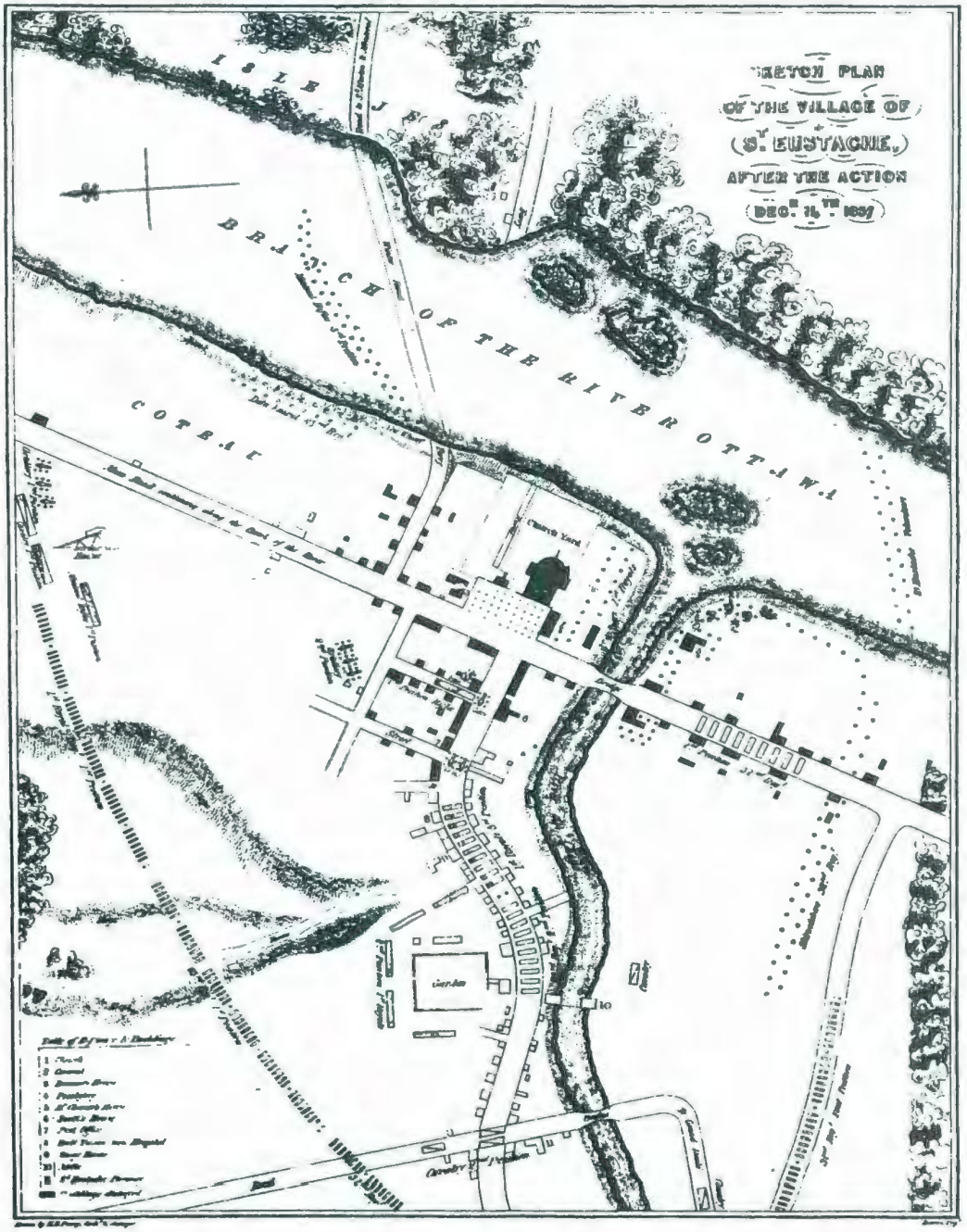
ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES

# BULLETIN

ASSOCIATION DES CARTOTHÈQUES ET ARCHIVES CARTOGRAPHIQUES DU CANADA

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# ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES / ASSOCIATION DES CARTOTHÈQUES ET ARCHIVES CARTOGRAPHIQUES DU CANADA

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H.B. Parry, *Sketch Plan of the Village of St. Eustache, After the Action Decr. 11th 1837*, [Montréal, 1837?]. Reproduite à partir d'un original de la Collection nationale de cartes et plans, Archives publiques du Canada (NMC 6260), dans la Série de cartes fac-similés de l'ACC, carte No. 118 (ISSN 0827-8024).

## PRESIDENT'S MESSAGE

This is my first President's Message and it is an honour for me to be President of our Association. The ACMLA has a reputation to be proud of for its accomplishments in improving the provision of spatial/cartographic information to our community. Stepping into the shoes of previous Presidents, Marcel Fortin, Grace Welch, James Boxall, Alberta Wood and others, will be a challenge - but made manageable by the support of an excellent Executive Board and members in general.

Our Executive Board sees some changes this year. As noted above, I have moved from 1st V-P to be President. Marc Coburn has returned to the Executive after a few years' absence in the position of 1st V-P and Conference Coordinator for the 2006 Ottawa conference. Colleen Beard (2nd V-P), Andrew Nicholson (Secretary) and Pat McIntyre (Treasurer) are continuing their strength and commitment in their current positions. Special thanks are in order for Marcel Fortin, now Past-President, and Grace Welch who relinquishes that position to him as she joins the esteemed group of Presidents Emeriti. Marcel's continuing membership on the Executive will be most valuable. Grace's knowledge and counsel has been of great benefit to the Board and the Association, and will, I'm sure, continue to be called on.

**CARTO 2005** - What a wonderful experience. Congratulations to Dan Duda and the team for organizing such a successful conference. Although we missed the presence of some of our 'regulars', it was encouraging and enjoyable to meet some newer members who have not attended previously. The presentations and social events reflected St. John's reputation for successful conferences. We will all carry fond memories of interesting sessions, windy weather, wine caves, Signal Hill, and the cruise on the schooner *Scademia*.

Now we start looking forward to CARTO 2006 to be held in Ottawa, June 17-19th. The conference theme, "Celebrating History and Innovation", marks the 100th anniversary of the Atlas of Canada. Stay tuned !

**Depository Services Program** - Among our major accomplishments is the NRCan-DSP agreement which has provided our community with affordable access to NRCan spatial data. I am delighted to report that this agreement has been extended until 2007.

**ACMLA Name Change** - Thanks to those of you who expressed your opinions through the name change balloting. The results, as reported at the Annual General Meeting, were inconclusive, there being no clear favourite. On this basis, the issue is being put aside for the time being and we will remain the ACMLA. The Board recognizes the efforts of the ad-hoc committee (Marcel Fortin, Cheryl Woods, Richard Pinnell and James Boxall) and the challenges they faced. The concerns about the limiting of the image of the Association because of its current name still exist, and we must investigate other approaches to better project our role and interests. Stay tuned for further developments on this and other ACMLA initiatives.

*David Jones*
*ACMLA President*

# REMOTE SENSING ISSUES AT THE SUPREME COURT OF CANADA

Susan McKee
Geography Librarian, MADGIC, University of Calgary

## Introduction

In 2004, the *R.* v. *Tessling* [1] case was heard at the Supreme Court of Canada. This case involved an important *Charter of Rights* [2] issue regarding unreasonable search and seizure. While the Charter is frequently discussed at the Supreme Court, other issues in this case were quite new. The search in question was a result of a type of airborne remote sensing known as forward looking infrared (FLIR) thermal scanning. This technology is increasingly used by law enforcement to detect heat loss from buildings, a common indicator of marijuana grow-operations in homes. The Supreme Court decided that FLIR use for police surveillance is acceptable in Canada. This article will discuss FLIR technology, law enforcement applications, and how the law is responding to developments in remote sensing technology.

## Remote Sensing Technology and FLIRs

To review the definition and some basic principles of remote sensing:

- "Remote sensing is the science (and to some extent, art) of acquiring information about the Earth's surface without actually being in contact with it. This is done by sensing and recording reflected or emitted energy and processing, analyzing, and applying that information." [3]
- All objects with temperatures above absolute zero naturally emit a broad range of electromagnetic energy. This energy is a function of the surface temperature of the object.
- The electromagnetic spectrum comprises all energy wavelengths, ranging from the shortest bands (cosmic rays, x-rays), the mid-range (ultra-violet, visible, infrared), to the longest (television and radio). Wavelengths are measured in micrometres (μm).

Most airborne electronic remote sensors acquire data using scanning systems, which employ sensors with an instantaneous field of view (IFOV) that sweep over the area of interest to build up and produce a two-dimensional image. The most common type of scanning systems are multispectral, which sense and record energy in many bands over a wide range of the electromagnetic spectrum, from about .3 to 15 μm.

Airborne forward looking infrared systems use a specific type of multispectral sensor called a thermal scanner. These scanners sense only in the thermal infrared portion of the electromagnetic spectrum, detecting infrared radiation (IR) or heat emissions. Thermal scanners measure relative radiant surface temperatures rather than actual temperatures. The current temperature resolution for thermal scanners is about 0.1 degrees C. While most airborne multispectral scanners view the scene of interest directly below the sensor, FLIR systems produce oblique image views ahead of the aircraft.

A thermal scanner system works in the following way: the system's scanner mirror receives IR radiation from the ground or object of interest. The radiation is focused on an array of thermal detectors which convert the incoming energy to an electronic signal. This signal is displayed on a monitor and recorded digitally to produce a thermal image. The standard convention is to have areas of higher temperature displayed as lighter toned on the image, while cooler areas appear darker. The resulting image provides a heat profile, which depicts areas of heat loss from buildings and other targets.

FLIR systems became commercially available in the late 1960s. Modern systems are lightweight and portable, and can be mounted on ground-based platforms as well as fixed wing aircraft and helicopters. They are used extensively by the

military and in law enforcement activities, fire detection, and electrical utility maintenance. [4]

## Law Enforcement Applications

Over the past decade, law enforcement organizations in Canada have increasingly employed FLIR systems for thermal imaging to detect illegal indoor marijuana grow-operations. This is due to the huge growth in recent years of marijuana grow-ops, many exporting to the United States. Law enforcement uses this technology to identify areas of unusually high heat loss from buildings, a common indicator of marijuana cultivation. Heat lamps are used for indoor plant growth, and excess heat produced must be vented to the outside of the building. In these police operations, FLIR thermal images are usually used to corroborate other evidence, such as tips from informants. [5]

Law enforcement organizations also use FLIRs for other activities such as perimeter surveillance, vehicle pursuits, search and rescue, structure profiles, analysis of disturbed surfaces, and locations of hidden compartments and grave sites.

If many urban police forces in Canada and the United States are now using FLIR systems and other high-tech surveillance tools, how did they acquire this technology? In the United States, several factors combined to produce a steady stream of new technology for use by urban law enforcement -- tools originally developed by the US military. These included joint programs such as drug war operations carried out by the military and urban police, federal programs for purchase of new technology, and the development of police paramilitary "swat" teams. [6] Now produced and distributed commercially, one can assume that these high-tech tools were introduced into Canada at about the same time.

The transfer of remote sensing technology from the U.S. government and military to law enforcement appears to be ongoing. The National Aeronautics and Space Administration (NASA) in particular touts its technology as assisting with crime scene investigations. NASA recently developed an image enhancing system called Video Image Stabilization and Registration (VISAR). This system has been made available to law enforcement through NASA's technology transfer program. [7] In another example, NASA and the National Institute of Justice have joined forces to develop and implement a "teleforensics" feasibility demonstration project using portable x-ray fluorescence systems. [8]

## Remote Sensing Legal Issues

Since law enforcement began using FLIRs in the 1990s, many legal cases have been launched in Canada and the United States concerning issues of invasion of privacy and unreasonable search. In 2003, there were about 500 cases at various court levels in Canada involving challenges to FLIR use. [9] Other remote sensing technology of increasing concern is very high resolution satellite imagery, with its potential "snooping" power. Unfortunately there is a lack of law or policy with respect to these legal aspects of remote sensing technology. [10]

There are some existing international and national regulations relating to remote sensing. The United Nations resolution *Principles Relating to Remote Sensing of the Earth from Space* [11] was adopted in 1986. This agreement seeks to promote data sharing and international cooperation. In December 2004, Canada introduced a new statute, the *Remote Sensing Space Systems Act* [12]. If passed, this act will allow the government to license the operation of remote sensing satellite systems and to regulate the distribution of data and products produced by these systems. However, these regulations don't address issues of privacy or legality of searches. In Canada, the *Charter of Rights* section 8 governs unreasonable search and seizure, while privacy issues are still mainly an area of common law.

Legal issues have been addressed in some professional associations' codes of ethics. For example, the *Code of Ethics* of the American Society for Photogrammetry and Remote Sensing stipulates that members should "Recognize the proprietary, privacy, legal, and ethical interest and rights of others." [13]

## The *Tessling* Case at the Supreme Court of Canada

The *R.* v. *Tessling* case began at the Ontario Superior Court in 1999, went to the Ontario Court

of Appeal in 2003 [14], and reached the Supreme Court of Canada in 2004. The facts were similar to many other cases before the courts on this issue. The RCMP received a tip from informants that certain persons were producing and selling marijuana from their home. Visual surveillance of the building and a check of electricity records did not reveal any indication of a grow operation. The RCMP then conducted a thermal heat profile of the suspect's home using airborne FLIR technology. The FLIR image indicated high amounts of heat escaping from the roof of the building. Based on this image and the informants' tip, the police obtained a search warrant and later found a marijuana grow-op in the home. Tessling was charged with a variety of offences. He argued in his defense that the FLIR overflight was a violation of his Charter s. 8 rights, making the search of his home illegal.

His conviction at the Superior Court was overturned by the Court of Appeal and subsequently restored in a unanimous decision at the Supreme Court of Canada. The two appeal decisions interpreted the technology issue very differently. The Court of Appeal found that the use of FLIR technology revealed information about private activities carried on inside the home, and therefore constituted an unreasonable search. This decision followed the same reasoning as that in *Kyllo* v. *United States* [15], a 2001 U.S. Supreme Court case on the same issue, where warrantless use of FLIR technology was found to be an unlawful search. The U.S. court's ruling was intended to encompass cruder existing technology as well as more sophisticated technology in development.

The Supreme Court of Canada in *Tessling* found that the FLIR imaging did not constitute a search, but was merely external surveillance. The court said that FLIR technology in use in 1999 was not sophisticated enough to detect activities going on inside the home and so was not an unreasonable search or an invasion of privacy. Technology had to be evaluated based upon its existing capability rather than its potential power.

## Future Technological Developments

Leaving aside the issue of the courts' ability to decide on highly technical issues such as remote sensing, the use of forward looking infrared systems for police surveillance of homes is now legal in Canada. A significant comment from the Supreme Court in the *Tessling* case concerned the detection capacity of FLIRs and other remote sensing technology; as this improves, courts will have to reconsider the legal issues.

So how has FLIR and other remote sensing technology improved since 1999? Research in sensor technology is producing faster, more compact, lower-cost systems with higher frame rates and better resolution, and sensor suites that can work with multiple wavelengths. [16] A quick scan of FLIR producers' websites reveals that technology has likely advanced a great deal since the *Tessling* case first went to court. For example, the commercial manufacturer FLIR Systems produces a wide variety of FLIR models for various uses. [17] Raytheon, a U.S. defense and aerospace systems supplier, has produced advanced targeting FLIR pods for the U.S. military. [18]

Another significant area of remote sensing technology development is the new commercially available very high resolution satellite imaging. The use of this for surveillance and business marketing purposes is sure to create a host of new legal challenges. Remote sensing will likely soon be back in the courts, as the law tries to keep pace with advancing technology.

## Notes

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2. *Canadian Charter of Rights and Freedoms*, Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c.11.
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17. FLIR Systems. 20 July 2005. <http://www.flir.com/imaging/> Path: Airborne Applications; Surveillance.
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# "THE EARLIEST KNOWN MAP OF ST. JOHN'S": HENRY SOUTHWOOD'S INSET OF ST. JOHN'S HARBOUR

Gerald Penney
Gerald Penney Associates Limited
St. John's, Newfoundland

*Paper delivered at CARTO 2005, joint conference of the Association of Canadian Map Libraries and Archives and the Canadian Cartographic Association, St. John's, Newfoundland, July 29, 2005.*

*Figure 1. Southside Hill excavation. (All photographs in this article courtesy of Gerald Penney)*

The rather large excavation (Figure 1) of the Southside Hill of St. John's, Newfoundland, is for the construction of a sewage treatment centre, part of the clean-up of our harbour. For the past year, myself and historian Robert Cuff have been engaged by the City of St. John's to prepare background research for an archaeological survey coincident with the installation of a three phase, two kilometer Harbour Interceptor Sewer pipe (HIS), along Water Street (Figure 2).

One purpose of this presentation is a plea for help, as we put forward a case study in the immediate utility of your profession to the heritage community. Technologies of digital scanning and colour photo-reproduction, and the support and interest of the City, have enabled us to design a research project which we feel will become a benchmark for archaeology in the city and add considerably to the knowledge of its early history prior to 1800.

A tourist map (Figure 3) outlines the "core" of St. John's in which we are specifically interested – "below the hill – downtown. It shows features which can serve as a reference for the following historic maps:

- Fort William (currently the Fairmont Hotel)
- Fort Townshend (currently the Rooms)
- The Murray Premises (Becks Cove/George Street)
- Kings Beach – the National War Memorial/ Harbourside Park

So what is it that we are looking for?

- natural features (coves and freshwater brooks, and also topography as it relates to some early, little-known fortifications)
- the natural shoreline and the progress of harbour infilling
- place names
- ships rooms
- plantations

Perhaps these last two terms are unfamiliar. A "room" is a shore establishment for the fishery. A "ships room" is an area of shoreline reserved by custom to the use of the English migratory fishing fleet. In St. John's, ships rooms were reserved until

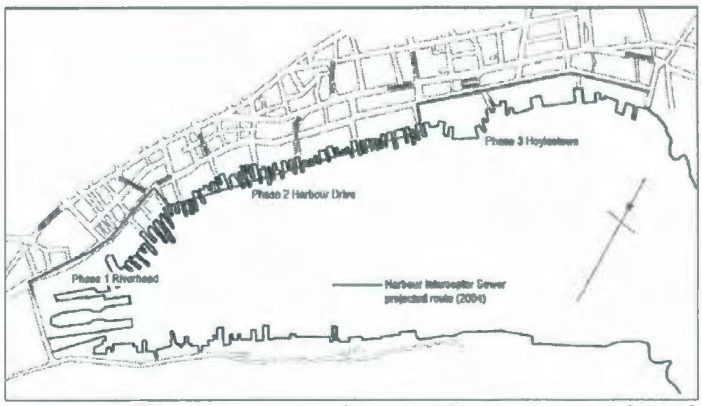


*Figure 2. HIS route projected on an 1885 insurance plan of the harbour.*

*Figure 3. Downtown Development Corporation, Schematic View of St. John's.*

1811, after which they became "public coves". These provided common access to the harbour; today those short streets leading south from Water Street are still named "coves".

The "plantations" we are looking for are not farms. Rather, a plantation (Figure 4) was the shore station of a year-round settler: his home, warehouse, stage, fish flakes, and cookroom (a bunkhouse for fishing servants), and possibly a garden and barn. These were the establishments of our pioneer settlers, called "planters".

A few key maps, mostly military survey plans, show the evolution of Water Street and the harbourfront.

The map in Figure 5, prepared in 1807 by military surveyor T.G.W. Eaststaff, "bookends" our period of greatest interest. This wonderful manuscript plan was obtained from the Public Record Office, London.

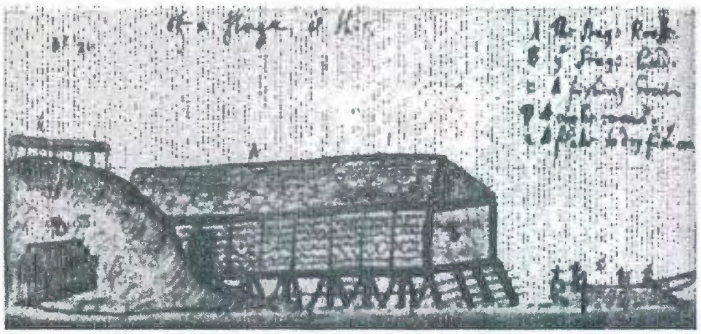

*Figure 4. James Yonge, The cod-fisher's stage, 1669.*

The area currently the War Memorial/Harbourside Park was, in 1807, the centre of town, Crown property, called the Admirals Beach Ships Room, landward of the labeled "Ordnance Wharf".

The plan in Figure 6 was prepared by artillery surveyor Hugh Debbieg in 1765, who was recommending improved fortifications. (St. John's had fallen to the French in one of the last actions of the Seven Years War – a circumstance that led to Captain James Cook's initial visit). The original, in the William L. Clements Library, University of Michigan, is particularly useful for its depiction of topography, and the courses of brooks.

Figure 7 shows a 1751 plan by naval surveyors James Braham and Edward Scott Hylton, from a copy at the British Library. Its specific utility is that it distinguishes between commercial wharves ("C") and "stages," and also shows both flakes and gardens.

Our favourite (Figure 8) is an anonymous plan of 1728, the original of which is at the Public Record Office. We are unsure of the cartographer, but it almost certainly relates to Lord Vere Beauclerk and his mandate to review the garrisoning of Newfoundland in that year. Although it employs an odd birds-eye-view perspective, it is tremendously detailed and, our analysis suggests, remarkably accurate.

This is only a sample of the most visually arresting manuscript maps of St. John's. The oldest known chart of the harbour paradoxically comes from a published source.

Although St. John's bills itself as "North America's Oldest City", little is known about its early settlement. Surviving documentation of the European migratory fishery is limited for the century and a half from 1500 to 1650. In these years, this admirable harbour, the closest to Europe, was used as a convoy point, entrepot and fishing station.

The early fishery at Newfoundland was an enormous industry and remains so even in our own time. Varying accounts from the 16th and 17th centuries suggest that St. John's was being used as a fishing station by 15-20 vessels per season, and was visited by as many more for trade and refuge.

Sir Richard Whitbourne, who spent 40 fishing seasons at Newfoundland (between 1579-1623), understood as "worthy of consideration, that so great wealth should yearly be raised, by one sole commodity of that country, yea by only one sort of fish [cod], and not upon any other trade..."

We estimate that from the first account of the fleet,

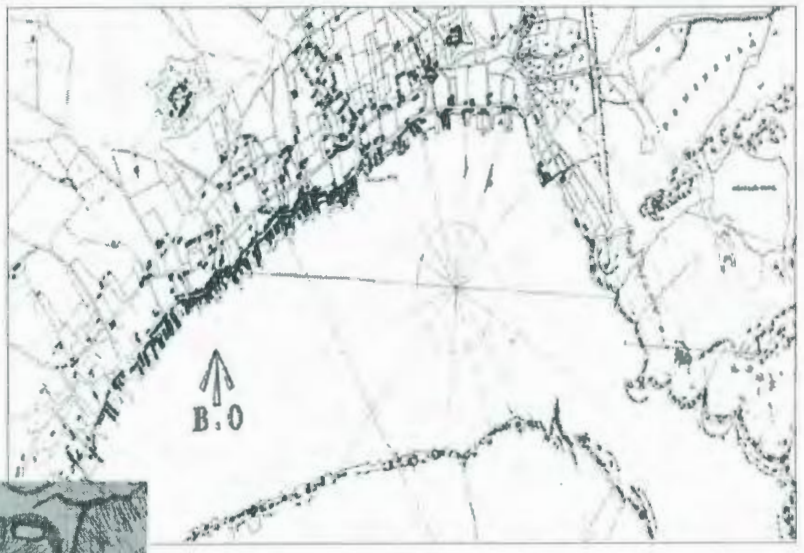


*Figure 5. Eaststaff, Map of the Town and Harbour of St. John's in Newfoundland.*

*Figure 6. Debbieg, Plan of the Town and Harbour of St. John's in Newfoundland.*

*Figure 7. Braham and Hylton, A Plan of St. John's Harbour in Newfoundland.*

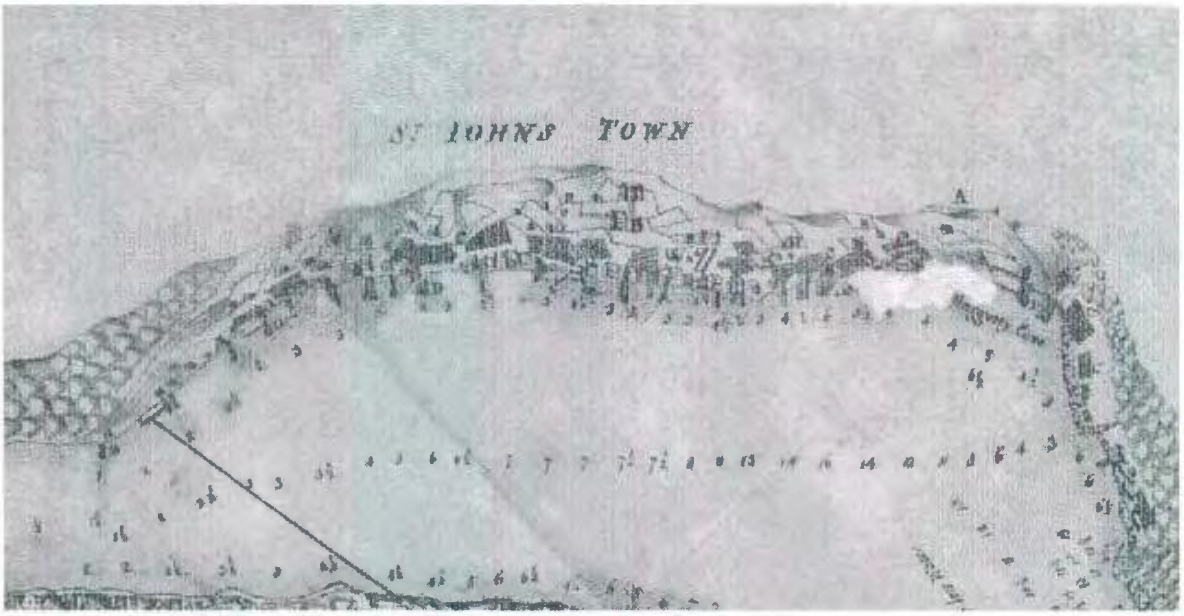


*Figure 8. Anon, A Plan of St. John's Harbour in Newfoundland 1728.*

in 1527, for the next 100 years St. John's was used as base for a seasonal fishery by 300-600 men annually.

Certainly St. John's is one of earliest place names and harbours to appear on maps of the new world, but maps indicative of settlement are unknown prior to 1675. Early maps which show St. John's harbour in some recognizable shape include the "Stockholm" map of 1605, the "Velasco" map of 1610 and John Mason's map (Figure 9) of Newfoundland, published in 1625, drawn from surveys which this governor of Cupids colony made in 1617. On the manuscript map "Terra Nova" from the Blathwayt atlas (c1660), "St Joanes" is depicted disproportionately large, but quite realistic in outline and orientation (Figure 10).

Newfoundland's second historic period is considered to start with the founding of the Cupids colony in 1610. It is the records of proprietary colonies, particularly Cupids and Ferryland, which are the major documentary sources of the 17th century. Active archaeology, at both sites, continues to inform an understanding of the early migratory and planter fisheries.

But the early history of the "plantation and colony of St. John", although it was the largest fishery and most important harbour from the first, has been almost unexplored. By 1630 or so, St. John's was an "English" harbour, at the centre of the "English Shore" which stretched from Cape Race to Cape Bonavista and was described by early cartographers as "the trading part of Newfoundland", or even "the only useful part of Newfoundland". Sir John Berry, in 1675, pronounced St John's as the "excellent Harbour... in the middle of the land".

There are a few references which have been interpreted to suggest St. John's was "settled" contemporary with the proprietary colonies.

One interesting document from our research is an account by Sir William Alexander of how his prospective colonists, bound for Nova Scotia, spent the winter of 1622-23 at St. John's. This is the earliest documented over-wintering. Alexander did not enumerate St. John's in his list of Newfoundland's year-round plantations, and noted that his colonists were seemingly marooned here in isolation and "in May some doubting of a supply, had engaged themselves to several Fishermen", which suggests that the harbour was not occupied year-round at that date. Yet William Payne, attempting to sell a share of his lot in 1627, marketed St. John's as "the principall prime and chief lot in the whole country... the yce being broken and some houses already built".

We postulate a "founding event" for the St. John's plantation in 1640 when the London patentees of the Ferryland colony sent one John Downing to investigate and dispossess Governor David Kirke. Downing eventually settled at St. John's where "The proprietors had given them... six admiral's places

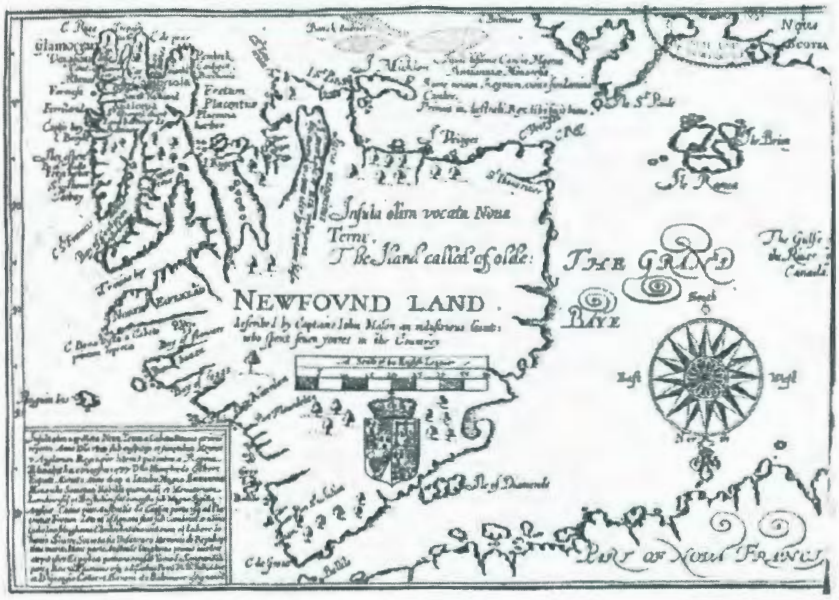


*Figure 9. Mason, The Island called of olde: Newfound Land.*

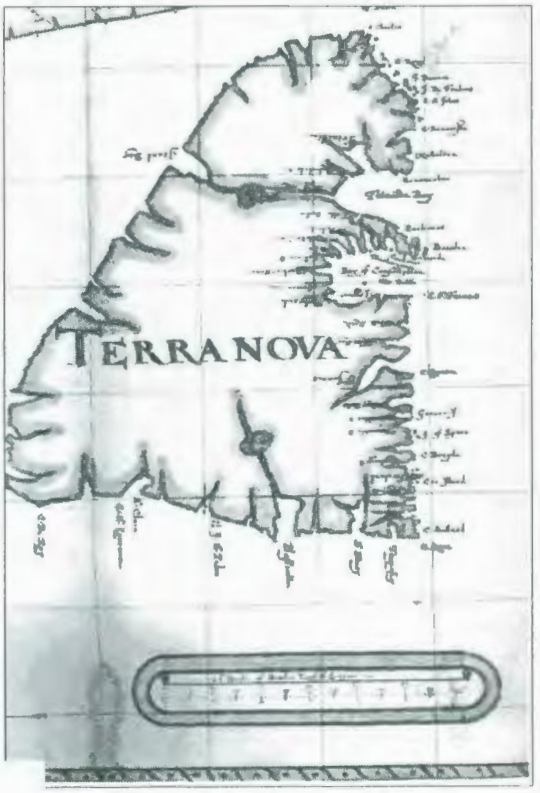


*Figure 10. Blathwayt. Terra Nova.*

*Figure 11. Southwood, The Coast of New-Found-Land from Cape Raze to Cape St. Francis.*

for fishing accounted the best." One of the "six admiral's places" was Downing's own plantation, between Jobs Cove and the Kings Beach.

If we move on to a printed chart (Figure 11), "The Coast of New=Found=Land from Cape Raze to Cape St. Francis. Described by Henry Southwood Anno 1675", you can find "Downings" on his inset of St. John's harbour.

In conducting a review of the cartography of the Narrows more than a decade ago for the Prossers Rock boat basin development, a co-worker, William Gilbert, discerned this chart as having the oldest inset of St. John's harbour. At that time, we were only interested in a specific harbour fortification. In revisiting the inset for this project, we are led to the conclusion that it was prepared from field survey by a painstaking cartographer. Its first state, from John Seller's *Atlas Maritimus* (c1676), is much richer in detail than other published states, and greatly informs the archaeology of the "oldest city".

This version of Southwood is the earliest of seven different published states, most of which appeared in editions of the *English Pilot*, from 1689 to 1784. Southwood's was the operative map of St. John's harbour until Cook. His accompanying sailing directions were also the operative, much reproduced, version until Michael Lane's *Directions for Navigating...* appeared in a 1775 *Pilot*.

So who was Henry Southwood?

In late May 1675, two frigates of the British Navy were assigned to the Newfoundland fishery, to convoy the fishing fleet and to enquire into the state of the fishery and settlement. In charge of the expedition was Sir John Berry, in HMS *Bristol*, accompanied by HMS *Swann* under Captain Carter. The *Swann* arrived at St. John's first, on June 17th.

Henry Southwood was ship's master of the *Swann*. On July 5th, Carter "sent my M[aster] in a Shallop to the Northward to take an account of shipps boats planters &c according to my instructions", while Berry sent a boat to the southward. This account comprises the first Newfoundland census, sometimes referred to as "Berry's List". To trace an ancestor to Berry's List is the dream of Newfoundland genealogists – the equivalent of ancestors on the *Mayflower*, or the *Hector*.

Captain Carter further notes that on 25th July he sent a letter to "Mr [Samuel] Pepys (by a Plymouth wessle) to lett him know I had sent my Master to the Northward". Despite Berry having sent his man, just a week before the convoy sailed from Bay Bulls, Carter dispatched Southwood "to take the same accompt".

It seems clear that the first state of Southwood's chart was prepared for publication from drafts that following winter. The inset of St. John's is one of two, the other being of Trinity Harbour (Figure 12), which is on a second sheet, *Salmon Cove to Cape Bonavista*.

We are unsure of whether Southwood was in Newfoundland in 1676, but in 1677 he and the *Swann* were back to compile sailing directions and chart courses and distances, as well as soundings "as we sailed in and out in His Majestys ship the Swan; by Henry Southwood, in the year 1677". It appears that his tables and "True Description of the Course and Distance of the Capes, Bayes, Coves,

*Figure 12. Southwood, Salmon Cove to Cape Bonavista.*

Ports and Harbours in New-found-land; with Directions how to sail in or out of any Port or Place between Cape Race and Cape Bonavista" were not published until the 1689 *English Pilot: the Fourth Book*. The Pilot also contains four detailed charts: Harbour Grace, Bay Bulls, Cattalina Harbour and Port Bonavista; an example is Bay Bulls (Figure 13). On the evidence of drafting style, as well as comparison with the nomenclature employed in Southwood's "True Description", we have concluded that all four are his charts, as are the insets of St. John's and Trinity. Professor Ronald Seary pointed

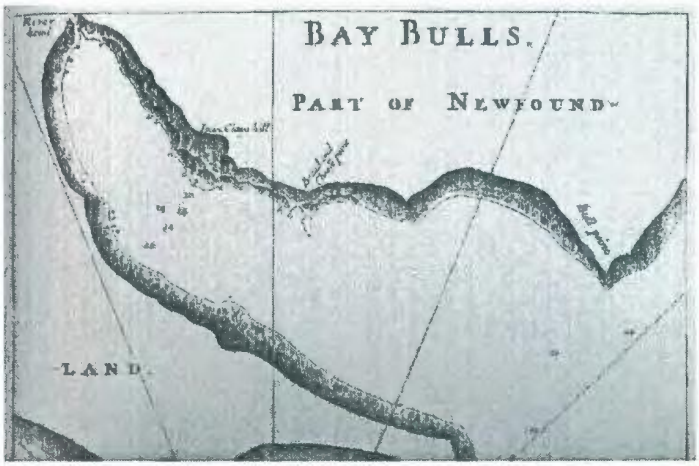


*Figure 13. Southwood, Bay Bulls. Part of Newfound-Land.*

out in 1971 that no cartographer before Cook recorded as many contributions to the nomenclature of Newfoundland as Southwood.

Incidentally, Augustine Fitzhugh's large manuscript chart of Newfoundland, dated 1693, has four insets: three "Southwood" harbours (Harbourgrace Bay, St Johns Harbour, and Bay of Bulls) and adds "Ferrey:land". Our reading of Southwood's sailing directions for Ferryland strongly suggests that Fitzhugh's "Ferrey:land" inset was also a poor copy of a Southwood harbour chart.

That, in nutshell, is all we know about Henry Southwood, a man whose contributions to the *English Pilot: the Fourth Book* (including numerous headland drawings, charts, tables and notes) make up very nearly 20% of the first edition and appear in the 37 editions of the *Pilot* from 1689 to 1794.

It is unknown whether "our" Henry Southwood can be identified with (or is perhaps a relative of) the Henry Southwood who served in the Parliamentarian, Commonwealth and Restoration navies as commander 1646-66, being promoted captain at the last. But whether our Southwood was an experienced captain, willing to accept a master's warrant in peacetime, or an ambitious young master keen to apply himself, his contribution to Newfoundland cartography was substantial, if largely unrecognized.

So why has his work been discounted or misinterpreted?

The major reason why Southwood's work would appear discounted as a source has to do with the limitations of his inset of St. John's (Figure 14) as reproduced in the 1689 *English Pilot: the Fourth Book* and subsequent editions.

So, if this is not the oldest surviving detailed map of St. John's, what is? and what does it show?

The *Atlas Maritimus* version of Southwood's chart with its harbour insert (Figure 15), presumed to date from 1676, shows numerous details which indicate that it was prepared from manuscript or field notes and drawings. Careful examination reveals details which are either not present in other versions, or which are poorly copied.

Our hypothesis is that Southwood depicted what he saw in a way that he felt would be useful to other mariners and, at least in this version, the publisher strove faithfully to depict his observations.

The original inset is only about four inches wide, so please excuse the fuzziness of our reproduction.

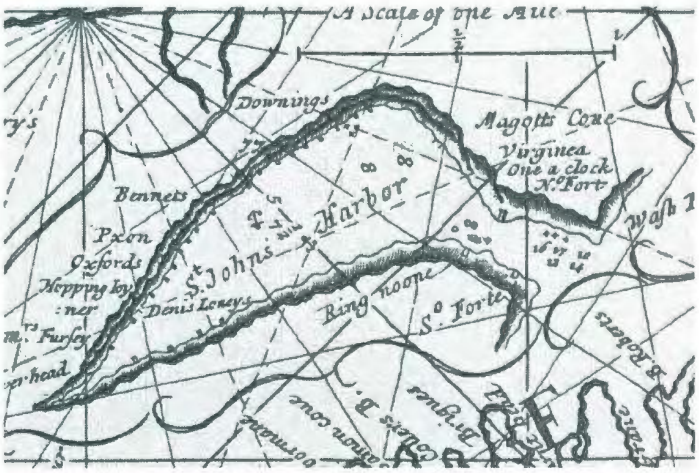


*Figure 14. Southwood, Inset of St. John's, from English Pilot.*

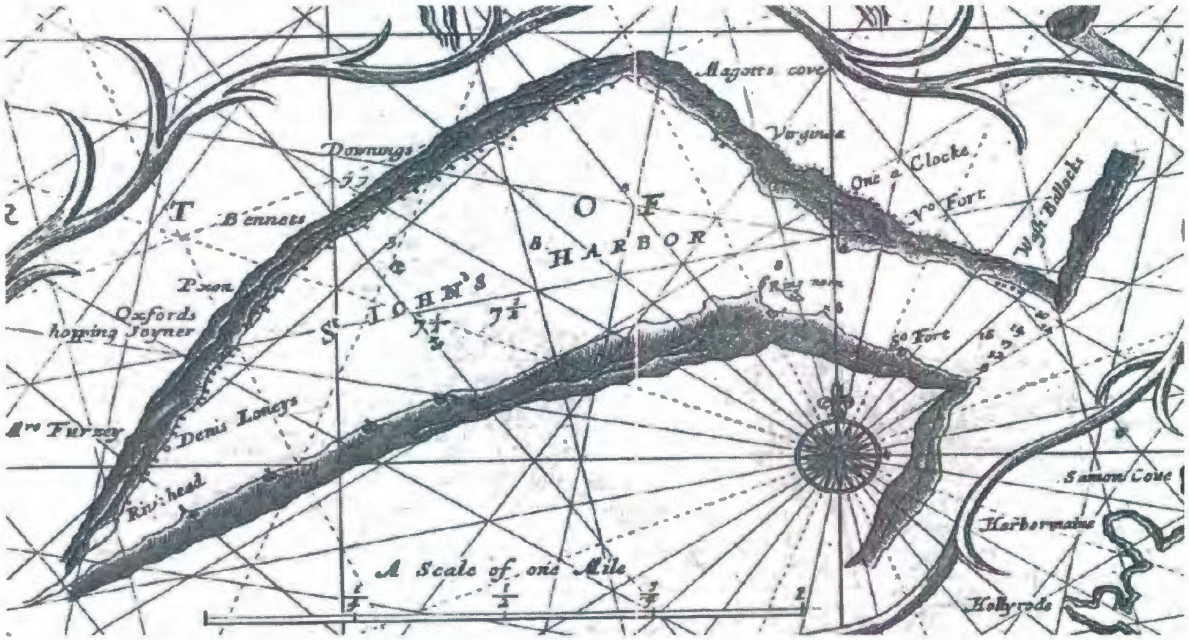


*Figure 15. Southwood, St. Iohn's Harbor, from Atlas Maritimus circa 1676.*

In the original it is actually extremely difficult to see detail with the naked eye.

The first state shows 27 houses. The majority are small structures depicted representationally. The eastern end (Figure 16) of the harbour (Maggoty Cove), shows three "huts" in the "upper rank" – in the vicinity of the present-day Fairmont Hotel.

Towards the harbour, there is a larger structure with a different roof type, with perhaps a porch. This is one of eight larger structures, each having distinctive roof-lines. Our suggestion is that these are landmark structures, the depiction of which was intended to aid ship-board identification of particular locales.


*Figure 16. Southwood, Maggots Cove.*

To quote a 1711 description by military engineer Christian Lilly:

> Between Fort William and the River mouth lies the Town of St. John's straggling along by the Water's edge... the houses in truth (except half a dozen) are but of little value and no better than just such Huts as used to be built in the Army during Winter Campaigns.

Figure 17 shows a "planter's" establishment, Oxfords. Notice also the undulations in the shoreline here, between our Bishops and Becks coves (the

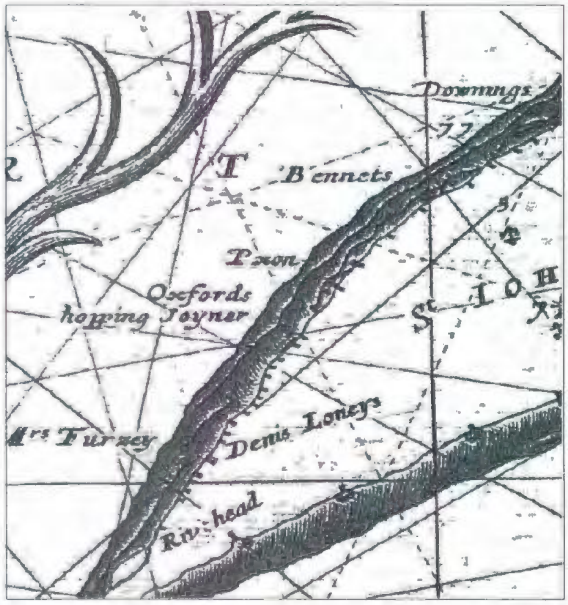


*Figure 17. Southwood, Oxford's plantation.*

Murray premises site).

The second point is that Southwood shows a pattern of distribution of wharves and stages reflective of settlement. (On later versions wharves are regularly and indiscriminately spaced.) There are two types of wharves depicted, one shaded, the other not. The largest wharf, "Denis Loneys," is half-shaded.

Thirdly, you will notice that through cross-hatching Southwood depicts topography. By comparison with other cartographic works and some early waterfront watercolours, we have concluded that this is a remarkable and valuable depiction. The number "77" at top we interpret as an elevation in the vicinity of Gower Street, at Nunnery Hill, suggesting a leading marker or flag mount visible for some distance through the Narrows.

Fourthly, there are a series of family surnames or locales, from west to east:

- Mrs Furzey
- Denis Loneys
- hopping Joyner
- Oxfords (note how these last three are grouped together)
- Pxon (listed as "Exton" in the census)
- Bennets
- Downings

Through an analysis of the early censuses, beginning with a list of planters compiled by James Yonge in 1669, through "Berry's List" of 1675, and similar censuses conducted in 1677, 1680 and 1682, supplemented by a 1701 list of fishing plantations, we are able to identify each of these properties -- with one exception.

"Joyner" does not appear in any list of residents or locales associated with 17th century St. John's (although the name is copied with each different state); our conclusion is that this planter identified in numerous records as Richard Hopping (or Hopkins), who lived near the current Murray premises site from 1666, was a joiner, a carpenter, associated with the establishment of Thomas Oxford.

Grouping Oxford, Hopping and Joyner together, our working hypothesis is that these named properties are the "six admiral's places for fishing" mentioned in John Downing's 1677 petition as having been granted in 1640.

Finally, accepting the first state as an accurate depiction of the distribution of stages, rooms, plantations and families in 1675 has allowed us to make sense of a number of other late 17th century records, previously regarded as "just" lists of names. Several lists are clearly geographic (either listing planters from east to west or vice versa), some are by size of establishment. One, from 1680, notes the length of residence of each head of household in St. John's and Bay Bulls. A document from 1701, which we call the "Graydon list," is invaluable as it is geographically arranged and attempts to relate 1701 fishing rooms to previous owners and to the locales identified on Southwood's inset. There are, by the way, 27 plantations in 1701.

This is only a small part of what we are learning from this small inset. Almost daily we are astounded anew at the level of detail in this published chart (particularly so as it is barely visible with the naked eye), and at its relevance for our task.

In conclusion I make a plea for any of you for your expert knowledge or suggestions, which will help us to further unravel Henry Southwood, the man and his charts.

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*Attendees at CARTO 2005 conference enjoyed a fabulous view of St. John's at the banquet site, the Admiral's Green Club House. (Photo courtesy of Alberta Auringer Wood)*

# PRESERVATION AND MANAGEMENT OF GEOSPATIAL DATA

David Brown
Library and Archives Canada

*Paper delivered at CARTO 2005, joint conference of the Association of Canadian Map Libraries and Archives and the Canadian Cartographic Association, St. John's, Newfoundland, July 28, 2005.*

## Introduction

According to a Statistics Canada's survey conducted in the year 2000 for the mapping and surveying services industry, there are over 2,000 companies in Canada that generate $1.5 billion worth of annual revenues from geomatics-based activities. From the design of the roads on which we travel, to the location of our place of work, nearly every facet of everyday life is touched, in some way, by geospatial data.

Geospatial data are being produced by all levels of government and in the private sector at an unprecedented rate. However, long-term access to the wealth of these data will be compromised unless policies and procedures are created and implemented by geospatial data custodians to ensure their preservation and continued availability to policy makers, industry and researchers. Decisions about our economy, environment and society cannot be based simply on current data; temporal analysis is required to identify trends, evaluate impacts and make informed decisions.

While considerable study and research is now being undertaken to address the subject of preserving electronic information, very little study focuses on the unique challenges to successfully preserve geospatial data. Part of the solution to the preservation problem lies in the development of an enhanced infrastructure for geospatial data that is based upon the use of sound information management and technology standards, and the application of suitable preservation techniques and tools. A common infrastructure provides the framework to ensure there is uniformity to meet the needs of the geomatics community. It also makes certain that data collection and maintenance are undertaken in the national interests of Canadian society.

> "The preservation and re-use of digital data and information forms both the cornerstone of future economic growth and development, and the foundation for the future of memory." (Seamus Ross, *Changing Trains at Wigan: Digital Preservation and the Future of Scholarship*, 2000)

The aim of this paper is to:
1. Identify the legislative and policy framework required for the management of geospatial data created by federal, provincial and territorial governments.
2. Identify and define the information management issues that must be addressed for the integral management of geospatial data.
3. Review existing archival strategies and practices concerned with the preservation of digital information.
4. Identify some information technology standards that should be considered and practised for the preservation of both the logical and the physical storage of geospatial information.

## Legislative and Information Policy Framework

The following are some of the Government of Canada legislation relating to information management:

- Access to Information Act
- Canada Evidence Act
- Copyright Act
- Criminal Records Act
- Emergency Preparedness Act
- Financial Administration Act
- Library & Archives of Canada Act
- Official Languages Act
- Official Secrets Act
- Personal Information Protection and Electronic

Documents Act
- Privacy Act
- Statistics Act

## Library and Archives of Canada Act

Under the auspices of the *Library and Archives of Canada Act*, the Library and Archives Canada (LAC) has responsibility for acquiring, preserving and making the 'documentary heritage' of Canada known and accessible. Under this mandate, it can acquire 'government and ministerial records' that it considers to be historical or of archival value. Under the definition of a record, this includes any documentary material, other than a publication, regardless of medium or form, including geospatial data.

Library and Archives Canada and federal government institutions have specific roles and responsibilities related to the management of government information. Under Section 12, 'no government or ministerial record... shall be destroyed or disposed of without the consent of the Librarian and Archivist'. Under this scenario, the Library and Archives has a responsibility to work with federal government institutions to develop record disposition authorities that identify information that should be transferred to the care and control of the LAC after its operational value to an organization has ceased. During this process, information is assessed (be it analogue or digital) to determine its enduring value to Canadians. For information that is identified as being of historical or archival value, an agreement is developed that outlines the dual roles and responsibilities of the institution and the LAC to ensure the integrity of that information while it resides in the custody of a department. The Library and Archives also has a responsibility to work with departments to help them manage the body of information that is not considered to be of historical or archival value, but contains considerable business value to an organization.

The primary librarianship functions of the LAC are to acquire, preserve and make accessible and known the published documentary heritage of Canada to all Canadians. Under Legal Deposit and its associated Regulations, all newly published information in various formats (including digital) are acquired from publishers who make a publication available in Canada.

Although cartographic and geomatic materials will not be explicitly covered by the Regulations of Legal Deposit until January 2007, in 1995 the former National Archives and the National Library entered into an agreement whereby the National Archives acquired and preserved both published and unpublished cartographic materials consisting of separately produced single sheet and series maps, atlases, globes and geomatic information.

## Copyright Act

The Canadian constitution provides that activities that are completed under the Government of Canada are to be carried out in the Queen's name. Today, the Crown includes units of the federal, provincial and territorial governments. Each of these units governs as part of the Crown and therefore exercises Crown copyright. Copyright protects 'intellectual' as opposed to 'physical' property.

Section 12 of the *Copyright Act* provides that the Crown owns copyright in any work that has been prepared or published by the Crown, or under its direction. The *Act* also stipulates that the copyright in the work shall continue for the remainder of the calendar year of first publication and for a period of 50 additional years. At the end of the 50 years term, a work falls into the 'public domain'.

Copyright in unpublished Crown works is perpetual. The majority of the information that is created in the federal government is of an unpublished nature. Under these circumstances, the *Library and Archives of Canada Act* implies that the transfer of historical or archival records includes not only the physical transfer of the records, but the transfer of 'crown copyright' and the intellectual property rights associated with them. Communication Canada is responsible for giving permission and/or issuing license agreements giving an individual, a publisher or the private sector written authorization to reproduce Crown works still under copyright. This is done with an author department's authorization.

## Management of Government Information Policy

The Government of Canada is increasingly using information technologies to serve Canadians and to record its business, which requires it to ensure that information is accessible and useable over time and through technological change. Furthermore, the

government must manage information to ensure that Canadians receive consistent service regardless of how they choose to obtain it, whether in-person, by telephone, through mail, or via the Internet. The objective of the *Management of Government Information Policy* is to ensure that government information is managed effectively and efficiently throughout its life cycle.

The *Policy* came into effect on May 1, 2003 and it provides direction on how government institutions, departments and agencies should create, use, manage and preserve information in a comprehensive and strategic manner. The key premise of the policy is that the preferred future business record of the Government of Canada will be digital.

The *Policy* advocates that institutions must meet the following objectives:

- Ensure that governance and accountability structures are implemented for the cost effective and coordinated management of information under their control to support effective decision-making, services and program delivery;
- Provide the infrastructure for the effective and efficient management of information, regardless of its medium or format, to ensure its authenticity and integrity for as long as it is required by legislation, departmental statutes, and other laws and policies;
- Manage information to facilitate its universal access by anyone and in a manner that optimizes its sharing and re-use in accordance with legal and policy obligations;
- Document the decision-making processes throughout the evolution of policies, programs, and service delivery;
- Preserve information of enduring value to the Government of Canada and to Canadians;
- Establish a coordinated and comprehensive approach to describing the institution's information; and,
- Maintain a current and comprehensive classification structure(s), including metadata.

The leadership required to achieve the objectives of the *Policy* are being provided through the Treasury Board Secretariat, Public Works & Government Services Canada and Library and Archives Canada. Together, these agencies are responsible for maintaining an overall understanding of the state of information management practices and providing the appropriate control mechanisms across government. These agencies will work with government institutions to help solve information management concerns and issues, and lead government-wide information management improvement initiatives.

These three pieces of legislation and policy set the overall context under which digital information should be managed within the Government of Canada. Even though the Treasury Board Secretariat develops Government of Canada information management (IM) policy, its implementation is enhanced through guidance from the Library and Archives.

## Provincial and Territorial Governments

There is also a legislative basis for provincial and territorial governments to preserve and archive electronic information, based on the following legislation:

- Alberta: *Historical Resources Act of 1980*
- British Columbia: *Interpretation Act*
- Manitoba: *Archives and Recordkeeping Act of 2001*
- New Brunswick: *Archives Act of 1977*
- Newfoundland and Labrador: *1983 Archives Act*
- Northwest Territories and Nunavut: *Northwest Territories Archives Act of 1988*
- Nova Scotia: *Public Archives Act of 1998* and *Government Records Act of 1995-96*
- Ontario: *1923 Archives Act*
- Prince Edward Island: *P.E.I. Archives and Records Act of 2001*
- Quebec: *1983 Archives Act*
- Saskatchewan: *Archives Act of 1945*
- Yukon Territory: *Archives Act of 1979*

## Data and Information Management Issues

Data collection, management, preservation and access activities in individual organizations and institutions are driven by the need for managers to make business decisions, and deliver products and services that are based on the use of reliable and accurate data. In many organizations today, data and information are maintained for only as long as they have immediate or short-term business value and they are not effectively managed after immediate interest in them has declined. Data and information go through phases of value to an

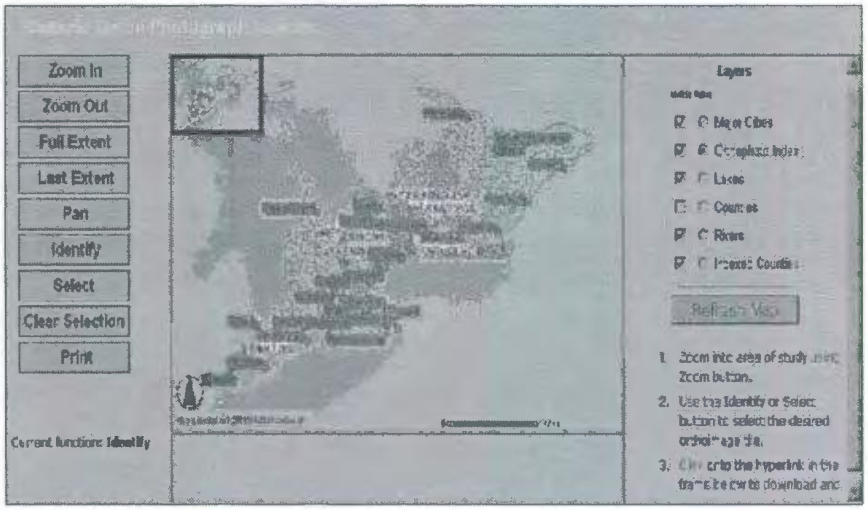


*Figure 1. Information Life Cycle.*

organization. To maintain the accuracy and long-term value of data, including geospatial data, there is a necessity for organizations to develop information management plans and adopt preservation strategies that are based upon an information life cycle management model (Figure 1).

Government program managers are entrusted with public resources and as data custodians they have a responsibility to protect the integrity of the data for which they are managerially accountable. Custodianship is the hub of an efficient and effective geospatial information management system because it provides accountability for data management practices and indemnifies an authoritative source within the organization. Custodianship provides a means to facilitate data management on the behalf of others and it provides continuity in the delivery of a geospatial data infrastructure. Custodianship roles and responsibilities should ensure the ability of an organization to provide quality and accurate data for reporting, decision-making and research purposes.

Unfortunately, many managers have no idea where their organization lies along the data management continuum (Figure 2). In fact, most managers have no idea what types of data are collected for operational requirements, nor do they know anything about the manner in which those data have been collected. Often, when they do know the answers to these questions, they have no substantive information that describes the structural characteristics of those data to facilitate their future utility. We do know however, that the management of corporate data is not occurring in an orderly fashion, and many problems exist regardless of requirements stipulated in information management policy and legislation.

## Technology Obsolescence

In terms of volume, federal, provincial and territorial governments are storing terabytes of digital information, most of which is stored in a variety of logical formats and some of which is at risk of being lost because of the manner in which it is physically stored. Digital information is by its nature fragile and impermanent and will quickly become obsolete if it is not first, properly managed within the context under which it was created and used, and then moved to an environment that ensures its preservation over time. Preservation activities for geospatial data are but one element that organizations must address in the information life cycle management process. However, it is an issue of enormous importance. The goal of preservation is to ensure the maintenance and protection of a body of information for access by present and future generations.

The challenge of managing and preserving digital information includes the development of a cost effective preservation strategy that will liberate the data from proprietary file formats that are

**Data Management Continuum**

- No organizational data architecture exists
- There is an incomplete organizational data architecture
- Organizationally-defined Data Management Standards are being applied for new applications
- Internal standards for data formats, data transfer and data definitions homogeneously applied
- Corporately-applied standards are compatible with those of clients, suppliers and business partners

*Figure 2. Data Management Continuum.*

dependant upon specific software and hardware. The creation of database backups that rely on the use of an operating system's restoration software cannot be considered to be a reliable long-term preservation strategy, even though this approach may fulfill short-term operational needs. In addition, a preservation strategy must account for the volatility of the physical medium upon which the data are placed for short, medium and long-term storage requirements.

Some organizations and agencies have created data management policies for their geospatial data, but the application of these policies is often inconsistent. Geospatial data are being created in both vector and raster based data structures. Of these, the most frequently used file formats for storing and interchanging geospatial data include:

- Digital Line Graphs - Level 3 (DLG-3)
- ESRI - E00
- ESRI - SHP
- GeoTiff
- Geography Markup Language (GML)
- IHO S-57, Edition 3.1
- TC 211, ISO 191xx Standards for Geographic Information
- Spatial Data Transfer Standard (SDTS)
- Canadian Council for Geomatics Interchange Format (CCOGIF)
- CARIS ASCII
- CEOS Superstructure Format
- Digital Elevation Model (DEM)

It is interesting to note that the majority of these data and interchange formats are based upon the application of industry, rather than the adoption and implementation of national or ISO, based standards.

The LAC has just completed research and is now in a position to provide guidance to departments and agencies in the Government of Canada on computer file types, interchange formats and information standards that should be considered during the creation of digital information, including those for geospatial data. It is expected that the adoption of these formats and standards will facilitate information exchange between departments, provide a basis for the implementation of common IM practices throughout the Government, and help to ensure the preservation of 'records of value' for future generations of Canadians.

In selecting the file types, interchange formats and information standards, the LAC attempted to balance the requirements for quality, stability, potential longevity and industry acceptance. Where possible, a preference was placed on the selection of non-proprietary national and international interchange formats, information standards, or *De facto* standard industry formats and file types. *De facto* standard formats are widely used and recognized formats and file types that have become industry standards because of their ubiquitous use and support, and not because they have been formally approved by a standards organization. In terms of application, publicly available specifications are being promoted for Government of Canada use to eliminate any potential reliance on the fate of any specific company recommendation. Standardizing the formats for the creation, use and transfer of digital information is an essential element of the long-term preservation process. A platform independent, industry-supported standard logical format should allow reliable access to electronic records for a period of five years before the information must be migrated to a new format.

Currently, Canadian data collection and management activities are driven by the individual business needs of organizations and institutions. As a result, there is a lack of consistency in the use of homogeneous data structures both within and between organizations, especially at a national level. As indicated above, many data structures are concurrently used to manage geospatial data within corporate entities. From a managerial perspective, this is not only undesirable, but also problematic because it requires multiple investments in software, hardware and the development of people skills and knowledge management activities.

## Storage Technologies

The physical medium upon which data are stored must also be carefully considered. A group of companies produce a ubiquitous number of disc and tape storage devices and data management solutions that use a variety of optical, metal and polyurethane-based storage mediums. Unfortunately, many of these Input/Output solutions are proprietary in nature and do not easily facilitate the interchange of data. One can have the best intentions by saving geospatial data in a

standard-based logical format, but unless similar standards-based practices are extended to the physical storage environment, data obsolescence is sure to result.

In most offline storage environments, the life of the physical medium will usually outlast that of the device that was used to copy the data. Although storage media can theoretically last for hundreds of years, the life of the physical reading and writing device used to copy and restore data is in the order of three to five years. Over the last thirty years, the geomatic, library and archival professions have seen many examples of this type of obsolescence. One of the keys to preventing obsolescence is to control the handling and storage of the physical carrier upon which the data are placed and to implement proper data refreshing and migration procedures. As many organizations find out the difficult way, the expense of maintaining proper handling and storage conditions is insignificant when compared to the cost of replacing or attempting to recreate lost data.

## Preservation Strategies

The archival community proposes a range of approaches to overcome technological obsolescence. However, it would appear as though no one solution is available that addresses all the archival challenges associated with the preservation of digital information. In fact, most archival institutions and government departments use a mixture of evolving approaches, and this same trend is expected to continue into the foreseeable future.

The most appropriate preservation strategy for any institution must be determined by considering the cost effectiveness of the preservation solution, legal issues and user access requirements. All preservation strategies must weigh the costs and benefits of preserving 100% of everything and defining rules of acceptable loss if these strategies prove to be cost restrictive. Some of the following strategies represent the most popular methods that are available to neutralize the interdependencies of technology and data:

- Technology preservation - maintain old software and hardware for access
- Technology emulation - use contemporary software to mimic old functionality, look and feel
- Information migration - transfer data from format to format
- Information encapsulation - group data objects with metadata to facilitate future use

From an operational perspective, at some point in time all organizations will migrate or transfer their data holdings to diminish the risk of the information becoming inaccessible. Most archives and government departments support information migration as the most plausible preservation strategy. In order to reduce obsolescence risks, information migration activities should be incorporated into the daily operations of an organization's business procedures, and be based upon corporately accepted logical and information storage standards and practices to ensure success.

## Documentation and Metadata

No organization can successfully preserve geospatial data without the proper documentation. Metadata, data about data, provides the information necessary to discover and successfully interchange digital information between geospatial data producers and users. It is a central component of any information management and preservation strategy for geospatial data, especially for creators.

The creation and use of spatially-oriented metadata is not a new concept. Map and nautical chart producers have created metadata for centuries to convey important information to users of their maps and charts. Historically, map legends have been created to provide a summarized description of map unit components and symbology, together with other supporting information about a map's title, date, scale, datum, location, data sources, reference numbers, credits and citation information. Librarians and archivists are key producers of metadata descriptions because they enable access and collection management activities.

In a digital world, metadata must be sufficient to support changes made to records through various generations of hardware and software, to support the reconstruction of the decision-making process, and to provide audit trails throughout the life cycle of a record. Within the geomatics community, there is a need to develop metadata infrastructure to complement preservation activities that support an increased requirement to share and distribute reliable geospatial data products between creators and users.

Metadata for geospatial information is required for a number of reasons. The most important are shown here:

- To provide detailed information about data content, provenance, collection methods and analysis techniques;
- To provide information about geographic coverage and data extent, accuracy, quality, scale, resolution and projection;
- To document information about copyright, intellectual property rights, restrictions on use and sharing, licensing, disclaimers, and liabilities;
- To provide information about the processing history of a data collection and to document the processes that may result in the change of geographic information as a result of data refreshing, reformatting and migration activities; and,
- To provide technical information about the hardware and software requirements that is needed to access and query a set of geospatial data.

## National Programs and Initiatives

### National Data Archives Initiative

At this point in time, Canada lacks the necessary archival infrastructure to ensure that all geospatial data created by Canadian society are preserved and made publicly available. The Library and Archives has been a leader in addressing archival issues related to preserving geomatic information. Although the *Library and Archives of Canada Act* provides LAC with the authority and mandate to acquire, preserve and make known the digital documentary heritage of the country, it currently lacks the capacity to serve the entire data-creating community, including the geomatics community.

In part, to address this problem, the LAC, in partnership with the Social Sciences & Humanities Research Council, has completed two studies to assess the need for the creation of a national data archive for social science and humanities research data. The National Data Archive Consultation Working Group completed a needs assessment report [1] in May of 2001 and an infrastructure report [2] in June 2002. Both reports stressed the current and growing need for the creation of a national research data archive service as a solution to problems related to the continual loss of research data that are being created in the support of government and academic research activities.

Similarly, the National Research Council of Canada in partnership with the Canada Foundation for Innovation, the Canadian Institutes of Health Research, and the Science and Engineering Research Council of Canada, held a forum for a National Consultation on Access to Scientific Research Data in November, 2004. The forum consisted of a group of Canadian researchers who were invited to explore ways to help Canada maximize the value received from its publicly-funded natural sciences, health and engineering research data. The purpose of the Forum was to recommend an appropriate framework and develop a strategy that will facilitate open and long-term access to research data that are produced in Canada. A report [3] was released in February and it recommended the creation of a task force to prepare a full national implementation strategy and mount a pilot project to show the value and impact of multi-person and multidisciplinary access to research data.

### International Programs and Related Initiatives

The collection, management, access and preservation of geospatial data are global issues. The potential use of geospatial data is only now being realized by a broader Canadian society. Canada is one of many countries that are initiating programs and conducting research about these issues. A number of key programs and international initiatives include:

- *The Australia New Zealand Land Information Council (ANZLIC)*
- *The Community Access to Natural Resources Information (CANRI)*
- *USGS: EROS Data Center Digital Data Archives*
- *Arts and Humanities Data Service (AHDS)*
- *The Cedars Digital Preservation Project*
- *The Electronic Resource Preservation and Access NETwork Project (ERPANET)*
- *The National Archives and Records Administration (NARA) Electronic Archives Project*
- *The International Research on Permanent Authentic Records Electronic Systems (InterPARES).*

## In Conclusion

Despite the considerable research that is now underway, it is apparent that there is no single solution available that addresses all the library and archival challenges that are associated with the preservation and access to digital information. There is a need for a mixture of strategies that must be implemented within an effective information management structure. Implementation will be dependent upon an organization's legislative, policy and information management requirements and its ability to invest in long-term preservation activities.

Geospatial data preservation issues fall within the realm of a national information policy, and a national data management strategy, neither of which currently exist in Canada. Working in partnership with the library and archives communities, data producers need to standardize and adopt organizational policies and practices to govern the creation, use, retention, dissemination, preservation, and disposition of geospatial data to ensure its authenticity and integrity for as long as it is required for legislation, departmental statues and other laws and policies.

As the first step in ensuring the long-term preservation and retention of valuable resources, data producers must adopt an information life cycle management approach, which will ensure that their data will be managed proactively from creation to eventual disposition. An efficient and effective geospatial information management system is based on a governance framework that provides accountability for data management practices. In government, data producers must work with their library and archival communities to identify information that is of historical or archival value, and implement procedures and practices to ensure the integrity of the information while it is under their control.

Metadata plays a pivotal role in any preservation strategy because it sets the context for creation and defines the circumstances surrounding an object's use. It is critical that metadata be defined and implemented at creation. It should also be as detailed as possible and be based and applied upon commonly accepted descriptive standards.

All organizations should build a business case for the creation of their core geospatial data products. It is essential that organizations assess the rationale for collecting and managing their data holdings and define the enduring value of these holdings to the delivery of their business activities. This rationale should be used to establish a set of information life cycle management criteria that can be used to establish data value and define retention and disposition rules that meet the operational requirements for the development of geospatial data products and services. The development of the business case will enable organizations to define the requirements to manage specific geographic data objects at a variety of scales, levels of detail and degrees of accuracy. The management strategy deployed should be based upon the business requirement to create and manage geographic data at the point, line, polygon or the composite geographic object level (e.g., map).

The hub of an efficient and effective geospatial information management system is based on a governance framework that provides accountability for data management practices. Organizations must establish authoritative responsibility centres that are empowered with the ability to define and apply the information management principles required to ensure the integrity of an organization's data holdings. An information management infrastructure must be adopted to ensure that collection management and preservation activities are facilitated in the best interests of Canadian society. This will require a commitment on the behalf of governments and organizations to allocate the resources required to establish a library and archival infrastructure with the capacity to sustain and support the needs and demands of the geospatial data community.

## Notes

1. National Data Archives Consultation. *Needs Assessment Report.* 2001. <http://www.sshrc.ca/web/about/publications/da_phase1_e.pdf>
2. National Data Archives Consultation. *Final Report.* 2002. <http://www.sshrc.ca/web/about/publications/da_finalreport_e.pdf>
3. National Consultation on Access to Scientific Research Data. *Final Report.* 2005. <http://ncasrd-cnadrs.scitech.gc.ca/NCASRDReport_e.pdf>

# NINETEENTH CENTURY CANADIAN COUNTY MAPS GIS PROJECT

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*As presented at the joint Canadian Association of Geographers/Canadian Historical Association Virtual Historic Communities session, June 1 2005, during Congress, University of Western Ontario, London, Ontario.*

Nineteenth Century County Maps of Canada are considered an invaluable source of settlement history for eastern Canada. These large wall maps usually covered one, but sometimes two or three, counties.

Most of the maps still in existence are held in libraries and archives across the country. Unfortunately, many of these maps are in a tattered state and none are available in high resolution digital format, although some are in black and white at a low resolution on the Library and Archives Canada web pages.

This project is similar to the Canadian County Atlas Project hosted at McGill University (http://digital.library.mcgill.ca/CountyAtlas). However the county atlases were produced between 1874 and 1881, and these county maps were produced 20 years earlier. Also, this later project plans to use GIS layering techniques, something not done in the previous project.

During colonization, county surveyors produced plans showing the layout of farm lots. These original township plans were kept by the Surveyor-General of the province, and as settlers arrived new plans were compiled. These maps were not available for sale to the public.

The more heavily settled counties of Ontario were the first to have these printed maps available publicly. Private companies, with the assistance of the provincial Surveyor-General, made plans available to the individual or company who wanted to do the map production. The earliest of these maps was of Prince Edward County published by Publius Elmore, a local surveyor, in 1835. It was engraved by a New York firm, Stiles and Company, at 90 chains to the inch. Between 1835 and 1896, 58 of these maps were made for counties in New Brunswick, Nova Scotia, Ontario, Quebec and Prince Edward Island. Notably, 32 are for counties in Ontario. The Tremaine family, H.F. Walling and A.F. Church made a business out of this type of map publishing. Others, who were land surveyors, only published one or two maps of their local area. These maps provided the only detailed mapping available at that time.

As was the case in the United States, this type of map was being sold by subscription before they were printed. The subscriber's name was printed on their farm lot or business. In addition to the property ownership information, insets showing small towns with street names were included on the periphery of the map. As well, views of buildings were sketched and these are of interest for local history and architectural research. Walling and Church maps show all houses, whereas Tremaine maps show only a few houses. Other significant features shown were: schools, post offices, churches by religion, mills, inns, stores, cemeteries, rail lines and a variety of road types (open or not, plank, gravel, macadamized). Found only on the Church maps are the boundaries of numbered polling districts which are valuable for research with census or electoral data.

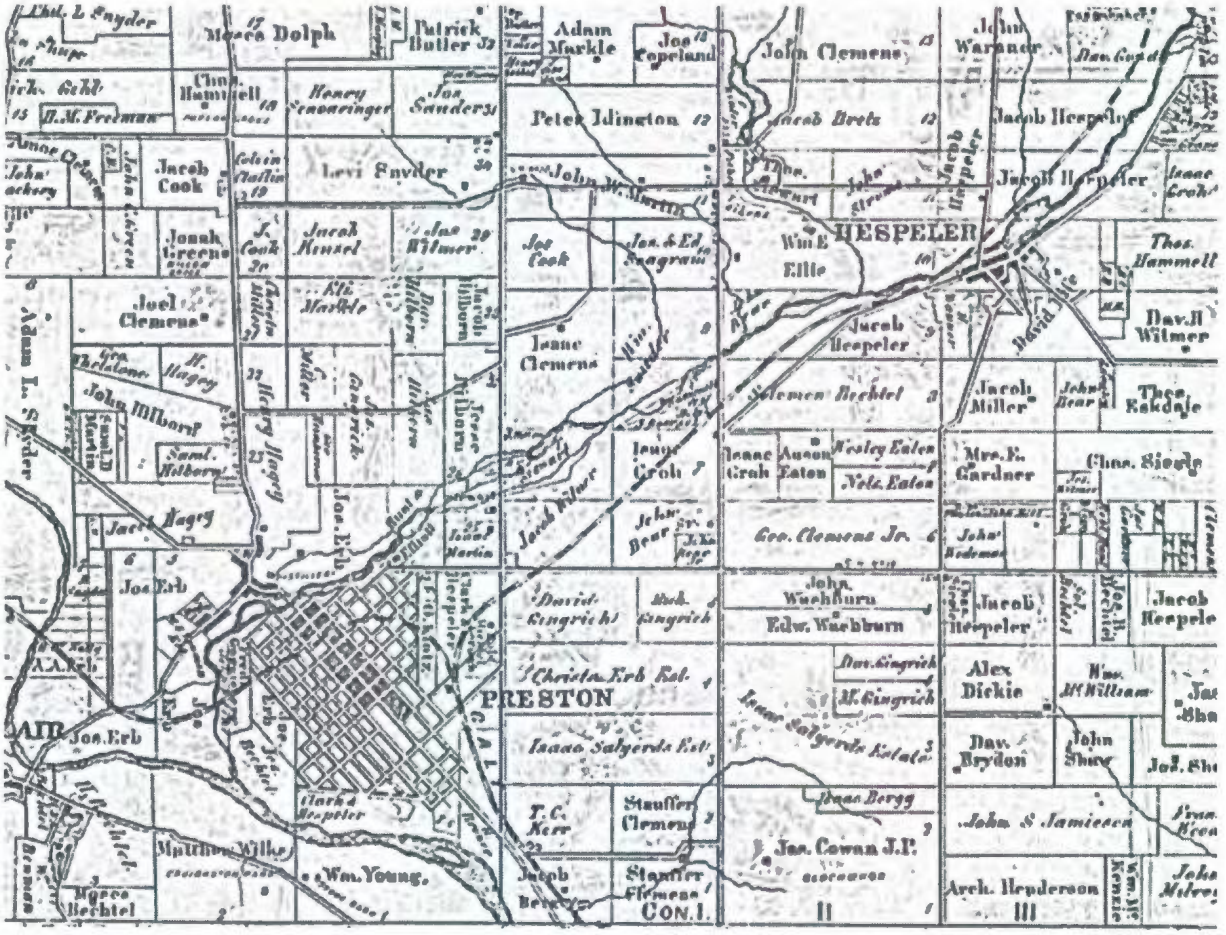
Our project is a work in progress. We are finding original county maps and having them digitally photographed. From these images, we are reading the land ownership names and assigning them specific identification codes in the database which we will then link to each parcel of land. To date, we have input all the land ownership information from the 1861 County map of Waterloo by Tremaine, and

the 1859 County map of Peel by Tremaine. Just for the single county of Waterloo, there are over 3,500 people entries on 4,100 parcels of land, by surname with lot and concession for each township property. We are presently finishing the data input from the 1860 County map of York by Tremaine, and intend to start the 1862 County map of Middlesex by Tremaine next.

The project also consists of creating a geographic information system (GIS) of land ownership information and cultural features. To do this, the current county, township, concession, lot, and parcel layers are overlaid upon the georeferenced raster images of the original maps. The new parcel layer is then drawn and collected into the new database of layers, and the ownership information is linked to the database of land ownership names. Cultural features on the maps are also compiled into the GIS database. These features include taverns, blacksmith shops, post offices, schools, mills, Orange Lodges, etc.

Our intention for this project is to provide a searchable database and web-mapping application that will display the images of the original maps along with the names and cultural features that appear on the maps. At some point, we hope that the project will be linked to other information such as census data.

The GIS and attribute data, along with the raster versions of these maps, will be made available to the world through the web-mapping application and through download. Crucial to the intent of the project is to make available an important 19th Century land ownership and cultural historical record of rural Canada. It is hoped that the project launch date for the website will be late January 2006.




*Sample image from the Tremaine map for Waterloo County, 1861.*

# USING ARCIMS TO PROVIDE AN INDEX / DOWNLOAD WEB SITE FOR THE ORTHOPHOTOGRAPHS FOR SOUTHERN ONTARIO

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*Paper delivered at the Ontario Council of University Libraries (OCUL) Map Group Library Assistants Workshop, Nipissing University, North Bay, Ontario, June 24, 2005.*

The University of Guelph Library needed to develop a seamless application to permit users to search and download Ontario orthophotographs. This collection, provided to the Ontario Council of University Libraries (OCUL) through the combined efforts of J.D. Barnes–First Base Solutions, the Ontario Ministry of Education and the Ontario Ministry of Natural Resources, includes thousands of digital orthophotographs from the Greater Toronto/Niagara corridor. These images were made available for download to Guelph users via a secure website. What we lacked was an online index for users to search the collection for the required image.

In our first attempt at indexing, we created an ArcMap Project. We layered the orthophotograph grid index over some topographic data (roads, administrative boundaries and place names). We added this index to our website, but users had to download the files, open the project, find the images they needed and them go back to the website, locate and download the files. This proved to be a clumsy solution.

To rectify this situation, we created a map service using ESRI ArcIMS. It offers searching capabilities and direct access to data on a web server. To see our map service, go to http://www.lib.uoguelph.ca/resources/gis/ORTHO/index.cfm and click on Ortho Photograph Index (Figure 1).

As pictured in Figure 1, the webpage is designed with the map in the middle of the screen, the toolbars for navigating within the map on the left and the layer list on the right for selecting visible and/or active layers. The user can zoom

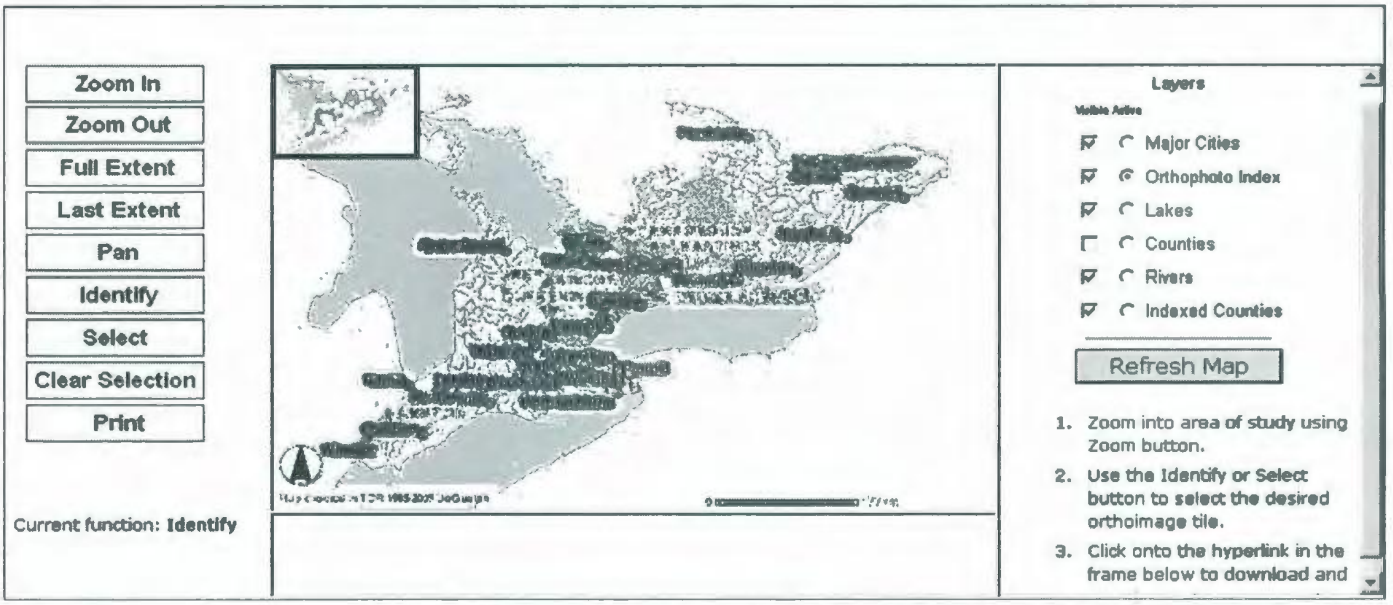


*Figure 1. http://www.lib.uoguelph.ca/resources/gis/ORTHO/index.cfm*

and pan to display the desired area. Note that as you zoom in, more features such as streets and street names, smaller cities and towns, and the Ortho Photograph Index grid, become visible. When the street layer is made visible and active by turning on the radio buttons beside the layer name on the right, the user can find out the name of a street by using the Identity button. (Be sure to click the Refresh Map button when you make changes to active/visible layers.) By making the Ortho Photograph Index layer active, the user can use the Select button and click on an individual or several images. The image will be highlighted and the attribute and URL for data access for that image will appear below the map. By clicking on the URL, the user initiates the download process.

### Creating the Site using ArcIMS - A Brief Description

Authoring maps and creating map services using ArcIMS can be done in a Windows or UNIX environment. At Guelph, we chose to use the UNIX environment. ArcIMS software includes three applications: ArcIMS Author, ArcIMS Administrator and ArcIMS Designer.

The first step in developing a map service is to define the content for the map. This is done in ArcIMS Author. Using Author is much like working in ArcMap. Data are added to the map as layers. For our index map, we included the following layers: provincial outline, major cities, lakes, railways, counties, rivers, highways and streets as well as the Ortho Photograph Index grid. We also included an inset map of the province that would show which area the user zoomed to. Author allows you to control the map properties such as scale factors and map units, colours, labels and symbology. To produce a map with the appropriate amount of detail, we used the "Set Scale" function. Thus counties and major cities show at the map's full extent, but highways, streets and the Ortho Photograph Index grid do not appear until the user zooms in to a smaller area. This map is saved as an AXL file. Author writes this text file in ArcXML (an Extensible Mark Up Language – XML).

The second step of the process uses ArcIMS Administrator to define how the website operates. In very basic terms, Administrator is used to create a map service that identifies the source data, how the source data will be displayed on the map and how the data will be transferred to users. There are several map service options available. Some require a client-side Java applet which means that most of the processing would be done on the client computer. Others do the majority of the processing on the serverside. We chose a serverside application called Image Service, with the image format as a JPEG. Each time a user performs an action (e.g. Zoom In, Find, Select), a request is sent to the server for a new image. (When using the Zoom button, the user sends a request for a new map image - the zoomed-in area – which is sent back to the user as a new JPEG image.)

The last step uses ArcIMS Designer to construct the website that will present the map service to the user. Designer provides different wizards for building HTML or Java viewers. We chose the "light weight" HTML option since we are not allowing users of our Web site to add their own data to the map. This option is the most efficient and easiest to use. (Along with the HTML, the HTML Viewer incorporates a significant amount of JavaScript and some Dynamic HTML, but it does not require a Java 2 plug-in or applet support). The HTML viewer is fully customizable using both HTML and JavaScript programming. There are a wide range of buttons to choose from for exploring the map and querying the data. We selected only the basic functions that would enable users to identify and select orthophotographs. These included Zoom In and Out, Full and Last Extent, Pan, Identify, Select and Print. When the wizard panels are completed, Designer generates a set of files and stores them in the Web site directory.

ArcIMS is a relatively easy-to-use tool to create an online indexing and/or download site. Any dataset that uses an index grid to locate a specific area is a good candidate for this application. For example: the Ontario base maps in digital and PDF format and the National Topographic Data Base (NTDB) tiles. The software does require a lot of hardware and systems support. Our main concern is that if the web service goes off line our patrons are denied access to potentially thousands of files. We will continue to investigate our opportunities and changes with ArcIMS.

# CARTO 2005: JOINT ACMLA AND CCA CONFERENCE JULY 26 – JULY 30, ST. JOHN'S CONFERENCE REPORT

Prepared by Alberta Auringer Wood

Based on conference abstracts and reports by
Colleen Beard (CB), Trudy Bodak (TB), Marc Cockburn (MC), Christine Cullingworth (CC), Wenonah Fraser (WF), Siobhan Hanratty (SH), Diana Hocking (DH), David Jones (DJ), Larry Laliberte (LL), Hugh Larimer (HL), Jennifer Marvin (JM), Susan Mowers (SM), Andrew Nicholson (AN), Roger Wheate (RW) and Barbara Znamirowski (BZ)

The preliminaries to the conference began on Tuesday morning with **executive committee meetings** and **workshops**. Three consecutive workshops were held in the Queen Elizabeth II Library of the hosting institution, Memorial University of Newfoundland. David Raymond gave one on "Map Production Using ArcGIS 9.x" to start. After a coffee break, he was followed by Edith Punt who conducted one on "Arc 9.2 Cartographic Enhancements for the Next Release". The rest of the afternoon after a lunch break was one session on "Discriminating and Mapping of Hydrologic Features with ArcGIS and Arc Hydro" presented by Andrew Millward.

Carto 2005 delegates were treated to Newfoundland's famous hospitality at the joint ACMLA/CCA **Ice Breaker Reception** held at St. John's historic Newman Wine Vaults. This cozy setting created by the stone and brick confines of the wine vaults was an unusual, but excellent, space for Association members to catch-up with one another and to meet new people. The generous amounts of seafood available at the occasion also added to the cheerful atmosphere of the reception. The event was sponsored by the Queen Elizabeth II Library, and University Librarian Richard H. Ellis welcomed Carto 2005 attendees on behalf of Memorial University. Mr. Ellis also took the opportunity to publicly thank and commend Alberta Auringer Wood, on the eve of her retirement, for her many years of service to the library community. The joint ACMLA/CCA Ice Breaker Reception was a great success and served to kickoff the conference in a congenial and hospitable fashion. Many thanks from the members ACMLA and CCA to the Queen Elizabeth II Library administration for sponsoring the reception and to Dan Duda and his local arrangement committee for organizing the event. (MC)

The venue for the remainder of the conference sessions was the Music Building on campus. The **Plenary Session** was held in Petro Canada Hall, the recently opened addition to the structure. Current CCA President, Christine Earl, introduced Dr. Henry Castner, one of the eight founding members of the Canadian Cartographic Association (CCA) when it was born in 1975, who officially opened CARTO 2005 with his address on "Those 'Unfranchised' Cartographers: 30 Years Later". Dr. Castner began by reviewing the beginnings and history of CCA. From its creation, CCA was to intended to improve communication among

*Henry Castner delivers the Plenary Session address. (Photo courtesy of Alberta Auringer Wood)*

cartographers, including research. One of the driving motivations was to include in the new organization the many "unfranchised' cartographers – people with interests in maps and mapping who were not comfortable in the larger, primarily surveying-oriented, cartographic organizations at that time. By structuring itself based on interest groups, CCA announced its willingness to have these people join and to cater to their interests. Today, thirty years later, Dr. Castner identified groups of "unfranchised" cartographers to whom CCA should be reaching out, such as Quebec francophones, government cartographers, theoretical cartographers, and children under the age of sixteen. (TB)

There was a coffee break followed by the first **atlas session** chaired by Diane Lacasse. Claire Gosson (Natural Resources Canada) noted that the first national atlas in the world was published by Finland while Canada's was the second. The *Atlas of Canada* will be celebrating its 100th anniversary in 2006. During the past years, it has supplied authoritative, current and accessible geographic information products at a national level. It was published for the first several editions in book form (1906, 1915 and 1957), the latter in particular being of extra large format allowing use of a scale of 1:5,000,000 and containing many more maps. From 1969 to 1974, both a separate sheet format and bound volume format were used with map scales varying from 1:15,000,000 to 1:7,500,000. From 1978 to 1995, 93 separate sheets were issued using a main map at a scale of 1:7,500,000, while currently for the 6th edition it is issued both as separate sheets and accessible interactively via the web. The Internet will continue to be a major focus for the atlas publication.

Claire was followed by Steven Fick (the chief cartographer at *Canadian Geographic*), who discussed both the print and the online editions of *The Canadian Atlas*. Both products have been released by *Canadian Geographic* to coincide with the magazine's 75th Anniversary. Mr. Fick began his talk by looking at the development of the print atlas. Although discussed for many years, *Canadian Geographic* had difficulty finding the appropriate partner for the project. After rejecting a number of different groups, *Canadian Geographic* eventually chose to work with *Reader's Digest* on the atlas. With *Reader's Digest* circulation reaching 4 million Canadian readers and *Canadian Geographic's* renown for presenting geographic information in an engaging manner, both parties felt that they could form a true co-production and deliver an excellent atlas. The marketing opportunities offered by *Reader's Digest* were also very attractive for *Canadian Geographic*. From a cartographic perspective, it was decided early on that the atlas should adopt a regional eco-zone approach to organizing the atlas, have a focus on urban Canada, and be highly visual, including use of photography. MapArt was also recruited to provide the reference maps. The publication of *The Canadian Atlas* has been a tremendous success, with the first print run selling out in just a few weeks. The second part of Mr. Fick's presentation focussed on the release of the *Canadian Atlas Online*. For this product, *Canadian Geographic* turned to DBx Geomatics from Gatineau, Quebec for assistance. Many of the features of *Canadian Atlas Online* include improved cartographic design, sophisticated web functionality, multimedia components, educational resources and expandability options. In a future phase, 1:50,000 scale maps will be shown along with postal code data, more games and more thematic content. The online atlas project is also looking for new partners and talks are currently taking place with Statistics Canada. (AN)

Brian Eddy (Carleton University) spoke next on the "Cybercartographic Atlas of Canada's Trade with the World: A Progress Report on Research and

*Diane Lacasse (left) and Clair Gosson in a session on the Atlas of Canada. (Photo courtesy of Alberta Auringer Wood)*

Development". The concept of Cybercartography embodies the theory and practice of cartography in the emerging information era. It is primarily oriented toward teaching. Its main elements involve incorporating multiplicity of scale, multi-media and multi-thematic content, a diversity of delivery modalities, user interfaces and user contexts. It is expected that a prototype will soon be available with updates to be provided via their website at http://gcrc.carleton.ca. The launch of the atlas is expected in December 2006.

The morning session concluded with "'For Future Generations': Mapping Indigenous Knowledge in Support of the Whitefeather Forest Initiative" presented by Andrew Chapeskie (co-authored with Alex Peters). In his presentation on the mapping of indigenous knowledge, Mr. Chapeskie (President of Taiga Institute) focussed on the work being conducted as part of the Whitefeather Forest Initiative (based in Northwestern Ontario). Led by the Pikangikum First Nation, this initiative has played a valuable role in moving the First Nation into the 21st century, while maintaining traditional values. For example, the First Nation began their "Forest Initiative" strategy by incorporating the Elder's indigenous knowledge and traditions into the data collection process. The end product included the mapping of First Nation cultural and ecological sites of importance, both today and many generations ago. Moreover, native pictographs also appear on the maps. With such knowledge, the Pikangikum First Nation will be able to take advantage of economic opportunities such as eco-tourism, while at the same time maintaining and preserving traditional knowledge, practices and the environmental sustainability of First Nation lands. (AN)

Dr. Robert (Bob ) O'Neil of NRCanada was the featured speaker after a typical Newfoundland lunch of cod and potatoes, held at the University Club at Memorial University and sponsored by several organizations. Dr. O'Neil's talk centred on the *Atlas of Canada*, which aims to provide a consistent federal government view of Canadian issues for Canadians. The *Atlas*, which is celebrating its 100th birthday next year, not only provides basic information for the casual user, but also complex data for the academic community. It includes the latest in visualization technology, and users may interact with available data and access data sources. The sixth edition takes advantage of the strengths of mapping on the Internet and continuous updating and linking to other data sources. It was an informative and interesting presentation. (HL)


*The Canadian Cartographic Association's anniversary was celebrated with a cake, which joined us at every coffee break. (Photo courtesy of Alberta Auringer Wood)*

The atlas session reconvened at 1:30 pm for a second part with three speakers rather than the originally planned two. Ed Light (Service Nova Scotia) described the GeoNOVA portal website, gateway to Nova Scotia's geographic information, from its roots in the hardcopy atlas. In addition to base data, it includes, for example, dynamic links to 2003 election results (www.geonova.ca). Peter Paul (Atlas of Canada) then outlined the continuing need for small-scale base map data for the 'big picture' versus the details seen at larger scale: relative versus absolute accuracy, federal versus provincial, blanket versus quilt. He called it "binoculars in a world of microscopes". Cameron Wilson (NRCan) who was introduced as the 'father of GeoGratis', closed the session by describing the transition from a 1890 lithographic press to current spatial data infrastructures in the production of national atlases. (RW)

Following the completion of the Atlas Sessions, Steven Fick introduced us to some of the fascinating history of the ***Canadian Geographic*** magazine which is celebrating its 75th anniversary year. The Royal Canadian Geographical Society was founded in 1929 by Charles Camsell, northern geologist and cartographer, and 27 other Canadian geophiles. The Society's first publication was called the *Canadian Geographical Journal* and began publication in May 1930. The journal originally had an Anglo/colonial focus, reflecting its contemporary society. Articles and production were Society-based with few, if any, professional staff. It developed a reputation, particularly in the 1950s, for its strong coverage of

the north, but also, similar to *National Geographic*, featured articles on Africa and other exotic locations. In the 1980s, it incorporated more colour illustration and evolved toward a more professional staff; now most articles are by professional writers. Maps are produced by cartographers and the publication has benefited from developments in cartography. It used to cost over $4,000 per issue to produce maps when working with film and scribing. Now, electronic techniques have greatly lowered costs and allowed an increased amount of cartographic content. *Canadian Geographic* has a wide range of readers, both lay and professional, and a high number of readers per copy with often several people in the same household reading the issue. Steven also illustrated the growth of the 'GeoMap', a frequent cartographic feature which has grown over the years from a half-page image to a two-page spread. He also introduced some of the related products, such as the print and online atlases produced by *Canadian Geographic*, independently or in association with other publishers or organizations. (DJ)

After the coffee break, the final session of the afternoon, facilitated by Trudy Bodak, was on "**Metadata Standards**: Why We Need Them and How We Get There". The speakers represented three perspectives: academic teaching, academic libraries, and national initiatives sponsored by federal government. Sally Hermansen, (University of British Columbia) divided her talk into two parts: "How we teach metadata" and "How we use metadata for student research projects". She described a typical approach to teaching introductory GIS courses, and how metadata fits into this process. Students begin by learning to recognize the key features of spatial data and attribute data, including coordinate systems, datums, projections, raster and vector file models, resolution including scale and pixel size, spatial and logical consistency of data, as well as forms of analysis and display, age of data and data reliability. In follow-up assignments, students use a standard set of questions regarding data features to assess the appropriateness of data sets for their research projects. Hermansen noted that whereas cartographers once saw metadata as the source information which one then puts on a map, new digital technologies provide other options for packaging and presenting metadata. For example, metadata may come as a supporting text file, appear on a data producer's web site, or come bundled with spatial files. In using diverse data sets, students learn to distinguish between key federal, provincial and commercial data sources and to recognize the extent to which metadata can vary in quality, appearance and reliability. Hermansen concluded by stressing that educators must encourage data providers to provide quality metadata, and teach students to be critical of map web sites in which data sets are not attributed.

The next speaker, Grace Welch (Library Network, University of Ottawa), provided a brief overview of the evolution of geospatial data information management issues. In the 1990s, libraries were "data poor", often accepting whatever data were available, and as a result experiencing the consequences of sketchy or non-existent metadata. Since then, considerable energy has been spent on negotiating data partnerships and data agreements, resulting in the widespread growth of data library collections and data services. In organizing data collections, libraries have become aware of the critical need for better metadata and its essential role in providing services to users. Libraries have worked closely with national committees and

*Participants in the Metadata Standards session: (left to right) Sally Hermansen, Grace Welch, Cameron Wilson, facilitator Trudy Bodak. (photo courtesy of Alberta Auringer Wood)*

stakeholders to adopt metadata standards. Since 2000, we have seen several important achievements: the adoption of FGDC as the Canadian standard for metadata, the emergence of web-based discovery portals for data and metadata, and the inclusion of metadata creation modules in leading GIS software (e.g. ArcCatalog). Welch stressed, however, that we still face many challenges. Welch concluded with several recommendations: that we increase dialogue between various communities; that the production of metadata be implicit in data information management strategies; that we provide more training and support mechanisms to encourage metadata production; that we reward the creation of good metadata in a standardized format; that we identify ways to share workload and expertise; and that we establish a national academic portal to facilitate sharing of metadata and data discovery.

The final speaker was Cameron Wilson (GeoConnections) who stressed the importance of considering the relevance of metadata, and suggested that the traditional definition of metadata as " data about data" is too narrow. A broader definition – "data about data and services" – is more appropriate, given new technologies and web-based services. Metadata is required for such services as web map services, catalogue services, web feature services and geo-data discovery services. Wilson described how the GeoConnections Discovery Portal can link us to data, organizations and services provided by Canadian and international organizations. Natural Resources Canada has offered workshops in metadata creation and these have been attended by a broad range of data producers including representatives from provincial governments. He concluded by stressing that we must continue to work cooperatively: developing partnerships, monitoring the needs of our users, and connecting data suppliers with users. A brief question and answer period followed. It was commented that as a last session of the day, the speakers had definitely made what could be "a boring session interesting"! But although our progress has been significant, it is also clear that we still face considerable challenges. Several members of the audience reiterated the need for more training. It was also noted that we need clear policies on how to capture or treat "legacy", "lost" and "dead end" data sets that are often accompanied by no or relatively unusable metadata. Perhaps a slide point introduced by Grace Welch provided the day's most fitting conclusion: "[We wish to] work toward a future when we can stop talking about metadata and just do it!" (BZ)

Late afternoon saw a meeting of the **Bibliographic Control Committee**. It included discussion on the status of reporting catalogued map records to the Library and Archives Canada for inclusion in Amicus, as well as plans for future cataloguing workshops.

A bit later in the afternoon and into the evening was The Ninth Nearly-Annual CCA/ACMLA **Orienteering Event** at Bowring Park. Diana Hocking was the organizer and reported that it was the most relaxing one for her. The map already existed, and the local club course planner, Nolan White, also provided both maps and controls. All she had to do was enjoy a peaceful outing with assistant Jean McKendry to hang some controls and wait for competitors to arrive. Unfortunately, due to many programming delays during the day, several who had signed up did not make it to the park. But those who did made it worthwhile. The clear winner, Tim Wykes, was most deserving of the honour. Last year, he made the orienteering map while also a major conference organizer, and the year before at Royal Roads he had not really got the hang of the sport at all. He had obviously been secretly practising! Runners-up, Rick Gray and Paul Heersink, were some way behind. John Fowler needs a watch next time, so he will not throw away the great prizes by coming in late. Sally Hermansen, this time with CCA President Christine Earl, proved again that choosing the right running mate nets you Top Female every time. Henry Castner made a great score, for an old-timer. And Trish Connor won the Good Sport award for low score. Edie Punt and Lori King were Top Rookies, both eager to do even better next year. A special mention should go to Alun Hughes and family who were merely walking in the park, and took a map, unofficially but successfully finding many controls. We'll expect great things from them all next year. Many thanks to Nolan for all his work and to David Mercer for making the arrangements. (DH)

Thursday morning the attendees reconvened in the Music Building to begin with a session on **Data Archiving**. Facilitator Anna Jasiak introduced the session, affirming the need for data archiving, without which today's data will be unavailable for future re-use or replication. This session was a follow-up on Wendy Watkins's Carto 2001


*Participants in the Data Archiving session: (left to right) Jean-Pierre Lemieux, facilitator Ann Jasiak, David Brown, Gaetan Drolet, Christine Cullingworth. (Photo courtesy of Alberta Auringer Wood)*

presentation on data archiving. The first presenter, David Brown (Library and Archives Canada), spoke on "The Management and Preservation of Geospatial Data", which was based on his report co-authored with Grace Welch for the GeoConnections Policy Advisory Node. He noted the case for government archiving of geospatial data: the importance both of temporal analysis, not just current analysis, and that of the Canadian geomatics industry, having $1.5 billion revenue in 2000 according to a Statistics Canada survey. He presented a continuum of custodial data management standards and practices, noting that database backups are not a long-term preservation strategy. Although no single solution exists for a government data management framework, Mr. Brown argued that the requirements for a solution are clear: cost-effectiveness, preservation (addressing, e.g., technology obsolescence) and metadata, identified core business data products, and accountability. Putting rules in place to meet these archiving requirements will be the key.

The second presenter, Christine Cullingworth (University of Winnipeg) talked about "Issues Surrounding the Archiving of Geospatial Data", and was a research contributor to the report for the GeoConnections Policy Advisory Node. She highlighted GeoConnections' achievements in furthering development of policies and practices, and particularly CGDI's role in providing an underlying foundation with which to share applications, services and data (http://www.geoconnections.org/CGDI.cfm) and noting the CGDI Developers Corner. Ms. Cullingworth provided an overview of distribution issues: intellectual property rights and restrictions and security/confidentiality, and custodianship issues including ongoing access issues, and the growing potential of open source and standards, and the need for innovations such as metadata crosswalks.

The third presenter, Jean-Pierre Lemieux (NRCan, Centre for Topographic Information Sherbrooke or CTIS), spoke on "Archiving of NRCan Geospatial Data". NRCan is maintaining Terabytes, and soon Petabytes (a petabyte is equal to 1,024 terabytes or 2 to the 50th power (1,125,899,906,842,624) bytes) of geospatial data distributed through the NTDB, GeoGratis, Toporama and GeoBase portals. Mr. Lemieux began by describing NRCan's three types of license. Currently, Mr. Lemieux explained, some 93 servers house CTIS's data, with active storage in the Terabytes (RAID), and some 75 Terabytes on tape. With this in mind, while users are demanding access to larger and larger amounts of data, Mr. Lemieux advocated downloading on an as-need basis. NRCan manages their datasets in terms of editions and versions, e.g., NTDB 3.2 is edition 3, version 2. A new edition represents a reprocessing of all data product files, and major data changes. A new version represents discrepancy corrections and updates to some product files. Metadata files are attached to each edition and version of a dataset, and are archived along with the datasets.

The fourth presenter, Gaetan Drolet (DLI/StatsCan) gave "Gone Today, but Here Tomorrow? Canada's National Data Archive: Update on an Over-Optimistic Outlook from CARTO 2001". This paper was written by Wendy Watkins and Ernie Boyko. Wendy Watkins presented the original paper in 2001. Mr. Drolet recapped the National Data Archive consultation process, explaining that phase two of the process saw a loss of momentum, with a change in key players and the lack of a lead player. Nonetheless, he argued that the glass is nearly half full. New developments since 2001 include two major reports, *National Consultation on Access to Scientific Research Data* (NCASRD) March 2005 (key partners, NRC, CFI, CIHR -- http://ncasrd-cnadrs.scitech.gc.ca/home_e.shtml) and *Archiving,*

*Management and Preservation of Geospatial Data: Summary Report and Recommendations* (GeoConnections Policy Advisory Node: Working Group on Archiving and Preserving Geospatial Data) February 2005 (Brown, Welch and Cullingworth -- http://www.geoconnections.org - see publications, key documents). In addition, he identified other progress made since 2001, such as more mainstream metadata standards, and several metadata template tools. On an individual level, we must work proactively, adopting the standards, preserving our unique collections, sharing data (for which the mechanisms have improved) and workload, and being involved in lobbying for a National data archive. (SM)

This was followed by the **CCA annual general meeting** and a session chaired by Cathy Moulder focussing on topics primarily of interest to map librarians. Cathy Moulder (McMaster University), Colleen Beard (Brock University), and Andrew Nicholson (University of Toronto, Mississauga) presented what they felt were three of the more interesting things that they learned at the Map and Geographic Information Collections in Transition conference held in Washington DC in May of this year. They reported that 150 people were in attendance, including seven Canadians. Cathy discussed changes in the U.S. data culture concerning access to geospatial data. Until recently, Canadian librarians have looked at their American counterparts with envy, as they enjoyed free and uninhibited access to government-produced geospatial data. Changes in legislation since 9/11 and privatization has allowed the U.S. government to partner with commercial bodies, resulting in the creation of value-added data, complete with a price tag and restrictive licensing clauses. American librarians are newly embarking upon consortial and lobbying strategies which their Canadian colleagues have long since become well versed in to combat this shift. Colleen discussed a presentation concerning digitization of analog collections. This topic is important for several reasons, specifically preservation, provision of remote access, and sharing unique collections through co-operative projects. Colleen related what she learned to how Brock is embarking upon a digitization project of their historical maps. Andrew reviewed the concerns expressed in Washington about archiving government geospatial data. Many U.S. government agencies are now including archiving in their long term mission statements and planning documents. There was a recognition expressed for the need for support from the map and GIS librarian communities in this endeavour. Budget constraints, preservation, and storage were cited as the major impediments.

Anne Draper, Chief, Government Documents Cataloguing Section of Library and Archives Canada, provided an overview of the structure and initiatives of this newly formed agency. Anne focussed on the impact of the merger on the selection, legal deposit, acquisitions, and cataloguing in AMICUS of cartographic materials. She informed the group that since summer 2004 published cartographic materials have been catalogued in AMICUS. These materials will also become part of the legal deposit system in 2007. Unpublished maps and geospatial data will not be included in these initiatives, but will continue to be under the jurisdiction of the Geomatics division of LAC. (JM)

After this session and fortified by box lunches, Alberta Auringer Wood led a group of 12 intrepid adventurers via taxis on a **tour to The Rooms**,

*Provincial Archives staff demonstrate the "shelf picker" during a visit to their storage vault at The Rooms. (Photo courtesy of Alberta Auringer Wood)*

the newly opened archives, gallery, and museum of the Province of Newfoundland and Labrador. Meeting a tour guide in the multi-storey atrium at the entrance of the striking building, set on the heights of Fort Townshend with a magnificent view of the downtown and harbour entrance, this group had a general, twenty minute tour of the building which provided an introduction and locations of galleries. They were then transferred to Melanie Tucker and Greg Walsh of the Archives Division who gave a brief welcome to the facility in the spacious reading room. They described the services that they offer to researchers, as well as equipment that was available. There is a separately enclosed room for microform readers, two computers for Internet access, electrical outlets for notebook computers, and an extra-large table for use with maps. The storage vaults which allow all their maps to be housed in the building were visited, though not by their oversize elevator which they use to move materials between the floors. Greg demonstrated the use of their electrically-powered "shelf picker" with the moveable compact storage shelves, which hold map cases as well as 5 shelves of boxes for rolled maps, and extend to a height of about 12 feet.

*ACMLA Annual General Meeting in progress. (Photo courtesy of Alberta Auringer Wood)*

In the intervening time, several **demonstrations** were held in the Music Building. Patricia Connor (University of Western Ontario) and co-authors Sean Irwin and Iris Gutmanis demonstrated I-MAP SWO. This freeware is the product of a joint venture between the Geography Department at Western, Patricia Connor (cartographer, geographer), Sean Irwin (programmer) and Iris Gutmanis (epidemiologist). The product was demonstrated so that attendees could determine if it has a useful role to play for teaching or research purposes in their workplaces. It is an easy-to-use desktop application suitable for either Mac or PC computers. I-Map SWO (southwestern Ontario) was designed in response to SWO epidemiologists and health planners with small budgets (and little expertise in GIS or custom drawing packages like Illustrator or CorelDraw) looking for a product to create base maps and visualize health data using various classification systems and methodologies on maps. Since communicating this information to the public is an important role for this group, they also made it their objective to develop a product where the output would remain crisp for reports (i.e., the capability to render postscript images, not just jpegs). Christine Earl (Carleton University) gave a demonstration on "Geomatics at Carleton University". This summarized the program and courses available, as well as proposals for the future. Plans are to eventually offer courses that will lead to an Honours B.A. or B.Sc. in Geomatics, which will give the program and the course offerings greater visibility and identity. Patty Zhao (*Atlas of Canada*) presented a short introduction to "Mapping Snow in the *Atlas of Canada*". On the *Atlas of Canada* website are three maps on snow cover. Map subjects included are the median start date, median end date of continuous snow cover, and average maximum snow depth. She also covered data problems, major steps in converting the point data to a contour map, and some technical issues encountered during the conversion process. Finally, Xiuxia Liu (Carleton University) presented a demonstration on "Web-based Map Transfer". She included three main methods of transferring maps: static maps, embedded media, and the database approach. The static map approach dealt with the file formats such as JPEG, PNG and GIF, which are supported by most web browsers. The embedded approach referred to interactive media (e.g., 2D/3D animations, movies), which are supported by browsers with the aid of plug-ins/viewers. The database approach integrated with interactive web mapping applications, which are manipulated through database management systems. The advantages and disadvantages of the three methods were evaluated in the presentation. The tour group returned to join the **ACMLA**

**annual general meeting** already in progress by a few minutes. The AGM will be reported on separately in a later issue of the *Bulletin*. There was a repeat of the tour in the afternoon for another group of eight, primarily CCA members.

In the evening, the **banquet** was held on another high hill overlooking the city, but further from the water. Upon arrival by bus or car, nearly the entire group assembled on the hillside to take photos with the city, South Side Hills and harbour in the background. The Admiral's Green club house was a wonderful facility for a well-attended banquet. The food was very good. There were speeches, drawings and contests for lots of door prizes, and much fun for all on hand.

Friday July 29th saw the group reassembled in the practice facility at the Music Building to hear a session chaired by Paul Heersink which began with an **Education Panel** discussion of representatives of both colleges and universities on:

- how they teach cartography and GIS
- how what they teach fits into the larger program
- how they develop curriculum
- what kind of balance they maintain between practical and theoretical issues
- can colleges learn from universities and vice versa when it comes to teaching cartography and GIS?

Sally Hermansen (UBC) mentioned that most geography and GIS programs still include at least one cartography course. She feels positive about cartography in academia for the next few years; however with that being said, retiring traditional cartography academics are being replaced by GIS, spatial modelling, and geovisualization academic specialists. Another key remark that was reflected in her answers to the above mentioned questions was that cartographic design has not been lost in GIS technology, and teaching a mix of technology and theory creates the best fit. An example is not just training students how to use ESRI software, but educating them as to the underlying theory of perception, cognition, and cartographic design. Sally has her students critique maps for two weeks before they start to draw/hand map with a computer; this is to get them to think before they draw. Tim Wykes (Sir Sanford Fleming College) noted that the college perspective is different, although they have also been going through the transition where the focus has turned more to GIS. Sadly, their curriculum is based on economics; if they cannot keep student enrollment at a certain number then the program is cancelled. Colleges award certificates and/or diplomas and have a combination of different people who enroll, i.e. students out of high school, post-degree students or educators. The student's main focus is job placement, thus a decision has been made about what is being taught, i.e. software is based on industry demand because they are the ones hiring the technicians. The teaching of theory has declined; as well little is taught about information visualization. They also cannot use "cartographic" in their course description, but use the term "Geosciences" instead. The course work tends to be applied or hands-on with small assignments.

*Participants in the Education Panel session: (back row, left to right) facilitator Paul Heersink, Tim Wykes, Jennifer Marvin; (front row left to right) Sally Hermansen, Rick Gray, Marcel Fortin. (Photo courtesy of Alberta Auringer Wood)*

According to current students (with previous degrees) whom Tim polled, the main differences between college and university are that college has lower tuition fees, more computer hardware/ software availability, and much more course work. Rick Gray (Ridgetown College) attended university and then college. His initial statement was that the university taught him to "think" and college taught him to "do". He referred to himself as a "GIS jockey", not a "cartographer" because his maps tend to be ephemeral, i.e. models of disease in crops based on weather. He made an excellent point on the ratio of job opportunities for GIS technicians versus those available for cartographers. The main interest of college students is to get a job. One course is taught in the Environmental Management diploma, and this program takes students straight from high school.

This panel was followed by Marcel Fortin (University of Toronto) and Jennifer Marvin (University of Guelph) talking about "Libraries: Bridging the Geographic Literacy Gap". This presentation showed the importance of GIS services that focus on more than simply providing access to data and software, but instead informing a user at a more fundamental level. The speakers described the more traditional roles of libraries as repositories of information and providing access to information, but also the educational role that libraries have in this modern world of digital information. Information literacy (including Geographic Information Literacy) is helping people find, use (read), evaluate, and think critically about information and maps. It also raises awareness of the authenticity, validity and reliability about that information or map. Marcel discussed the beginning of map literacy, the slow start to modern geographic information literacy, GIS in libraries, and data access landmarks. He also mentioned the current state of GIS holdings and library GIS services. Jennifer described the elements of Geographic Information Literacy to include: cartographic basics and mapping theory, software basics, data and database basics, geographic analysis, and the integration of paper maps and paper statistical sources with electronic information. Building awareness is the first step of literacy, as are also creating initiatives such as tutorials, help guides, one on one consultations, and group instruction. Collaboration both internally (within the university) and externally (different associations, consortiums, and government departments) is also very important. The presentation finished by indicating the possible areas of improvement, which included increased awareness among users, better liaison with departments and faculty, support from library administration, professional development, data needs and collection development. (CC)

These presentations were followed by a coffee break in the display and exhibitors' area. Several local firms had set up booths and provided financial support for the conference, as well as a number of prizes for attendees. These included Norman Wade Company Ltd.; M. Francis Kelly Limited; Surveys and Mapping Division, Dept. of Environment and Conservation, Government of Newfoundland and Labrador; Canadian Institute of Geomatics (CIG) Newfoundland; and the Centre for Topographic Information, Natural Resources Canada. The maps submitted to the International Cartographic Association as the Canadian exhibit and several posters were also on display.


*Participants in the first of the Historical sessions: (left to right) Paul Light, Alun Hughes, Gerald Penney and Michael Staveley. (Photo courtesy of Alberta Auringer Wood)*

After the morning break, the first session dealing with **historical topics** took place, chaired by Alberta Auringer Wood. First off there was Michael Staveley (Memorial University) who read John Robson's (University of Waikato, New Zealand) paper on James Cook's contribution to the mapping of Newfoundland, with many stunning examples of the island's early cartography. Gerald

Penney (independent archaeologist and early maps and books dealer, St. John's) aptly followed with a presentation on the early cartography of St. John's and what he believes is the earliest known map of St. John's: that done by Henry Southwood as an inset map of the harbour in 1675. (RW)

Paul Light, a student of the Centre of Geographic Sciences, presented his research as a result of his COGS project on "The Evolution of the Nautical Chart: 13th to 19th Century". He unfolded the historical events of the nautical chart, noting its importance in the way man perceived and discovered the world. The presentation included reference to the Romans, sailing charts, development of rhumb lines, projection, scale, latitude determination, triangulation, and milestones such as the advent of the British Admiralty charts in 1800. To conclude the session, Alun Hughes (Brock University) provided a very entertaining history on the difficulties encountered in establishing the route of the first Welland Canal in 1818. Although one may think the 150-foot rise of the Niagara Escarpment would have been the main obstacle to overcome when constructing a canal, Hughes described that what appears to be an insignificant rise in the landscape, known as the Niagara Falls Moraine, caused more hardship. The stretch of the canal that cuts through this moraine, known as the "Deep Cut", extends from Port Robinson to Allanburg (NTS sheet 30M/3&6) – a mere 4 kilometres. Originally surveyed in 1818 by William Hamilton Merritt -- the principal force behind the canal -- the cut was intended to divert water from the Chippawa Creek to his mills situated on Twelve Mile Creek in St. Catharines. However, due to the loose composition of the moraine, slumping activity was a major impediment in construction. The surviving field notes Hughes studied revealed several surveys that were conducted (including Merritt's survey); plans to traverse the escarpment by a railway; an unsuccessful attempt at building a tunnel through the moraine; and plans of alternate canal routes that threatened the water supply for Merritt's mills. However, assuring his water supply, Merritt was determined to see that the canal did indeed take the Deep Cut route to his mills on the Twelve Mile Creek regardless of the difficulty in construction. His determination saw the opening of the first canal by 1829, aka Merritt's Ditch! (CB)

During the lunch break, the presenters of **posters** were available for questions and comments. The posters were "Cartography at COGS" by David Raymond, "Austro-Hungarian Maps" by David Jones, "Modelling Biodiversity Using the Genetic Algorithm for Rule-set Prediction in the Sierra de Manantlán Biosphere Reserve" by James R. Ferguson, and "Tactile Maps" by James Richmond.

Conference organizer Dan Duda chaired the after-lunch session. With a growing interest by academic libraries in scanning historical maps, the back-to-back presentations by David Raymond and Edith Punt were greatly anticipated. They did not disappoint! The first paper "Current Technology for Historical Research: GIS and Comparative Cartography" made use of historic maps of Newfoundland to highlight the issues associated with scanning maps with a known projection, in order that they can be integrated into a GIS environment. The presenter, David Raymond (Centre of Geographic Sciences, Nova Scotia) detailed the four main steps involved in the print to digital conversion process, along with the problems associated with each. The steps include data capture, geometric correction, georeferencing and overlay analysis, and David's discussion of the process was very informative. One example was the explanation of scanning creep, where the scanner introduces distortion into the process and, as a result, there is a need for a geometric correction of an image after it is scanned. David also outlined the procedure of using graticules to line up historic maps with modern projections, providing a more error free method in aligning old maps with current data. Finally, the most practical part of the presentation was when he invited delegates to contact him with any questions relating to scanning historic maps for use in GIS. No doubt there will be a few!

Anyone who had just finished reading the highly visual publication *Cartographica Extraordinaire* eagerly awaited Edith Punt's presentation, "Building a Portal to a New World". After reviewing the Rumsey website, Edith spoke about the various "behind the scene" aspects in compiling the book through the use of mapping examples. In one fascinating series of maps titled "Who's Land Is It Anyway", Edith argued that the Indigenous Peoples' understanding of land was better represented on a 1814 Lewis and Clark map which described tribal territories with sweeping text. Edith then displayed a map of the same area, published 53 years later,

*Participants in the second Historical session: (left to right) Paul Light, Alberta Auringer Wood, David Raymond, Edith Punt, Alun Hughes. (Photo courtesy of Alberta Auringer Wood)*

where the First Nations presence on the land had been reduced by denoting their territory with dashed lines representing various treaties. Finally, a third map was displayed showing that by 1879 the lands granted to First Nations in the Dakotas had been reduced to an awkward triangle wedged in among the orderly squares of the Government's public land survey. This and the other examples in Edith's presentation brought home the fact that historic maps have a critical role to play in understanding how landscapes, at all scales, have come to be. (LL)

Next Alberta Auringer Wood (Memorial University) introduced the Fabian O'Dea Map Collection, which was donated recently to the Queen Elizabeth II Library of Memorial University. Her overview covered the scope and importance of the nearly one hundred maps in this collection, donated by his family after his death in 2004. The historical maps of Newfoundland he collected will be useful to scholars who want to see early maps of the area. The earliest map is a woodcut from 1556. The most recent one is dated 1979. There are harbour and nautical charts, as well as land surveys. The majority of the maps are from the eighteenth and nineteenth centuries, and about half of them were not previously in the library's collection. It was interesting to be able to view nearly thirty of the maps, which were on display in a special exhibit in the Queen Elizabeth II Library during the CARTO 2005 conference, and to imagine how developments in survey techniques, politics and printing have affected the cartography. Over the next while, the staff at the library intend to complete a listing of the maps and to scan them as appropriate, so they can be included in the library's digital collection.

As a conclusion to this session, we had the second presentation by Dr. Alun Hughes (Brock University) who is an animated speaker with an engaging narrative style. This time he talked about "John Graves Simcoe and the Naming of Upper Canada". John Graves Simcoe was the first Lieutenant-Governor of Upper Canada (1792-1796) and was responsible for naming many places there at that time. He applied a county-based naming policy, deriving names for townships, districts and rivers from similarly named counties in England (that is, place names in Yorkshire, England, were applied in the county of York, Upper Canada). French and German names were replaced and even some English names were changed. He advocated naming a city "Niagara", not changing it to Newark, and some of the names usually attributed to him were in use before he arrived. He was naming what previously had no name, such as counties, ridings for elections, and townships -- they were just being surveyed. He also named some counties after English statesmen, though it is not always clear who they were. It appears that he was honouring families, not individuals. Simcoe demonstrated a broad, fairly


*Colleen Beard was the winner of a GPS generously donated by Norman Wade. (Photo courtesy of Alberta Auringer Wood)*

consistent naming policy as he oversaw the naming of Upper Canada, and he was not strictly substituting English names for aboriginal ones as is often suggested. (WF)

After a final coffee break and opportunity to view exhibits and posters, the final session began which was facilitated by Rodolphe Devillers. Neil McNaughton (Director, Surveys and Mapping Division, Dept. of Environment and Conservation, Government of Newfoundland and Labrador) talked about and demonstrated MapsNL, the online portal for Newfoundland and Labrador maps which is OGC (Open Geospatial Consortium) standards compliant. The map viewing client displays gif images of multiple layers of coverage and vector data from any OGC compliant Web Mapping Server. Several indexes are available, including one for air photos. It is possible to see geodetic information. The site address is http://www.MapsNL.ca/. Following this presentation was Gaetan Drolet (DLI/ Statistics Canada) who spoke about citing statistics, data and maps. He advocates use of proper citations and did a proposal in May 2004 to develop a citation guide that will include monographs, databases, the Census, maps and so on produced by Statistics Canada. He briefly demonstrated a web tool that will assist this endeavour.

In his talk "Land Indeed", Bert Riggs (Centre for Newfoundland Studies, QE II Library, Memorial University) described a rich collection of papers which represent four generations of the Peyton family. Of particular interest are the documents relating to Thomas Peyton's tenure as Land Surveyor. In this role, Peyton made duplicates of the land deeds and surveys he submitted to the government. These records, which are held by the Centre and in excellent physical condition, not only provide a wealth of information for genealogists, but also insight into settlement patterns and land use, demographic growth patterns, origins of place names, as well as the development of the land survey in the province. The Peyton Family Collection (collection number 150) is heavily used at the Centre for Newfoundland Studies. At the moment, there is no on-line finding aid; however, Mr. Riggs indicated they were hopeful that the Centre will be able to create a database based on this collection.

Dan Duda had the unenviable task of giving the final presentation of the conference, on a topic which is so uncertain that few were surprised when his general conclusion was that no one seems to have answers. 20 June 2005 saw the introduction to Parliament of Bill C-60, *An Act to amend the Copyright Act*, which is the first significant move on this issue in quite some time. Along with Richard Pinnell and Elizabeth Hamilton, Dan is on the ACMLA Copyright Committee, and assured the audience that as per their mandate, they will continue to follow the progress of the legislation and communicate what they know to the ACMLA. For more information on the status of copyright legislation in Canada, see Richard Pinnell's report, submitted 28 June, 2005 (http://www.ssc.uwo.ca/assoc/acml/ACMLACopyrightCom.pdf). (SH)

It was reported later that many from the conference spent an enjoyable Friday evening at the George Street Festival. This was despite the rain. Others enjoyed dinner in groups downtown.

On Saturday, about 30 attendees went on the **tour/ field trip**. Despite some lingering fog and even a bit of rain, they enjoyed a two hour boat tour out of St. John's Harbour to Cape Spear on the "Scademia", a 90 foot schooner. The weather improved throughout the day. There was a bus tour of some of the historic sites of the city, a tour of the Johnson GEO CENTRE, and the day-long adventure wrapped up with a tour of the Quidi Vidi Brewing Company in the historic village of Quidi Vidi. Everyone is looking forward to the meeting next year in Ottawa to help celebrate 100 years of the *Atlas of Canada*!

*Conference organizer Dan Duda takes a well-earned break on the schooner "Scademia" at the end of CARTO 2005. Congratulations, Dan, on a job well done! (Photo courtesy of Cathy Moulder)*

# MAP AND GEOGRAPHIC INFORMATION COLLECTIONS IN TRANSITION CONFERENCE LIBRARY OF CONGRESS, WASHINGTON, DC MAY 12-13, 2005

Notes prepared by Cathy Moulder
with assistance from the other Canadian attendees

**Canadian Attendees:**
- James Boxall (Dalhousie University)
- Colleen Beard (Brock University)
- David Jones (University of Alberta)
- Cathy Moulder (McMaster University)
- Andrew Nicholson (University of Toronto-Mississauga)
- Lori Sugden (University of Victoria)
- Cheryl Woods (University of Western Ontario)

## Pre-conference IFLA Workshop on Paper Maps (attended by David Jones)

- focus was on the handling and future of paper maps in libraries and other institutions
- many major future issues will not be technologically driven, but revolve around freedom of information versus security - in the last decade, we envied the United States for their accessibility of spatial data, what the government produced was not generally restricted through copyright - now Canada and the European Union are expanding the access to their information, while security concerns in the US are restricting the distribution of spatial data and material that was once available is being withdrawn
- large amounts of Russian mapping have become available, in many cases much better than from other sources, EastView Cartographic is a major distributor
- the US government depository program is switching from print to electronic format, for both documents and maps - 75-80% of their distribution is now electronic, and the number of physical items received by depository libraries has dropped from $40,800 to about $8,000 per year
- many map collections are involved in digitization projects and there is a strong need for a clearinghouse to monitor/list items already digitized and projects underway or being considered

## Sessions on Thursday May 12

### Session 1: Future of the Paper Map

**Future of the Paper Map from the USGS Perspective** (Dr. Robert Pierce, United States Geological Survey)

- USGS presses have been "silent" for 2 years, all map printing is now outsourced
- originally it took 3 man-years to produce a topographic map (1948) - because 55,000 maps were needed to cover the country, they were always out-of-date and their value eroded
- modern replacement is "The National Map": seamless, continuously maintained, nationally consistent digital base data, which is available over the Internet and never more than 30 days out-of-date
- Geospatial One-Stop (http://www.geo-one-

*The Canadians at the Library of Congress: (left to right) Andrew Nicholson, David Jones, Cathy Moulder, James Boxall, Cheryl Woods, Lori Sugden. Missing from the photo: Colleen Beard. (Photo courtesy of Lori Sugden)*

stop.gov/) is a catalogue of metadata
- FGDC, National Atlas and National Map are now administered by one program called National Geospatial Programs Office (http://www.usgs.gov/ngpo)
- aim is to derive 1:24,000 product from data in the National Map, print on demand and eliminate lithographic production - it is hoped to have the whole country complete by 2010
- there are print-on-demand quality issues, the content is different and less well reviewed, the cost is higher ($7 litho now $30-40, with $15 eventually as best case)
- USGS Publications Warehouse (http://infotrek.er.usgs.gov/pubs/) is scanning content of all publications at the rate of 1000/month, with the goal of getting everything (text) online; they are also geocoding all publications to allow spatial searching

**Commercial View on the Future of the Paper Map** (Russell Guy, Omni Resources)

- most general map stores are not involved in selling digital products
- the advent of large-scale "super" bookstores in the past 15 years has affected independent commercial bookstores, difficult to compete with deep pockets
- the availability of products like StreetAtlas USA and Map Quest (with 1.3 million visitors per day) means more daily downloads than total annual print sales
- many factors affecting travel (9/11, SARS, Middle East situation) have drastically reduced map and guidebook sales
- also consolidation in the industry, independents bought out by larger chains in the 1990s (eg. Rand McNally, American Map) - GeoCenter sold to Bertelsmann, classic special map section now down to 4 employees
- many paper products have gone digital eg. USGS topographic maps, street atlas products
- some US libraries provide scans instead of referring for sales
- all these factors have resulted in loss of paper sales
- forecast = the general public attachment to electronic data/products will eliminate paper products - commercial map dealers will not make a living from digital products - those general retailers may survive who can fit to a local market as "travel centres" including offering knowledgeable staff, luggage, workshops, planning, photography as well as text/print products - retailers cannot compete with ESRI and USGS, so must fit a niche market to survive

**Role of the Paper Map in Libraries** (David McQuillan, University of South Carolina)

- described Wednesday's workshop and a survey being conducted by IFLA, aimed at developing guidelines for the handling of paper map products in libraries which will ultimately be published on the IFLA webpage
- purpose of the guidelines is to develop a standard as a consensus document - guidelines may be used as a defence against uninitiated management who do not see the continued importance of traditional cartographic materials and wish to downsize to save space; should be a bridge to the development of digital collections
- topics of discussion from Wednesday's workshop:
1) centralized scan warehouse to eliminate duplication
2) collaborations on digital projects
3) what do users want? digitize parts of collections eg. indexes first to determine interest and then set digital priorities
4) remote storage issues: retrieval and research access compared with local availability and organization
5) copyright issues on scanned material: sometimes paper must be used instead eg. Sanborn plans after 1923

**Break-Out Sessions**

During the lunch hour, the conference participants broke into four smaller groups for discussion:
A) Increasing Awareness of Map and Spatial Data Collections
B) Needs of Spatial Information Collections
C) Future Role of Map Library Organizations
D) Offering GIS Services in Libraries
Reports on the break-out session discussions were delivered during the Friday sessions.

## Session 2: Developing Digital Cartographic Collections

**Can Librarians Make a Difference in the Geoworld? The Story of INSIDE Idaho** (Lily Wai and Bruce Godfrey, University of Idaho)

- description of Interactive Numeric & Spatial Information Data Engine (INSIDE), State of Idaho's official geospatial data clearinghouse (http://inside.uidaho.edu/)
- vision = every dataset accessible on the web with

full metadata
- have found pdf format files more popular than downloadable data

**Collection Development Policies for Maps and Geospatial Information** (Wangyal Shawa, Princeton University)

- issue for collection development = how to develop both paper and digital collections to support researchers "location-based data needs" (inclusive term used for diverse body of users)
- the wealth of geospatial data has created different expectations and US public domain data has resulted in very small budgets - now researchers want large geographic areas and much foreign and commercial data which is not available as public domain - many countries consider large scale geospatial data as a political asset which makes it difficult to obtain and expensive
- Princeton's solution is to attempt to obtain basic level data: emphasis first on administrative units, transportation networks, hypsometic elevations and gazetteers at the world level; geology and land cover at the regional or country level
- Princeton will purchase scanned digital images in preference to paper copies, but prefers not to purchase electronic atlases where the data cannot be extracted or is bundled with software
- recommended Macon company for world administrative data (expensive, http://www.macon.de/en/digital_maps.htm)

**Collaboration in Practice: University of California/Stanford Map Libraries Group** (Julie Sweetkind-Singer, Stanford University)

- description of a partnership between all of the University of California libraries and Stanford University library (13 groups, http://library.ucsc.edu/maps/ucsmg/)
- benefits of collaboration include: central e-list used as many collections are not fully catalogued and interlibrary loans are processed directly including scans of maps either to library or direct to patrons; central index map showing air photo centroids linked to scans of air photos themselves; collective cataloguing efforts including links through MARC records to images; collective scanning projects
- shared purchasing was the most difficult aspect of the collaboration to achieve - 1% of each library's collection development budget is set aside for collaborative purchases - a joint committee and a unified collection development policy guides decision-making on purchases - Associate University Librarians have all signed agreements to codify the collaborative policies - areas of collection responsibility are assigned based on California counties and the LC G schedule - every library has the same collection policy assignment for digital data and for paper - $327,023 spent over 30 years, most on aerial photography and digital orthophotos, some LANDSAT
- collective scanning projects include pre-1923 Sanborn plans of California, USGS topographic maps of California - now being more systematic about coordinating existing projects as many agencies have already scanned the same materials

## Session 3: Distribution and Archiving of Digital Spatial Information

**Data Archiving at the National Archives** (Robert Chadduck, U.S. National Archives and Records Administration)

- challenge in developing an active program for archiving federal government business records and data = there is no single unifying model or technical benchmarks, although 3 decades of practical experience
- confronted by problem which is fundamental to all computer sciences = how to preserve and provide access which is free from dependency on any specific hardware or software?
- federal government has recognized problem and assigned funds to achieve archive of over 3 million files in nationally distributed sites, with the intention to support Internet access and delivery

**Government Printing Office Policies and Plan for Spatial Information Distribution** (Judy Russell, Government Printing Office)

- the Federal Depository Libraries Program (FDLP) was initiated 1813; the Government Printing Office (GPO) 1895 - originally these dealt with tangible publications for which libraries provided storage and access - now 95% of new titles are available in electronic format (and sometimes tangible)
- the mission of the GPO is still the same: "perpetual, free and ready public access" but there is a change to digital delivery and content - GPO is also trying to increase the percentage of federal documents which enter the FDLP
- GPO is aiming for a complete digital collection of

*Lunch-hour tour of the collection area, Library of Congress. (Photo courtesy of Liz Paulus)*

federal documents including legacy documents (although they will continue to offer essential documents including maps in print) - they are encountering problems with retrospective conversion of old CD-ROMs with now-obsolete software/hardware requirements

**Archiving Geospatial Data at EROS Data Center** (John Faundeen, EROS Data Center)

- National Center for Earth Resources Observation and Science (EROS)
- in 1972, LANDSAT images were generally printed to film for interpretation, today images are mainly digital - aerial photography is still analog but changing to digital rapidly - storage implications: took 30 years to get to first petabyte of storage, 3 years to get to second
- collection presently includes other non-EROS data (like Apollo), 20 federal agencies' data which was originally deposited to make use of EROS public sales/print facilities - now working to get mandate for only EROS data
- collection policy took 16 months to develop, but is very important for building collections and also for fending off unwanted collections - use USGS "Records Appraisal Tool" (http://edc2.usgs.gov/government/RAT/tool.asp) as a test to decide whether things should be kept
- offer several Internet tools for access to archived EROS data: USGS EarthExplorer (http://edcsns17.cr.usgs.gov/EarthExplorer/, search based on metadata) and USGS Global Visualization Viewer (http://glovis.usgs.gov/ImgViewer/ImgViewer.html, search based on data itself)

## Sessions on Friday May 13

## Session 1: Future of Cartographic Information Collections

**The Role of GIS in Libraries for Geographic Information Management** (Clint Brown, ESRI Inc.)

- advent of GIS has implemented the process of rediscovering geography - maps are now viewed as a "business form" for accessing information, with geography as the key to integrating all types of data
- GIS is now moving up to server architecture and parts of GIS are also downloadable to hand-held devices - eventually the future will be in web services networks, where users/resources are connected together
- these "federated GIS" nodes are both formal/informal and integrated by web connections and services - require the interoperability of servers/hardware/content in order to interconnect GIS at all levels across the US - intended not just as a source of data, but to share management, metadata and tools
- library role = metadata/cataloguing, archiving, data publishing, data access and services
- the larger this federated collection becomes, the more unpredictable the demand, the users and the software applications possible - therefore make things as generic/open as possible

**Future Directions for Geolibraries** (Mike Goodchild, University of California-Santa Barbara)

- the original "geolibrary" concept was implemented in 1997, a library searchable by geographic location (which was impossible in a physical library but possible in a digital world) - most people approach the Alexandria geolibrary by place name; visual and coordinate searches are not user friendly
- problem now is that there are multiple geolibraries/clearinghouses - SAPs (Spatially Aware Professionals) guide users but their knowledge is usually at the local level - problem also with interoperability, how to extract from multiple datasets/sources
- some attempts at solution: MapFusion = smart systems that scan for anything recognizable as a geospatial dataset, ignore differences in format to display - Geography Network = file menu in ArcGIS provides direct link to Geography Network, "live

data" is displayable from servers anywhere but never downloads to local server, common consequence is that datasets will not fit together - Geo One-Stop = signals a move beyond Alexandria, live data is extractable, providers "publish" to site including metadata, 76,000 datasets January 2005
- will never be possible to have a single stop GIS data source, there will always be human competition/segmentation even within agencies and unique jurisdictions so there will always be a problem of where to look
- help for the SAP = a data set is most likely to be found on a server in local region; a data set most likely to be found on a server of agency whose footprint is closest to that responsibility
- library model = search/retrieval of information objects, information chunk size determined by historical precedence (g. USGS quadrangles), difficult to merge datasets, there is always a gatekeeper assessing the value of offered information
- information model = purpose is to answer queries, answers are dependent on the depth of the source, any information source may answer, system doesn't care which and decides on the appropriateness of the source
- geolibraries model = somewhere between - focus on GIS is closer to the information model - but there will always be two models - SAPs have an assured future as the collection-level problem will continue

*Edward Redmond shows how much has been catalogued and how much remains to be done. (Photo courtesy of Liz Paulus)*

and multiple data sources will always exist ("a person with one watch always knows what time it is; a person with two watches is always uncertain")
- future geolibraries should employ "child of 10" rule and video game paradigms to make access simple, no scale, totally implicit, overcome barriers imposed by existing chunking of geospatial data - probably always necessary to have gatekeepers/SAPs
- interesting website "continent of Bergonia", artificial, raises question: how to assess geographic reality? (http://bergonia.org/index.html)

**National Geographic: From Paper to Digital to Distributed Mapping** (Allen Carroll, National Geographic Society)

- National Geographic Society has 90 year cartographic tradition and has seen dizzying change: 100 years ago maps meant political power; 50 years ago maps were published as static documents to capture information; today maps are still created by professionals but are a dynamic tool for anybody (eg. Map Machine http://plasma.nationalgeographic.com/mapmachine/); 20 years from now movement to populism in map-making - distributed mapping is the current revolution and what GIS is all about = transferring the power of map-making to communities of users and away from individual cartographers
- examples of distributed mapping: Wild World (http://www.nationalgeographic.com/wildworld) example of liberating spatial data and making it available to a wider audience; NG Civil War Project underway where maps will serve as powerful index to other information; Conservation Commons project, open sharing of data and world conservation base map (http://www.conservationcommons.org); Bird Source (http://www.BirdSource.org) cooperative community of non-scientific data collectors
- the next NG World Atlas will be built on a new database (presently based on hand-drawn maps from the late 1950s/60s - may eventually include a "Global Photo Album" combined with the maps, which will ask people to contribute georeferenced photos and ultimately could allow genealogists to create custom gazetteers and generate maps based on own collections of family placenames
- recognize that all this is a nightmarish challenge for geo-librarians, how to determine provenance of multiple datasets? how to "freeze" such a database for archiving?
- NG may ultimately get into the business of datasets

- their fonts and placement are carefully guarded, but geographic data itself might be licensed

**Reports from Break-out Sessions**

A) Increasing Awareness of Map and Spatial Data Collections (attended by Cheryl Woods, Andrew Nicholson)

- ideas for reaching different audiences: internal - displays, tying into local services eg. GIS project results, handouts to accompany displays; outreach to administrators eg. gifts, creating maps of something of interest, long-term loans from collection, meeting space within library eg. for faculty recruitment, applicants; outside - web outreach, web exhibits; media relations good but can bring too much success
- repositories/clearinghouses: scanning parts of collection and indexes online, high cost in creation and maintenance
- tools and resources: Geo One-Stop possible way to share metadata; "friends of the library" are important outreach tools; some exhibits may be material of outside agencies, not all from library's own collections

B) Needs of Spatial Information Collections

- problems discussed include:
- who has it?: cataloguing records are often incomplete
- archiving: what to save, who, how? need standards for digital archiving; storage space still a real problem, must be selective in priorities to eliminate duplication
- searching: desire to search multiple resources at same time, clearinghouses to accomplish large cost goals, need help of government agencies, need regional consortia; portal technology, open source and standardization offer hope for future, comfort with using remote resources over the web, do not have to reinvent the wheel; need to create a checklist of scanning projects to draw on existing expertise eg. LC, Rumsey collection; it is sometimes necessary to buy data on demand, but better to rationalize through consortia for more complete purchases

C) Future Role of Map Library Organizations (attended by David Jones)

- there are presently 6-7 map organizations in the US, competing for executive personnel - asked question is it time to reorganize into 1 group? response was no, but do require improved coordination, collaboration, communication - CUAC should take the coordinating role - the heads of all organizations should communicate and try to organize a conference every 5 years
- publications: suggested using one publication to strengthen the view of maps? (eg. MAGERT coordinate as a forum for digitizing projects) - consensus was to stick with status quo
- this conference at LC seen as important in establishing role of CUAC with administrators

D) Offering GIS Services in Libraries (attended by Colleen Beard, Lori Sugden, Cathy Moulder)

- success stories: 1) (Harvard) weekly workshops & sessions with faculty = "GIS Lab" service, application-specific training aimed at students/ faculty who don't have time for full-time course - GIS specialist does higher level, 1 technician does class-specific and introductory levels, 1 technician does online tools, 7 workstations, no other training on campus, no Geography Dept.; 2) (Princeton) emphasize "geographical information" to all departments and visibility to university/ administrators, GIS too specific, offer 4 workshops over the year on topics to all disciplines; 3) (Florida) library is coordinator of a unique certificate program between 15 departments using GIS; recommends trying to get involved in grant-writing as a source of data and pushing metadata at project beginning ; 4) (W. Illinois) county GIS is a faculty position within Geography Dept., library participates in faculty interviewing thereby establishing contacts
- copyright/licensing: when possible, get a site-wide license rather than single-user
- archiving: need to have a formal policy
- suggested sources of training for GIS librarians: obtain ESRI qualified instructor status; GIS conferences at state-level; hold workshops for reference librarians before patrons to ensure informed referrals; initiate own GIS research projects, to become more than a casual user
- considerable discussion as to whether GIS specialist or librarian background was more necessary/ desirable for working with geographic information: generally conceded that librarians are better at access rather than technology, GIS specialists are more project-oriented, librarians have stronger training in archiving, access, reference interviewing and are more service-oriented = a combination of both

backgrounds gives a more balanced reference response, utilizing both paper and digital information
- problem-solving is the most essential skill

**Lunch-hour Tutorial on JPEG2000 for Mapping Applications** (Carsten Heirmann, LuraTech) (attended by Colleen Beard)

- LuraTech is a company that has developed software, LuraWave JP2, that creates JPEG2000 files - a compressed image format. One would want to use this for converting detailed scanned maps into highly compressed pdf files for web access.
- The tutorial provided an overview of the JPEG2000 ISO standard that focussed on those parts dealing specifically with map applications (parts 1 and 6). Part 6 of the standard deals with compound image format for documents. Apparently, maps are considered documents rather than images when using LuraWave JP2.
- Part 1 deals with image compression. The advantage of LuraWave JP2 is losslessness of detail. In other words, when compressed there is no, or very little, loss of quality or detail. As well, there is built-in functionality of scaling; the product is robust and resilient against transfer of errors and can decode part of a map without decoding the entire map. LuraTech claims that image quality can actually be improved when highly compressed. Carsten demonstrated a 3.2 gigabyte image that was brought into GeoView in a matter of seconds; image quality was impressive! GeoView is a LuraWave JP2 product with viewing tools, has zoom capabilities and gml metadata functionality.
- Georeferenced data, such as satellite imagery, is, however, lossy - quality is lost when compressed. Degree of lossiness is based on compression ratio.
- LuraTech software can also compress single images that combine different raster types, such as text, pictures and graphics, maintaining all detail. Through a unique process, text and images are separated into their own individual layers (multi-layered segmentation process) and then optimally compressed. This compression creates extremely small LuraDocument JPM files while maintaining excellent text and image quality. Again, quite impressive! (http://www.luratech.com)

## Session 2: Data Copyright, Licensing and Access Issues

**Licensing Geographic Data and Services: Vision for a National Commons and Marketplace** (Harlan Onsrud, University of Maine at Orono)

- recently licensing has emerged as the prevalent business model because geographical information is difficult to protect through copyright; now access is to databases rather than distinct datasets, and business models are dependent on multiple subscribers and intended to manage risk - the proliferation of non-standard licenses are not accommodating to all sectors of need/stakeholders
- necessary to look beyond present initiatives eg. what comes after the National Map and Geo One-Stop? will all access problems be solved by these tools? no, there is probably too much data to gather into one repository, so will still have to depend on local organizations which are already gathering data
- propose National Commons in geographic information where individuals can post and acquire licensed data and National Marketplace for offering/acquiring commercial geodata (http://www.spatial.maine.edu/geodatacommons)
- concept of "data donations": would require users of Marketplace to donate data to Commons after some time period eg. 5 years (ie. after initial high retail value)
- way of capturing data from small local projects, isolated datasets which are presently inaccessible and not archived, often not owned by spatial specialists (which are currently very difficult for average person to find and share)
- creators are more willing to share data if: easier; can reliably retain credit; minimize liability/exposure from decisions; obtain benefits even if not financial (eg. longer term archiving, peer review, increased recognition, format conversion) therefore Commons project should emphasize incentives and facilities for sharing
- Commons = peer to peer sharing system that supports open access licenses, user friendly metadata & document creation detailing the parent lineage of newly submitted datasets (meaning must be accomplishable by a non-specialist in less than 10 minutes for metadata/license creation) - metadata creation by the data creator should eliminate huge cataloguing backlog (http://creativecommons.org; http://science.creativecommons.org)
- presently looking at technologies where common people could do data/metadata creation themselves rather than visions for national "supertanker" infrastructures created by specialists - for example "One minute license form"

**The Idea of Discovery: Planning and Implementing Access to Geospatial Data at Harvard** (Tim Strawn, Harvard University)

- Harvard Geospatial Library (HGL) (http://hgl.harvard.edu) supports university with no Geography Dept. or centralized GIS services - aim of the tool is to assist researchers in finding and downloading parts of datasets, through a scalable, robust and non-proprietary application that can be migrated to many other uses (eg. ESRI Geography Network searches HGL) - searching is predicated on metadata, no specific topical or discipline-based themes, fewer than 5% of searches are gazetteer-based - LCSH is used for thesaurus and keyword fields; gazetteer is based on US GNS Geonet Names server - presently 6,000 layers of data are available, including 18th century US east coast, 19th century topographic maps, information on China including Army Map Service (AMS) maps

**Technology Transfer Opportunities for Map and Geographic Information** (Julia Giller, USGS Technology Transfer Office)

- goal of the Technology Transfer program = expand commercial applications of government technologies - previously no one would invest in Research & Development for public domain ideas, industries and government could not work together because of anti-trust legislation - government was not allowed to be included in any joint project unless specifically mandated
- legislation now allows government to partner with the private sector and to receive funds in services/equipment/know-how - partnerships will result in more sales products rather than free or public domain, as the commercial partners must recover their costs for organizing the information
- examples of USGS Cartographic Technology Transfer Projects: TerraServer maps and aerial photographs worldwide (http://www.terraserver.com); TerraFly searchable aerial views of US cities and towns (http://www.terrafly.com); Our Earth as Art website (http://earthasart.gsfc.nasa.gov/index.htm); CD-ROM datasets eg. Aggregates Industry Atlas of the United States (http://minerals.usgs.gov/minerals/pubs/commodity/aggregates), Global GIS (http://webgis.wr.usgs.gov/globalgis)

PowerPoint presentations and abstracts are available at http://cuac.wustl.edu/cuac.htm

*All those sessions... and still a little time to relax. (Photo courtesy of David Jones)*

# REGIONAL NEWS / NOUVELLES REGIONALES

Andrew Nicholson

## Alberta

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Spring and summer have been busy times for the William C. Wonders Map Collection and its Map Librarian and staff. Recently received map cabinets have allowed the shifting of the LC Classified (post 1995) maps to improve access and reduce overcrowding.

During the Spring Semester, working with Bess Sadler, a student, now graduate of the U. of A. School of Library and Information Studies, we prepared a poster (1 m x 2 m) on our Austro-Hungarian Collection. This poster was presented at the International Conference on the History of Cartography in Budapest and at CARTO 2005 in St. John's. Some progress has also been made on the cartobibliography with the development by Bess Sadler of an interface for the XML file. However, limited staffing resources and other, higher priorities have slowed the growth of the file.

The collection has received through donation a number of older maps including:
- "Les Isles Britannique qui comprennent Les Royumes d'Angleterre, d'Ecosse et d'Irlande" by Robert (1754)
- "Carte general de l'Empire des Russes en Europe et en Asie, dresse d'apres les cartes de l'Atlas Russien" by Vaugondy (ND)
- "The Russian Empire in Europe and Asia" by Wilkinson (1814)
- "Russia in Europe with its Dismemberments from Poland in 1773, 1793 and 1795" by Wilkinson (1809)

## Manitoba

University of Manitoba
Larry Laliberte
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The University of Manitoba Library would like to announce the donation of digital aerial images of Winnipeg by ATLIS Geomatics. These full colour images were taken in May 2002 at a scale of 1:10,000 and have been ortho-rectified to a pixel resolution of 20 cm. The acquisition of ATLIS's 2002 digital aerial images will be very useful to all members of the University Community carrying out research in the fields of geography, landscape architecture, city planning, engineering, history and other studies focussed on urban issues.

## Ontario

University of Toronto
Marcel Fortin
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Marcel Fortin will be taking parental leave starting at the end of December 2005. He will then be taking a one year sabbatical starting in March 2006 to write a Guide to GIS Services in Libraries due to be published by the ACMLA in 2007.

University of Western Ontario
Cheryl Woods
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The Geography Department is going through a few changes. As of July 1, our new chairman is Dan Shrubsole who will have a 4-year term. On that same day, an announcement was made that the Department will be hiring a GIS technician who will start January 2006. And as of September 16, Dale Smith, map library assistant will be retiring. Advertisement for that position will start in late September.

Through the Social Science student levy fund, the map library purchased a Geochron Global Time Indicator. The "ever-changing areas of day and night make a complete cycle every 24 hours and gradually changes shape with the seasons." It automatically shows where on earth it is daylight or darkness at the moment the map is viewed. The Geochron has been installed inside the entrance to the Map Library and has received much attention.

May 12-13, Cheryl attended the Map and Geographic Information Collections in Transition conference hosted by the Library of Congress, Geography & Map Division. It provided 2 full days of interesting speakers, break-out sessions and discussion.

The Map Library offered 2 tours and display to employees in the faculty of Social Science who wanted to use recreational maps to plan summer vacations. A wide variety of maps were discussed – fishing, provincial parks and hydrographical charts were the most frequently requested maps.

The University of Western Ontario hosted Congress 2005, May 28-June 5. The Geography Department hosted the Canadian Association of Geographers during the Congress. There were 2 exhibits that the Map Library set up for the duration of the event.

The City of London is celebrating its 150th anniversary during 2005 and the Map Library has been assisting with numerous exhibits throughout the city. A commemorative map was printed, having been designed by a local artist who got the idea from historical maps she viewed in the Map Library.

Donations of 19th century material are always a bonus and a recent gift we received is an atlas dated 1861. It is "Mitchell's New General Atlas, containing maps of the Various Countries of the World, Plans of Cities, etc. embraced in Forty-seven Quarto Maps, forming a series of Seventy-six maps and Plans, together with Valuable Statistical tables". It is a very welcomed addition to the collection.

Queen's University
Susan Greaves
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Many of you are already aware that Shirley Harmer retired from Queen's University in November 2004 after over 20 years of directing the activities here in the Map and Air Photo Collection. I joined the MADGIC unit at Queen's University in May 2005, arriving just in time for the name change from Documents to MADGIC. I have come from Cornell University in Ithaca NY, where I was Map & GIS Librarian since 1992. Prior to that, I was Map Curator at Dalhousie University. I am delighted to be back working with Canadian data and look forward to meeting with ACMLA members.

This summer our Library is constructing a Learning Commons area on the main floor. Phase I should be up and running by early fall. MADGIC, on the lower level, will be actively involved in a later Phase II. More to come on this, but I do have visions of GIS capabilities available throughout the Commons.

We are in planning stages for GIS Day 2005 at Queen's, in collaboration with the new Geographic Information Science program. There will be presentations from people working in the field, poster sessions, a map gallery, and hands-on workshops. We plan participation from data providers and software vendors and hope for lots of interaction between students and practitioners. More to come on this too.

Alex Cooper, Data & Map Technician, attended the OCUL Map Group's Library Assistant Workshop and reported back very favourably on the sessions. Cate Jackson, Public Service Technician, continues to add records for our aerial photograph collection to an InMagic database which indexes them by NTS number, keyword and flight line. In addition to their regular map and data related responsibilities, Alex and Cate also participate on library-wide Functional Teams and Special Projects. I have been exploring the campus and the city, meeting many inspiring people, working on the SSH reference desk, getting to know the collection, planning for a major recon, working on ArcGIS 9.1 tutorials, having a great summer and anticipating with pleasure the arrival of the students next week. Best wishes to all from Kingston.

# NEW BOOKS AND ATLASES

Eva Dodsworth

Asquith, George and Daniel Krygowski. 2004. *Basic well log analysis, 2nd edition.* Tulsa, OK: American Association of Petroleum Geologists. 244 p. $59.99 US. ISBN0891816674.

Balkaran, Lal. 2005. *The Rupununi savannas of Guyana: a visual journey : photographs of the people, landscape, and everyday life in the north and south Rupununi.* Toronto: LBA Publications. 115 p. $45.00 CDN. ISBN 0973554517.

Brewer, Cynthia. 2005. *Designing better maps: a guide for GIS Users*. Redlands, CA: ESRI Press. 200 p. $24.95. ISBN 1589480899.

*Canadian atlas: our nation, environment and people.* 2005. Vancouver: Douglas & McIntyre. 192 p. $69.95 CDN. ISBN 1553650824.

Casey, Edward. 2005. *Earth-mapping: artists reshaping landscape.* Minneapolis: University of Minnesota Press. 256 p. Paper : $27.95 US. ISBN 0816643334. Cloth : $83.95 US. ISBN 0816643226.

Davis, Timothy, Todd A. Croteau and Christopher H. Marston. 2004. *America's national park roads and parkways: drawings from the historic American engineering record.* Baltimore: Johns Hopkins University Press. 400 p; 331 plates. $55.00 US. ISBN 0801878780.

Dawson, Joan. 2005. *Historical atlas of the Maritime Provinces 1878.* Halifax: Nimbus Pub. $29.95 CDN. ISBN 1551095343.

De Blij, H.J. 2005 *Atlas of North America.* New York: Oxford University Press. 320 p. $125.00 US. ISBN 019516993.

De Blij, H.J. and Peter Muller. 2005. *Concepts and regions in geography, 2nd edition.* Toronto: John Wiley & Sons. 400 p. $94.95 CDN. ISBN 0471649910.

De Jong, Steven and Freek D. van der Merr. 2004. *Remote sensing image analysis : including the spatial domain.* London: Kluwer Academic. 359 p. 117,70. ISBN 1402025599.

Fiorani, Francesca. 2005. *The marvel of maps: art, cartography, and politics in Renaissance Italy.* New Haven: Yale University Press. 347 p.; 160 illus. $60.00 US. ISBN 0300107277.

Francaviglia, Richard. 2005. *Mapping and imagination in the Great Basin: a cartographic history.* Reno: University of Nevada Press. 256 p.; 79 maps. $44.95 US. ISBN 0874176174.

Gradstein, Felix, et al. 2005. *A geologic time scale 2004.* New York: Cambridge University Press. 610 p. $70.00 US. ISBN 0521786738.

Harris, Richard. 2004. *Creeping conformity: how Canada became suburban, 1900-1960.* Toronto: University of Toronto Press. 160 p. Paper : $19.95 CDN. ISBN 0802084281. Cloth : $45.00 CDN. ISBN 0802035566.

Herzfeld, Ute. 2004. *Atlas of Antarctica: topographic maps from geostatistical analysis of satellite radar altimeter data (with CD-ROM).* Berlin: Springer. 364 p.; 169 illus. £115.50. ISBN 3540434577.

Johnson, David. 2004. *The geology of Australia.* New York: Cambridge University Press. 288 p. Paper : £27.99. ISBN 0521601002. Cloth : £65.00. ISBN 0521841216.

Kane, Joseph and Charles Aiken. 2004. *The American counties: origins of county names, dates of creation, and population data, 1950-2000, 5th edition.* Lanham, MD: Scarecrow Press. 552 p. $95.00 US. ISBN 0810850362.

Kermel-Torres, Doryane. 2004. *Atlas of Thailand: spatial structures and development.* Chiang Mai, Thailand: Silkworm Books. 209 p. $38.46 US. ISBN 9749575431.

Knight, Gregory, et al. 2004. *Drought in Bulgaria: a contemporary analog for climate change.* Burlington, VT: Ashgate. 352 p. $99.95 US. ISBN 0754642151.

Li, Zhiln, Oing Zhu and Chris Gold. 2004. *Digital terrain modeling: principles and methodology.* Boca Raton, FL: CRC Press. 344 p. $89.95 US. ISBN 0415324629.

Longley, Paul, et al. 2005. *Geographical Information Systems: principles, techniques, management and applications, 2nd edition, abridged.* Toronto: John Wiley & Sons. 404 p. $84.99 CDN. ISBN 0471735450.

Lunetta, Ross and John G. Lyon. 2004. *Remote sensing and GIS accuracy assessment.* Boca Raton, FL: CRC Press. 304 p. $129.95 US. ISBN 156670443.

Margat, Jean. 2004. *Mediterranean basin water atlas.* Paris: UNESCO Publishing. 48 p. 10,00 . 9231039636.

Martin, Geoffrey. 2005. *All possible worlds: a history of geographical ideas.* New York: Oxford University Press. 624 p. $80.00 US. ISBN 0195168704.

Mayhew, Susan. 2004. *Dictionary of geography, 3rd edition.* New York: Oxford University Press. 558 p. $15.95 US. ISBN 0198606737.

Mithen, Steven. 2004. *After the ice: a global human history, 20,000-5000 BC.* Cambridge, MA: Harvard University Press. 664 p. $29.95 US. ISBN 0674015703.

Monmonier, Mark. 2004. *Rhumb lines and map wars: a social history of the Mercator Projection.* Chicago: University of Chicago Press. 256 p. $25.00 US. ISBN 0226534316.

Pedley, Mary. 2005. *The commerce of cartography: making and marketing maps in eighteenth-century France and England.* Chicago: University of Chicago Press. 232 p. $40.00 US. ISBN 0226653412.

Royal Geographical Society. 2005. *The Firefly great world atlas.* Richmond Hill, ON: Firefly Books. 340 p. $49.95 CDN. ISBN 1554071216.

Smith, AG, et al. 2004. *Atlas of Mesozoic and Cenozoic coastlines.* New York: Cambridge University Press. 109 p. £14.99. ISBN 0521602874.

Stalker, Peter. 2005. *A-Z of countries of the world.* New York: Oxford University Press. 428 p. $16.95 US. ISBN 0192805940.

Stow, Dorrik. 2004. *Encyclopedia of the oceans.* Oxford: Oxford University Press. 256 p. £25.00. ISBN 0198606877.

Villard, Ray and Lynette Cook. 2005. *Infinite worlds: an illustrated voyage to planets beyond our sun.* Berkeley: University of California Press. 252 p. $39.95 US. ISBN 0520237102.

Wang, Chunzai, et al. 2004. *Earth's climate: the ocean-atmosphere interaction.* Washington, DC: American Geophysical Union. 414 p. $70.00 US. ISBN 0875904122.


*Thanks to these good folks, and the many others who made CARTO 2005 an excellent conference: (left to right) Suanne Reid, Alberta Auringer Wood, Joanne Costello. (Photo courtesy of Alberta Auringer Wood)*

# REVIEWS

Michele Shular

Carroll, Francis M. **A Good and Wise Measure: The Search for the Canadian-American Boundary, 1783-1842**. Toronto: University of Toronto Press, 2001. 2003 reprint. 462 p. $32.95 CDN. ISBN: 0-8020-8358-7 (pbk).

The amount of detail that Carroll uses to describe the arduous task of defining the Canadian-American boundary is most impressive. His referencing includes extensive notes (numbering 102 pages); 18 pages of sources that include manuscript materials, newspapers, and other types of publications; and 31 pages of index. There are also 16 maps that support the voluminous description of surveying both land and sea that this delineation entailed. The two areas which are described in the most detail are the boundaries between what is now Maine and New Brunswick, and between Minnesota and Ontario.

One of the most interesting early maps of North America played an essential role as a cartographic record to the authors of the Webster-Ashburton Treaty (1842) -- John Mitchell's 1755 map of North America. Although this map did not accompany the Treaty of Paris (1783) which described the boundary that stretched for twenty-five hundred and forty miles, the map was used along with one by William Faden dated 1783 to assist the survey crews.

Carroll writes chronologically about sections of the border and interpretations of those sections, from the 1783 treaty and in the Treaty of Ghent (1814), by surveyors and politicians. What an exhausting undertaking it must have been for the surveying crews of these four commissions to define the boundary. The true definitions of the words - "dispute", "compromise", "negotiation" and "arbitration" were all put to the test over the 60 years discussed in this book.

Quotations from diaries, memoirs and letters add a sense of "being there" for the reader. The daily toil of the surveyors, the reactions of the Indians, and the thoughts of the diplomats are revealed. Names of notable people who played key roles in the delineation of this vast area, such as Bouchette, Johnson, Odell, Thompson, Campbell and Ogilvy, are brought to life.

Similar titles, by Howard Jones *To the Webster-Ashburton Treaty: A Study in Anglo-American Relations, 1783-1843* (1977), by C.P. Stacey, *The Undefended Border: The Myth and the Reality* (1967) and by H. S. Burrage, *Maine in the Northeastern Boundary Dispute* (1919), when added to Francis Carroll's work, give an enormous amount of reading on the theme of Canadian-American boundary history.

The author's thorough research on this topic demonstrates his dedication to the subject of history. There is no question that this book should be purchased by anyone interested in geopolitics, and on the History shelf of academic and public libraries. Its usefulness as a reference source cannot be overstated.

Cheryl Woods
Curator, Serge A. Sauer Map Library
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Nebenzahl, Kenneth. **Mapping the Silk Road and Beyond: 2,000 Years of Exploring the East**. New York: Phaidon Press Limited, 2004. 176 p. $49.95 US. ISBN: 0714844098.

Kenneth Nebenzahl's *Mapping the Silk Road and Beyond* is a valuable addition to the body of knowledge pertaining to historical cartography. It features 80 full colour rare maps, over half of which have never been published before. These maps illustrate two millennia of European discovery and exploration of the overland and maritime network of trade and missionary outposts scattered throughout the exotic East, that have come to be known as the Silk Road. The historical works of cartographers from England, France, Portugal,

Holland, Turkey, Italy and China transport the reader through the age of Alexander the Great to the eighteenth century voyages of James Cook, from Constantinople to present day Alaska.

*Mapping the Silk Road* is organized chronologically into five parts. Part 1 examines the ancient and medieval geographical concepts of the East. As there are no surviving European maps exhibiting classical perceptions of the East, Nebenzahl uses 15th century renditions of Ptolemaic maps published in the historical atlas of Abraham Ortelius. Part 2 examines the 15th and 16th century quest for the sea route to the Indies. Part 3 looks at the establishment of the Portuguese, Dutch, British, French and Spanish Empires in South and South East Asia and the Philippines. Part 4 depicts resistance to European encroachment in Japan, Korea and China. And part 5 focuses on the northern exploration of a North West passage from Europe to the Pacific.

Each map is accompanied by an essay that provides information about the mapmaker and his work, the printing process, method of colouring, place, publisher and date of publication. English translations for titles are also provided if not originally printed in English. Typical of the cartography of their times, the majority of the maps include intriguing illustrations and details, such as camel caravans, native plants and animals, battle scenes and cityscapes. To enable the reader to interpret the full meaning of these works of art, Nebenzahl describes the features, degree of geographical speculation and accuracy, and the contexts of trade, exploration, or conquest of each map.

Nebenzahl is an internationally recognized authority on antiquarian cartography and thus provides a solid account that offers an important historical perspective to the renewed western fascination of the East. A definite must for anyone interested in the history, cartography and politics of Europeans and the Orient.

Jennifer Marvin
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Seaver, Kirsten A. ***Maps, Myths, and Men: the Story of the Vínland Map***. Stanford, Calif: Stanford University Press, 2004. 480 p. $24.95 US. ISBN: 0804749639 (pbk).

*Maps, Myths, and Men* provides an introduction, history, and research update on the continuing discussion about the Vínland Map. It also examines the Vinland Map's description in the book *The Vinland Map and the Tartar Relation* (both 1965/66 and 1995 editions). The author provides a documentary history of the Vínland map, including thoughts about its origin, authenticity, and the studies that have been made between 1967 and 2002.

Kirsten A. Seaver is a historian, a Fellow of the Royal Geographical Society, London, a novelist, and a translator. She is knowledgeable in cartographic works in the Middle Ages, and also of the Norse language and history that is needed to understand the relationship between the original Norse exploration of North America and the Vínland Map. In one book, she provides a brief history of those explorations, what is known by archaeological and historic evidence, background on cartographic developments from the period, the story of the appearance and study of the Vínland Map in the 1950s, and subsequent research performed in an attempt to prove the map's authenticity.

The investigation is related in an objective manner, and though the author does have her own opinions which are given in later chapters, she states that it is not her intention to prove or disprove anything, but instead to provide a documentation of what has been done (or not done) in attempts to get at the truth.

Seaver does not just repeat previous arguments and research; she describes and correlates the various components throughout the text and explains herself clearly, so that the text is both informative and interesting. However, one of the book's unique features is her conjectures about the map's creator, what the map shows, and its relation to cartographic and human history. The chapters on who most likely created the map, and why, along with the sequence of the probable actions and events of the various participants in the map's present history from its "discovery", sale, initial documentation, and its unveiling to the public,

show a depth of knowledge of the subject and of the rare map trade.

Seaver's writing style is clear, with notes for both introductory and knowledgeable readers, covering all aspects of the subject. The book has illustrations and maps, some drawn for the book, that explain various concepts in the text. Both the hardcover and paper editions are printed on acid-free paper, with good typography and layout. The Bibliography and Notes are extensive, and the index has a large number of cartographers and personages through the history of the period, as well as the present day researchers of the map.

Overall, this book gives a well-rounded study of the entire Vinland Map history. It is well suited for acquisition in map collections, as well as for libraries in the fields of history, geography, Norse studies and rare book collecting, among others. It would even be interesting reading as an "investigative" type story.

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Bright, William. **Native American Placenames of the United States**. Norman: University of Oklahoma Press, 2004. 600 p. $59.95 US. ISBN 0-806-13576-X.

No map library should be without a healthy collection of place name dictionaries, and William Bright's latest instalment will prove an essential addition to the genre. This 600 page geographic dictionary is one of, if not the most, comprehensive dictionaries of its kind. Until recently, most Native American place name dictionaries have been regional in nature. Now Bright has created a single resource for the entire U.S. utilizing modern linguistic research techniques and methodologies.

The first 15 pages provide a thorough introduction to the author's choice of places, the problems faced in researching this topic and the methods used to ensure accuracy. In addressing accuracy, Bright conferred with a team of 12 editorial consultants, all experts in Native American linguistics. The 13 page bibliography demonstrates the extensive nature of Bright's research and provides useful information for further investigation. A six page pronunciation key, using the English Phonetic and the International Phonetic Alphabet, offers a detailed description of non-English letters and symbols.

Pages 19-585 are the main body of the text with approximately 11,000 entries. Each entry contains a headword, the place's location, the pronunciation, the etymology and a citation linking the entry to the source of information. One might like to see the latitude / longitude coordinates for each place, but those can easily be searched elsewhere. Conducting my own informal analysis, I searched dozens of place names from my home state of Wisconsin, bordering states of Illinois and Minnesota and I also perused the map *Dine´ bike ´yah: Navajo lands* from 2004 of the Four Corners region of Southwestern United States. Each place that I looked up, I found in this book; from the small towns like Minong, Wisconsin to large cities like Chicago or Minneapolis. My brief investigation showed this resource useful. Individual entries are brief, but the inclusive nature of the citations and bibliography offers a springboard for additional research.

William Bright is a Professor Emeritus of Linguistics and Anthropology at the University of California, Los Angeles, as well as an adjunct professor of Linguistics at the University of Colorado, Boulder. He is an accomplished editor and author, having written such reference works as *International Encyclopaedia of Linguistics*. Bright concedes that there is more research to be done in regards to Native American place names for regions such as Alaska with living Native languages and the Atlantic coast with extinct languages. But, this place name dictionary is an affordable and valuable resource for map libraries and other research libraries supporting Native American specialists.

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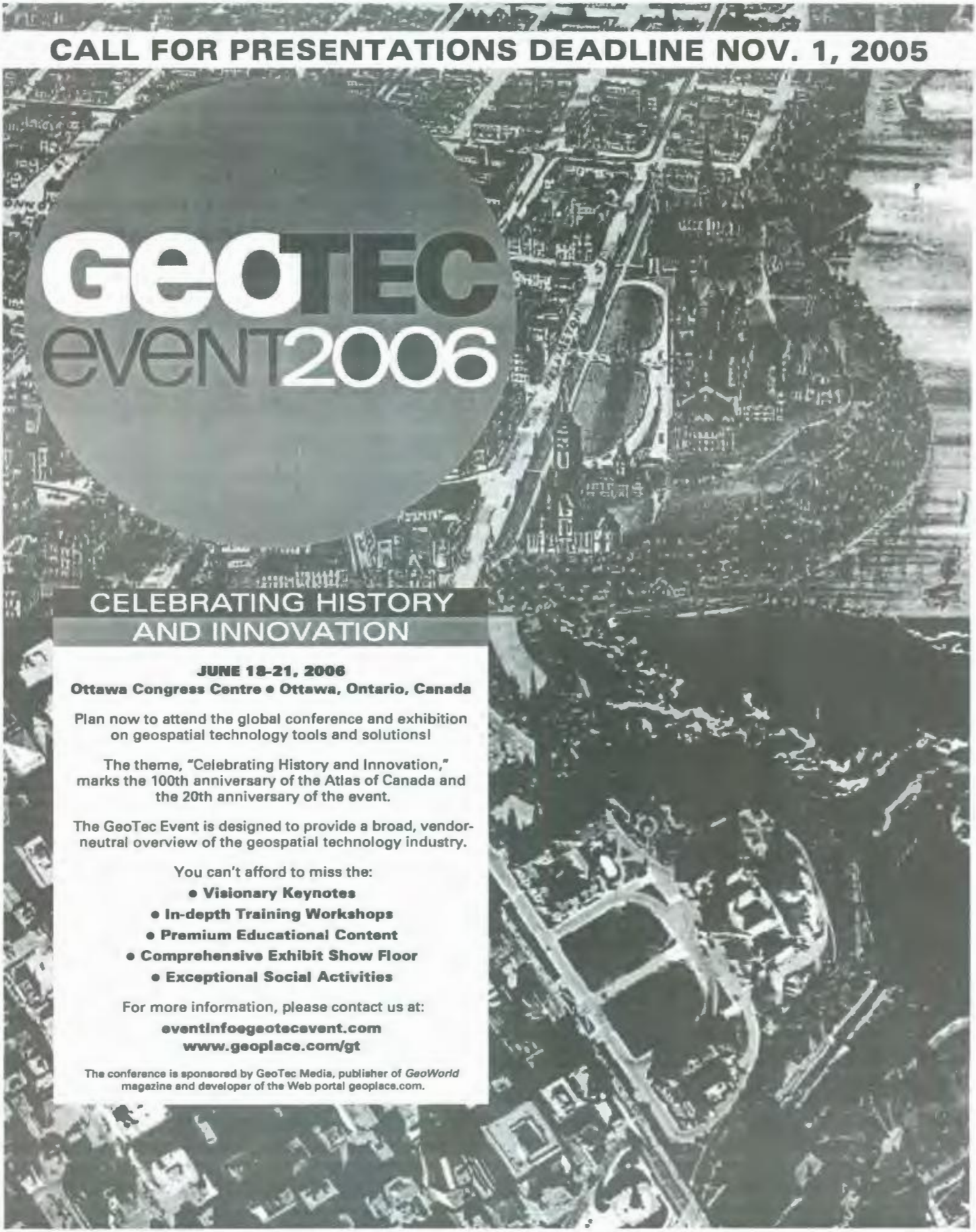
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