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ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES /
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ON THE COVER...

PRESIDENT'S MESSAGE

In June of 1967, the first meeting of the Association of Canadian Map Libraries was held, bringing together 70 professionals from across Canada to discuss common problems, a nationwide union catalogue of map holdings, and other co-operative ventures to support a growing and vibrant map library community. Fifty years later, the Association of Canadian Map Libraries and Archives continues to build on the legacy of our founding members, serving as the representative professional group for Canadian map librarians, cartographic archivists, and others interested in geographic information in all formats. Though the world of geographic information, services, and resources has changed dramatically in recent years, the need for a national association representing the full cross-section of the geo-information community's interests is just as necessary, and important, as ever.

This special issue of the Bulletin is a celebration of our contributions to our field – looking back at the past fifty years, the issues that have influenced our profession, and the changes that have shaped the current information landscape.

As newly elected President, I am looking forward to working together to build on the work we have all contributed to making a difference in the ever-changing world of geo-information collections, services, and research. This year, the ACMLA Executive will be focussing in particular on enhancing opportunities for professional development, exploring new platforms to publish our scholarship and research, and engaging members in open communication in an effort to bring all of our voices together to create a strong, dynamic community for the future.

Deena Yanofsky
President, ACMLA

En juin 1967, la première réunion de l'Association des cartothèques du Canada a eu lieu, réunissant 70 professionnelles et professionnels de partout au Canada pour discuter de problèmes communs, un catalogue collectif national des cartes, et d'autres entreprises coopératives afin de soutenir un plan de croissance de la communauté dynamique des cartothèques. Cinquante ans plus tard, l'Association des cartothèques et archives cartographiques du Canada continue de miser sur l'héritage de nos membres fondateurs, servant en tant que représentant du groupe professionnel des cartothécaires, des archivistes cartographiques et autres personnes intéressées par l'information géographique dans tous ses formats. Bien que le monde de l'information géographique, des services, et des ressources ait considérablement changé au cours des dernières années, la nécessité d'une association nationale qui représente la section transversale complète des intérêts de la communauté de l'information géographique est tout aussi nécessaire, et importante, comme toujours.

Ce numéro spécial du Bulletin est une célébration de nos contributions à notre domaine - en regardant en arrière au cours des cinquante dernières années, les questions qui ont influencé notre profession, et les changements qui ont façonné le paysage de l'information actuelle.

En tant que la nouvelle Présidente, j'ai hâte de continuer le travail sur lequel nous avons tous contribué afin de continuer à faire une différence dans ce monde en évolution constante des collections de l'information géographique, les services, et la recherche. Cette année, l'exécutif de l'ACACC se concentrera en particulier sur l'amélioration des possibilités de perfectionnement professionnel, d'explorer de nouvelles plateformes afin de publier nos études et recherches, et des éléments d'engagement en communication ouverte dans un effort d'apporter toutes nos voix ensemble pour créer une forte communauté dynamique de demain.

Deena Yanofsky
Présidente, ACACC

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GEOSPATIAL INFORMATION AND THE FUTURE CONTEXT OF MAP LIBRARIES
ACMLA Bulletin Number 104, Winter 1999

Yves Tessier
Chief Map Librarian
Library, Université Laval

The Map Library developed as a new field of practice in specialized libraries during the 1950's and 1960's. Based on traditional library models, this new profession generated service centres offering cartographic documentation (current and old maps, atlases, aerial and satellite photos), the development of a new and distinct field of knowledge - map librarianship, tools for document standardization (ISBD-CM and standards for cataloguing cartographic documents), and the creation of map library associations on an international, national, and regional level.

The recent advent of geospatial information (or spatially referenced information) and of geomatics (the science that manages this information) has introduced a new perspective on the delivery of information services which up to this moment was dependant on traditional print methods. In this text, we will present the growth of this new information paradigm offered by map libraries, and the possible consequences to the management and the organization of services. Equally, we will show the state of geomatics within map libraries in the province of Quebec, using the help of a survey completed in the Fall of 1997.

1. THE GROWTH OF THE NEW MULTI-DISCIPLINARY INFORMATION PARADIGM : GEOSPATIAL INFORMATION

1.1 The origins of map libraries within libraries

Map libraries began to develop in the U.S. during the 1950's and in Canada during the 1960's, primarily in university environments. Often map libraries would begin within Departments of Geography, but would eventually become integrated within the main research library. We begin to see the start of a new information area with its own method of organization that is based on similar library structures. The first edition of the Directory of Canadian Map Collections (Tessier and Winearls, 1969) lists 87 existing map collections (including archival collections).

A new information profession is born, map librarians with a background in either Geography/ Cartography or Library Science (often times both simultaneously). Presently, we number many professional associations: Association of Canadian Map Libraries and Archives - ACMLA (founded 1967), Geography and Map Division of the Special Libraries Association, ALA Map and Geography Roundtable - MAGERT, Western Association of Map Libraries (Western United States), Map Librarian Group of the Association of European Research Libraries - LIBER, the Section of Geography Libraries and Map Libraries of the International Federation of Library Associations and Institutions - IFLA. A new information field (map librarianship) emerges and becomes a specific topic with practical manuals (Harold Nichols, 1976 and Mary Larsgaard, 1978). With ISBD-CM and the publication of a manual of interpretation for AACR2 for cartographic materials (Hugo Stibbe, 1982), bibliographic map description was standardized.

Map libraries have evolved into a new form of specialized Library as well as a new professional field. This debut has also given way to the new arrival of geospatial information.

1.2 The emergence of geospatial information and geomatics

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The advent of geospatial information and geomatics began with computer assisted cartographic systems and the development of geocoded information, or a link between data and a geographical feature. We then see the appearance of Geocoded Information Processing Systems and Geographic Information Systems (GIS).

Geomatics starts as a science for managing spatially referenced information. The first groups to generate data were also the first to consume this data afterwards: planners (Governments and Municipalities) or infrastructure managers (telephone, power, gas, roads, etc.). Basic digital data (topography, cadastral survey, communication networks) is completed more and more by other digital datasets (land use, forest and urban inventory). Newly acquired raw geospatial information also complements existing printed paper maps.

1.3 The development and accessibility of new spatial analysis capabilities

Software tools that process digital information are becoming more functional and accessible. Spatial analysis functions are being enhanced in GIS, and the range of geomatics applications also becomes more broad (socio-economic analysis, marketing of services, etc.).

We equally see a liberalization in accessing information (presently only socioeconomic statistics) generating a growth in potential users. Documentation tools have become more varied: electronic atlases, customized map atlases created from databases, software allowing the creation of superimposed layers of information including multimedia, etc.

A new multi-disciplinary information paradigm is emerging:
•new sources of information become available
•new customers arrive with different document needs
•map libraries have to anticipate requests for new services.

We must now consider offering unique services based on a new category of data requiring a specific management and delivery infrastructure, new skills and guidelines for usage.

2. A BRIEF HISTORY OF THE DEVELOPMENT OF GEOMATICS WITHIN THE LIBRARY SYSTEM

The introduction of Geomatics into map libraries and library systems started with a partnership between the Association of Research Libraries and the ESRI Company who developed a user-friendly GIS software called ArcView. The first two phases of the ARL GIS Literacy Project (1990-1994) allowed 70 map libraries free access to the ArcView software, geospatial data, an introductory training session, and user support.

In Canada, Phase 3 of the American project (1995) allowed the introduction of geomatics into approximately 30 map libraries. Afterwards, a dialogue between the Canadian Association of Research Libraries (CARL), the Association of Canadian Map Libraries and Archives (ACMLA), and the Canadian Association of Public Data Users (CAPDU) helped in May of 1996 to establish a Canada wide agreement for collaboration towards the progress of geomatics: "GIS in Canadian Libraries Initiative (GCLI)". A working group was created to further develop geomatics in map libraries and study the following five aspects: access to GIS software, access to Canadian datasets, training staff/personnel, establishing regional databanks, and establishing links or connections with other partners. In the province of Quebec, geomatics is slowly being introduced in some map libraries. Under the supervision of the CREPUQ Working Group on the Access to Resources, a second sub-group on geomatics in map libraries was established in June of 1997. Its mandate was to establish a plan of action for developing access to geospatial data, with particular attention to data from the province of Quebec, and to share available expertise and experience already achieved within the university libraries of Quebec.

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At the government level, a major and strategic study administered by the "Centre de developpement de la geomatique (1997)" is presently under way to determine the accessibility of geospatial data in Quebec.

3. THE PLANNING OF GEOMATIC SERVICES IN MAP LIBRARIES: KEY QUESTIONS

The planning of geospatial information services raises new questions because of its innovative character and the importance of information technologies. The ARL publication titled Transforming Libraries: Issues and Innovations in Geographic Information Systems (George J. Soete, 1997) brings to the forefront important questions. Below is a condensed version of the questions from the above-mentioned publication.

3.1. Which services to offer?

•Analysis of needs to satisfy in terms of data and the ability to process the data
•Analysis of user types and their ability to access GIS independently
•Evaluation of services requested by users •Definition of services to offer and training needs
•Trend towards independent access by users
•Examination of training partnerships with teaching faculties
•Emphasis on a library "clearinghouse" role where data and metadata, including those produced locally, are distributed

3.2. Which collections to develop?

•Base data: general or national data, administrative boundaries, geostatistical boundaries, topography, cadastral surveys, road networks, etc.

•Thematic data •Regional and municipal data
•Locally produced data
•Partnerships with data producers 3.3. Who will ensure support?
•A certain expertise level required
•Content evaluation also required

•Advanced GIS expertise? Or rather an individual with comprehensive experience needed to develop a databank, manage services, find, develop, and operate resources, develop partnerships, and promote new services for new users

3.3. How to train personnel and users?

•The learning curve is considerable for staff and users
•Relearn the profession within a new paradigm
•Use available tutorials and documentation •Wider range of university education
•Create customized training sessions •Combine training with data service librarians •Make use of university departments that teach GIS
•Share expertise among organizations •Become familiar with the contents and not only the technology
•Make users more self-sufficient

3.4. With whom to collaborate?

•Internally, collaborate with the person in charge of digital data, specialized advisors in various subjects, computer scientists, network and server administrators •Externally, collaborate with researchers, geographical information laboratory technicians, professors, governments and non-governmental producers, local agencies, software and service providers
•Support collective coalitions that favour consortiums for data access or that represent common interests
•Play the "neutral" card that libraries have compared to departments and faculties, when it comes to asking for data, support, and distributing information

3.5. How and where to store data?

•Local servers or allocated space on central computers?
•Collective servers?
•National or regional servers presently being developed through data providers
•FTP transfer trends instead of on-site storage ("just in time" rather than "just in case")

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3.6. What is the cost structure?

•Equipment: less critical than in the past, a good quality PC will suffice
•Software: limited number, group buying will lower costs
 •Data accessibility: prohibitive prices at this time, FTP consortium is needed
•Initial and continuous training: significant but essential cost
•User support: important and again essential cost
•Development strategy in progressive steps

For an overview of the development of geomatics in European map libraries, consult the Bulletin du Comite frangais de cartographie (1998).

4. TYPES OF SERVICES TO OFFER

Under these guidelines for development, we can then outline a range of user services on a continuum towards a growing specialization.

4.1. Consulting electronic atlases

•Expansion of electronic services already offered with print documents
•Limited expertise required, CD-ROM type service

4.2. Access services for data and metadata (descriptive data)

•These services are a high priority for libraries
•Make data available and accessible to independent specialists and to new users •Favour accessibility and promote development of metadata for organizations (including cataloguing of local production)

•Distribute information on new developments, projects, and innovative techniques (clearinghouse role)

4.3. Visualization and basic cartography
•Data display through GIS tools (systems, softwares)
•Offer various technical processing capabilities (projections, coordinates, conversions, etc.)

•Basic map production and map printing 4.4. Spatial analysis
 •Give access to spatial analysis tools •Production of maps or "compilations" for users Some libraries are setting up GIS Centres or are intensively developing services with the help of software providers and data production partnerships.

5. RECENT SURVEY OF GEOMATICS IN QUEBEC MAP LIBRARIES

A survey of geomatics in Quebec map libraries was conducted during the Fall of 1997 by the working sub-group of the CREPUQ.* The goal of the survey was to report on the status of geomatics and to identify development support needs in order to establish priorities for action.

Below is an overview of survey results and general conclusions.

5.1. Collections Eight out of eleven respondents have electronic documents in their map libraries, seven of which have electronic atlases. The true position of map libraries in Quebec becomes clear when noted that only five possess raw geospatial data and three map libraries have a collection development policy for electronic resources.

A fact first noted was that: only three map libraries within the province of Quebec have presently genuinely initiated the "GIS transition". These transitions were most likely completed because of institutional influences as respondents also answered positively when the survey asked if they had GIS related software developed at their university.

Two additional map libraries have come close to making their GIS transition because it was noted in the survey that five map libraries have raw data, five map libraries (the same?) use GIS; ArcView is being used in five map libraries, and Maplnfo is being used in only two.

Locating electronic products is by on-line catalogue (in five cases), by consulting paper lists (in 3 cases),

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and by web page (in 2 cases). Geographical name datasets are still rarely used; three respondents are presently using one or two.

The results of the first portion of the survey clearly show that map libraries lack geospatial data: the few map libraries that have initiated the "GIS transition" possess only a few documents of that nature. Could this mean that the "GIS transition" has not taken place within Quebec map libraries and that we are starting to fall behind considerably in comparison to others? It is hard to draw this conclusion without more information about the situation elsewhere in Canada. However, the existing policy for the distribution of geospatial data largely explain the poverty of available collections. For example, the digital format of a topographical map may cost approximately 50 times more than its paper version.

5.2. Services and Users

Only four map libraries offer orientation activities. Six have a specific policy for data release and use. In terms of user support and direct help, five map libraries offer minimal support, six leave users to work by themselves and answer questions, one assists users throughout the entire process and only one centre produces customized maps for users.

In terms of services offered to users, three centres refer users to existing or new data available elsewhere, four download data on request, four store data on-site and offer on-site access, four offer a reference service and basic cartographic service and none offer more advanced cartographic or spatial analysis services.

Only two map libraries have established a collaboration with faculties and departments.

The number of users registered by libraries are as follows: five have fewer than five users per week, and only one map library reports five to ten weekly users.

5.3. Training and Expertise

Survey respondents confirm the lack of required expertise in organizing and using geospatial datasets. Only one centre asserts that their expertise level is satisfactory and six others say the opposite.

In terms of training received: two centres report formal training on GIS software, six had an introduction to GIS softwares, and three had other forms of training.

Two comments were received regarding the distinctive expertise that the respondents had developed. The comments refer to knowledge of Canadian and American standards for metadata, developments by the province of Quebec, and to the preparation of training course for Softmap users.

Eight answers were received regarding the use of statistical digital data. Three respondents stated that they were working with statistical data via the Data Liberation Initiative (DLI) while five respondents indicated they were not.

5.4 Equipment

The computer systems used are Windows 95 (5), Windows 3.1 (2), and Windows NT (1). The survey shows the dominance of Windows 95 and the use of individual stations instead of a network setup. The number of workstations available to users varies considerably: no work stations (1), 1 station (4), 4 stations (1), 100 stations (1). In the last example at McGill, the number includes 42 workstations in the GIS laboratory (Geography Department) that are part of the map library, plus other work stations on campus that have GIS "capacity". All the reported stations are linked to the Internet.

Four (out of eight) respondents offer colour printing; three control the quantity and two charge fees.

Maintenance of equipment is done primarily by a technician (in three cases) or analyst (in two cases) within the library network, by an analyst and GIS technician (in one case), and by the Map librarian (in one case). The fact that most map libraries are linked to main libraries explains this situation.

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From these results, it is apparent that equipment is up to date, that accessibility reflects the demand, and that technical support seems to be appropriate.

5.5 Needs and Expectations Respondents were asked to comment on their needs and expectations. The first three priorities are as follows:
 •Sharing of experience and expertise
•Basic training in GIS
 •Access to basic geospatial data for teaching

This selection in priorities reflects this general situation: we are still taking the first steps towards the implementation of GIS and geospatial data in map libraries.

In the second question, people were asked to express their expectation for the working group. There were five answers. Many topics were brought up and can be grouped as follows: sharing of resources and expertise, access to Quebec government data, and training. In terms of "sharing of resources and expertise", one of the participants suggested the following project: establish a web site of Internet references common to Quebec map libraries and augmented by contributions from other map libraries.

5.6 Primary conclusions The situation with respect to GIS in Quebec map libraries can be summarized as follows:

• the "GIS transition" has begun within only half of map libraries
• there is a lack of availability of data
• the services offered are diverse and varied
• the number of users remains low
• the absence of basic expertise is unfortunate
• training was mainly focussed on software
• some interest in metadata
• DLI statistical data is still in limited use
• Windows 95 platform and independent work stations are preferred
• limited work stations are available (except in one case)

The survey clearly shows that for geospatial data in map libraries, we are still in the infancy stage, that we need to develop many aspects simultaneously (sharing, training, access to data), and emphasis on partnership development.

6. PLAN OF ACTION

The situation with map libraries in Quebec regarding geomatics and the anticipated needs allows us to realize some plans for action on a medium term basis:

• Assessment of specific expertise within each university in order to create a pool of resources and expertise, develop partnerships between universities and other institutions that have established similar action priorities;

• More advanced use of geospatial data through the Data Liberation Initiative (DLI), with the help of ArcView GIS software, with intensive training on ArcView and Statistics Canada data, and a closer partnership with better organised data services in universities;

• To establish and define educational groups in order to demonstrate and promote Canadian and Quebec geospatial data to users;

• Identification of needs and assessment of geospatial data accessibility conditions in Quebec within the framework of a more realistic government access policy;

• Expansion of basic GIS training suitable for Map librarians and activities to insure that knowledge remains up to date;

• Participation in initiatives towards the progress of GIS in libraries across Quebec and Canada.

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7. CONCLUSION

The recent growth of geospatial data as an indispensable source of spatial information, and knowledge combined with a new expertise to master, imposes upon map libraries a new context and complex challenge for future information services.

Development of new information sources, more powerful software tools, improved delivery via the Internet, new users to train in this emerging area of information service - these are the key elements that will initiate the "second debut" of map libraries in the next millennium.

Yves Tessier Chief Map Librarian (June 1964 to April 1998) Universite Laval Library.

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* Sub-group on GIS or geospatial data founded in June 1997 by the library sub-committee of the CREPUQ with the following members: Anastassia Khouri (McGill University), Pierre Lepine (Bibliotheque nationale du Quebec), Pierre Roy (Universite du Quebec a Montreal), Onil Dupuis (research officer at Crepuq) et Yves Tessier (Universite Laval), president of the sub-group.

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GIS: TECHNOLOGY THAT SHOULD BRING GOVERNMENT AND LIBRARIES TOGETHER

ACMLA Bulletin Number 98, Winter 1997

David A. Cobb
Head Harvard Map Collection
Harvard University

"As a cartographer of 32 years I can assure you that you have undertaken a task that is daunting. By your own admission, you are untrained. You have no experience, other than that of utilizing ARC View software. You are even contemplating going into business, yet have no idea as to how much your services are worth. Worse yet, you will probably want to give away data, due to guilt.

Please, please, please leave the map making industry alone. We have already spent needless amount of hours and money trying to undue the damage that you folk have inflicted upon our clients by confusing the issues of GPS, GIS, AM/FM, Photogrammetry, Business GIS and DeskTop Mapping. Additionally, you above anyone else, should be aware of copyright issues that you may or may not infringe upon."

The above quote was a response on Maps-L when someone asked for advice on the use of ArcView in a library setting. We have far to go in converting some "professionals" to the more recent research tools being used in libraries and, too often, the quote reflects the attitude of government officials regarding our use of GIS technology and data. It may be too soon for them to realize but as one colleague recently remarked: "This isn't the kind of library my mother used to work in." Indeed, the times are changing and geographic information systems are providing powerful graphical tools for libraries and allowing them to create partnerships that would not have been possible just a short time ago.

But, let us take a brief historical perspective before we become too enamored with this new technology. We need not go back to the days of papyrus or clay tablets but let us remember the almost forgotten 3" x 5" catalog card. Most libraries have closed their card catalog and many others have converted them to online catalogs and this is simply reformatting.

The addition of bibliographic databases into these online catalogs, i.e. Academic Index, Geo-Ref, etc., is also simple reformatting. The early electronic atlases, i.e. PC-Globe, US Atlas, were also simple reformatting non-interac tive slide shows. The introduction of GIS brought together software and segmented databases. Initially, these covered very small, almost micro, geographic areas and were dominated by environmental studies. If your library happened to be in the area of coverage you might be interested but the technology remained cumbersome, problematic, and very non-user-friendly. The major change occurred, in the United States, with the TIGER line files and the advent of the 1990 census. Suddenly, we had a rich national database and it could be combined with similarly rich geographic datafile despite its flaws. Out of this has grown several datasets now known to libraries worldwide: ArcWorld, ArcUSA, Wessex ProFiler, MapInfo data, StatCan, and Macon USA to name but a few.

The next level - we're not there yet - will involve the use of numeric data. Some statistical libraries are using and downloading data from different sites but are not taking advantage of GIS technology to 'Map It!'. It is the 'Map It' option that will make map libraries in the near future a very popular place to be and the students will come - Just Build It!

Libraries, in general, passed on numeric data and technology as a whole in the 1950's and 1960's leading to the development of computer centers, social science quantification laboratories. Essentially, we were not prepared then to commit to the technology

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and yet a variety of analytical faculty required it and several centers were established. Today, however, is a different time. We now have powerful personal computers, powerful software, and many experienced librarians that will seize the opportunity at this time. I believe the use of numeric data will be a much larger change (dare I say revolution?) for libraries than they may themselves perceive because they have avoided it in the past and it may now infringe on current academic and government territory.

Why should we consider using numeric data? First, there is a small country to your south that provides significant amounts of government data to its libraries and other constituents. Let us be aware that nothing is really free and cataloging and providing access to numeric data can sometime be more difficult. Secondly, information available via the Internet and the World Wide Web increases at a phenomenal rate. And, finally, we now have the equipment, the software, and the staff potential to use this data. I realize that not everyone is at this level but you may be surprised how close you are.

Given the opportunity to take advantage of the technology I then see that libraries have two very important options. The first is Access and, technically, this is our minimum library obligation. In the U.S. this is a government depository library obligation but it must go beyond. We must be prepared to Service this technology as our other obligation. Perhaps it is the reference librarian in me but do we not help users when they ask a question after we have handed them a book or a map? We cannot, not should not, segregate digital data away from library service.

There are significant library organizational implications to the above and, at a minimum, this initiative requires library administration support. This is certainly not shrink-wrap technology, at least not yet. There are training demands and these should be supported. One person CAN'T do acquisitions, administration, reference, cataloging, preservation, AND GIS! Or, if they can, they won't do it for long!

When it comes to equipment you need the biggest, the baddest, and the fastest machine that money can buy - it is as simple as that. Whatever you do, DO NOT purchase anything that matches the minimum requirements for anything because that configuration is probably already out of date. You must also plan to update equipment every three to four years and it remains difficult for administrators to understand why you must upgrade that 486 they got such a good deal for just last year. Most data from local sources will be like maps - those paper things from the old days - free. Even though this may be true for most locales in the U.S., and only wishful thinking in most of Canada, I believe that you may be able to work with local commercial and government sources to establish alliances and partnerships. One successful example of this can become the shining

example referred to and lead to many more. Governments must learn that cooperative partnerships are as much to their advantage, and maybe even more so, as it is to yours and that a wider audience is introduced to the technology, data, and its useful public action. At the same time you will have to look harder; few governments publish lists of available GIS datasets as the technology is changing so rapidly.

Similarly, libraries will have to compare federal 'free' data with similar 'cost' data from commercial vendors. It must be weighed for monetary value, ease of use, and number of users that can be serviced in a period of time (sorry to sound like the local Petro Canada but we too must move people through so to speak). Usually, the federal data, albeit free, always loses when compared to various value-added commercial software and data. Any federal census ages rapidly as does all other data. It is then that other local sources can be used to update and project population trends and these are almost always numeric data: birth rates, school enrollments, housing sales, income, etc.

There are time implications, as alluded to above, with this technology. This is very seldom your five minute

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reference interview. Our situation at Harvard deals mainly with social science data but is beginning to include more geocoding, personal data mapping, and a typical reference question may last an hour and some are longer. You won't always do mapping; if you have large datasets your users may wish to subset numeric data, copy to a floppy, and take it to their room or department to work with it.

Currently, I do not see smaller research libraries able to adopt this technology into their services strategy without technical expertise consulting. It is not that they cannot 'play with it a bit' and provide some Access to it, but I do not believe they can really provice Service. The initial time requirements for training and equipment set-up are usually stagering; it is related to any home improvement project - estimate the time and cost and then at least double it. Furthermore, technical support will always remain an issue. It will also attract users that you have never seen before i.e. Public Health, Biology, and maybe even History.

I also see four dark sides to GIS.

Privacy - increasingly databases are getting closer to our individual addresses and marketing may be able to "target" individuals and families; **Data Quality** - data is hard to find; data is difficult to access; data is not always current; data is almost always undocumented; and data is often incomplete. This is an area where libraries and government could cooperate to each other's benefit.

Technology vs. Traditional Library Documentation - how are we going to balance costs, staff, and services related to technology with continuing print resources? I worry that some libraries are all too embrasive of the technology and that traditional collections are, or will be, slighted.

Archiving: Access vs. Ownership - Who is responsible for archiving? How often should an archive be made? Who is responsible for creating bridges from old technologies to new? What will be our relationship with our users when we don't own the material but simply pay a licensing fee to access the data somewhere else? How dependable

is that source: today? Tomorrow? in the future? Old data is often of little use to those managing 'state of the art' systems, but often critical to libraries.

And what of GIS and the Internet? One national library has suggested that they may place one million images on the WWW; now that is just need. Since the Net continues to be much like the Wild Wild West let me suggest a cowboy-type idea: would it not perhaps be more profitable - I'm thinking of searching now - to have regional centers such as Dalhousie for the Maritimes and Harvard for New England. These centers would establish cartographic WEB collections for their area and then could be linked to various national collections.

The whole issue of standards: image size (in MB, not cm.), color targets, use of facsimiles vs. originals, types of scanners; these issues are not being discussed in the map community, but should be, with various technical advisors.

Let me suggest the use of the Internet as a reference source. Could it not be used to develop the capability of placing specific images on a website for a specific query or research project. For example, we currently have 3,000 fire insurance maps on CD's; they will probably never be totally available on the WEB but what if someone were studying early Boston and wanted to see a particular area in 1867, 1883, 1892, and 1906? I think it might be possible to develop a 'Reference Shelf as part of our WEB page, place these images there for a week, let the researcher in Newfoundland download them, and they can then use them as needed. If they need to visit Harvard, that's fine, but they may not need to. My experience tells me, at this very early period, that we may be worrying ourselves too much over how we get a 100 MB image file over the WEB when few computers or networks can deliver it, AND when the student or scholar on the other end would be very pleased to receive a 4 MB black and white image. In other words, maps are more than pretty pictures, they convey information; let's not complicate it.

And finally, someone should have told me, and 1 will tell you: "Some Assembly May Be Required!"

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MAP LIBRARIES, MAP LIBRARIANS AND CARTOGRAPHERS

ACMLA Bulletin Number 16, November, 1974

Yves Tessier, official representative
Association of Canadian Map Libraries/
Association des cartotheques canadiennes

There is an interesting correlation in the history of cartology (yet to be written) between cartographers and map librarians. Although cartographers have existed and produced maps for a long time, their natural counterparts, map librarians, came into existence only very recently. Map collecting began at the same time as the gathering of printed materials. Both books and maps were collected in large repositories of knowledge called libraries or archives, mainly for the sake of keeping these intellectual artifacts from destruction. You have certainly heard of the existence of the Map Room of the British Museum; le Departement des cartes et plans de la Bibliotheque nationale de France; the Geography and Map Division of the Library of Congress or the Map Division of the Public Archives of Canada, now known as the National Map Collection. But, until recently, what was known more than that? Archivists looked after maps mainly for their archival interest. Librarians were rather bored by these bunches of paper impossible to unroll and shelve. Neither were to blame for reasons too long to explain at this time.

MAP LIBRARIANSHIP

It is also interesting to note that war almost gave birth to map librarianship. When World War II ended, government offices in the United States were crowded with tons of surplus topographic maps. Why not create map depots to get rid of this embarassing material no longer of strategic value? This is the way in which many map libraries came into being. The emergence of geographic studies on larger scales came and gave a sense to this garbage disposal operation. Authentic geographic education was not conceivable without maps which then began

to be considered as valid records of knowledge and information...like books. Then appeared map librarians as a professional body, around the forties in the United States, and in the sixties in Canada. As a matter of fact, the Geography and Map Division of the Special Libraries Association, that is to say the association of American map libraries, was founded in 1941, and its Canadian counterpart the Association of Canadian Map Libraries/ Association des cartotheques candiennes, in 1967.

Both communities, of cartographers and map librarians, can no longer ignore each other or live apart, since they are involved in the same communications process, at different stages. If we refer to cartography as an act of communicating ideas in geo-graphic form by means of a physical substratum called a map, we refer to an intellectual communication between a map maker and a map user.

In this scheme, we must not forget that this level of intellectual communication is possible only after a physical communication took place between the map itself, which conveys the message, and the user. It is here that the justification of map librarianship lies: in serving as an interface between map production and map utilisation.

MAP LIBRARIES

To cartographers, map rooms are as essential as plotters' rooms or should be so to say the least. Map libraries are essential at three levels in cartography:

A. AT THE CONCEPTUAL STAGE OF MAP PRODUCTION

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A cartographer has to process data into graphic form. He must collect information from many sources and among these sources existing maps are certainly not insignificant. He must compare what he has in mind with what other cartographers have previously done with similar subjects. The map library should be the cartographer's current reading room.

B. - IN THE GEOGRAPHIC INFORMATION TRANSFER PROCESS

Geographic information is characterised by its geo-location. The most efficient way of communicating this geo-located information is undoubtedly a map. A map library is to a geographic information user as a "straight" library is to a literature oriented user. In many instances, a map library comprises not only maps and atlases but books, periodicals and pictures of geographic interest.

C. - IN THE CARTOGRAPHIC EDUCATION PROCESS

Can sound cartographic education be possible without intense use of maps as teaching tools and research materials? Cannot the map library be considered as one of the focal points of cartographic education? as the best place for continuous exposure to map production? In this era of continuing education, should not students be trained to keep themselves informed and up to date on map production, once the relationship professor-student is over? I used to say that documentation is among the best way to promote self education and among the least expensive too, since this concept involves using existing resources more intelligently.

MAP LIBRARIANS

What to say about the map librarian himself? Besides on-the-job training, more and more of them have formal backgrounds in geography, cartography, history, information science or librarianship. They are or all want to be information specialists, information "brokers" for the benefit of users. They are just willing to play their role in a team-teaching-oriented education.

These are a few dozen of them in Canada. They are very active within their Association of Canadian Map Libraries. The aim of this association is to further the professional knowledge of its members and to promote general interest in map libraries and knowledge of maps. These objectives can be accomplished by encouraging high standards in the organization, administration and development of Canadian map libraries. The Association acts as a forum for the discussion and exchange of information and ideas. Technical papers, panel discussions, work-shops are parts of meetings, especially during the annual conference which is interesting enough as to attract a few noted cartographers regularly. The Association publishes the Proceedings of the Annual Conference and a Bulletin which keeps members informed of activities in matters of cartographic interest. It has also published a Directory of Canadian Map Libraries.

The distribution of institutional memberships is roughly as follows:

> 70% university map libraries
> 10% archival map collections
> 10% government agencies
> 10% others

Map librarians belong to the cartographic community and they are living in symbiosis with it. They hope to be involved more closely with map-making people in whatever possible "political status", be it federation, confederation, souverainete-association, and what else!

Speech delivered at the Fall meeting of the Cartography Committee of the Canadian Institute of Surveying, Foret Montmorency, Quebec, August 26-29, 1974.

CARTO 2016

http://acmla-acacc.ca/carto2016/

50th Annual Conference of the Association of Canadian Map Libraries and Archives (ACMLA)

June 14-17, 2016
Fredericton, New brunswick

50 years: Mapping our past; Navigating our future

As the ACMLA celebrates its 50th anniversary, a 'golden' opportunity exists to reflect upon the ways in which the Association and its members have supported changing needs across Canada, and celebrate the contributions that have increased awareness, understanding, and value of geospatial and cartographic materials. While embracing lessons learned from the past, we look towards the future to anticipate changing needs, new opportunities, and new strategies for success.

The members of the program committee are:
•Jay Brodeur, McMaster University
•Joël Rivard, Carleton University
•Tracy Sallaway, Trent University
•Sarah Simpkin, University of Ottawa

The members of the local arrangements committee are:
•Mary-Ellen Badeau, Provincial Archives of New Brunswick
•Laura Corscandden, University of New Brunswick
•Siobhan Hanratty, University of New Brunswick
•Kaitlin Newson, Scholars Portal
•Tracy Sallaway, Trent University

CARTO 2016 CONFERENCE SUMMARY

June 14th - June 17th, 2016

Tuesday June 14th : Pre-Conference Workshops

GETTING STARTED WITH OPEN-SOURCE GIS SOFTWARE
Jay Brodeur
McMaster University
Summarized by Andrew Nicholson

This introductory workshop highlighted the functionality of Quantum GIS software (or QGIS) as an everyday alternative tool to ArcGIS, and how it can be utilized and promoted by an academic library. Led by Jay Brodeur, manager of the McMaster University Library's Maps/Data/GIS Department, the workshop took users through four tasks each of varying difficulty using City of Fredericton Geospatial data.

The workshop began with participants getting familiar with the QGIS interface and the Fredericton data that was imported into the program. From the provided data, we then put together a map of Fredericton recreational facilities, composed and annotated it, added a legend and scale bar, allowing participants to get used to these essential components of QGIS. We then exported the map as a PDF.

The next task in QGIS allowed us to join tables, change projections, and get to grips with the various "plug-ins" available. The end product was a map of Fredericton highlighting the spatial variability in the city, which we also learned how to publish to the web direct from QGIS.

The final task of the QGIS workshop was perhaps the most illuminating: Georeferencing. Participants walked through the easy steps of georeferencing in QGIS by taking a scanned 1:25,000 Fredericton NTS sheet and georeferencing it with digital geographic coordinates taken from OpenStreetMap, available through the OpenLayers plugin.

GETTING MORE OUT OF GEONB
Bernie Conners and Kristy Nicoll, GeoNB
Service New Brunswick
Summarized by Andrew Nicholson

The second pre-conference workshop of the day had participants exploring the open data provided by the GeoNB web service. Presented by Bernie Conners and Kristy Nicoll from Service New Brunswick, GeoNB serves a web based portal for almost all the geographic data including vector files and orthophotos produced by the province, and is made available for free to users anywhere.

Beginning with a look at their ArcGIS servers which house the GeoNB data content, the workshop then took participants thru accessing New Brunswick data through the GeoNB website, and through ArcGIS Desktop, Google Earth, and ArcGIS Online. Perhaps the most interesting part of the workshop was being able to access GONB data through a variety of mobile devices which had ArcGIS Explorer installed.

Wednesday June 15th: Conference Presentations

KEYNOTE: THE IMPORTANCE OF THINKING SMALL
Dr. Paul Peters, University of New Brunswick

Dr. Peters shared several projects that analyzed population change in small areas, both urban and rural. With his work being spatial in nature, there is a strong data visualization and mapping component present in the projects.

VISUALIZING THE PAST: MAPPING, GIS AND TEACHING HISTORICAL CONSCIOUSNESS AT UNB
Sasha Mullally and Siobhan Hanratty, University of New Brunswick

This paper evaluated the prospects for team teaching in the digital humanities, and explored the possibilities for historical instruction when digital maps and mapping are at the centre of the learning process. Drawing from the experiences bringing forth a 2014 graduate course on Digital History (HIST 6388 Understanding the Virtual Past/Making Digital History), the authors reflected on their experiences helping advanced students "spatialize" parts of their graduate work. It evaluateed the way that historical consciousness (Seixas, 2006) evolves when students visualize the past through digital mapping. It provided examples from several projects, for instance, the placement of Canadian communities' World War One memorials, the regional and global distribution of Heritage Minutes subject matter, or the creation of US Naval bases in the Pacific during the Second World War. Incorporating feedback from students, the authors discussed the logistical challenges involved in launching such a course at a small research university, and put forth a template for collaboration between History professors and GIS/Data Librarians.

EXAMINING NEIGHBOURHOOD CHANGE IN THE MAP & DATA LIBRARY
Jordan Hale, University of Toronto

In this session, Jordon reviewed a workshop for youth that she designed with the dual purpose of developing geographic research skills and familiarizing them with the special collections of the Map & Data Library. Using Canadian census data, GIS, and University of Toronto's collection of aerial photos, students used quantitative and qualitative research methods to examine neighbourhood change over time in the city of Toronto.

CROWDSOURCING WITH ARCGIS ONLINE FOR DATA COLLECTION AND VISUALIZATION
Eva Dodsworth and Markus Wieland, University of Waterloo

The Geospatial Centre, University of Waterloo, has collaborated with the Faculty of Health Sciences to employ ArcGIS Online to conduct public space research. Through the use of the GeoForm Graduates, a configurable web mapping application template, members of the public are invited to geotag areas of interest, upload photos and describe the public spaces that in some way improves their quality of life. The result will be a public ArcGIS Online map of resources displaying the Region of Waterloo's community spaces that the public finds interesting, amusing, or pleasurable. This paper discussed the technical aspects of building a crowdsourcing application that is straight forward and light on resources, demonstrating the ease of use of ArcGIS Online for data collection and visualization.

INSIDE MAP WORLDS: THE PERSONAL AND SOCIAL CHALLENGES ABOUT WRITING SOMETHING NEW
Dr. Will C. van den Hoonaard, University of New Brunswick

Most scholars comfortably stick to writing within their field. *Writing Map Worlds: A History of Women in Cartography* represented surprisingly many personal and social challenges. Dr Will C van den Hoonaard's presentation offered his insights on these challenges.

GÉOINDEX+ : UNE PLATEFORME GÉOSPATIALE POUR LES DONNÉES DE RECHERCHE ET LES DONNÉES HISTORIQUES SUR LE NORD
Stéfano Biondo, l'Université Laval

Cette conférence vise à démontrer le potentiel de Géoindex+ pour héberger et diffuser des données géospatiales nordiques historiques et récentes. Ces données sont tirées de documents cartographiques des collections de la Bibliothèque et de données de recherche produites par des chercheurs membres du réseau ArticNet. Géoindex+ est une plateforme de découverte, de visualisation et d'extraction de données géospatiales développée par le Centre d'information géographique et statistique (Centre GéoStat) de la Bibliothèque de l'Université Laval.

Le conférencier présentera brièvement le fonctionnement de Géoindex+ ainsi que son potentiel pour la valorisation des données de recherche et des données historiques nordiques à l'aide de trois exemples.

Le premier exemple démontrera la possibilité de donner une seconde vie aux documents cartographiques historiques par la numérisation, le géoréférencement, la visualisation et la diffusion de certaines cartes de l'expédition Coppermine, menée au cours des années 1819 à 1822 sous le commandement du Britannique John Franklin.

Le deuxième exemple mettra en valeur l'expertise développée au Centre GéoStat par la création de nouvelles données interactives provenant de la vectorisation du trajet de l'expédition Coppermine et donnant accès à des contenus textuels et iconographiques du livre relatant cette aventure : Narrative of a journey to the shores of the Polar Sea, in the years 1819, 20, 21, and 22.

Le troisième exemple cherche à démontrer que Géoindex+ peut également héberger et diffuser des données de recherches polaires récentes, dont les données bathymétriques récoltées à partir du brise-glace scientifique Amundsen. Les usagers de la Bibliothèque peuvent désormais repérer, visualiser et télécharger des données bathymétriques généralisées des eaux nordiques du Canada.

EMERGING TOPICS FOR GIS AND GEOSPATIAL DATA IN LIBRARIES: A ROUNDTABLE DISCUSSION
Facilitator: Julie Jones, Simon Fraser University

This session provided participants an opportunity to engage in a discussion around one of a number of emerging issues related to GIS and geospatial data in libraries. Attendees collaborated in groups to discuss challenges in these areas, with the purpose of improving understanding, developing potential solutions and communicating outcomes to the larger audience.

Thursday June 16th: Conference Presentations

MAPPING THE SECOND WORLD WAR: GIS AND ITS PRACTICALITY WITH MILITARY HISTORY
Eva Dodsworth, University of Waterloo; Trevor Ford, Wilfrid Laurier University

In recent years, online access to maps has reduced the need to acquire certain maps in print. With an easy way to search for and download specific maps, many libraries have started examining their own map collections in detail, exploring possibilities of either weeding, or digitizing historical maps for the same easy online access. Particularly with large collections of donations that have been for years stored in boxes, these maps may have been forgotten about, or not completely understood, now re-surface and are added to the online pool of historical gems.

A recent mapping project aims to blow the dust off of some Defence Overprints, a collection originally construed by the Canadian, American, and British Armies of the Second World War. The Overprints themselves in most cases included weapon pits, artillery position, trenches and anti-tank defenses – in other cases, especially with overprints on the Netherlands, flooding and canal closures are noted. The Laurier Centre for Military Strategic and Disarmament Studies (LCMSDS) originally received these overprints in the early 1990s when the Directorate of History and Heritage (DHH) began downsizing their archival holdings from the Second World War. At this same time LCMSDS also received approximately 30,000 Canadian aerial reconnaissance photos of the same locations and time periods as the overprints. Both aerial photos and overprints are extremely rare as most copies have either been destroyed or lost to history. Many of these maps have been digitized and georereferenced and uploaded to mapping sites for public viewing and distribution.

This presentation showcased these Defence Overprints, demonstrating some of the various online mapping tools that have been tried and tested to share the maps with the public.

TAKING THE HISTORICAL MAPS OF GRAND LAKE MEADOWS ONLINE
Heather McGrath, Emmanuel Stefanakis, University of New Brunswick

Grand Lake Meadows (GLM) is a historically and ecologically significant wetland in New Brunswick. This area is known for its diverse ecology, abundant wildlife, system of freshwater rivers and lakes, rich soil and moderated climate. These are some of the reasons which may explain why human settlers have been attracted to GLM since the early 1600s. This research studied Grand Lake Meadows through the analysis of historical maps held at the Provincial Archives of New Brunswick. The map analysis aimed to uncover previously unknown societal and geomorphological information about the area. Maps from the study area were identified in collections of microfilm and microfiche and were digitally scanned, analyzed, and georeferenced. The digital versions have been posted on the internet and made accessible through dynamic web-based map mashups using OpenLayers and Web Map Services. A series of supporting web pages were created to encourage site visitors to explore the GLM historical maps through a series of puzzles and quizzes created with Hypertext Preprocessor, JavaScript, and Scalable Vector Graphics. The website aims to support existing initiatives of the Grand Lake Meadows Project Management Committee which promote awareness and the significance of this area and blend historical maps with present day mapping. Funding support for this research was provided by the Grand Lake Meadows Endowment Fund.

TRENT THROUGH TIME: STRATEGIES FOR EXHIBITING DIGITIZED INFORMATION TO SUPPORT STUDY OF THE CAMPUS ENVIRONMENT
Barbara Znamirowski, Trent University

This paper reviewed how Trent University Library's Maps, Data & Government Information Centre is using various mapping technologies to create products from digitized material that can assist with the study of the Trent campus and endowment lands. We have created a variety of products that can be helpful in understanding and appreciating the evolution of the campus environment in relation to a diverse array of local landscape features – both natural (such as geological features, forests, and streams), and cultural (including farms, waterways and other transportation routes). A variety of examples illustrate how diverse types of materials and information have been integrated into our web site or other end products, as well as some of the processes involved in making these resources available. One example is the presentation of historic aerial photography through web indexes, web services, time-line visualizations and exhibits. A second example is the use of story maps that integrate course-relevant materials involving the study of a campus nature reserve. Finally, this paper situated these projects in relation to teaching, research and administrative activities on campus.

UPDATE AND DISCUSSION ON COPYRIGHT FOR CARTOGRAPHIC MATERIALS DOCUMENTS
Joël Rivard, ACMLA Copyright Task Force

This presentation introduced a document that has been prepared by the ACMLA Copyright for Cartographic Material taskforce. Joël introduced the guide, which was followed by a group discussion. Joël hopes to bring this document out of draft form and post it on the ACMLA website in the near future for all to consult.

MAKING LAC FIRE INSURANCE PLANS MORE EASILY ACCESSIBLE
Rebecca Bartlett and Joël Rivard, Carleton University

Have you ever used the Fire Insurance Plans of your area and found the search interface at Library and Archives Canada (LAC) difficult to use? Did you lament having to use the paper index? Are you tired of only seeing 5 images at a time, especially when you need item 36 of 70? So were we! Using the 1902 fire insurance plans of Ottawa, Joël and Rebecca demonstrated how they created an interactive online index to allow users to more easily download the fire insurance plans from LAC.

THE FIGURES, MAPS & PHOTOS OF THE ACMLA / ACACC BULLETIN OVER THE YEARS: WHAT DO THEY TELL US?
Daniel Brendle-Moczuk

The *Bulletin* of the ACMLA / ACACC (and its various previous names) has been published since 1968.

There are numerous figures, maps & photos throughout the many issues. Examining these throughout the Bulletin reveals much about the authors, creators, photographers and the history and trends in the organization, and in Canada generally, over the years. Daniel reviewed and summarized several figures, maps and photos previously published in the *Bulletin.*

WHAT TO DO WITH OLD GIS FORMATS?: A CENSUS DATA MIGRATION PROJECT IN LIBRARIES
Amber Leahey, Scholars Portal

Digital data are just as susceptible to loss and degradation as print resources, such as paper maps. Data stored in proprietary data formats are subject to format obsolescence, and often over time, users are required to have working copies of old software on old hardware to read data. Sometimes, data conversion is required to use data in modern software, and this can often be cumbersome, restrictive to researchers, and lead to loss of data in some cases.

Older digital census boundary files made available to the Data Liberation Initiative (DLI) community come in spatial data formats that are out-of-date and proprietary (e.g. ArcInfo Interchange E00 format). As time goes on, there will most likely be less support for reading these older data formats, further decreasing the accessibility of this data. To allow for improved access and preservation, together with the University of Toronto Map and Data Library, we are conducting a project to convert older boundaries (1971 to 2001) from original, into Shapefile format.

Digital census boundaries that are converted and digitized are being uploaded to Scholars GeoPortal as open access content. From Scholars GeoPortal, users will be able to view the boundaries online and download them as Shapefiles. Each dataset will have metadata describing the conversion / or digitization process, and, users will be able to download the original data files and documentation.

Friday June 19th: Conference Presentations

ACMLA-ACACC BREAKOUT AND GROUP SESSIONS

Over the course of Thursday's final afternoon session and Friday's morning session, conference attendees participated in breakout and group discussion activities intended to explore a number of key issues being addressed by the organization. In the first half of the activity, participants were asked to join a facilitated conversation around one of three discussion items, which were: a) increasing and engaging ACMLA membership; b) the ACMLA Bulletin; and, c) the ACMLA conference. Through their discussion, the groups identified current challenges facing the ACMLA in these areas, and offered ideas for potential solutions. The outcomes of these discussions were captured in notes, which were presented and discussed on Friday morning. In addition to a number of specific action items that transpired from discussion (e.g. hosting institutions and partner organizations to pursue for 2017 and 2018 conferences; a review of online journal platforms), an overarching theme emerged around the need for re-engaging with existing membership and expanding the organization to new audiences. As a result of this successful activity, many outcomes have been adopted by ACMLA Executive as action items for the upcoming year.

ACMLA / ACACC 50TH CONFERENCE CELEBRATION - CAKE AND SLIDESHOW

FIELD TRIP TO THE PROVINCIAL ARCHIVES OF NEW BRUNSWICK

CONFERENCE PHOTOS

All photos were taken by Stéfano Biondo, l'Université Laval

ACMLA Awards

The ACMLA Executive was honoured to recognize several individuals for their outstanding contributions to the Association of Canadian Map Library and Archives. Winners were announced and recognized during the Carto 2016 Banquet.

Cathy Moulder Paper Award

The Cathy Moulder Paper Award is awarded to an individual who has researched, written and published a paper of significant value in the *ACMLA Bulletin*. The paper is considered for its solid contribution to map librarianship, curatorship or archiveship

The recipients of the Cathy Moulder Paper for 2015 are Colleen Beard, Jay Brodeur, Sharon Janzen, Amber Leahey, and Sarah Simpkin, for their article, "Ontario's Historical Topographic Map Digitization Project," Bulletin no. 150.

ACMLA Student Paper Award

The Student Paper Award is awarded to a student from Canada or studying in Canada currently enrolled in a post-secondary institution (college or university) who has written an original paper related to the interests of the ACMLA. Primary consideration for the award is given to the essay's originality and its contribution to new knowledge and inight in GIS or cartography. Other considerations include the author's demonstration of the relevance of the subject, the quality of the presentation and documentation, and the literary merits of the essay.

Award Recipient: Adrian Christ, University of Alberta
Student Paper Title: "Delineating East and West: Dutch Cartographers and Divided Hungary, ca 1570-1685." Adrian's paper can be found on page 46.

Association of Canadian Map Libraries and Archives /
Association des Cartothèques et Archives Cartographiques du Canada

MINUTES
of the
50th ANNUAL GENERAL MEETING
Harriet Irving Library, University of New Brunswick
Fredericton, New Brunswick

Thursday, June 16, 2016
12:30 p.m.- 2:00 p.m.

PRESENT: Marilyn Andrews (University of Regina); Mary-Ellen Badeau (Provincial Archives of New Brunswick); Rebecca Bartlett (Carleton University); Stéfano Biondo (Université Laval); d(D)aniel Brendle- Moczuk (University of Victoria); Jay Brodeur (McMaster University); Eva Dodsworth (University of Waterloo); Jordan Hale (University of Toronto); Siobhan Hanratty (University of New Brunswick); Julie Jones (Simon Fraser University); Amber Leahey (Scholars Portal); Carina Xue Luo (University of Windsor); Kim Maguire (Provincial Archives of New Brunswick); Gavin Moore (Provincial Archives of New Brunswick); Andrew Nicholson (University of Toronto Mississauga); Rosa Orlandini (York University), Joël Rivard (Carleton University); Tracy Sallaway (Trent University); Sylvie St-Pierre (Université du Québec à Montréal); Deena Yanofsky (McGill University); Barbara Znamirowski (Trent University)

Distributed at the meeting by the treasurer:

ACMLA Budget 2016
ACMLA Financial Report – January 01, 2015 to December 31, 2015
ACMLA Financial Report – January 01, 2016 to May 31, 2016

1.0   Establishment of Quorum; Call to Order
Quorum was established (21 members); meeting called to order at 12:30 p.m. by President Hanratty

2.0   Opening Remarks from the President ACMLA-ACACC
After reviewing the agenda, Siobhan Hanratty introduced the 2015/2016 ACMLA executive board: Deena Yanofsky (vice-president and president-elect), Jay Brodeur (vice-president, professional development), Tracy Sallaway (vice-president, communications & outreach), Rebecca Bartlett (treasurer), Rosa Orlandini (past president) and Marilyn Andrews (secretary).

3.0   Approval of Agenda
Moved: Barbara Znamirowski - - -**Carried.**

4.0   Approval of the Minutes from the 2015 Annual General Meeting

Motion to approve the minutes, as amended.

Moved: Eva Dodsworth - - -**Carried.**

5.0   Business Arising from the 2015 Annual General Meeting

5.1   Copyright task force

Siobhan Hanratty led a discussion of the work done by the task force: Joël River (Carleton University), Susan McKee (University of Calgary) and Virginia Pow (University of Alberta). Appreciation was expressed to the members for their work (ongoing) on the copyright document which is soon to be published on the ACMLA-ACACC website.

5.2   Revenue generation in the future Deferred to item 12.

5.3   Conference Deferred to item 9.

5.4   *Bulletin*

A proposal regarding format of the *Bulletin* will be forthcoming and it is one of the topics to be discussed during the conference breakout session.

5.5   Travel/Conference Funding

Rosa Orlandini reported that information and instructions on how to apply for a travel subsidy were sent to the list. Subsequently, Rosa reviewed the applications and approved the allocations for the 2016 conference. Effective this year, the grant is no longer restricted to actual travel costs; other related expenses may be considered.

6.0   President's Report

Siobhan Hanratty reported that as per item 5.1, the copyright task force guidelines document will move to the ACMLA webpages after allowing one month from the date of the AGM for feedback followed by translation into French.

Siobhan participated in discussions with GeoAlliance via conference calls in January. In March, Deena attended a GeoAlliance meeting along with other interested parties, in Calgary. See item 8 for more information.

Siobhan reported that a member asked whether she may self-archive (in her institution's repository) an article that was published in the *Bulletin*. The answer was yes.

It was noted that the Canadian Library Association (CLA) disbanded in January and has been superseded by the newly organized Canadian Federation of Library Associations (CFLA). Noteworthy is that CFLA is based on institutional memberships while CLA was based on individual memberships. It is very early in the transition period; CFLA will be reaching out to potential members, including ACMLA.

The president's report will be posted to the ACMLA-ACACC website.

7.0   Past President's Report

Rosa Orlandini reported that as a result of the 2015 changes to the ACMLA Rules of Procedure and the ACMLA bylaw, the past president became the chair of the awards committee and was given responsibility for dispersing the association's travel funds. (Refer to item 5.5).

Rosa thanked Eva Dodsworth for her dedication and service to the awards committee for the period 2011 to 2015. Another long serving member of the committee, Cheryl Woods, stepped down earlier in the year and appreciation was expressed for her dedication and service.

The current members of the awards committee are Rosa Orlandini, Francine Berish (Queen's University) and Rhys Stevens (University of Lethbridge). Rosa thanked Francine and Rhys for their work on the committee.

ACMLA awards three prizes: the ACMLA Honours Award, the Cathy Moulder Paper Award and the Student Paper Award.

Paper Award for his paper *Delineating East and West: Dutch Cartographers and Divided Hungary, ca 1570-1685.* Adrian will receive the $250 prize, a one year membership in ACMLA, as well, his paper will be published in the Bulletin.

The winner(s) of the Cathy Moulder Paper Award was not announced at the meeting because there will be a presentation at the conference banquet.

The ACMLA Honours Award was not awarded in 2016.

The past president's report will be posted to the ACMLA-ACACC website.

8.0   Vice President/President-Elect's Report

Deena Yanofsky oversaw the membership committee. Leanne Trimble was thanked for her work as chair of the committee. Unfortunately, membership in the ACMLA has continued to decline.

Deena also oversaw the mentoring program. Colleen Beard headed the program until earlier this year and Rosa Orlandini stepped in to replace her. Rosa will continue in this role while the program is re-evaluated. Both Colleen and Rosa were thanked for their contributions.

Deena represented ACMLA at GeoAlliance Canada (previously Canadian Geomatics Community Round Table). In 2015, both Rosa and attended the launch. GeoAlliance is looking for partners. Potentially, ACMLA could be a "good fit" given the depth and breadth of knowledge and experience within our organization. The $1,500 membership fee is a barrier to joining, but nevertheless, it is worth considering given everything that ACMLA knows about preservation, standards and the value of accessing the data. As GeoAlliance has not yet got off the ground, holding off on the decision about membership is reasonable. Deena discussed membership with Brad Ashley, Executive Director (West) who has indicated that ACMLA is welcome to participate regardless of membership status. Deena will report back periodically as things unfold.

Deena thanked Eva Dodsworth for her ongoing commitment to publishing the *Bulletin*. During the year, for the first time, peer reviewed articles (2) were published. Feedback is requested about whether this should continue and/or is sustainable.

The vice-president/president-elect's report will be posted to the ACMLA-ACACC website.

9.   Vice President Professional Development's Report

Jay Brodeur commented that the 2016 conference registration was small, mostly due to the location, as is typical when it is hosted on either the east or west coasts. It was recognized that the venue enabled some people, who might not have otherwise been able to attend the conference, to do so. It is hoped that by a combination of location, and better advertisement and recruitment (perhaps including joint conferences), future registration numbers will be increased. Part of this work has been initiated by a call to host the 2017 and 2018 conferences. This call was sent out in May and although venues for these years have not yet been identified, work is ongoing to confirm hosts for both upcoming conferences.

Questions about holding conferences persist. Discussion ensued as to whether there is the possibility for joint sessions or conferences with other groups. Andrew Nicholson surmised that joint conferences could perhaps be held in the future and/or conferences could be held biennially. The conference planning manual needs to be revised to aid with easy transitions. A more detailed discussion of these points is included in the vice-president's report.

The vice-president, professional development's report will be posted to the ACMLA-ACACC website.

10.   Vice President Communications and Outreach's Report

Tracy Sallaway commented that the work of the newly formed communications committee was minimal in the first year of the association's new reporting structure. The committee will be working on developing and implementing a communications strategy for the association in the coming months.

Tracy is also working on establishing and implementing records management procedures for the association. She is seeking information on the whereabouts of records pertaining to the ACMLA's functions over the years and asked that anyone who may have knowledge of such records to contact her.

The vice-president, communications and outreach's report will be posted to the ACMLA-ACACC website.

11.   Treasurer's Report

Rebecca Bartlett reported that the profit made from the 2015 conference in Ottawa was approximately $1,000. She summarized the 2015 (calendar year) budget before reviewing the 2016 expenses for the period January-May.

Rebecca explained that we hold a GIC (guaranteed investment certificate) because it is a requirement for having the credit card we use; it is similar to having a line of credit.

For clarification, it was noted that subscribers were formally referred to as institutional members. The projected deficit for 2016 is $7,000.

Motion to accept the report:

Moved: Mary-Ellen Badeau - - - **Carried.**

12.   Future of ACMLA

Rebecca Bartlett and Deena Yanofsky led a discussion about the association's future. A variety of factors have contributed to the current precarious financial situation. Although the Social Sciences and Humanities Research Council (SSHRC) travel grant ceased in 2012, the association has continued to help fund members with travel expenses. Membership has declined. This important topic will be addressed during a breakout session and will then spill over to the ACMLA listserv.

A survey of members who did not attend the conference will be carried out over the ACMLA listserv to determine if there are ways to encourage attendance in future.

13.   New Business

Julie Jones suggested that it may be wise to update the ACMLA Recommended Best Practices in Citation of Cartographic Materials document. This would be in line with creating standards for citing research data.

Deena thought this might warrant the creation of a task force to study the matter and further suggested that this might also be a good time to consider changing the document from PDF format to a living document which could be made available on the ACMLA website. The executive will consider the matter and, perhaps, put out a call for volunteers to work on a project.

Stéfano Biondo suggested that it would be useful and interesting to create a map showing ACMLA membership. The executive will follow up with this idea.

14.   Nominations Committee Report on Election

The nominations committee, chaired by the president had three members: Siobhan Hanratty, Wenonah (Fraser) van Heyst (Brandon University) and d(D)aniel Brendle-Moczuk.

There were no nominations received for the vice president/president-elect position, therefore, the search failed. In keeping with the bylaws, the position will remain vacant for 2016/17. Deena has agreed to assume the president's position for two years and it, therefore, follows that Siobhan will hold the position of past president for two years.

The nominating committee's report will be posted to the ACMLA-ACACC website.

15.   Adjournment

Moved: Barbara Znamirowski

The meeting adjourned at 2:20 p.m.

Minutes recorded by Marilyn Andrews, Secretary.

Comme vous vous en souvenez peut-être, l'Association avait cette année un poste à combler pour le conseil d'administration : vice-président/président élu. Pour ceux qui n'ont pu assister au congrès, je tenais à vous informer que cette année, le comité des candidatures n'a trouvé personne pour pourvoir le poste. Malgré l'appel aux membres et des demandes ciblées faites auprès de certaines personnes, l'Association n'a reçu aucune nomination pour le poste. Le comité des candidatures a donc informé le conseil d'administration de la situation et a sollicité son aide pour la marche à suivre.

Après avoir consulté le règlement administratif ainsi que les règles de procédures, le conseil a conclu que l'Association ne dispose pas d'un mécanisme pour gérer les postes non comblés. Ainsi, après maintes discussions, le conseil a décidé que le poste de vice-président/président élu demeurera vacant pour l'année 2016-2017.

L'article 8 « Comités » du règlement administratif détermine la forme et la composition du comité des candidatures et en définit le rôle et l'article 7 des règles de procédures, « Comités spéciaux » définit le mandat et la structure hiérarchique du comité des candidatures; cependant, aucun des deux articles ne précise quoi faire si le comité des candidatures n'arrive pas à pourvoir un poste. Seul l'article 8.03 du règlement administratif donne une indication de la procédure à suivre. La dernière phrase de l'article stipule que « Le comité des candidatures peut se réunir aussi souvent que nécessaire pour élaborer la liste des candidats à condition que la liste des candidats soit prête avant l'heure à laquelle la liste doit être incluse dans l'avis annonçant l'assemblée annuelle. » Essentiellement, le comité a été incapable de pourvoir le poste dans les délais prescrits.

Lors de l'AGM, une personne s'est manifestée pour le poste dans la mesure où nous pouvions organiser une élection; toutefois, à la section « Obligations et responsabilités » du règlement administratif, on indique que le comité des candidatures est responsable de « Conduire les élections conformément au règlement administratif et les conclure avant l'Assemblée annuelle des membres. L'élection sera organisée de telle façon que tous les membres habiles à voter auront la possibilité de participer à l'élection. » Cette condition nous empêche donc d'accepter les candidatures lors de l'AGM.

Puisque l'Association ne dispose pas d'un mécanisme pour gérer les postes non comblés, plutôt que de modifier les règles procédurales, le conseil d'administration a décidé de laisser le poste vacant jusqu'à l'année prochaine. Au besoin, Deena a accepté de demeurer en poste comme présidente une deuxième année. Il pourrait cependant être possible de tenir une élection pour deux postes l'an prochain : président et vice-président/président élu. Le conseil d'administration examinera cette possibilité et informera les membres le cas échéant.

Ainsi, en raison d'un échéancier serré et du manque de bénévoles, le comité des candidatures déclare officiellement que le processus a échoué. Bien que le conseil d'administration apprécie que quelqu'un se soit porté volontaire quand le processus habituel n'a pas donné fruit, nous préférons ne pas nous engager dans cette voie pour les années à venir. Cette année, nous examinerons comment modifier les règles de procédures pour régir les processus à suivre lorsqu'il n'y a aucune candidature et pour l'élection de 2017, nous nous assurerons que le conseil soit constitué en temps opportun.

Je vous remercie de votre compréhension.

Siobhan Hanratty

As you may recall, we had one position to fill on the Executive Board this year: Vice President/President-Elect. For those of you who were unable to attend the conference, I wanted to inform you that this year the work of the Nominating Committee resulted in a failed search. Despite the general call and a number of personal solicitations, there were no nominations forthcoming for this position. The Nominating Committee reported the results of the search to the Executive Board and asked for advice as to how to proceed.

After going through the Association's By-laws and Rules of Procedure, it became clear that the Association does not currently have a mechanism in place for a failed nomination process. Thus, after considerable discussion, the Board was in agreement that the position of VP/President Elect should remain vacant for the 2016/17 term.

Section 8, "Committees," of the By-laws, established the existence and general duty of the Nominating Committee and Section 7 of the Rules of Procedure, "Special Committees," established the terms of reference and reporting structure of the Nominating Committee; however, neither specifies options for those instances when the Nominating Committee fails to produce a slate of candidates. The most direction we have appears in the By-laws, article 8.03. The last line of that section states "The nominating committee may meet as many times in the year as is necessary to formulate the slate provided that the slate is completed prior to the time when the slate must be included in the notice announcing the annual meeting." So, we were unable to fill the slate in that time-frame, basically.

We did have someone offer to stand for the position if we could have an election at the AGM; however, under "Duties and Responsibilities" in the Rules of Procedure, the Nominating Committee is charged to "Conduct an election in accordance with these Rules of Procedure, to be concluded before the Annual Membership Meeting. The election should be conducted in such a way that all voting members have the opportunity to participate in the election." It is this condition that essentially prevents us from taking nominations from the floor during the AGM.

Since we don't have a process in place for a failed search, rather than play fast and loose with the process, the Executive thought that it would be fitting to let the position remain unfilled until next year. If need be, Deena will consider staying on as president a second year, but it may also be possible to hold an election for two positions next year: President and VP/President Elect. The Executive will investigate the feasibility of this approach and will notify the membership accordingly should this prove to be an option.

Thus, due to a restricted timeline and a lack of volunteers, the Nominating Committee has officially declared a failed search. Although the Executive Board does appreciate that a volunteer came forward when the traditional process produced no nominations, we would prefer that this not be the way we continually fill the slate. This year, then, we shall consider how we might amend the Rules of Procedure to allow for the possibility of a failed search, and for the 2017 election we shall ensure that the committee is struck in a more timely fashion.

Thanks for your time.

Siobhan Hanratty

MAKING LIBRARY AND ARCHIVES CANADA (LAC) FIRE INSURANCE PLANS (FIPS) MORE EASILY ACCESSIBLE

Joël Rivard and Rebecca Bartlett
Carleton University

Introduction

Fire Insurance Plans (FIPs) are large-scale building atlases available for multiple Canadian cities at various time periods from the late 1800s to the mid-1900s, and which are of value to researchers in a wide variety of fields. At Carleton, these plans are primarily used by our students to determine historical context of the evolution of core municipalities.

Originally in print, FIPs were comprised of multiple sheets that, together, made up large-scale atlases for major municipalities. Each sheet is a large-scale plan which illustrates in great detail the construction materials of buildings, building size and layout, street widths, and the location of fire protection facilities, and each sheet has a coverage of a few blocks at most. As FIPs are available only for larger municipalities which generally cover a significant geographic area, a key plan is provided: the key plan shows the entire municipality divided into sections, with each section having a sheet number superimposed upon it for ease of finding one's area of interest.

Many of the older FIP collections have been digitized and made available online. Library and Archives Canada (LAC) has made available a large collection of fire insurance plans that are available to the general public. These FIPs are out of copyright as LAC has researched them and obtained the copyright certificates of the plans that they've put online.

Finding the FIP on LAC's website

To find the FIPs through LAC's website can be somewhat challenging and time-consuming for users. Users must use either LAC's advanced library search or by searching through AMICUS. LAC has some excellent guides that will allow users to better find cartographic products - http://www.bac-lac.gc.ca/eng/discover/maps-charts-plans/pages/maps-charts-architectural-plans.aspx

A tip for when using the advanced library search is to type the following for a search for FIPs of Ottawa – **"fire insurance plans" Ottawa**. This should give you the results for the various collections of FIPs that LAC has made available online.

Once a user has found the collection, viewing and downloading these can be similarly time-consuming. After viewing the key plan and identifying their area, users then have to navigate in the browser 5 plans at a time to reach the desired plan in the browser, which is particularly inconvenient if the user wants to view sheet 67 of 130 sheets. Once the user views the target sheet, they can either view the image file or download it for use in their research or assignment. This must be repeated for each plan from that particular collection. The key plan is also inaccurate at times, which can make it difficult to find and use the maps.

Solution

Our solution to this problem was to create an interactive geographic index based on the locations of the fire insurance plans, so that users could click on their area of interest and be linked to the FIP sheet covering that location. The FIP collection that we chose was *Insurance plan of the city of Ottawa, Canada, and adjoining suburbs and lumber districts, January 1888, revised January 1901.* In this collection there were 113 sheets, which we downloaded from the Library and Archives Canada website. Of the 113 sheets, 80 were single areas, 22 sheets had multiple areas shown, and 11 sheets were key plans or street indexes.

This solution was designed to solve not only the time consuming nature of accessing the FIPs via LAC's website and key plan inaccuracies, but to accommodate for the fact that street names have changed over the decades which can make it difficult for students to find their area of interest.

Methodology

Before our GIS student assistant georeferenced the FIP sheets, he clipped the sheets that had multiple areas and saved the clipped areas as PNG files. PowerPoint was used for this process as it was not possible to freehand clip while maintaining a transparent background using the graphics software on the student's workstation. The student then used ArcMap 10.3 to georeference all the sheets in MTM Zone 9, adding 8-12 ground control points per sheet. He used multiple referencing layers: 1928 air photos from the City of Ottawa and current Ottawa-Gatineau open data street files. A potential issue arising from this is that the referencing layers are at least 30 years more recent than the FIPs, so there could be some minor inconsistencies. Furthermore, no data frame or coordinate system was used in the FIPs so some distortion is to be expected.

Once the FIP sheets were georeferenced, the index was extracted in ArcMap by creating a personal geodatabase and adding an empty mosaic dataset. The FIP rasters were added to the mosaic dataset

and the Build Footprints tool in the Mosaic Dataset toolset was used to make index polygons fit perfectly around each of the sheets. The footprints layer was exported to a shapefile, and the unique URL link for each FIP sheet on LAC's website was added to the attribute table. The index was then uploaded to ArcGIS Online for hosting.

Next Steps

Following discussion at Carto 2016 and a serendipitous encounter with a LAC employee at the airport on the way back to Ottawa, we will be adding the georeferenced FIP sheets as a download option from the index. Our initial concern was for copyright claims by private companies, but we were assured by LAC that they have copyright certificates for the FIPs they make available online. We would also like to tackle another year of FIPs for the Ottawa region.

Link to index: http://arcg.is/2a6EJnn
Link to methodology Google document: http://bit.ly/29J66Bo
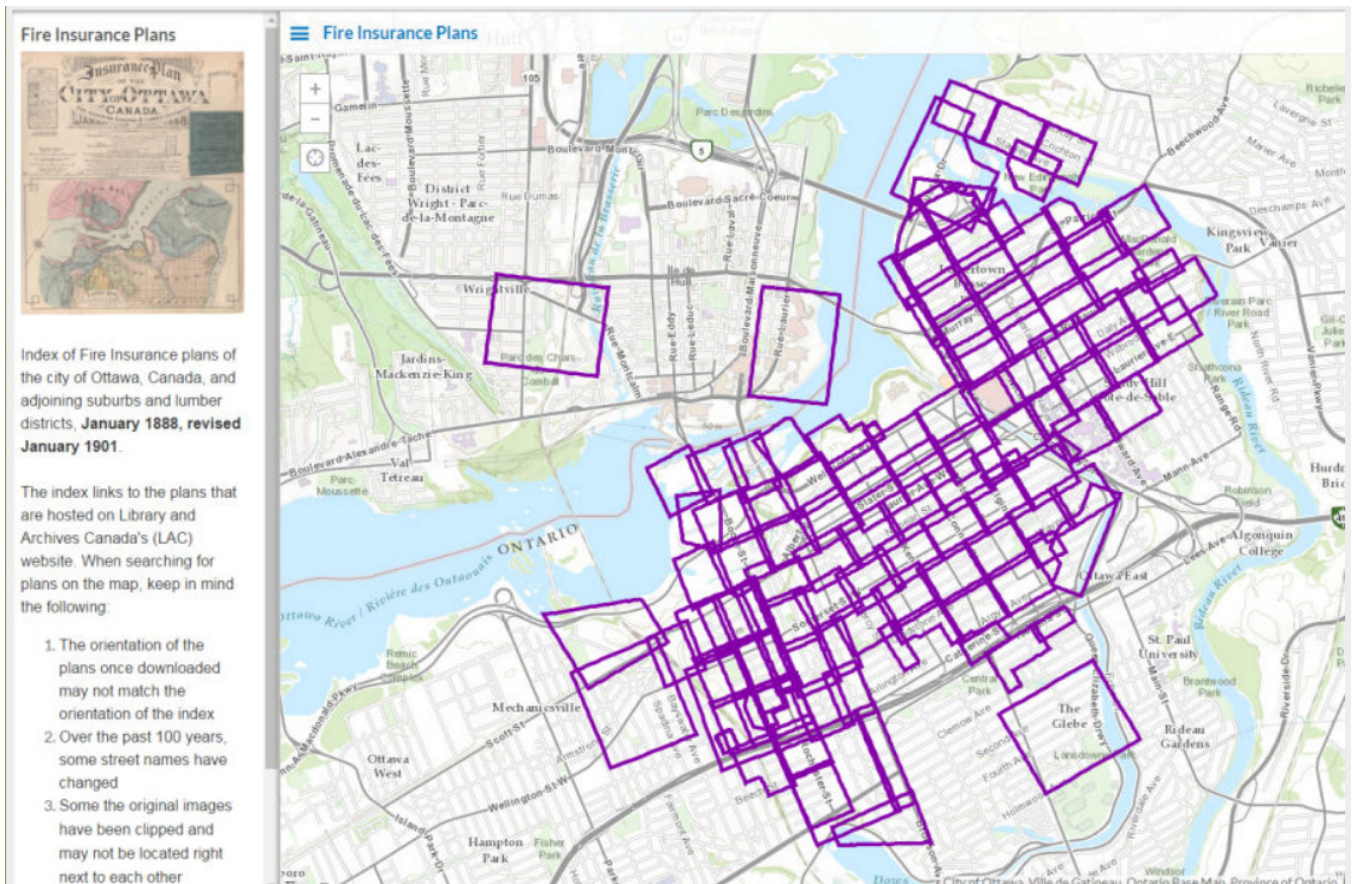
Fire Insurance Plan Index

IMPROVING ACCESS TO DIGITAL HISTORICAL CENSUS BOUNDARIES IN CANADA

Jeff Allen & Amber Leahey
University of Toronto

Introduction

Historical census boundary datasets are invaluable resources for mapping and analyzing demographics over space and time. In Canada, finding and using historical census boundary data can be a little difficult. Statistics Canada makes tabular census data available online for the 2011, 2006, 2001, and 1996 Censuses, with some summary profile tables available back to 1991. For boundary files however, fewer censuses are accessible, with only 2011, 2006, and 2001 available online. Today, access to the older collections is typically mediated by Statistics Canada, or academic libraries who have access through the Data Liberation Initiative (DLI) program. Given that the data from these earlier years are not readily available online publically, it prevents researchers from easily accessing and using them. In addition, for some of the older censuses, the digital spatial data are stored in archaic data formats which present challenges for use in modern Geographic Information Systems (GIS).

In the fall of 2015, Scholars Portal and the University of Toronto Map and Data Library embarked on a project to bring together the dispersed collection of digital census geography datasets and make them available online so they can be easily accessed by researchers, students, and the general public. This project makes data and documentation available openly through the Ontario Council of University Libraries (OCUL) Scholars GeoPortal platform (http://geo.scholarsportal.info). In making the collection available online openly and all in one place, these datasets will be shared and reused more effectively, thus reducing barriers and duplication for researchers everywhere.

This paper outlines the current status of census boundary datasets in Canada and then details our work which includes collecting known datasets from a variety of sources, data conversion, composing a comprehensive set of metadata, and providing online access to the collection. We also compiled an extensive inventory of all known boundaries produced in order to keep track of the collection as well as assess any gaps to help plan future digitization projects. We hope that this work is utilized and shared with others so that more attention is given to this important historical GIS collection.

Overview of Census Geography in Canada

The Census of Canada program provides a statistical portrait of the country. It is administered by Statistics Canada who are mandated "to collect, compile, analyse, abstract and publish statistical information relating to the commercial, industrial, financial, social, economic and general activities and condition of the people" (Statistics Act, 1971). The Canadian Census dates back to 1666, when French colonial administrators collected information on the new settler populations of New France. There were a number of colonial and regional census projects that occurred during the 18th century and first half of the 19th century, which depending on historical circumstance, focused on collecting data on armaments and agricultural resources. The first post-confederation census was conducted in 1871 and the census was administered by the Ministry of Agriculture until 1912. The Statistics Act was passed in 1918 shifting the responsibility of the census to the new Dominion Bureau of Statistics who administered the census decennially up until 1951 (Statistics Act, 1918). The first mid-decade census was conducted in 1956 and censuses have been conducted quinquennially ever since. In 1971, the Statistics Act was amended, which resulted in the Dominion Bureau of Statistics being replaced by Statistics Canada, a full-fledged federal department (Statistics Act, 1971). This change also introduced new methodologies like self-enumeration instead of in-person interviews,

splitting the census into long-form and short-form questionnaires, and storing collected data in machine readable formats. The most recent census was distributed in May 2016 by Statistics Canada and the data for this census is being planned for staggered release in late 2016 and early 2017.

Census data is inherently linked to both *when* and *where* it was collected. Data is collected at the household level at specific addresses on specific dates. Census boundaries are delineated by Statistics Canada to enable the enumeration and aggregation of census data to designated areal units. Census boundaries range in area from those representing entire provinces and territories down to individual urban blocks. This allows for mapping and analyzing census data at different scales. Some census boundaries are designed for the enumeration of certain census variables. For example, crop reporting districts are delineated for the analysis of the Census of Agriculture. Larger census regions are typically composed of smaller regions to allow for the upward aggregation of census data (e.g. dissemination areas are composed of blocks, census tracts composed of dissemination areas, and so on).

Figure 1 shows the census boundaries and their hierarchical relationships for 2011 Census. Every census year has uniquely defined boundaries. They are redrawn because of changes in population distributions or enumeration methodologies. In some cases, the naming conventions of boundaries have changed as well. For example, enumeration areas were renamed dissemination areas in 2001.

Beyond areal boundaries for disseminating data, Statistics Canada also produces other types of spatial datasets for analyzing and visualizing census data. Road network files and block-faces are produced to connect census data to streets and address ranges; ecumenes are delineated for thematic cartography purposes; and geographic attribute files are generated for linking between boundary levels, coordinate data, and population and dwelling counts.

Aggregated tabular census data can be linked to boundary files in a geographic information system (GIS) for mapping and spatial analysis using unique geographic identifier codes. Common applications of mapping census data include choropleth and dot density maps for visualizing spatial patterns of social,
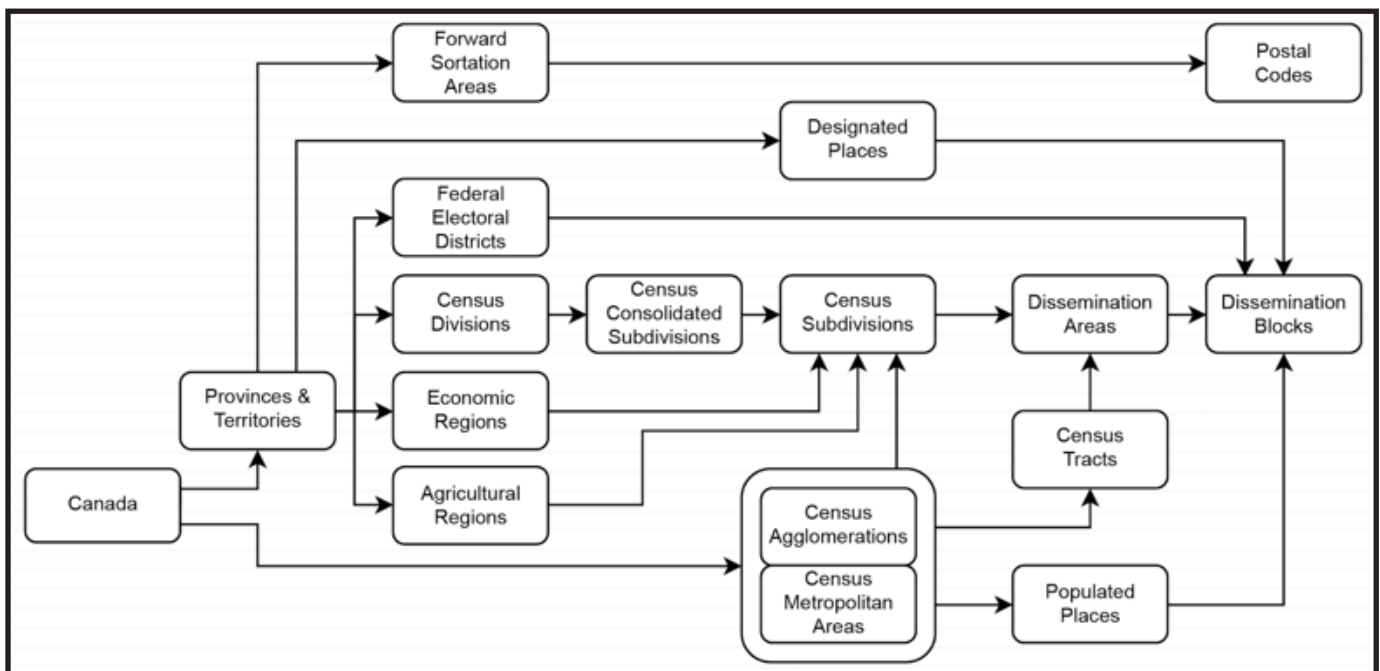

Figure 1 - Diagram of Hierarchical Relationships of Census Boundaries for the 2011 Census (adapted from Statistics Canada documentation)

economic, and demographic characteristics. Analysis of census data linked to boundaries are used to aid wide range of public planning and policy decisions (e.g. healthcare, education, transportation, etc.), for delineating electoral districts, and have countless research applications, particularly in the social sciences. Boundaries from older censuses can be used for mapping demographics at certain points in time and spatial comparison with other historical datasets. This is part of a larger increasing trend in using GIS to aid historical research (see, for example, Gregory & Ell, 2007 or Knowles & Hillier, 2008). Moreover, combining census data and boundaries from different census years can lead to insights on how places change over time. Canadian research in this area include analyzing spatio-temporal patterns of population density (e.g. Millward & Bunting 2008), urban growth (e.g. Burchfield & Kramer, 2015), and gentrification (e.g. Meligrana & Skaburskis, 2005).

Status of Census Spatial Datasets & Project Motivation

Today, Canadian census boundaries are typically produced and stored digitally, as vector datasets in a spatial data warehouse (e.g. representing boundaries using points, lines, and polygons). Together these form the national spatial data warehouse and provide mechanism for the enumeration, collection, and production of a variety of census data products. Boundaries are represented as features, and each feature (e.g. polygon) has associated attribute data including a unique identifier to link with aggregated census data for mapping and analysis.

Digital boundary files for the Canadian Census have been produced by Statistics Canada since 1971. Boundaries are available back to earlier pre-confederation censuses, thanks to the research and data creation of the Historical Atlas of Canada. Up until recently, most early digital spatial datasets were only available for purchase from Statistics Canada, or through the department's Data Liberation Initiative (DLI) program, a national consortium made up of universities that formed together in 1996 to pay for and access Statistics Canada data, namely Public-Use Microdata Files (PUMFs). Part of the DLI includes census data, and boundary files, including census tracts and dissemination/enumeration areas, with some boundary coverages back to 1971. Without the

DLI, individual datasets would typically cost several hundreds of dollars, and these high costs severely limited who was able to acquire and use these datasets for research and analysis (Klinkenberg, 2003).

Access to the DLI collection, including boundary files, was typically mediated by the library at subscribing DLI institutions, some providing links to the data files online, and most only have access via a local connection FTP server. Given that the data for 1971 to 1996 are not available online publically, this prevents people from finding and using these census boundary files. The collection also has little metadata for the data files, which is required for description and indexing in repositories, such as in Scholars GeoPortal. The accompanying data documentation provide details about the data and source information, however, machine-actionable metadata is required for description and discovery on the web, and greatly enables data reuse by capturing important information about the original data, including coordinate systems, projections, collection period, purpose statements, feature counts, etc.

At the time of writing, Statistics Canada has made their spatial datasets for the 2001, 2006, and 2011 censuses freely available online. These will be joined in November 2016 by the boundary datasets that delineate the 2016 census. For the 2006 and 2011 censuses, Statistics Canada provides spatial data as Shapefiles, MapInfo TAB format, and Geography Markup Language (GML). Shapefiles are widely used across GIS applications today, and are largely considered the standard for sharing spatial vector datasets. GML in an open format that uses XML grammar to define geographical features, it is less frequently used by researchers, but it is an open standard supported by the Open Geospatial Consortium (OGC). MapInfo TAB is a lesser used today, and like ESRI's Shapefile format, is a proprietary vector data format designed for use in it's own software.

For digital data produced prior to 2006, boundaries were published and remain stored in spatial data formats that are currently out-of-date and can only be opened by specific, often proprietary, GIS software. For example, the ArcInfo Interchange format (E00) and the MapInfo TAB format, were widely used to store Statistics Canada digital spatial

boundaries. There are also older datasets that are only available as flat files containing ASCII text. They require a codebook to parse the data to provide any use. Some of these datasets come with SPSS syntax files, generated by the University of Toronto Map and Data Library, but again, these require SPSS or other statistical software packages. SPSS is an expensive, proprietary software that not everyone has access too. At the very least, some knowledge of programming is required to read the data, and this isn't considered accessible to the public.

National Infrastructure Projects and Other Digitization Initiatives

Prior to 1971, census boundaries were not produced digitally, only on paper. There have been several separate projects conducted by different academics, librarians, and cartographers, which have digitized historical census boundaries into vector datasets for use in GIS. Part of our project was to acquire these digitized historical boundaries and make them easily available in Scholars GeoPortal alongside digital boundaries from more recent censuses.

Probably the most substantial digitization project was conducted by the Canadian Century Research Infrastructure (CCRI). The CCRI created a harmonized database of census subdivisions boundaries from 1911 to 1951. This database also allowed for dissolving boundaries and associated data up to census divisions and the constructed framework enabled the location, selection, aggregation, and analysis of data for any census year from 1911 and 1951. Working from modern census boundaries as a reference, the CCRI generated a harmonized spatial database for this recreation of historical boundaries. The CCRI has been instrumental in providing a basis for historical census data mapping and analysis and it is well documented and often referenced by historians and GIS researchers (for more information on this project, see St. Hilaire et al., 2007).

There have been several other digitization initiatives conducted by cartographers and librarians across Canada as well. On such initiative was the Historical Atlas of Canada Online Learning Project (HACOLP), which included digitizing census divisions from 1851 to 1961. These boundaries are part of an online interactive cartographic application and

are available for download as Shapefiles. Another project was conducted by librarians from the University of British Columbia who digitized urban Census Tracts and Census Metropolitan Areas for the 1951 Census across Canada (Brittnacher & Lesack, 2013). The University of Toronto Map and Data Library have also undertaken digitizing projects. They digitized 1981 census tracts to vastly improve accuracy over imprecise original data files and they have digitized 1961 census tracts for Toronto from paper maps, which were previously unavailable in any digital format. These projects typically used a technique in GIS of editing modern boundaries to align with the historical boundaries displayed on a georeferenced paper map. This technique allows for maintaining the precision of newer boundaries and saves time by not needing to digitize boundaries that have remained stable.

Data Migration Project (1971 to 2001)

We have been conducting a data migration project to convert census boundaries from 1971 to 2001 from their original, out-of-date, digital formats into Shapefiles to allow for easier usability and long term preservation. Mapping and geographic analysis of census data requires accurate and accessible census spatial datasets. Also, digital data is often more susceptible to obsolescence compared to material sources like paper maps. Over time, data becomes less accessible as file formats change and newer software offers less support for older formats. Data migration is the process of transferring data between storage types and is used as a form of digital preservation to make sure historical datasets, like census boundaries, can be used for people now and in the future. Moreover, since these datasets have become open as part of the Data Liberation Initiative, they should be freely and easily accessible across GIS applications. The Shapefile format was chosen as the output since it is widely used both in proprietary (e.g. ArcGIS, Global Mapper, FME, etc.) and open source GIS (e.g. QGIS, GRASS, PostGIS, etc.). Also, there are plenty of tools available to convert Shapefiles into other geospatial formats if needed (e.g. GDAL/OGR).

Beyond data format conversion, census boundary datasets are also being enhanced as part of the data migration process to further their spatial analysis capabilities in modern GIS applications. All

census boundary datasets are being transformed into North American Datum 1983 (NAD83), which is the datum that Statistics Canada currently uses for their datasets. Over the years, the projections and coordinate systems of census geography datasets varied from Lambert conformal conic, Universal Transverse Mercator, or unprojected NAD27. Conforming datasets data to a single geographic coordinate system allows for consistency when comparing between census years and boundary types. Moreover, features in census boundary datasets are then dissolved to their unique identifiers (e.g. CTUID for Census Tracts). Older datasets typically did not include multi-part features. For example, each island in a group of islands that were part of the same census area would have separate records in the dataset. Dissolving to unique identifiers combines all features with the same identifier into one multi-part feature. This allows for for one-to-one joins with associated tabular data. For some census boundary datasets, additional fields were generated to allow for easier relationships with associated tabular data and other census geography files. For example, in one dataset, existing identifier fields were converted from integers into strings with leading 0s (e.g. from '1' to '001') to allow for joins with tabular data that have the same structure. Also, the original datasets for some census boundaries, primarily prior to 1991, were divided by metropolitan area (e.g. there were separate datasets for Montreal, Vancouver, etc.). These have been appended into one Shapefile to provide a Canada wide coverage.

Much of the data migration process was automated through custom Python scripts with help from geospatial libraries like ArcPy and GDAL. ArcPy is the Python library for scripting geoprocessing tasks in ArcGIS while GDAL is an open source translation library for geospatial data formats. For this project, automated tasks include batch converting between file formats (e.g. from .e00 to .shp), dissolving and appending features, joining and updating attribute fields, defining coordinate systems, and parsing ASCII text files. Converted datasets are checked using Statistics Canada documentation to confirm their coverage and feature counts, and where possible, are compared to any datasets that were previously converted from

different Canadian University libraries (University of Toronto, Waterloo, Western, and Queens).

Organization in Scholars GeoPortal
All acquired and converted datasets are being made available through Scholars GeoPortal as open content meaning that the datasets are available for anyone to access, regardless of affiliation. In Scholars GeoPortal, each census geography dataset can be viewed with reference to a base map, and if the user wants, in conjunction with other datasets. Datasets can be queried either by attribute or on map selection. Each dataset layer has unique symbology and labels identifying the names or unique identifier codes of individual boundaries. Data are available for downloaded as a zip package which includes the converted datasets, documentation, the original data, and any associated attribute tables (e.g. concordance tables).

Each individual dataset has detailed metadata describing its coverage, source, and notes on the data migration or digitization process. Metadata records have unique URIs, meaning datasets can be easily linked to, shared, and found in external search engines. For organization, individual metadata records are aggregated into series records by year, language, data collection category. For 1991 and onward, census boundaries are divided into two categories Digital Boundary Files (DBF) and Cartographic Boundary Files (CBF). DBFs depict the full extent of the geographical areas, including the coastal water area while CBFs depict the geographical areas by clipping to the shorelines of Canada and its coastal islands. CBFs are typically used for general map making as well as calculating population densities and other areal functions. There are also series records for special collections like road network files or health regions. French datasets and associated series records are also available for the 1996, 2001, 2006, and 2011 censuses. These have the same geographic data as their English counterparts, but include French fields in associated attribute tables.

Metadata is generated as part of the loading process into the Scholars GeoPortal. The metadata standard used for the portal is based on the ISO 19115 - North American Profile. A custom

metadata editor provides the form for the descriptive fields, and information and values are entered online in the editor. The metadata provides the rich descriptive information about the boundary files, as described above, and links to the web map service to provide access to the resources online. Users are able to search across dataset metadata, filter based on keyword, spatial coverage, and year of publication, allowing for improved access and discovery online. Metadata and data are provided openly for anyone to search, find, access, and download. The creation of rich, standard metadata enables easy access online, and provides a machine-actionable record (XML) of the dataset information that can be stored and preserved for the long-term.

Looking Forward

Figure 2 shows the digital census boundaries available and our progress (at the time of writing) collecting and converting census spatial datasets and uploading them to Scholars GeoPortal. However this table also indicates that there are a number of significant gaps within the collection. Overall, we are hopeful that this project will raise awareness for librarians, researchers, and cartographers to share any datasets that we are not aware of, and, moreover, spur future digitization projects to fill the gaps in the collection. There are already some

ongoing efforts to fill in these gaps. For example, Statistics Canada is in the process of converting and digitizing Enumeration Area boundaries from 1971 and 1981. Since census geography is hierarchical, these datasets can be dissolved up to recreate other missing boundaries. Furthermore, our collection of census boundaries will be added to with spatial datasets from the 2016 census, which is planned for release in November, 2016 and will subsequently be uploaded in Scholars GeoPortal.

Another major issue and avenue for future work going forward is the current lack of harmonization and accurate concordance between spatial boundaries over time. This hinders the ability to conduct accurate spatio-temporal analysis, particularly from the early digital years of the census (1971 to 2001) where boundaries were defined with varying methodologies, precision, and coordinate systems. There are some concordance and correspondence tables for relating census data between years to the same boundaries. However, these existing tables are limited as they only exist for pairs of years and they do not indicate any percentage changes in area or population. This potentially leads to imprecise results when using them to examine how demographics at specific places change over time. There have been some attempts to rectify

CENSUS BOUNDARIES	ID	2011 CBF	2011 DBF	2006 CBF	2006 DBF	2001 CBF	2001 DBF	1996 CBF	1996 DBF	1991 CBF	1991 DBF	1986	1981	1976	1971	1966	1961	1956	1951	1941	1931	1921	1911	1901	1891	1881	1871	1861	1851
Census Agricultural Regions	CAR	F	F	F	F	F																							
Crop Reporting Districts	CRD																												
Agricultural Ecumene	ECA	F		F		F																							
Census Consolidated Subdivisions	CCS	F	F	F	F	F		F	F																				
Census Divisions	CD	F	F	F	F	F		F	F																				
Population Ecumene	ECU			F		F																							
Census Subdivisions	CSD	F	F	F	F	F		F	F																				
Census Metropolitan AreaS/Census Agglomerations	CMA	F	F	F	F	F		F	F										U										
Census Tracts	CT	U F	U F	U F	U F	U F		U F	U F	U	U	U	U	U	U		T		U										
Provincial Census Tract	PCT																												
Designated Places	DPL	F	F	F	F	F		F	F																				
Designated Place Parts	DPP					F																							
Enumeration Areas	EA							F	F																				
Dissemination Areas	DA	F	F	F	F	F																							
Dissemination Blocks	DB	F	F	F	F		F																						
Economic Regions	ER	F	F	F	F	F																							
Federal Electoral Districts	FED	F	F	F	F	F		F	F																				
Forward Sortation Areas	FSA	F	F	F	F	F	F	F				U																	
Provinces & Territories	PR	F	F	F	F	F		F	F																				
Urban Areas	UA			F	F	F		F	F																				
Population Centre	PC	F	F																										
Additonal Spatial Datasets																													
Road Network Files	RNF	F		F		F																							
Skeletal Road Network Files	SRNF					F																							
Street Network Files	SNF							U		U		U																	
Skeletal Street Network Files	SSNF							U		U																			
Geographic Attribute File	GAF																												
Block-Face Attribute File	BF																												
Place Name Master File	PN																												

Legend:
- In Scholars GeoPortal
- Converted to .shp, but not in GeoPortal
- Exists Digitally in some form, but not as .shp
- Pretty sure not produced in digital form
- Urban only (most Canadian cities) — U
- Toronto only — T
- French version available as well — F

Figure 2 - Inventory of Datasets

these issues. For example, when the CCRI digitized census subdivisions from 1911 to 1951, they used consistent boundaries to allow for harmonized spatio-temporal analysis over this time period. In another project, Schuurman et al. (2006) looked at fixing spatial mismatch between the 1996 to 2001 census boundaries in Vancouver by conflating the road network files. More extensive longitudinal harmonization and concordance projects have been undertaken in Great Britain (Gregory & Ell, 2005) and the United States (Logan, Xu, & Stults 2014), but not in Canada at the same scale. The first author of this paper is currently working on a project to create a harmonized longitudinal spatial database of census tracts across Canada to allow for accurate spatio-temporal analysis of census data at the neighbourhood level.

Conclusion

In this paper, we overviewed the landscape of digital historical census boundaries in Canada and detailed our work collecting these datasets from a variety of sources, converting those in older formats into Shapefiles, and making them available online in Scholars GeoPortal. Our progress has made these datasets more accessible and easier to use for researchers, librarians, and the general public. Moreover, by consolidating and converting these datasets, we are enabling long term preservation to prevent them from becoming lost or obsolete. With the creation of an inventory, we plan to assess any gaps between digitally available boundaries and those only available in paper maps in order to spur future digitization projects. Improving the collection may also require further curation, harmonization, and collaboration between stakeholders (government, libraries, researchers, etc.). This will be explored as we move forward and work towards building a more comprehensive national historical census boundary database.

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DELINEATING EAST AND WEST: DUTCH CARTOGRAPHERS AND DIVIDED HUNGARY, CA. 1570-1685

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Introduction

Historical maps are sources for more than simply geographic information: they also provide valuable insight into the assumptions and understandings of their makers. Borders in particular are revelatory of past associations between space, identity and difference. The simple choice to divide two areas with a line or change of colour suggests the cartographer's belief that some fundamental difference separates those two areas. By analyzing cartographers' specific choices to separate spaces into different regions or to leave them as whole units, modern-day assumptions about the beliefs of those who lived in the past can be either supported or challenged. In this essay, I use seven Dutch maps of Hungary from the sixteenth and seventeenth centuries to challenge the oft-expressed contention that by that period "the problem of the expansion of the Ottoman Empire [...] increasingly preoccupied the public in the whole of Europe."[1] Contrary to this argument, for the first century after Ottoman occupation divided Hungary between two zones of political control by the Islamic Ottoman and Catholic Habsburg empires, Hungary was associated at least as much with its pastoral products as with Ottoman conflict. The presentation of the region as one divided only appears in the later seventeenth century, when changing Dutch attitudes toward the Habsburgs and renewed Ottoman aggression coincided to allow a feeling of solidarity with the Habsburgs. This cartographic evidence suggests that any overarching European opposition to or preoccupation with the Ottomans was not automatic, but rather slowly constructed.

Historical Context

During the sixteenth and seventeenth centuries, European geographers were forced to undertake a radical reconception of global geography on account of the vast new regions of the Americas, Africa and Asia that Europeans were encountering. Old allegorical maps transitioned into ones more focused on accurately reflecting distance and space through the use of new cartographic methods, especially mathematical projections inspired by Ptolemy's then recently rediscovered *Geographia*.[2] The move away from direct allegory toward more systematic representations did not remove the symbolic and allegoric elements of earlier maps, but did obscure them behind a guise of perceived correctness and thick detail.[3] Maps became prestigious symbols of European sovereignty, rationalism and global influence, further developing European popular demand for them. In earlier centuries, the Italian peninsula had been the principal centre for map production in Europe, but by the late sixteenth century, the Low Countries were emerging as a global commercial entrepôt, and a centre for cartographic production as well.[4]

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[1]Mirela Slukan Altić, "Between the Cross and the Crescent: Countries Bordering the Ottoman Empire in the Eyes of Dutch Cartographers," *The Cartographic Journal* 49, no. 2 (2012): 118. I use the term Dutch for simplicity's sake, but should clarify that I use the adjective to refer to the entire geographic region of the Low Countries including present-day Belgium as well as the Netherlands.

[2]Denis Cosgrove, *Apollo's Eye: A Cartographic Genealogy of the Earth in the Western Imagination* (Baltimore: The Johns Hopkins University Press, 2001), 41-46, 52.

[3]Elizabeth Sutton, "Mapping Meaning: Ethnography and Allegory in Netherlandish Cartography, 1570-1655," *Itinerario* 33, no. 3 (2009): 12-42; Charlotte Colding Smith, "'Depicted with Extraordinary Skill': Ottoman Dress in Sixteenth-Century German Printed Costume Books," *Textile History* 44, no. 1 (2013): 25-50.

[4]Growing Dutch cartographic production: Robert Karrow, "Centers of Map Publishing in Europe, 1472-1600," in H*istory of Cartography Volume Three: Cartography in the European Renaissance*, ed. Woodward (Chicago: University of Chicago Press, 2007), 615-619; the Low Countries as a global trade entrepôt: Jonathan I. Israel, *Dutch Primacy in World Trade, 1585-1740* (Oxford: Oxford University Press, 1989), 3-7.

ACMLA Student Award Winner

Through the seventeenth century, cartographers in the Dutch Republic's capital at Amsterdam would produce maps in a wide variety of languages intended for markets across the European continent.

As cartography developed greater popular interest and larger markets, efforts to better define the limits of the European continent itself gained impetus as well. Complicating this process was the expansion of a non-Christian polity into traditionally European space: the Ottoman empire. The Ottomans first invaded Hungary in 1526, before occupying the southeastern half of the kingdom in 1541. The Ottoman occupation began a period of prolonged imperial confrontation between them and the members of the Habsburg dynasty, who had been elected to rule the northwestern part of the kingdom by most of its nobility. This confrontation was not only imperial and military, but also religious and cultural. Traditionally, to be European had meant to be a Christian under the spiritual authority of the Roman Papacy.[5] An Islamic empire's expansion into lands long considered European challenged this association between Christian rule and European status. The reaction to this perceived intrusion is evidenced in a sudden proliferation of popular and religious prints that appeared depicting the Ottomans as savage barbarians whose successes indicated the coming apocalypse.[6]

Older historians such as Pirenne fixated on the negative discourse expressed in these sources to argue that the Ottoman advance into Eastern Europe created an "insuperable barrier" between Ottoman and European territory.[7] Newer scholars have perpetuated this view: Samuel Huntington contends that the Ottoman-Habsburg border was "the most significant dividing line in Europe," which excluded Ottoman-controlled Europe from participating in key events of the traditional narrative of Western history: "the Renaissance, the Reformation, the Enlightenment, [etc]."[8] These scholars push the evidence of an anti-Ottoman discourse too far: while this discourse certainly existed, it did not govern practice. Significant other evidence exists that suggests commercial integration, cultural interaction and political cooperation between the Ottomans and the Christian-ruled states of Europe was commonplace in general and on the Habsburg-Ottoman frontier in particular.[9] Despite the cartographic industry's close ties to the print media that generally depicted the Ottomans in a negative fashion, the evidence of the seven following maps suggests that integrative commercial associations held greater weight than ones of civilizational conflict or difference in depictions of Hungary during the first century of its division.

Method and Sources

To investigate how Dutch cartographers conceived of Hungary during the Ottoman occupation from 1541 to 1699, I analyze a series of seven maps produced by men from the Low Countries during that period. I organize the maps into three groups based on their years of production: first, the two maps of Hungary by Abraham Ortelius (1570, 1579) and one by Gerard Mercator (1585); second, those by Henricus Hondius (1623) and Joan Blaeu (1635); and third, those by Frederick de Wit (c.1664) and Justus Danckerts (c.1685). Every one of these maps was printed within an atlas meant for commercial markets, suggesting their popular impact. As I look at each map, I pay

[5]William Chester Jordan, "'Europe' in the Middle Ages" in *The Idea of Europe: From Antiquity to the European Union*, ed. Pagden (Cambridge: Cambridge University Press, 2002), 74-6.

[6]Charlotte Colding Smith, *Images of Islam, 1453-1600: Turks in Germany and Central Europe* (London: Pickering & Chatto, 2014); Nina Berman, "Ottoman Shock-and-Awe and the Rise of Protestantism: Luther's Reactions to the Ottoman Invasions of the Early Sixteenth Century," *Seminar* 41, no. 3 (2005): 226-245.

[7]Henri Pirenne, *Mohammed and Charlemagne* (Cleveland: World Publishing Co., 1957 (reprint, original 1937)), 164.

[8]Samuel Huntington, "The Clash of Civilizations?" *Foreign Affairs* 72 (1993): 30.

[9]Several essays summarize the general evidence for Ottoman-European interaction: Eric Dursteler, "On Bazaars and Battlefields: Recent Scholarship on Mediterranean Cultural Contacts," *Journal of Early Modern History* 15 (2011): 413-434; Claire Norton, "Blurring the Boundaries: Intellectual and Cultural Interaction between the Eastern and Western; Christian and Muslim Worlds," in *The Renaissance and the Ottoman World,* eds. Contadini and Norton (Burlington: Ashgate Publishing Co., 2013), 3-21; William Dalrymple, "The Porous Frontiers of Islam and Christendom: A Clash or Fusion of Civilizations," foreword to *Re-Orienting the Renaissance: Cultural Exchanges with the East*, ed. Maclean (Basingstoke: Palgrave Macmillan, 2005), ix-xxiii. Claire Norton describes interaction on the Hungarian frontier in particular: "Liminal Space in the Early Modern Ottoman-Habsburg Borderlands: Historiography, Ontology, and Politics," in *The Uses of Space in Early Modern History,* ed. Stock (New York: Palgrave Macmillan, 2015), 75-96.

close attention to the borders within and around Hungary, as well as any imagery included in the map's geography, its title cartouche or around its margins. Throughout the essay, I consider the political context surrounding their production, especially the animosity they may have held towards the Habsburgs on account of the Dutch Revolt (1568-1648).[10] Considering context, regional borders and imagery, I conclude that Dutch cartographers did not begin to depict Hungary's division until the end of their conflict with the Habsburgs allowed them to express solidarity with the Habsburg cause. Renewed Ottoman aggression coincided with these changing attitudes to create a new emphasis on Habsburg-Ottoman opposition in Hungary and its surrounding regions by the later-seventeenth century maps.

Analysis

The first three maps within the sample were printed in two of the earliest modern atlases by two of the most well-known figures in sixteenth century cartography: Abraham Ortelius (1570 and 1579) and Gerard Mercator (1585). Both these cartographers were from the southern Netherlands, which was in turmoil in the 1570s and 1580s after the outbreak of the Dutch revolt. Three common features stand out within these maps as most relevant to how cartographers positioned Hungary and the Ottomans within European space: 1) there is no division marked between Habsburg and Ottoman Hungary; 2) Hungary is marked as its own, single region; 3) the Ottomans are present in the text of two of the three maps.[11] All these features together suggest that these Dutch cartographers were aware of and acknowledged the presence of the Ottomans in the region, but that that presence had not forced a reconception of it or its boundaries.

In all three maps, Hungary is not only clearly its own region separate from others, but also an undivided one without the major internal separation of the Ottoman-Habsburg border. In Mercator's map

especially, Hungary stands out as the undivided centrepiece outlined in bright colour.[12] This choice to retain Hungary's unity comes in spite of Mercator and Ortelius' almost certain awareness of the Ottoman presence within Hungary. That both cartographers knew of the Ottoman presence within the region is attested to by other evidence within their maps. In the lower corner of Ortelius' 1570 map and Mercator's 1585 one, the cities of Gradiskia and Kobas [Kowacz] stand on the northern bank of the Sava River across from "Gradiskia Turcicum" and "Kobas [Kowacz] Turcicum."[13] By including these paired cities, the two cartographers demonstrate that they were aware not only of the Ottoman presence within the region, but also had some sense of the location of the Ottoman-Habsburg border. While noting the presence of the Ottomans, neither Ortelius' nor Mercator's maps give a sense of conflict or opposition; they certainly do not suggest that they depict "the theater of war for Turks and Europeans for the next century and a half."[14] The two cartographers saw Ottoman control as something to acknowledge, and likely to regret, but not something that created an ideological or commercial barrier across the region, real or conceived. These three maps suggest that thirty to forty years after Hungary was divided, cartographers in the Low Countries still saw no real division there.

The depiction of the Ottomans and their border with the Habsburgs in Hungary presented by the three maps of 1570-1585 is hardly changed in maps from half a century afterward. This continuity makes sense: Henricus Hondius' map (1623) and Joan Blaeu's one (1635) were in fact both duplicates of Mercator's map of 1585. Both cartographers worked from the model of Mercator's copperplates, but oddly enough the focus on the plates themselves created a different impression of the region than Mercator's original. While Hondius' print was exactly identical to Mercator's, his map lacks any superficial colouration, shifting the emphasis of his map away from the sense of regional unity given by

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[10]Such animosity was central to the development of Dutch identity and often expressed itself through violent imagery: Amanda Pipkin, "'They were not humans, but devils in human bodies': Depictions of Sexual Violence and Spanish Tyranny as a Means of Fostering Identity in the Dutch Republic," *Journal of Early Modern History* 13, no. 4 (2009): 229-264.

[11]The three maps referred to here are attached below in Appendices I, II, and III.

[12]Appendix III.

[13]Detail provided in Appendix I.

[14]Zsolt G. Török, "Renaissance Cartography in East-Central Europe, ca. 1450-1650," in *The History of Cartography Volume Three: Cartography in the European Renaissance*, ed. Woodward (Chicago: University of Chicago Press, 2007), 1827.

Mercator's.[15] Blaeu's map went a step further to colour the faint, dotted borders drawn onto Mercator's map, which had been present but mostly unnoticeable.[16] These borders outline the neighbouring margraviate of Moravia and archduchy of Austria, but not Hungary itself, possibly meant to outline only member states of the Holy Roman Empire. Regardless of intention, Blaeu's choice to colour these borders gives no sense of a consolidated Hungarian region, only of an amorphous political mass beyond the edge of the two German regions. The two maps might suggest Hungary was uncivilized for its exclusion from the Holy Roman Empire, but certainly do not suggest it was a region divided between empires and faiths. As with the others, the only signs of the Ottoman presence in Hungary within its representation by these two cartographers are Gradiskia and Kobas and their "Turkish" counterparts across the Sava River.

In addition to adding new colouration to his map, Blaeu added a new, colourful title cartouche to it. This cartouche suggests an attempt to market the map and the region it depicted romantically, but calls on classical tropes of imagery rather than warlike ones to do so. In the imagery surrounding Blaeu's cartouche, a suggestively pregnant woman stands surrounded by wheat, an overflowing cornucopia at her side, and stream of water flowing from a pipe at her feet.[17] This imagery suggests an effort by Blaeu to make his atlas more visually and commercially appealing, an effort that would stand in line with his general efforts to compete in an increasingly cutthroat commercial mapmaking industry. Rather than choosing to decorate the region with imagery of savage or exotic Ottomans, however, Blaeu chose to give a sense of the region's fertility and flourishing pastoral production. A significant Hungarian cattle trade crossed the Ottoman-Habsburg border in Hungary to supply urban markets in Vienna and Venice, where Hungarian merchants involved in this trade were likely one of the most visible signs of Hungarians outside of Hungary itself.[18] In aiming to make his map more visually appealing to popular European map purchasers, Blaeu chose

to highlight its fertility rather than the turmoil upon which modern narratives of the region focus.

The final two maps made after 1660 present a radically different image of Hungary. Their dates of publication are somewhat less certain, but De Wit's map was produced at some point between 1664 and 1670 and Danckerts' 1680 and 1685. Exact dates aside, at least three decades separate these maps from the 1635 Blaeu map. Within this time, hostilities between the Ottomans and Habsburgs had reignited. The change in the status quo on the Habsburg-Ottoman border in part stemmed from the rise of the ambitious Köprülü family to dominate the Ottoman central administration and foreign policy. Important battles like the Habsburg victory at St. Gotthard in 1663 had made the Ottomans appear as present and threatening as ever. Furthermore, the Dutch domestic context had changed radically since the publication of Blaeu's map: the signing of the 1648 peace of Westphalia had ended hostilities between the Dutch Republic and the Habsburgs. Likely impacted by these events, these two maps show a changing tone in cartographers' attitudes towards the Ottomans. Whereas the earlier maps had almost dismissed the Ottoman presence in Hungary and Eastern Europe entirely, these final two maps present the region as a climactic point in the conflict between Ottomans and Habsburgs. These cartographers no longer saw it as acceptable or possible to ignore the Ottomans, altering traditional regional boundaries and adding imagery to give a stark sense of opposition within their maps. The return to hostilities between the Ottomans and Habsburgs in the second half of the seventeenth century provoked cartographers in the Low Countries to finally represent Hungary in the divided manner many modern historians impose upon it from 1541 or even 1526 onward. Both later maps mark the division within Hungary itself outright. While Hungary remains a single unit marked by a single colour, it is in these final two maps a divided unit split into "Hungaria Christiana" and "Hungaria Turcarum."[19] This change shows a definite effort by these two cartographers to stray from the example of their predecessors.

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[15]See Appendix IV.
[16]See Appendix V.
[17]See the detail of the cartouche in Appendix V.
[18]Ian Blanchard, "The Continental European Cattle Trades, 1400-1600," *Economic History Review* 39, no. 3 (1986): 433-436, 442-446.
[19]See the detail included in Appendix VI.

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Hondius and Blaeu had seen no issue with duplicating Mercator's printed images, even if Blaeu enhanced it with new colouration and imagery. By De Wit's map's publication in 1664, leaving the division in Hungary unmarked would either make his map appear incorrect or less appealing to a commercial audience now interested in the conflict in Hungary. The division of Hungary into "Christian" and "Turkish" regions by De Wit and Danckerts reflected the over a century-old political division that had been left out almost entirely by earlier cartographers.

As well as dividing Hungary into these two regions, De Wit's and Danckerts' inclusion of new imagery around their title cartouches suggests their intent to portray the region in terms of opposition. Earlier, the Ottomans had only appeared in the small details of city names, but they dominate the imagery of De Wit's 1664 map. Facing each other across the title cartouche with olive branches extended stand the Habsburg Christian king of Hungary and the Ottoman sultan, each bedecked in all the symbolic attire of their positions.[20] The olive branches suggest peaceful relations, but the two rulers' posture and stance towards one another suggests the confrontation within the entire depicted region. The expanded area depicted in De Wit's map reinforces this sense, showing all of Ottoman Europe and its neighbouring Christian territories. This choice gives the sense that the conflict and border within Hungary are version of the imagery from De Wit's cartouche: rather than Habsburg king and Ottoman sultan confronting one another, the Ottoman sultan stands alone threatening Christian Europe.[22] This choice again reflects the immediate circumstance of the map's creation in the early 1680s, as renewed Ottoman hostilities were brewing that would culminate in the 1683 siege of Vienna. De Wit and Danckerts presented Hungary as a key theatre of a broader imperial conflict and as a region in danger from Ottoman aggression, both responding to the immediate contexts of the time of their mapmaking. Hungary's division and the place of the Ottomans in its governance do not appear automatically with the region's division, remaining unmarked until Dutch attitudes towards the Ottomans and the Habsburgs had shifted.

Conclusion

Maps are designed to show difference and similarity. Cartographers' lines, dashes, and roughly coloured symbols become much more than merely marks on a page, giving important insights into the priorities and assumptions of the cartographers who made them. For historians, cartographic expressions of difference can either reinforce or call into question present-day assumptions about past conceptions of space. From 1541 to 1699, histories of Hungary and the Ottoman and Habsburg domains cast the Hungarian region as one divided, defined by the differences between Habsburg and Ottoman rule. These maps from the Low Countries call this assumption of perceived division into question, along with the discursive binaries upon which it is founded: Christian and "Turk," Habsburg and Ottoman, East and West. The cartographers of arguably the largest print centre on the continent suggested no such binaries in their depictions of Hungary until long after the region's division first began. Their maps suggest popular knowledge about Hungary was largely unchanged by the Ottoman occupation and Habsburg election to power, remaining more closely associated with pastoral bounty and prosperity than with any world-shattering civilizational or continental divide. Only with their own changing political circumstances in the mid-seventeenth century did cartographers in the Low Countries begin to express the discursive binary upon which historians often focus from 1541 onward. These seven maps grant insights into the development of these binaries even as they challenge their most basic premises of historical difference and categories. The sense that Ottoman conquest rendered space different, something innately other than European, non-Christian, was not an immediate reaction, but rather one slowly developed over centuries of exchange and interaction.

Adrian Christ is currently a history student at the Univeristy of Alberta

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[20]Ibid.
[21]See Appendix VI.
[22]See detail from Appendix VII.

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APPENDIX I

Ortelius' 1570 map based on Lazius from the *Theatrum Orbis Terrarum* (above), detail of Gradiskia and Kobas (below). Courtesy of the William C. Wonders Map Collection.

APPENDIX II

Ortelius' 1579 map based on Sambucus added to the *Theatrum Orbis Terrarum*. Courtesy of the William C. Wonders Map Collection.

APPENDIX III

Mercator's 1585 map from his own *Atlas*. Courtesy of the William C. Wonders Map Collection.

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APPENDIX IV

Hondius' 1623 map "per Gerardem Mercatorem" from his own *Atlas*. Courtesy of the William C. Wonders Map Collection.

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APPENDIX V

Blaeu's 1635 map published from his own atlas (above), detail of the title cartouche (right). Courtesy of the William C. Wonders Map Collection.

APPENDIX VI

De Wit's map published c. 1664-1670 (above), details of title cartouche (following page top) and Hungarian region (following page bottom). Courtesy of the William C. Wonders Map Collection.

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APPENDIX VI

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APPENDIX VI

Danckerts' c. 1685 map from his *Atlas* (above), detail from title cartouche (right). Courtesy of the William C. Wonders Map Collection.

REVIEWS

Compiled by Sarah Simpkin

Designing Better Maps: A Guide for GIS Users
Reviewed by Andrew Nicholson

Brewer, Cynthia A. **Designing Better Maps: A Guide for GIS Users**. (Second Edition) Redlands, CA: ESRI Press, 2016. 232 p. $59.99 US ISBN: 1-58948-440-5.

In the Fall 2006 edition of the ACMLA *Bulletin* (#127), this reviewer described the first edition of Cynthia Brewer's *Designing Better Maps* as being "a terrific reference guide for all levels of ArcGIS user" and noted that it works best as a "companion piece" to a ArcGIS manual.

Today, 10 years later we see the publication of the second edition of *Designing Better Maps.* With so much change taking place in the fields of cartography, GIS and computer technology in general, it is no surprise to see the author take account of the changes and update this key reference resource. At first glance, the most striking change is the actual size of publication. The first edition was available in a compact 23 x 19 cm sized book which made it a perfect ready-reference source. In contrast, the second edition is a considerably larger sized 25 x 25 cm volume which accommodates more maps, but makes it a little more awkward to open and access as a quick reference resource.

Dipping into the content, another surprising change is soon apparent. Unlike the first edition which made frequent use of ArcGIS screenshots, Brewer adopts a more agnostic GIS software approach in this volume. Ms. Brewer in fact concedes in the "Preface to the Second Edition" that the arrival of Google Maps and other GIS applications has created a need for a broader approach in promoting better map cartography.

By removing the overt references to ArcGIS, Brewer makes up for it with a more universal approach to cartographic practice which will appeal to any GIS user regardless of application.

The content presentation of the book has also seen significant change with a reorganized structure. Unlike the first edition, Brewer takes a greater focus on the process of designing more effective maps, especially in the first few chapters in which "planning, explaining, and publishing maps" are each given their own chapter. Moreover, Brewer has also extensively rewritten each chapter and added new ones to address advances in colour coding, 'multiscale mapping', online map publishing, and map sharing services. In the areas of colour and map resolution, Brewer especially praises the advent of higher resolution computer screens for promoting the use of colours and visual hierarchies in maps. The chapter on the "Publishing and Sharing of Maps" is much welcomed addition with the growth of social media and smartphone ownership potentially making us all amateur cartographers.

With so much technological and societal change in how we create and use maps today, Ms. Brewer should be commended for producing this important update. Unlike other 'later editions' of text and guidebooks which only have minor changes or a new preface to justify their publication , Ms. Brewer has provided us with a completely fresh and updated perspective on *Designing Better Maps*. Although its size makes it a little more bulky as a desk-side guide compared to its predecessor, the second edition of *Designing Better Maps* remains a highly recommended resource for any academic library, especially those with patrons interested in GIS or visual design programs.

Andrew Nicholson
Coordinator, GIS & Research Data Services
University of Toronto Mississauga Library
Mississauga, ON

Essential Earth Imaging for GIS
Reviewed by Tomasz Mrozewski

Fox III, Lawrence. **Essential Earth Imaging for GIS**. Redlands, CA: Esri Press, 2015. 115p. $59.99. ISBN 978-1-58948-345-3.

Essential Earth Imaging for GIS is a slim volume that serves both as a primer and as reference on the practices and principles of remote sensing. The book promises to cover "concepts and methods of image formation and manipulation that enable you to efficiently and effectively display, coregister, enhance, interpret, and delimit features from an image" (p. vii).

Written by a professor emeritus of GIS and remote sensing consultant, the style and the organization of materials are consistent with what you would expect in an introductory class on remote sensing. In eight chapters the book covers: an overview of imaging GIS; methods of remote sensing; the effects of the atmosphere; creating images from sensor data; displaying images in GIS software; generating 3-D data; image processing; extracting information from images. The clear and logical structure of the book guides the reader from the first principles of how remote sensing works to identification and delineation of features. Unlike the books on remote sensing in Esri Press' Making Spatial Decisions series, however, *Essential Earth Imaging* doesn't provide detailed workflow walkthroughs and is context-agnostic. There is a great deal of technical information about spectrums and resolution that could serve as useful reference material.

The book includes numerous full-colour sample images to illustrate concepts such as the output of different sensor types, atmospheric noise in different spectral bands, and comparison of colour composites. The illustrations are particularly useful for understanding the content without having any practical experience with the subject matter and without needing to follow along with GIS software and learning data sets - although, as with many Esri Press offerings,

Essential Earth Imaging comes with an 180-day trial of ArcGIS.

The only real issue with the book is, thankfully, more of an annoyance than a major problem: most graphs in the book lack scales and units on the Y axes (p. 9, 13, 26, 38). The omission is at odds with the level of detail present in the text (and in the X axes!) and means that these graphs are only useful to illustrate general trends rather than concrete information.

As an "accidental" GIS librarian without formal training, I found the book to be a fairly concise introduction to remote sensing and a valuable boost to my level of GIS literacy. I would recommend it as supporting material for courses in GIS and as reference material for researchers using earth imaging in their work.

Tomasz Mrozewski
Data, GIS and Government Documents Librarian
J.N. Desmarais Library
Laurentian University
Sudbury, ON

Glasgow: Mapping the City
Reviewed by Susan McKee

Moore, John. **Glasgow: Mapping the City.** Edinburgh: Birlinn Ltd, in association with the National Library of Scotland and University of Glasgow Library, 2015. 274p. £30.00. ISBN 978 1 78027 319 8.

Glasgow: Mapping the City is an annotated collection of about sixty maps of Glasgow, Scotland, covering the period 1596 to 1988. The maps were selected for the stories they convey about the historical, social, economic, and political development of Scotland's largest city. Each map is accompanied by an article discussing the theme and also the background of the cartographers and surveyors. The author's purpose is to depict the relationship between individuals and the environment they live in,

reflecting the city's current promotional slogan: "People Make Glasgow". The maps are drawn from numerous sources including the National Library of Scotland, the National Records of Scotland, University of Glasgow Library and Archives, and private collections. This is a companion volume to *Edinburgh: Mapping the City* and *Scotland: Mapping the Nation*, also published by Birlinn. Author John Moore is a librarian and collections manager at the University of Glasgow Library and a specialist in Scottish cartography.

The author tells us that early Glasgow had no major political or strategic significance and thus there are few city maps prior to the mid-eighteenth century. The book begins with the earliest depiction of Glasgow, part of a 1596 manuscript map by Timothy Pont, who recorded Scottish place names, topography and local information. Other early mapping includes surveyor John Adair's 1731 map of the Clyde River, the Military Survey of Scotland mapping which began in 1747 after the failed Jacobite Rebellion, and the first comprehensive urban plan of Glasgow by John McArthur in 1778. Nineteenth century cartography includes thematic mapping of medical epidemics, tourism and cycling, educational institutions, penny banks, policemen's beats, tramways and railways, parks, and James Cleland's 1822 census maps. The lithographic printing process was first used for map production in Glasgow in 1825.

Some of the most interesting sections in this reviewer's opinion are those on the Ordnance Survey's 1860s and 1890s detailed 1:500 town plan series of Glasgow, recently digitized by the National Library of Scotland; Thomas Sulman's mid-Victorian era bird's-eye view of 1864; Charles Goad Ltd's 1898 fire insurance plans, apparently not well known or widely available; Glasgow's 1888, 1891 and 1938 International Exhibition plans; the 1938 "Special Emergency Edition" city map by the Ordnance Survey, and a 1941 map of Glasgow produced by the German

military. The final maps in the book celebrate the city's post-war regeneration with the 1988 Garden Festival plans and the 2011 Hillhead subway mural map by artist Alasdair Gray.

This is a very interesting and readable book, tracing the unique history of Glasgow with high quality colour map images and stories. A bibliography of books and websites on the city and Scottish cartography are included. It would make a great addition to any map library, and also libraries with urban studies collections.

Susan McKee
Geospatial Librarian
Spatial and Numeric Data Services

From the Reviews Editor:

Thanks to those who submitted book reviews and to all who have expressed interest in reviewing! I'll continue to request review copies from publishers - but please let me know if you have read a book of interest to the ACMLA and would like to submit a review, and if you have any suggestions for titles/sources. Here are the review guidelines:

ACMLA Bulletin Book Review Guidelines

Review Format

1.   Bibliographic Citation
This should include: author, title, edition, place of publication, publisher, date, number of pages, price (if known) and ISBN. Example:

> Bussey, Ben and Spudis, Paul D. The Clementine Atlas of the Moon. Cambridge:
> Cambridge University Press, 2004. 316p. $80.00 US. ISBN 0-521-81528-2.

2.   Content
The review should describe and critically evaluate the work. Typical review elements include: scope, purpose and content of the work; intended audience; writing style; background and authority of the author; how the work compares with other titles on the same subject; its usefulness as a research tool; any unique features; and its suitability for library collections.

The length of the review is at the reviewer's discretion, but should normally reflect the importance of the work. A typical review is about 500 words.

3.   Your name, title, institutional affiliation, city and province/state

Editorial Policy

Opinions expressed in reviews are those of the reviewer, not of the ACMLA. The Reviews Editor may make minor edits, without communicating with the reviewer. Should the Editor determine that a major revision is required, she will contact the reviewer for discussion.

Sarah Simpkin
Reviews Editor

REGIONAL NEWS

Compiled by Tomasz Mrozewski

Regional News wants to hear from you! Staffing updates, funding awards, events, new projects or new developments on old projects - let me know! Submissions accepted in English or in French. Please email news items to Tomasz Mrozewski at tmrozewski@laurentian.ca or (705) 675-1151 x3325.

On veut vos nouvelles! Veuillez partager les nouvelles au sujet de changements de personnel, des bourses, des activités, de nouveaux projets ou des mises à jour sur les projets existants. Les soumissions seront acceptées en français ou en anglais. Veuillez communiquer les nouvelles avec Tomasz Mrozewski par courriel au tmrozewski@laurentian.ca ou par téléphone au (705) 675-1151, poste 3325.

Alberta

David Jones
Edmonton Map Society

The Edmonton Map Society held its spring meeting on May 11, 2016 with over 20 members in attendance. We were treated to two fascinating presentations.

Lesley Cormack, History and Classics and Dean of Arts, spoke about her recent research: "The whole earth, a present for a Prince: Molyneux's Globes and the creation of a global vision in Renaissance England." Abstract/summary:

In 1592, a pair of globes, one celestial and one terrestrial, was presented to an appreciative English market. Designed and built by Emery Molyneux, financed by William Sanderson, these instruments were arguably the first globes manufactured in England. They were also the largest available on the European market – over two feet in diameter – and they charted, for all to see, the extraordinary achievements of English explorers in the last twenty-five years. These globes represent the English achievements of that last quarter century, but even more importantly, they signalled the direction of England's ambitions, ambitions that included containing and controlling vast parts of this terraequeous world.

In this paper, I described the construction and history of these globes, and argued that three different, interactive publics sprang up around these innovative instruments: a constructing public; a discursive public; and a consuming public. The constructing public of these globes would include engravers, cartographers, explorers, and astronomers, as well as the merchants interested in funding the enterprise. But given that the use of these globes for their owners and viewers was not self-evident, treatises were written to explain their use – a discursive public. Finally, the public who owned these globes tells us something important about how early modern Europeans used and read globes.

Adrian Christ, Honours History, spoke about his research project: "Delineating East and West: Dutch Cartographers and Divided Hungary, ca. 1570-1685." Adrian's paper was subsequently submitted to the ACMLA as a candidate for the Student Paper Award. His paper won the award and is included on page 43 in this issue of the *Bulletin*. Abstract/summary:

My presentation was a summary of the research I completed for my undergraduate honours thesis. This research used a series of seven maps of Hungary made in the Low Countries, the earliest in 1570 and the latest in the early 1680s, to assess European attitudes toward the Muslim-

ruled Ottoman empire and their control over the southeastern portion of Hungary. From 1541 to 1699, the traditional region of Hungary was split between the control of the Ottoman and Habsburg dynasties. Often, historians cast this division as a site for clashes between rival civilizations or as an absolute barrier that separated the Western world from the Islamic or Oriental. While evidence from many printed sources suggests the existence of such a general "civilizational" European animosity towards the Ottomans, the evidence of printed maps of Hungary made across the continent in the Low Countries does not until long after that border appeared.

As conflict continually erupted within the shifting Hungarian frontier region, Dutch depictions of the region relied on out-of-date maps as sources for their own newer ones: later maps contained old geographic information accented with new imagery and decoration. These superficial additions reflect Dutch cartographers' understandings of this turbulent region hundreds of miles away from them, as well as the well-known division within it. Neither the border itself, nor any major identification of the region with the Ottomans, appears until the 1660s, more than a century after the region's division began. To represent the region in such a fashion suggests that Ottoman military successes did not spark an immediate reconception of Hungary or other traditionally Christian-ruled regions by Dutch cartographers. Furthermore, as Dutch mapmakers sought to make their maps more commercially appealing in the early seventeenth century, they chose to do so with decorations that referred to the region's ongoing economic importance rather than the imperial conflict occurring there. Only after the treaty of Westphalia in 1648 started to shift Dutch attitudes toward the Habsburg rulers of Hungary changed did the region's division suddenly become a major feature of cartographic depictions of it. Altogether, the changing representations of Hungary within the maps I analyzed suggests that if a general European preoccupation with the Ottoman conflict in Hungary did exist, it was not automatic, but rather developed slowly when

allowed to do so by more immediate concerns.

The Edmonton Map Society's fall meeting will be in November. Notices will be sent closer to the time.

Ontario

Heather Whipple
Brock University

Colleen Beard has started her well-deserved sabbatical. Heather Whipple will be acting Head of the Map, Data & GIS Library until Colleen returns in July 2017.

Eva Dodsworth
University of Waterloo

This winter, the Geospatial Centre has teamed up with Special Collections and Archives to help visualize some of their online exhibits using ArcGIS Online. One example of this collaboration is Abraham Moyer's journey to Canada (https://goo.gl/4VuJYa). On July 1, 1899 Abraham Nash Moyer began a trip from his home in Kansas, travelling across the United States to visit his family in Ontario. He brought along a Kodak camera and did his best to capture a portion of the many places he passed through including Kitchener and Waterloo. After his return home, Abraham's daughter Metta created an album with his photographs and Abraham's descriptions. Both descriptions and photographs have been included in the online travel diary.

This past winter term we also offered three workshops: Introduction to ArcGIS, Getting Started with QGIS, and a new, 'field-based' one, Understanding GPS Data Gathering and Mapping with GIS. The latter event provided a hands-on understanding of how GPS units gather data. When the data were collected, participants then plotted a CEP (Circular Probability of Error) and corrected the data for presentation.

The Geospatial Centre team is continuing with various digitization projects. We are now scanning the post 1967 1:25,000 topographic map series, many of our Region of Waterloo photomap series, as well as creating building vector files from Fire Insurance Plans. We are also getting reading to upload the 1966 georeferenced air photos of the Region of Waterloo onto our Historical Air Photo Project website. None of these projects would be possible without the great assistance of our student and co-op workers!

On a personal note, I will be taking a part-time study leave from September 2016-December 2017 as I co-author a research guide on geographic and cartographic resources.

Tomasz Mrozewski
Laurentian University

Since the establishment of the Laurentian Map Library in 2015 (https://goo.gl/k8rhlu) we have been working on collecting and creating inventories of map collections throughout the university. We have discovered several unprocessed donations with a wide variety of maps, including mid-20th century Japanese Antarctic survey maps. We also discovered, abandoned in the Geography department's storage room, a set of meticulously annotated maps on geological and forestry themes dating from the 1880s to the 1940s. Unfortunately, there is no indication as to what purpose these maps served or who collected them so we are currently investigating the maps' purpose and provenance. We have begun to investigate through local networks of researchers and geologists but, so far, have had no luck. We hope to publish a description and images of the maps later this year to solicit advice about possible purposes behind this mysterious collection.

NEW MAPS

Compiled by Cheryl Woods

Baseball Travel Map
Scale: NA
Publisher: Professor Pathfinder (Hedberg)
Year of Publication: 2016

Route 66 Cycling Maps (set of 6)
Scale: varies
Publisher: Adventure Cycling Association
Year of Publication: 2015

Bataille de la Somme 1916
Scale: 1:75,000
Publisher: IGN
Year of Publication: 2016

Bataille de Verdun 1916
Scale: 1:75,000
Publisher: IGN
Year of Publication: 2016

Waterloo 1815
Scale: 1:50,000
Publisher: NGI
Year of Publication: 2015

Guadeloupe (137)
Scale: 1:80,000
Publisher: Michelin
Year of Publication: 2016

Martinique (138)
Scale: 1:80,000
Publisher: Michelin
Year of Publication: 2016

Switzerland
Scale: 1:301,000
Publisher: Kummerly & Frey
Year of Publication: 2016

Gomera
Scale: 1:35,000
Publisher: Freytag-Berndt
Year of Publication: 2016

Malta-Gozo
Scale: 1:30,000
Publisher: Freytag-Berndt
Year of Publication: 2016

Mallorca
Scale: 1:50,000
Publisher: Freytag Berndt
Year of Publication: 2016

Argentina North – Uruguay
Scale: 1:2,500,000
Publisher: Nelles Verlag
Year of Publication: 2016

Central America
Scale: 1:1,750,000
Publisher: Nelles Verlag
Year of Publication: 2016

Taiwan
Scale: 1:400,000
Publisher: Nelles Verlag
Year of Publication: 2016

Bolivia - Paraguay
Scale: 1:2,500,000
Publisher: Nelles Verlag
Year of Publication: 2016

Indonesia: Bali - Lombok
Scale: 1:180,000
Publisher: Nelles Verlag
Year of Publication: 2016

Denmark
Scale: 1:300,000
Publisher: Reise Know-How
Year of Publication: 2016

Angola
Scale: 1:1,400,000
Publisher: Reise Know-How
Year of Publication: 2016

Finland
Scale: 1:875,000
Publisher: Reise Know-How
Year of Publication: 2016

Colombia
Scale: 1:1,400,000
Publisher: Reise Know-How
Year of Publication: 2016

Southern England - Wales
Scale: 1:400,000
Publisher: Reise Know-How
Year of Publication: 2016

Algarve
Scale: 1:100,000
Publisher: Reise Know-How
Year of Publication: 2016

China
Scale: 1:4,000,000
Publisher: Reise Know-How
Year of Publication: 2016

Iraq, Kuwait
Scale: 1:850,000
Publisher: Reise Know-How
Year of Publication: 2016

Iran
Scale: 1:1,500,000
Publisher: Reise Know-How
Year of Publication: 2016

Japan
Scale: 1:1,200,000
Publisher: Reise Know-How
Year of Publication: 2016

Indonesia – Java
Scale: 1:650,000
Publisher: Reise Know-How
Year of Publication: 2016

Kenya
Scale: 1:950,000
Publisher: Reise Know-How
Year of Publication: 2016

Northern Poland
Scale: 1:350,000
Publisher: Reise Know-How
Year of Publication: 2016

Ecuador, Galapagos Islands
Scale: 1:650,000/1:1,000,000
Publisher: Reise Know-How
Year of Publication: 2016

Israel (topographic set of 28 sheets)
Scale: 1:50,000
Publisher: Survey of Israel
Year of Publication: 2016

Israel (topographic set of 22 sheets)
Scale: 1:100,000
Publisher: Survey of Israel
Year of Publication: 2015

Georgia (topographic set of 130 sheets)
Scale: 1:50,000
Publisher: Geoland
Year of Publication: 2015

European Gas Pipeline System
Scale: 1:8,333,000
Publisher: VGE
Year of Publication: 2016

GIS TRENDS

Barbara Znamirowski
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Editor's Introduction

I am pleased to welcome a guest writer: Mike Kyffin. Mike is an application developer who has worked on a variety of spatial web projects in Canada and the US, including at Scholars Portal and at Trent University Library. He is currently working as a developer in Cleveland, Ohio. We thank him for his leadership in spatial web technologies, and for his interest in libraries.

Barbara Znamirowski, Editor, GIS Trends

DYNAMIC TILING IN MODERN WEB GIS
Mike Kyffin

Introduction

Data management is one of the chief tenets of building and maintaining a Geographic Information System (GIS). We must remember that the 'S' in GIS stands for 'System' - a collection of data, decisions, tools and processes. It is not simply software. Most importantly, without data *there can be no GIS!*

A challenge often faced by those building a GIS is the sheer size of the data itself. GIS data is notoriously large, often to the surprise of IT departments or those assessing the hardware requirements for a project or department. GIS data comes in a variety of current and legacy formats - ranging from simple texts files to scanned maps and database tables. This variety leads to many complications and challenges in the architecture of a GIS - a situation far beyond the scope of this discussion. However, what is consistent across almost every GIS project is *delivery* - or, "how will I deliver this data to my users?" The answer to this question is increasingly to use methods for the web and mobile devices. This may seem like old news, but many projects - and indeed businesses - still struggle with how to deliver their enormous amount of data to users in an efficient fashion.

Map tiling is a consistently implemented solution to this challenge. It is a well-documented methodology for delivering data, with a variety of products and services to aid in implementation. Many of these solutions are very mature after fifteen years of development. In short, tiling is an effective method of data display over the web, based on the premise of creating an indexed archive of data cut into small georeferenced image (.png, .jpg, etc) squares. Client devices - web browsers, mobile devices, etc - load the tiles from a server and can view the data using the same HTTP technology that allows us to check the weather online or get stock quotes. There remain some important challenges, however.

Map tiling, sadly, does not solve the problem of data size. In fact, it is quite common for map tiling to have a serious impact on storage requirements. It is more than just data replication. In many cases, especially where large geographic areas are involved, maps tiles can take up more space on a server than the data itself, because tiles are stored at many scales - or *Levels of Detail* (LODs) in map tiling terminology. Additionally, it is important to address the fact that once the tiles are made and stored on a server, they cannot be changed. This eliminates the possibility of using such tiles for dynamic online mapping.

These are the limitations being addressed: storage size and dynamic mapping. The dynamic nature of data perhaps may not apply to imagery or scanned products. These formats reference data captured at a point in time and are generally delivered as such. Importantly, they are already images, and thus

investing the storage space needed for map tiles may be justified, and dynamic rendering can likely be ignored[1]. Vector (point, polyline, polygon) data display, on the other hand, can be hindered by these limitations. Data storage requirements can quickly add up and the inability to customize the symbology remains. Happily, in the last few years we've seen some services and technologies appear that seek to mitigate these limitations. We will examine three below, noting solutions from ESRI, CartoDB and MapBox.

The following sections are meant for a general audience. GIS data custodians and developers can follow the associated reference links for further implementation information.

ESRI ArcGIS JavaScript Vector Tiles

With the release of the ArcGIS API for JavaScript version 4.0, developers building ESRI-centric web applications have the ability to leverage **Vector Tile Layers** for dynamic online mapping. This was a much anticipated addition. This functionality allows GIS data custodians to create a single (vector) tile representation of operational data - and allows developers the chance to create web applications that give end users the opportunity to customize the look and feel of their online maps, even if the data is very complex. As an example, let's imagine a GIS project that intends to publish a customized basemap with 27 separate layers. A Vector Tile Package can be created and stored *only once,* but the display of these 27 layers can be customized in any combination determined by developers or end users themselves. There is no need to store multiple tilesets with differing symbologies, or to enforce a single visual representation of the data on end users. Vector Tile Layers are well worth exploring, but be aware of current considerations in the API.[2]

Rendering definitions can be stored on the server as a JavaScript Object Notation (JSON) file, or applied by end-users actions directly in the browser. The latest (June, 2016) API documentation sample from ESRI for Vector Tile Layers[3] includes an example similar to figure 1 below, where the rendering definition is pre-made and stored on the server as a single JSON. This is effective way of displaying one or more pre-made rendering definitions to users. However, it's possible to determine the rendering symbology as the web map loads, or during an interactive session by the user.

In Figure 1, we can see a simple example of Vector Tile Layers. We've chosen to render all roads on a plain background with the same width. This rendering style is not enforced by the server, but by the web application itself, which makes it very straightforward to simply "make the major roads wider" - as shown in Figure 2.

Figure 1: Basic symbology

Figure 2: Symbology with user initiated rendering

This may not seem very significant - re-styling geometries on the map has been relatively straightforward in several APIs (ArcGIS JavaScript, Google Maps, Bing Maps, etc) for some years. However, let's remember that Vector Tile Layers allow us to re-render the symbology features on-the-fly for all features at *any scale, any complexity and over any extent*. This is an important distinction that can aide in the performance of a web application while more effectively managing its data footprint. Imagine offering the ability for users to stylize their own basemap, to their own liking, for multiple datasets at a national level - without having to store any extra data to do so.

CartoDB

CartoDB may not be as well known as ESRI, but they offer a powerful solution for web mapping with a very small footprint. Most importantly for the purposes of this discussion is that they provide a way to create dynamic tiles on-demand for extremely large, complex datasets.

At its heart, CartoDB is a cloud-based platform. There is no specific software to install or manage, and every account is backed by access to PostgreSQL[4] with PostGIS[5] - a combination that offers a vast array of analytical possibilities to the GIS professional familiar with SQL queries. All datasets exist as PostGIS tables in a database, and data can be queried by simple queries, complex queries or even custom functions. Significantly, since it's a cloud-based platform, there's no need to purchase hardware, consider server requirements or manage network performance. This is potentially a good match for web-only projects that do not need to consider desktop GIS access.

Like ESRI's ArcGIS JavaScript API, CartoDB has a method to pass rendering rules to layers on a map. This method is called CartoCSS[6] and well worth exploring. A comparative example is shown below, demonstrating the power of CartoDB's solution on a large dataset. Figure 3 below shows a section of a very geometrically accurate dataset of *every single county in the United States.*

The stylized rendering of the CartoDB in Figure 4 can be zoomed in and out to any level (scale) and panned to any region of the United States - and the dynamic tiles behind the layer will continue to appear.

Additionally, it's worth noting that the query behind the data can also be edited on-the-fly. For instance, it's possible to refrain from rendering counties in certain states, or only render counties below a certain threshold of square kilometres. The tiles behind the layer will update themselves. How is this possible? The software behind CartoDB can create
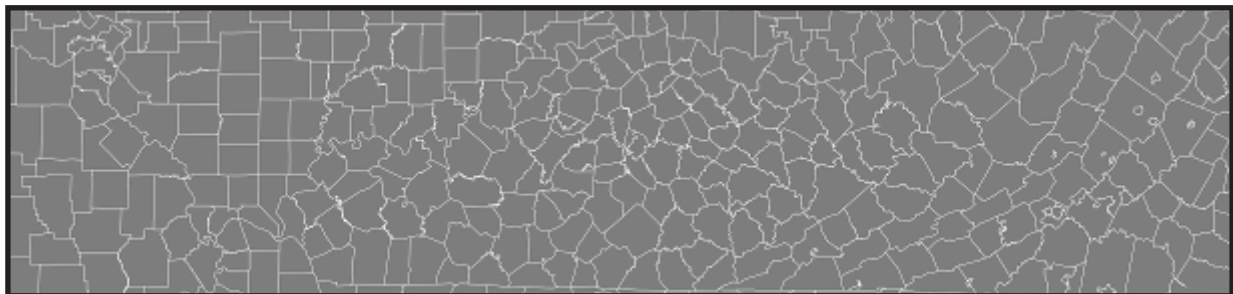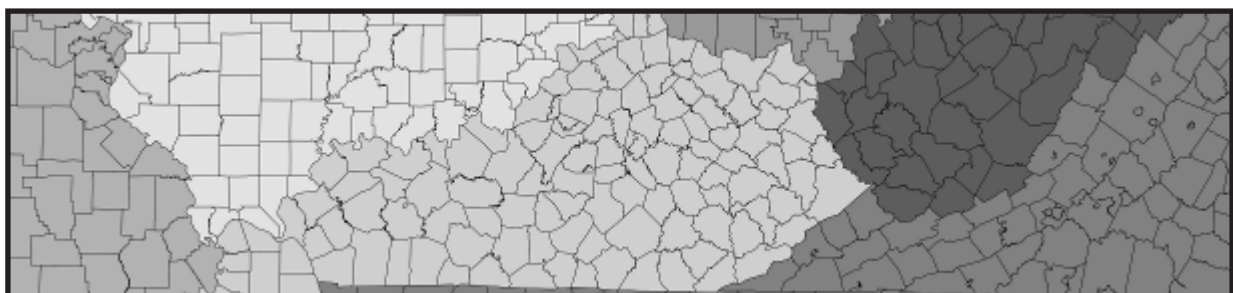

Figure 3: Simple CartoDB layer

Figure 4: CartoDB layer with CartoCSS rendering

tiles on demand as applications need them and serve them back to clients (browsers, smartphones, etc) as they are requested. It isn't necessary to rely on a pre-made cache of tiles at all.

CartoDB has a free starter account to learn the system and explore the possibilities.[7,8]

MapBox

MapBox is another organization that has made huge strides in the web GIS world, and a preferred solution for cartographic-level basemap management - even at continental or global scales. Their vector tile specification is one also used by ESRI, making it possible to import MapBox vector tiles directly into an ESRI ArcGIS API for JavaScript project.[9]

The same dynamic symbology methodology can apply. Styling specifications can be pre-made and stored on a server, or they can be dynamically set by the user in an interactive session.

Figure 5 shows a small scale view of MapBox's standard base map. Figure 6 shows the same view but with all the place labels removed by the user - a common practice in desktop GIS, but previously completely impossible with pre-made tiles for web maps. It is worth reiterating that *no extra storage space* was required to do this and no data duplication has occurred.

MapBox is well worth considering for projects that are not ESRI-centric and may require a high-degree of cartographic finesse. MapBox Studio is an excellent tool for online cartography and allows for high quality vector tiles to be created.[10] Additionally, their SDKs for mobile (iOS & Android) development are worth exploring.[11]

Conclusion

Map tile cache management has been a challenge for web GIS projects, especially those covering large geographic areas. Storage requirements for tiled, high accuracy vector data can add up. There are finally solutions, however, to mitigate this concern and allow storage resources to be focused on imagery and archiving.

Figure 5: Standard MapBox rendering

Figure 6: MapBox basemap with user-initiated label removal

Notes

[1]Dynamic imagery **can** exist. See: https://www.azavea.com/projects/raster-foundry-doe/, https://developers.arcgis.com/javascript/latest/sample-code/layers-imagery-renderingrule/index.html

[2]https://doc.arcgis.com/en/arcgis-online/reference/vector-tile-layers.htm

[3]https://developers.arcgis.com/javascript/latest/sample-code/layers-vectortilelayer/index.html

[4]https://www.postgresql.org/

[5]http://postgis.net/

[6]https://docs.cartodb.com/cartodb-platform/cartocss/

[7]https://cartodb.com/pricing/

[8]Pro-tip: have a look at Torque.js for developing around time-based or historical datasets. https://docs.cartodb.com/cartodb-platform/torque-js/

[9]https://developers.arcgis.com/javascript/latest/api-reference/esri-layers-VectorTileLayer.html

[10]https://www.mapbox.com/mapbox-studio/

[11]https://www.mapbox.com/help/#build-a-mobile-app

GIS Trends: Note from the Editor
Submissions and Feedback

GIS Trends is a place to share ideas, observations and discoveries in the area of GIS and other spatial technologies. If you have something you would like to share please write to me. We also welcome feedback on GIS Trends articles. Proposals for articles and feedback should be sent to: bznamirowski@trentu.ca

Thanks for reading and contributing! Barbara Znamirowski, Editor, GIS Trends

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