some really important items. Maybe the search was completed without ever leaving the office, taking advantage of the wonders of online searching, and the plans attached to deeds are not in the file. Someone may have looked on LSRI or Land Survey Records to accumulate a pile of previous surveys, but missed the plan not available on these databases. The field crew may have even scraped a previously “unknown origin” bar to get a number, but no one was smart enough to contact that surveyor for their records. The one calculating the project may not have looked at the 50 year old survey that was so hard to track down, because there is a brand new reference plan next door. It makes the job of the OLS very difficult indeed.

At our office, Gord Wallace takes the stand that we, the Ontario Land Surveyors, need to be more vigilant. We need to make sure we have that 50 year old survey. We need to find numbers on bars. We need to make every possible effort to ensure that the re-establishment of a boundary is in exactly the same spot as when originally set. In Gord’s frustrations, he has sarcastically suggested that we need a different Surveyor’s Certificate that simply says:

***“Based on the information in front of me, I hereby certify this plan correct”.***

Hmm. Well, from sarcasm comes inspiration.

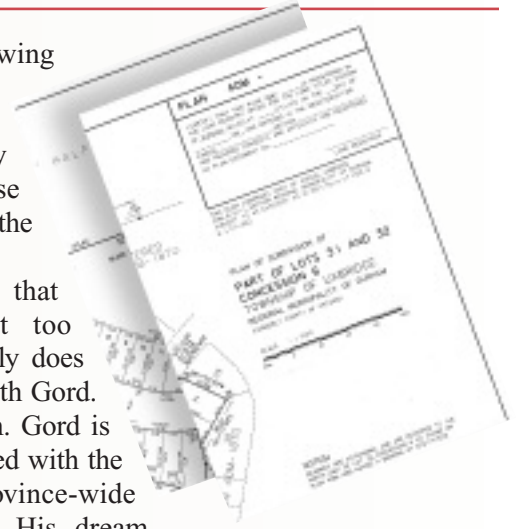
If Gord were to have his way, we would all do a better job of researching our projects. Research is often difficult. Sometimes you will have no way of knowing if another surveyor was in the area until the field notes show a number on the found survey bar. Sometimes a surveyor from Thunder Bay did his sister a favour by surveying her property in Oshawa, and there is no logical way of knowing that this survey exists on the property next to your survey. Sometimes the 50 year old plan of the subject property sits in the musty basement of a recently retired OLS, who has no way of digging it up. Sometimes the required records were lost or misfiled. All too often the recent reference plan next door was prepared without the benefit of proper research, and

by now following Gord’s path of proper research, your new survey will again cause great calamity in the neighbourhood.

The argument that research is just too onerous and costly does not hold water with Gord. He has a solution. Gord is becoming obsessed with the idea of a province-wide digital database. His dream would be to have all of us enter every survey record in our offices into a digital database that is accessible to every cadastral surveyor in the province. He envisions a day when he can sit at his computer, and punch in a geographic description, and be rewarded with access to every survey ever done on the property, or within reasonable vicinity. Can you imagine? In his world, all of us could within seconds, and with just a few keystrokes, complete a full historical search on any property in the province. We would no longer have excuses. We would save an immense amount of time (in business time means money), and we would actually have the ability to do far superior survey retracements.

Well, I suppose there is some truth to that. But who of sane mind would actually believe such a ludicrous dream could ever come to fruition. Imagine every survey in the province available in one location. I can already hear the Doom and Gloomers yelling about the impossibility of it all. They will tell us that it is too much work, rather than foreseeing the ease it will create. They will complain about the upfront costs, rather than understand the long term savings. Gord’s dream will never be discussed for its merits. It will be viewed as the lunatic ranting of an idiot. Can’t argue with that.

And so, I have an alternative. I say we embrace Gord’s sarcastic certificate, and embed it into our practices. We could all save an immense amount of time by taking away the requirement to do all this crazy research. Let’s embrace the concept of general boundaries that is common place in our founding nation, the United Kingdom. Hell, if it’s good enough for the Brits, it’s good enough for us. Why should we waste all that time and money completing all that historical research just to get the boundary exactly perfectly right. Let’s adopt the slogan “Close Enough.” Perfection is overrated.





Now I know that this goes against everything the AOLS has ever advocated. So maybe we need to go one step further. Maybe we need two classes of surveyors. One group would stay under the umbrella of the AOLS, and maintain the same high standards and requirements. The second group would adopt a more lax attitude and set boundaries in more general terms. "Close enough" is good enough for many of the surveys we do. This new group could go national, and offer an alternative to the public. I was thinking of branding the name as the "National Alternative Society of Surveyors". But, then I figure in this age of intermobility and consistency, the "National" part might be redundant. So I suggest we form the Alternative Society of Surveyors. Those of us who wish to shun the high standards of the AOLS could find a new home with the A.S.S. We would adopt Gord's suggested Surveyor's Certificate and hold the exclusive right to call ourselves ASS's. Perfect. All the ASS's could assemble annually to discuss other successful cost savings shortcuts. We could hold ASS seminars on the benefits of reduced service and certainty. We could promote the advantages of dealing with ASS's to the public. We could brand ourselves as the best ASS's in the whole world. Now that's what I am talking about.

While Gord and friends struggle with the promotion of a province wide database (PWDB), we ASS's could offer dirt cheap prices for our proudly inferior product. While Gord and friends struggle with the impossible task of promoting a system that would revolutionize research and result in better surveys and cost savings, we ASS's can become the great promoters of the theoretic lot line. While Gord and friends begin the impossible task of moving an immovable group of OLS's, we can work on making perfect ASS's of ourselves.

Stepping back to reality, I do recognize that many progressive firms have already scanned their plans and have either joined an already established database, or made their own internal database. I know that at my firm, we now have access to all of our plans all of the time, irrespective of where we happen to be. I can access any of our plans with a laptop in Kathmandu or Timbuktu. It did cost us a lot of money to get to this point, but now every day we save a lot of money by having instant access to our plans. I will never again have to pull a plan from those horrible GABS cabinets. In fact, we happily traded our last GABS for 2 bottles of Highland Park whisky and one bottle of Crown Royal Cask No. 16. It was cause for a celebration and we toasted ourselves for moving into the 21<sup>st</sup> Century. We also reorganized the space where we once stored all of those plans, into an office area for another CAD operator. Nice. Now that floor space that used to cost us money is being used to make us money. Who'd of think it?

I wondered why not everyone was running to join us in this new found freedom where we easily access plans. But, I wonder even more why we are not all using some similar system to offer all of our plans for sale to other surveyors, at a reasonable price of course. Never let it be said that surveyors are not reasonable. Yup, we could make research easy; we could offer reasonable prices; we could disburse

these costs to the public who will ultimately benefit from this research; we could recoup our costs to scan and upload the plans, and we could earn the respect of the public while actually following a business plan that would increase profit.

Who'd of think it? Well, truthfully, Lorraine Petzold thought of it, and that was 20 years ago. If you read and reread the old Quarterlies, you may also recall an article written by Lorraine way back when. She was suggesting the same concept that we are suggesting today. We failed to follow good advice 20 years ago, but I have sensed a shift in the mentality of surveyors recently, and maybe now the time is right. And if not, then in 2030, some astute surveyor will be rereading the Quarterlies, and wonder at the sheer genius of that Crystal gal, and take the torch anew. I'll have retired rich and happy, and will no longer care about fighting to improve the industry.

I did want to briefly address those companies who have created their own individual databases. I hold an inexplicable respect for these firms, because they have trodden upon a territory that, quite frankly, intimidates me. But, I also cannot help thinking they missed the boat. Sitting alone and independent seems almost selfish and short sighted. Sure, it makes it easier for that company to access their records, but it does nothing to promote easier research for our industry. The solution for industry-wide improved research will not occur if we all have to search 50 independent databases. The perfect solution would involve one fully populated, up to date, easily accessible, and all encompassing database.

So, let's talk about it. Do we need to truly take on this task of improving our research, resulting in more consistency between surveyors and a better quality of surveys? Should we be taking advantage of technology to ultimately make our businesses more profitable while supplying a superior product? Should we be using the strengths of our expanded profession to help take the lowly cadastral surveyor into the 21<sup>st</sup> Century? Or should we just keep on the current path that will eventually make ASS's of all of us?

Opportunity seems to be knocking on our doorstep right now. At the 2011 Annual General Meeting, there was a very positive and progressive discussion on the advantages of creating a province-wide digital database. I am all for that. But, I think we would be missing an incredible opportunity if this province-wide database did not incorporate a compulsory inclusion of our historical records as well. If we are just going to create a new database of poorly researched surveys then that would be akin to building a mansion to hold our garbage. Let's build a mansion and fill it with nothing but price-less surveys – all completed with the research material found in that very mansion. Sweet!



**Crystal Cranch** has been an Ontario Land Surveyor since 1997. She is the surveyor of record of Ivan B. Wallace Ontario Land Surveyor Ltd. in Cobourg. She can be reached by email at [crystal@ibwsurveyors.com](mailto:crystal@ibwsurveyors.com).

# Chains on the Landscape: Re-enacting Surveying in “The Land Between”

By Yvonne Drebert, Producer, The Ontario Visual Heritage Project

“This much I will say as far as I have explored the prospects are not flattering which I am sorry to relate...” These are the words of Surveyor John Huston, found in a letter written in 1826 to Thomas Ridout, the Surveyor General of Upper Canada. Huston was describing lands in the southern part of what is now Haliburton County, and the northern reaches of *The Land Between*. In 1826, surveyors were neither interested in biodiversity nor cottage properties – settlement was their number one concern (however, if they happened upon a large mineral deposit while they were out, it was a pleasant bonus).

*The Land Between* is what ecologists call an ecotone, a large transition zone which lies between the Canadian Shield and the St. Lawrence Lowlands stretching 240 kilometers across south-central Ontario from Georgian Bay to Kingston. With the help of the Ontario Trillium Foundation and many community groups, a three part documentary series is being created on this diverse and fragile landscape. The thin soils, rocky barrens, and

wetlands characteristic of *The Land Between* were the cause of great concern for early surveyors. Andrew Miller,



David inspecting the circumferentor from 1857.

who surveyed Burleigh and Harvey townships in 1823, found that they constituted an “extremely rough and rugged tract of Country; comprising but very little if any land that in the strict sense of the word may be called good tillable land.”

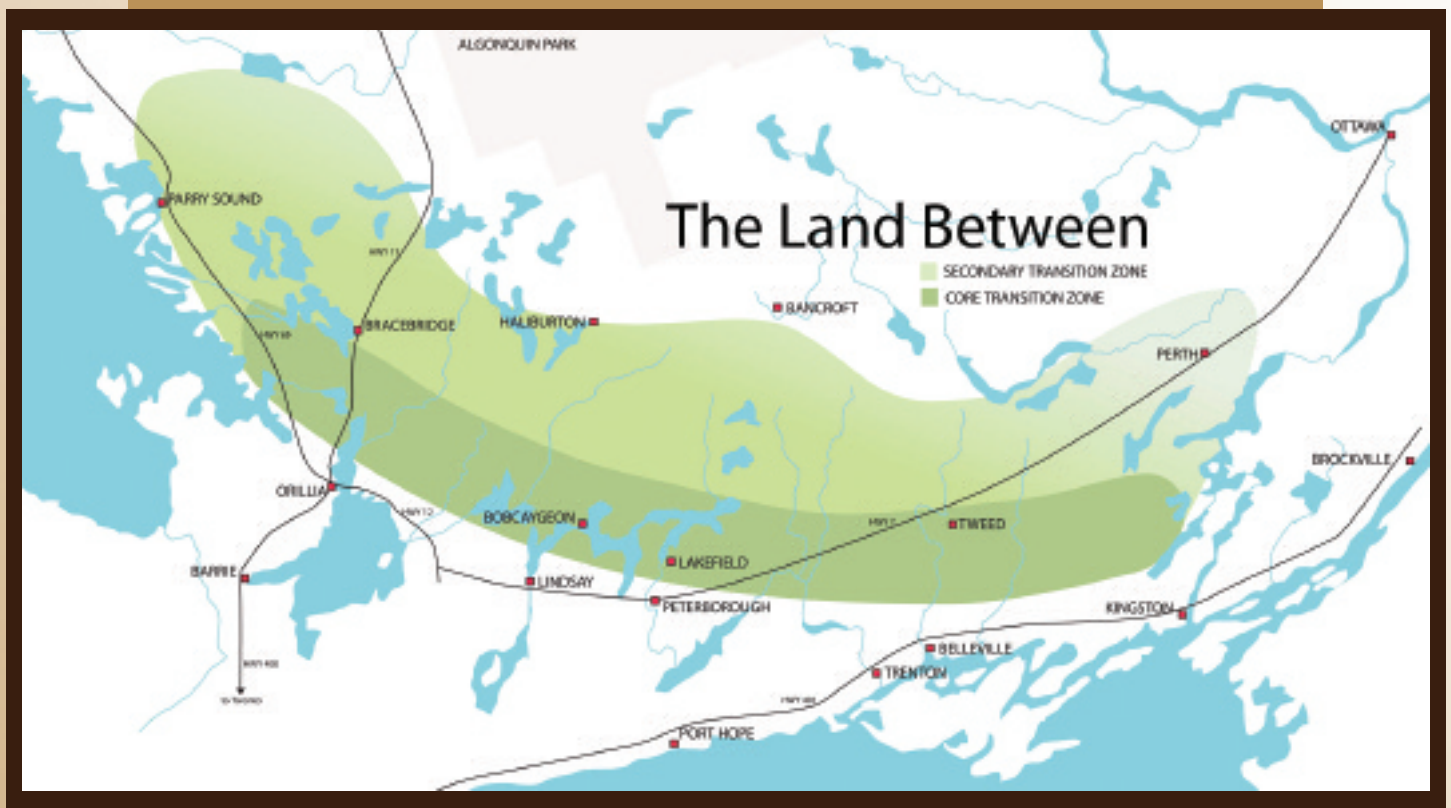
On April 2nd, three brave volunteers relived some of what Miller and Huston and his fellow surveyors faced in the 1800s in a re-enactment for *The Land Between* series. David Dossett, Poul-Erik Busk, and Lyle Merriam donned many layers of wool, rolled in the mud, and lugged historical surveying equipment over the limestone plains of the Warsaw Caves Conservation Area and Campground. Devon Jacobs from Curve Lake First Nation, acted as a guide for the surveyors, as in historic times when First Nations people were relied upon to navigate the areas of the province that were largely unknown to Europeans.

The views of the surveyors of the 1800s are quite different from contem-



Poul-Erik, Lyle, David, and Devon on the Limestone Plain





porary sentiments. “Much of the scenery chosen for the shoot was spectacular and the equipment was state-of-the-art (Red Cam, etc.), so I know that the finished project will be high-quality,” said re-enactment surveyor, David Dossett. “Re-enactments such as these are a fantastic way to engage the audience and attract people who would otherwise not be interested in the history of this region. During breaks in the filming we often answered questions about the project from the many curious passers-by who indicated that they were eager to see the finished result. For me, it was a very enjoyable and rewarding experience - I learned a lot about the conditions endured while trying to map that remote area, and I would eagerly participate in another similar project if given the opportunity.”

The Association of Ontario Land Surveyors was consulted prior to filming and graciously lent out the necessary implements for the task, including: Gunter’s chains, level, transit, Jacob’s Staff, tripod, and circumferentor ‘sighting compass’ from 1857. Series Director, Zach Melnick noted that “The artifacts and advice garnered from the Association of Ontario Land Surveyors really lent an authenticity to the re-enactments that would’ve been difficult to duplicate otherwise. There was something about using actual, period tools that really helped to transport the actors - and the resulting scenes, back in time.”

For the last year, the Living History Multimedia Association has been hard at work on *The Land Between*, part of its *Ontario Visual Heritage Project*. The Living History Multimedia Association is non-profit organization dedicated to the preservation and promotion of Ontario’s local history through educational and entertaining media. The central component of this project will be a broadcast-ready documentary series featuring the natural and cultural history of *The Land Between*, complete with cinematic re-enactments of historical events, interviews, photographs and film. Also included in the tool-kit are an interactive website, a course-guide for educators, an interactive DVD and Blu-Ray disc and a “Mobile Companion” for iPhones and Blackberries. In the fall of 2011, a series of launch events will be held across the Land Between to celebrate the completion of the project, the story of the land and the distribution of the tool kits to every school, library and museum in the area - free of charge. To find out more about the project, and to watch the previous eleven projects in streaming media, go to [www.visualheritage.ca](http://www.visualheritage.ca).



For more information, **Yvonne Drebert**, the Producer of The Ontario Visual Heritage Project can be contacted by email at [yvonne@visualheritage.ca](mailto:yvonne@visualheritage.ca).

# Some Recent Advances in GPS Precise Point Positioning

By Mohamed Elsobeiey and Ahmed El-Rabbany, Department of Civil Engineering (Geomatics Option), Ryerson University

## Abstract

Global Positioning System (GPS) surveying has traditionally been carried out in the relative (differential) positioning mode. This is mainly due to the higher positioning accuracy obtained with relative positioning in comparison with point, or standalone, GPS positioning. A major disadvantage of GPS relative positioning, however, is its dependency on the measurements or corrections from a reference receiver or network; i.e. two or more GPS receivers are required to carry out the job. New developments in GPS positioning show that a user with a standalone GPS receiver can obtain positioning accuracy comparable to that of relative positioning. Such technique is known as precise point positioning (PPP).

A major drawback of PPP, however, is that about 30 minutes or more is currently required to achieve centimetre- to decimetre-level accuracy. This relatively long convergence time results from remaining un-modelled GPS residual errors. This article discusses some recent developments in PPP, which are carried out by the Global Navigation Satellite System (GNSS) research group at Ryerson University.

## Introduction

Differential carrier-phased-based GPS techniques have traditionally been used in high-accuracy surveying applications. These techniques inherit their high accuracy from the fact that GPS receivers in close proximity share, to a high degree of similarity, the same errors and biases. The shorter the receiver separation is, the more similar the errors and biases. As such, for those receivers, a major part of the GPS error budget can simply be removed by combining their GPS observables. Unfortunately, as the baseline length increases, the errors at the reference and the rover receivers become less correlated; i.e., they would not cancel out sufficiently through differencing. This leads to unsuccessful fixing for the ambiguity parameters, which in turn deteriorates the positioning accuracy. In addition, a major disadvantage of differential techniques is their dependency on the measurements or corrections from a reference receiver or network (e.g., virtual reference station). This, however, may not be a practical solution in many cases, as a result of, for example, high cost or lack of infrastructure.

With the termination of selective availability (SA) in May

2000 and the production of precise ephemeris and clock data through, e.g., International GNSS Service (IGS), it became evident that centimetre to decimetre positioning accuracy is possible with standalone geodetic-grade GPS receivers. Such technique is commonly known as precise point positioning (PPP). Unlike classical GPS point positioning, PPP attempts to account for all the GPS errors and biases (see El-Rabbany, 2006 for details). In addition to being cost effective, the PPP method provides an accuracy level comparable to that of differential carrier-phase-based positioning (i.e., centimetre- to decimetre-level accuracy).

Typically, in PPP ionosphere-free linear combination of undifferenced code and carrier-phase observations is used to remove the first-order ionospheric effect. This linear combination, however, leaves a residual ionospheric delay component of up to a few centimetres representing higher-order ionospheric terms (Hoque and Jakowski, 2007, 2008). Satellite orbit and satellite clock errors can be accounted for using the IGS precise orbit and clock products. Receiver clock error can be estimated as one of the unknown parameters. Effect of ocean loading, Earth tide, carrier-phase windup, sagnac, relativity, and satellite and receiver antenna phase-center variations can sufficiently be modeled or calibrated. Tropospheric delay can be accounted for using empirical models (e.g. Saastamoinen or Hopfield models) or by using tropospheric corrections derived from regional GPS networks such as the National Oceanic and Atmospheric Administration (NOAA) tropospheric corrections (NOAATrop). The NOAATrop model incorporates GPS observations into numerical weather prediction (NWP) models (Gutman et al., 2003).

At present, the IGS precise orbit and clock products do not take the second-order ionospheric delay into consideration. This leaves a residual error component, which is expected to slow down the convergence time and deteriorate the PPP solution. To overcome this problem, higher order ionospheric delay corrections must be considered when estimating the precise orbit and clock corrections and when forming the PPP mathematical model. In this article we restrict our discussion to the second-order ionospheric delay, which is much higher than all remaining higher order terms (Lutz et al., 2010). This article estimates the second-order ionospheric delay and studies its impact on the accuracy of the estimated GPS satellite orbit, satellite clock



corrections, and global ionospheric maps. In addition, the effect of accounting for the second-order ionospheric delay on the PPP solution is examined. It is shown that neglecting the second-order ionospheric delay introduces an error of up to 2 cm in the GPS satellite orbit and clock corrections, based on recent (May 5, 2010) ionospheric and geomagnetic activities. In addition, accounting for the second-order ionospheric delay improves the PPP convergence time by about 15% and the accuracy of the estimated parameters by up to 3 mm.

To further improve the PPP solution convergence, we developed a modified PPP model which uses between-satellite single difference code and carrier-phase measurements. The advantage of this model is that, with the exception of multipath and system noise, all receiver-originating errors and biases are cancelled out. This includes receiver clock error, initial phase bias, and others. Our results indicate that the PPP solution convergence is improved by up to 50% in comparison with the undifferenced PPP model. This is very encouraging as it reduces the station occupation time by up to 50% and is considered a major step towards real-time PPP.

## Second-order ionospheric delay

The second-order ionospheric delay results from the interaction of the ionosphere and the magnetic field of the Earth (Hoque and Jakowski, 2008). It depends on the slant total electron content (STEC), magnetic field parameters at the ionospheric pierce point, and the angle between the magnetic field and the direction of signal propagation (Figure 1). STEC values may be obtained from agencies such as the IGS and NOAA. IGS produces global ionospheric maps (GIMs) in the ionospheric exchange (IONEX) format. GIMs are produced with a 2-hour temporal resolution and a 2.5° (latitude) by 5° (longitude) spatial resolution on a daily basis as rapid global maps. NOAA, on the other hand, produces a regional ionospheric model known as the United States total electron content (US-TEC). US-TEC covers regions across the continental US (CONUS), extending from latitude 10° to 60° North and from longitude 50° to 150° West. The US-TEC maps have a spatial resolution of 1°x1° and a temporal resolution of 15 minutes (Rowell, 2005). The maps include both STEC and vertical total electron content (VTEC) for different locations and directions. Alternatively, STEC can be estimated by forming the geometry-free linear combination of GPS pseudorange observables and applying the receiver differential code biases.

The geomagnetic field of the Earth can be approximated by a magnetic dipole placed at the Earth's centre and tilted 11.5° with respect to the axis of rotation. The magnetic field inclination is downwards throughout most of the northern hemisphere and upwards throughout most of the southern hemisphere. A line that passes through the centre of the Earth along the dipole axis intersects the surface of the Earth at two points, referred to as the geomagnetic poles.

A more realistic model for the Earth's geomagnetic field, which is used in this article, is the international geomagnetic reference field (IGRF). The IGRF model is a standard spherical harmonic representation of the Earth's main field. The model is updated every 5 years. The International Association of Geomagnetism and Astronomy (IAGA) has released the 11th generation of the IGRF in December 2009. The coefficients of the IGRF11 model are based on data collected from different sources, including geomagnetic measurements from observatories, ships, aircrafts, and satellites (NOAA, 2011). The relative difference between the dipole and IGRF models ranges from -20% in the east of Asia up to +60% in the so-called south Atlantic anomaly (Hernández-Pajares et al., 2007).

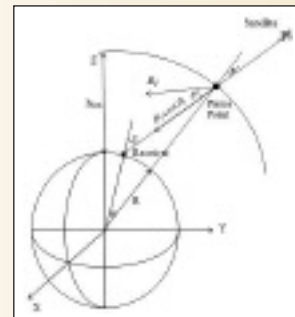


Figure 1. Magnetic Field and Propagation Direction

## Effect of second-order ionospheric delay on satellite orbit and clock corrections

To investigate the effect of second-order ionospheric delay on the GPS satellite orbit and clock corrections, Bernese GPS software was used. A well-distributed global cluster of 284 IGS reference stations was formed based on a priori information about the behaviour of each receiver's clock and the total number of carrier-phase ambiguities in the corresponding observation files. GPS measurements collected at the 284 IGS stations were downloaded from the IGS website for May 05, 2010 (DOY125). The raw data were first corrected for the effect of second-order ionospheric delay. The corrected data along with the broadcast ephemeris were used as input to the Bernese GPS software to estimate the satellite orbit and clock corrections. Our study shows that the effect of second-order ionospheric delay on GPS satel-

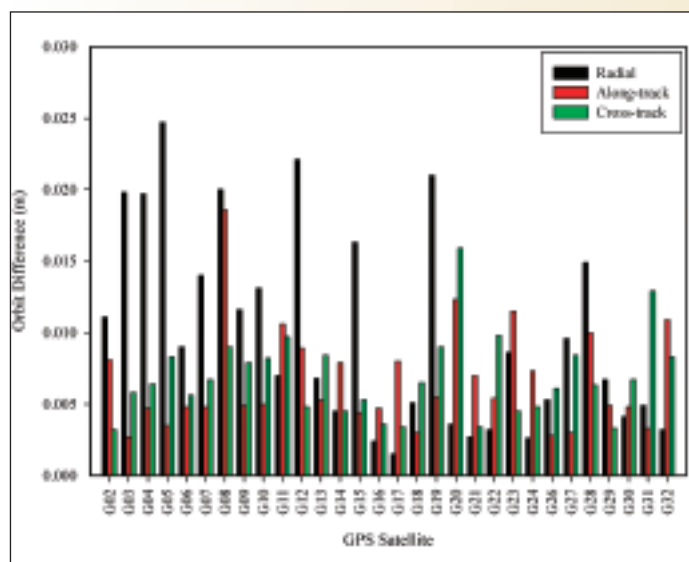


Figure 2: Impact of Second-Order Ionospheric Delay on GPS Satellite Orbit

cont'd on page 34



lite orbit ranges from 1.5 to 24.7 mm in radial, 2.7 to 18.6 mm in the along-track, and 3.2 to 15.9 mm in cross-track directions, respectively (Figure 2). Satellite clock corrections, on the other hand, show differences within 0.067 ns (2 cm) compared with the final IGS satellite clock corrections. Figure 3 shows that impact of second-order ionospheric delay on GPS satellite clock corrections root-mean-square (RMS). Interested readers should refer to Elsobeiey and El-Rabbany (2011) for more details.

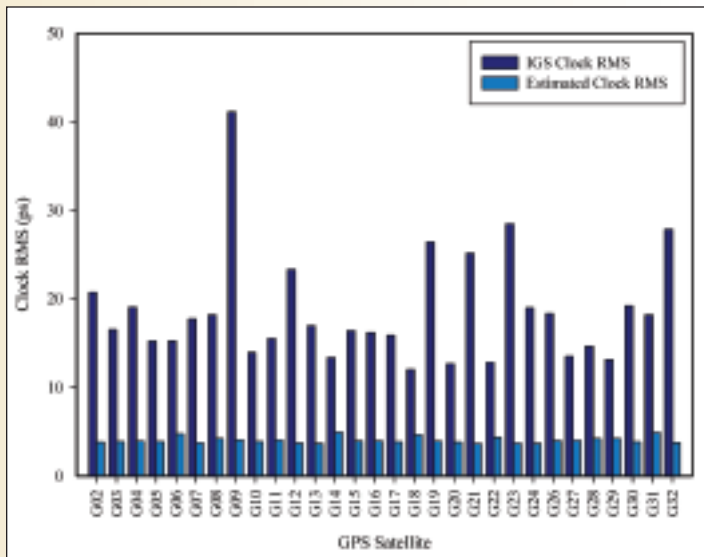


Figure 3: Impact of Second-Order Ionospheric Delay on GPS Satellite Clock Corrections RMS

## Results for undifferenced GPS PPP

The GPSPACE PPP processing software, which was developed by Natural Resources Canada (NRCAN), was modified to accept the second-order ionospheric correction, the NOAA tropospheric correction model, and others. To examine the effect of rigorous error modelling on the undifferenced PPP solution, GPS data from 12 randomly selected IGS stations were processed using the modified GPSPACE. The data used were the ionosphere-free (with both first- and second-order corrections included) linear combination of code and carrier-phase measurements. The estimated precise satellite orbit and clock corrections, from the previous step, were used in the data processing. The results show that improvements are attained in all three components of the station coordinates. Figures 4 through 6 show the 3D solution obtained with and without the second-order ionospheric corrections included, for station ALGO (Algonquin Park), as an example. As can be seen, the amplitude variation of the estimated coordinates during the first 15 minutes is reduced when considering the second-order ionospheric delay. In addition, the convergence time for the estimated parameters is reduced by about 15% on average. The final PPP solution shows an improvement in the order of 3 mm in station coordinates. It should be pointed out that the solution improvement is much higher at low latitudes whereas the second-order ionospheric effect is much higher.

## Results for between-satellite single-difference model (BSSD)

GPSPACE was further modified to perform between-satellite single difference observables. A major advantage of BSSD over the undifferenced mode is that the GPS receiver clock error, receiver hardware delay and non-zero initial phase of the receiver's oscillator are cancelled out. This, however, comes at the expense of introducing mathematical correlations to the BSSD observables. Such mathematical correlation, however, can be easily obtained by applying the law of covariance propagation. To examine our BSSD model, we processed the same data sets at the 12 IGS stations again. The results show that the solution convergence has improved at all stations by 20% to 50%. This improvement is significant and is considered a major step towards real-time PPP. Figures 4 through 6 compare the results obtained for ALGO with both the undifferenced and BSSD modes.

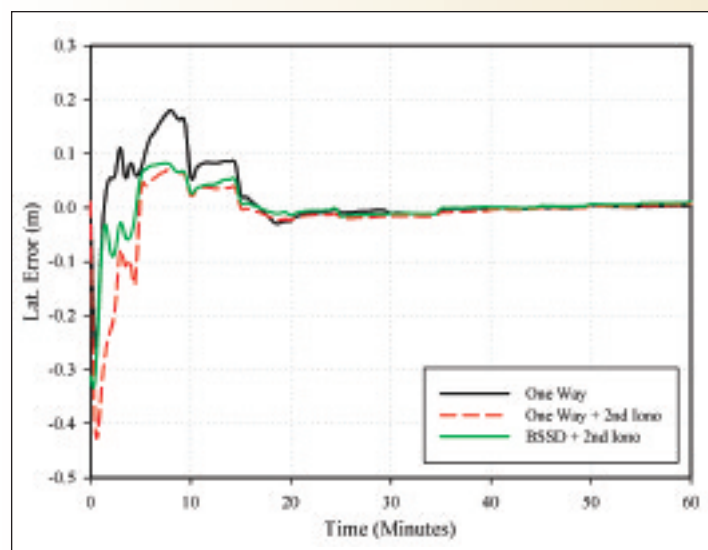


Figure 4: Latitude Improvement Using BSSD and Second-Order Ionospheric Delay vs. Undifferenced Model

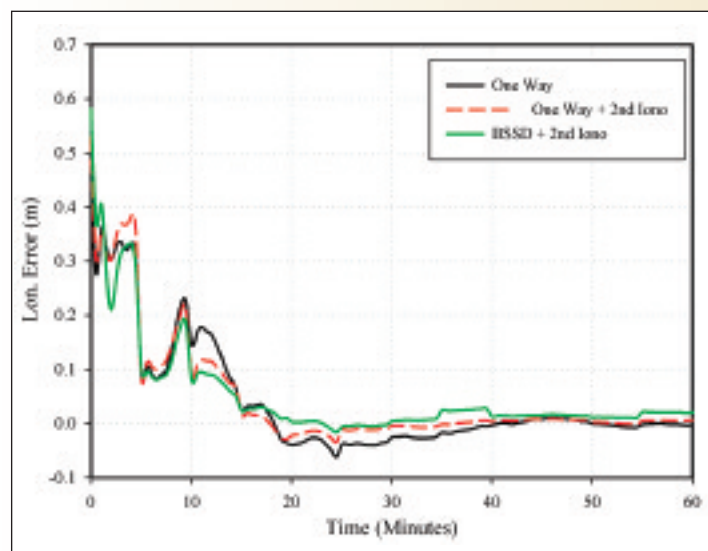


Figure 5: Longitude Improvement Using BSSD and Second-Order Ionospheric Delay vs. Undifferenced Model

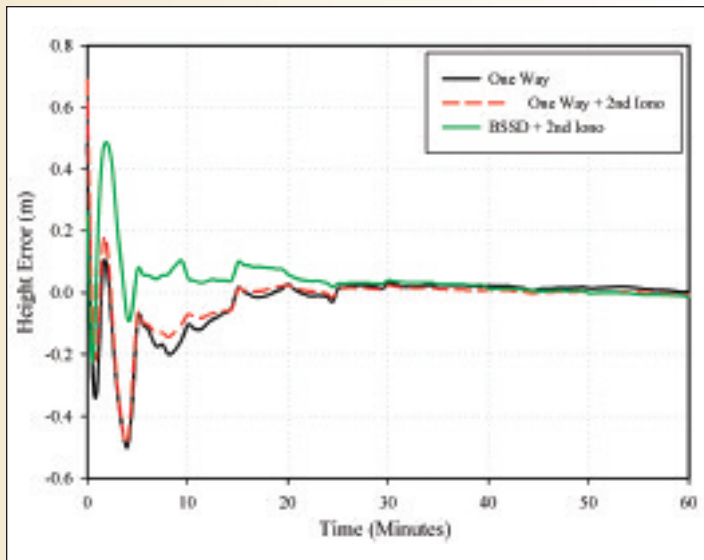



Figure 6: Height Improvement Using BSSD and Second-Order Ionospheric Delay vs. Undifferenced Model

## Conclusions and future outlook

It has been shown that rigorous modelling of GPS residual errors can improve the PPP convergence time and solution. It has been shown that neglecting the second-order ionospheric delay can produce an orbital error ranging from 1.5 to 24.7 mm in radial, 2.7 to 18.6 mm along-track, and 3.2 to 15.9 mm in cross-track directions, respectively. In addition, neglecting the second-order ionospheric delay results in a satellite clock error of up to 0.067 ns (i.e. equivalent to a ranging error of 2 cm). Moreover, accounting for the second-order ionospheric delay can improve the final undifferenced PPP coordinate solution by about 3 mm and improve the convergence time of the estimated parameters by about 15%. Further improvements of up to 50% in the PPP solution convergence can be obtained when the BSSD model is used. This is very encouraging and is considered as a major step towards real-time PPP.

Future research will develop a PPP ambiguity resolution technique for precise real-time surveying  applications.

## Acknowledgements

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Network of Centres of Excellence (Canada) and by the Natural Sciences and Engineering Research Council (NSERC) of Canada. The authors would like to thank the Geodetic Survey Division of NRCan for providing the source code of the GPSPACE PPP. The data sets used in this research were obtained from the IGS website <http://igsceb.jpl.nasa.gov/>.

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# Industry News

## MicroSurvey® Releases embeddedCAD™

MicroSurvey announces an all-new product in its CAD line-up. With MicroSurvey being an authorized Autodesk® developer, their team has developed a stand-alone application that is powered by the Autodesk engine – but contains the MicroSurvey suite of enhanced tools for Land Surveyors.

MicroSurvey embeddedCAD bridges the gap between MicroSurvey's IntelliCAD-powered MicroSurvey CAD and Autodesk's CAD tools; providing users with a slick interface, but also a complete survey drafting toolkit, including COGO, DTM, traversing, adjustments, volumes, contouring and more. Gone gold with two available versions – Premium and Standard – embeddedCAD gives users the choice between two tiers of features to ensure they are getting precisely what they need. Staying on top of which features are used in this industry, and providing the most logical combinations of these features is how MicroSurvey has been able to stick to their mission of providing the absolute best value in software – hands down.

MicroSurvey embeddedCAD 2012 opens and saves AutoCAD® 2012 drawing files and uses DWG as its native format. The command set, toolbar and menu structure are almost exactly like AutoCAD 2012 – so the implementation of MicroSurvey embeddedCAD into existing AutoCAD environments will be smooth, painless and free of conflicts. It is 100% compatible with AutoCAD because it's Powered with Autodesk Technology™.

MicroSurvey Software Inc. has been developing software and hardware solutions for surveying and mapping for over twenty five years. MicroSurvey Software is a two-time winner of PROFIT Magazine 100 Fastest Growing Companies and a winner of Deloitte Technology Fast 500. Both have recognized MicroSurvey Software for its outstanding sales growth. For more information visit  [www.microsurvey.com](http://www.microsurvey.com).

*Autodesk, AutoCAD, DWG, DWG (design/logo), Powered with Autodesk Technology are registered trademarks or trademarks of Autodesk, Inc., in the USA and other countries.*

## Calendar of Events

**August 3 to 4, 2011**

**AGRC2011**

*Advances in Geomatics Research Conference  
Kampala, Uganda*  
<http://tech.mak.ac.ug/survey/agrc2011>

**August 23 to 25, 2011**

**Digital Earth (ISDE7)**

ESRI/ACSM  
*Perth, Australia*  
[www.isde7.net](http://www.isde7.net)

**August 29 to 31, 2011**

**ISPRS Workshop**

*Laser Scanning 2011  
Calgary, Alberta*  
[www.ucalgary.ca/laserscanning2011](http://www.ucalgary.ca/laserscanning2011)

**September 27 to 29, 2011**

**INTERGEO 2011**

*Nuremberg, Germany*  
[www.intergeo.de/en/englisch/index.php](http://www.intergeo.de/en/englisch/index.php)

**September 29, 2011**

**GeoTec Event 2011**

*Vancouver, British Columbia*  
[www.geoplacement.com](http://www.geoplacement.com)

**October 5 to 7, 2011**

**Geomatics Atlantic 2011**

*"Knowing Where It's At"  
St. John's, Newfoundland*  
[www.geomaticsatlantic.com](http://www.geomaticsatlantic.com)



# Industry News

## Northway/Photomap/Remote Sensing Ltd.

We are pleased to announce that Tim Bunker, Chris Bunker and Tom Bunker have collaborated with Paul Francis in the formation of **Northway/Photomap/Remote Sensing Ltd.** The Bunker surveying firm had engaged the services of Northway-Photomap Inc. over the last two decades, using its full range of photogrammetric services in areas of mapping and scanning technologies on pre-engineering and land use planning projects and historical photo research of the existence and location of man-made and natural features. The acquisition of the assets and talent at the mapping firm maintain this long standing relationship.

**Northway/Photomap/Remote Sensing Ltd.** is an aerial photography, photogrammetric mapping and Terrestrial LiDAR scanning company with many years of experience. The company has its roots dating back to 1946 when first incorporated as the Photographic Survey Corporation.

During the 1990's Photomap Air Surveys Limited, a leader in digital mapping and GIS, was able to acquire three other mapping companies. The company acquired *Vector Mapping* in 1995, *Meridian Mapping Services (1994) Limited* in May 1998 and *Northway Map Technology Limited* in July 1998. The resulting company, Northway-Photomap Inc., had been operating since July 10, 1998 and went into receivership on March 4, 2011.

On April 21, 2011 **Northway/Photomap/Remote Sensing Ltd.** opened their doors at new facilities in Barrie, Ontario. The ownership of the mapping company has returned to its roots in the professional surveying community.

**Northway/Photomap/Remote Sensing Ltd.** operates three business lines.

The primary business is the production of topographic maps from new or existing aerial photography. Client project specifications for planning, design and quantification often require the acquisition of site specific scale aerial photography.

A unique business segment is the use of ground based LiDAR to document information about hard-scapes, namely; scenes, sites, engineered facilities and architecture for conversion into CAD enabled drawings. The capture of feature film scenes is provided for use in computer generated special effects.

The third part of our business is the managing and marketing of historic aerial photography. We have about 1 million frames of aerial photos from the 1960's onward. The photography documents the timing of the evolution of features, such as old roads, encroaching features, changes in shorelines, new construction, etc.

We'll be pleased to respond to enquiries about our range of services that give "the complete picture" and can assist other professional firms to develop unique solutions for clients.



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## EDUCATIONAL FOUNDATION NEWS

### Congratulations to our Spring 2011 Award Winners and Additional 2010 Award Winners

#### Loyalist College (2011)

Keith Watson attended the 44<sup>th</sup> Annual Convocation Ceremony on June 9<sup>th</sup> to congratulate **Matthew Brandon Davis** who was the recipient of the Eastern Regional Group Award, which is co-sponsored by the Eastern Regional Group and the Educational Foundation. This award is presented to a graduating student for scholastic achievement and leadership in the Survey Technician Program.

#### Fleming College (2011)

On Friday, June 3<sup>rd</sup> Bruce Pettit was on hand at the Annual Awards ceremony to present two awards. **Arjun Rattan** was the recipient of the Geomatics Award, which is presented to a student with the highest overall average in his/her second year in the Geomatics Technician Program. **Sarah Degenhardt** received the GIS award, which goes to the student in the GIS Applications Specialist Program who exemplifies leadership in project management. Herman Wimmelbacher also attended the ceremony to present the Lawrence Nesbit Memorial Award to **Stacy Tinkler**. This award is co-sponsored by the Kawartha-Haliburton Regional Group and is presented to a student in Geomatics who helps and assists his/her peers with patience and understanding in achieving difficult goals.

#### York University (2010)

**Mark Girin**, a 2<sup>nd</sup> year student and **Siong Tsang Kwai Kew**, a 3<sup>rd</sup> year student in the Geomatics Engineering Program received awards based upon their high academic standing. **Mark Girin** was also the recipient of the Hubert J. Reinthaler Award which is presented to a well-rounded student with a combination of high academic performance and evident characteristics of enthusiasm, leadership and professionalism.

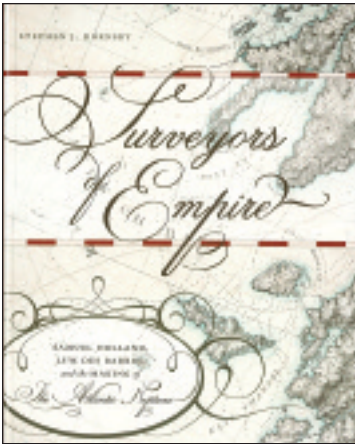
#### University of Waterloo (2010)

Awards for the 2010 academic year were presented to two students who achieved academic excellence in the Geodesy (Geog 310) course in the Geomatics program in the Department of Geography and Environmental Management. **Grace Cai** is a third year student in the Geomatics Co-op Program. Grace has plans to complete a Master's degree in either flood analysis or surveying. **Chen Shang** is in his final term of the Honours Geomatics program. He plans to expand his knowledge and pursue a graduate degree in Geomatics at the University of Waterloo. Both students articulated that the awards have not only benefitted them financially but also professionally.

The Educational Foundation would like to recognize with thanks, donations made in the memory of  
Dick Ross, Gren Rogers and Ken Hulme.



# BOOK REVIEWS



Published by McGill-Queen's University Press

ISBN 978-0-7735-3815-3

## Surveyors of Empire Samuel Holland, J.F.W. Des Barres and the Making of The Atlantic Neptune

By Stephen J. Hornsby

Colonial surveys were essential to the exercise of British imperial power in the eighteenth and nineteenth centuries. *Surveyors of Empire* is the first full account of how the British survey system was developed during mapping expeditions along the Atlantic coast of North America from 1764 to 1775. Well before

James Cook explored the Pacific, British army engineers had set the standard for coastal surveying and topographic mapping. Their exacting work culminated in *The Atlantic Neptune*, a four-volume hydrographic atlas that stands as a monument to European Enlightenment science.

*Information taken from the back cover.*

## Louis-Hippolyte LaFontaine & Robert Baldwin

By John Ralston Saul

Canada has no better interpreter than brilliant writer and thinker John Ralston Saul. Here he argues that modern Canada did not begin in 1867; rather its foundation was laid years earlier by two visionary men, Louis-Hippolyte LaFontaine and Robert Baldwin. Opposites in temperament and driven by intense experiences of love and tragedy, together they developed principles and programs that would help unite the country.

After the 1841 union the two leaders of Lower and Upper Canada worked to create a reformist movement for responsible government run by elected citizens instead of a colonial governor. During the “Great Ministry” of 1848-51, despite violent opposition, they set about creating a more equitable nation. They revamped judicial institutions, established a public education system, made bilingualism official, and designed a network of public roads.

*Information taken from inside the front cover.*



Published by the Penguin Group

ISBN 978-0-670-06732-9



Published by CRC Press, Taylor & Francis Group

ISBN-13: 978-0-415-80483-7

## Advances in Web-based GIS, Mapping Services and Applications

Edited by Songnian Li, Suzana Dragičević & Bert Veenendaal

**A**dvances in Web-based GIS, Mapping Services and Applications is published as part of ISPRS WG IV/5 effort, and aims at presenting: (1) Recent technological advancements, e.g., new developments under Web 2.0, map mashups, neogeography and the like; (2) Balanced theoretical discussions and technical implementations; (3) Commentary on the current stages of development; and (4)

Prediction of developments over the next decade. Containing 21 contributions from 60 researchers active within ISPRS communities, most of them from academia and some from governments, the book covers a wide range of topics related to the state-of-the-art in web mapping/GIS and geographic information services.

*Information taken from the back cover.*

# The Last Word

## The North American Land Surveyors Canoe Team Honours David Thompson

By Bruce Clark, O.L.S., O.L.I.P., A.L.S.

On June 2<sup>nd</sup> ten Voyageur canoes left Invermere, British Columbia on a 1,800 km trip to the Pacific Ocean via the Kootenay, Clark Fork, Pend Oreille and Columbia Rivers. They will arrive at Astoria, Washington on July 15<sup>th</sup> – exactly 200 years to the day of surveyor and mapper David Thompson's arrival in 1811.

Two of these 25-foot canoes, the "Paddle Song" and "Koo Koo Sint", will hold members of the North American Land Surveyors team which is composed of land surveyors from Alberta, British Columbia, Montana, Idaho, Oregon and Washington - and one Ontario Land Surveyor! "Koo Koo Sint" is a replica of one of the original voyageur canoes created for the 1967 Centennial Canoe Races. Named for Thompson's Salish language nickname - "one who looks at the stars"- the "Koo Koo Sint" is a veteran (as are a few of the paddlers!) of the 2008 David Thompson Brigade from Rocky Mountain House, Alberta to Prince Albert, Saskatchewan. Using six paddlers at a time, the 1100 km route along the North Saskatchewan River was completed in just 15 days.

This year's Brigade honours David Thompson's exploration of the Columbia River watershed. At the age of 41, Thompson became the first person to survey and map the Columbia from its source in British Columbia to its mouth at Astoria. This feat completed the final leg of the

Northwest Company's Great Fur Trade Highway that stretched from Montreal to the Pacific Ocean.

David Thompson was a 14 year old apprentice when he landed on the shores of Hudson Bay with the Hudson's Bay Company. By the age of

17 he was embarking on overland expeditions with the First Nations and travelled as far south as Southern Minnesota.

At the age of 18, Thompson suffered a serious leg fracture that required almost a year to heal. During his long convalescence, he learned practical astronomy and developed a passion for surveying and mapping, initially for the Hudson's Bay Company, but later for the Northwest Company and finally

as Chief Surveyor of the International Boundary between Canada and the United States.

It is estimated that David Thompson travelled almost 90,000 km by foot, canoe and snowshoe across much of northern North America. His efforts to map over 1.5 million square miles from 1784 to 1826 are today largely forgotten, but this June and July, North American surveyors will join forces to honour "one of our own" by participating in the 2011 David Thompson Brigade. For more information on the team visit: <http://www.skylark.ca/nals.htm>.



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