## Where in the world can you find your ancestors?

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**Abstract**

*There is a rising awareness of the tools of Geospatial Information Systems on the part of both amateur and professional historians. Professionals (historians, political and social scientists, and even medical historians) are able to see and think about various trends in a more visual and useful way to them (think of seeing how various diseases spread and where and why), while amateurs seeking more information of their ancestors can also benefit by seeing migration patterns and places of origin, which could help them think about why their ancestors left a place to immigrate to a new country.*

*Knowing who controlled what land and when can make the task of finding appropriate records, for any purpose, a bit easier. Also mentioned are grass roots initiatives, that is, not created by governments or commercial organizations, but by local genealogical and historical groups. This brief overview, done primarily from a layman's viewpoint, can engage the reader with an idea of how to get their work more appreciated and out "into the world". A study by a student at California State University at Fullerton mentions that such genealogy researchers tend to be generative (that is, concerned with passing information along to those following), and very aware of themselves and their ancestors in a time and place.*

*Hopefully this will get more interaction between academics and people out in the world who can appreciate their work.*

**Keywords**: genealogy, family history, GIS, local history

Genealogists are often pigeonholed as looking only at censuses, and once in a while at an online family tree. But now it is becoming far more common for them to be aware of and use maps, and even GIS tools to enhance and expand their research. People exist in the physical world, and where they live has a great deal to do with what they do for a living, how they live, what food they eat, and what they do for work.

What I want to show is how genealogists are becoming more aware of the tools that are out there to be utilized; how they see these tools helping their (specialized) research; what they are contributing to the larger corpus of knowledge, and lastly to mention some interesting sites (a few out of far too many for one short article) that are using maps and data for the greater research good.

The average age of genealogical researchers appears to have dropped. This comment is based on a study done by Pamela J. Drake at Fullerton (California) State College for her degree in psychology. She stated that 72 per cent of the researchers were female (thus 28 per cent are male); but only 20 per cent were over the age of 65, which could be considered the age at when more people have the most time to do searching after their working years. She also stated that her subjects had an average length of experience of 14 years, that being not at all a beginning amount of time. However they did start their searching at about age 40 – coinciding with when childbearing is mostly done, but people are still young enough to have time and energy in passing along family information. Many more people have fairly powerful home computers and are comfortable with using and trying new ideas than might have been the case a few decades ago.

Maps also have the advantage of being able to display various kinds of information at a glance. They can help to visualize historical movements and landmarks, and if coded with metadata provide amplified content on their inhabitants of a certain time and place.

I have been involved with maps and cartography for quite some time – fifty years or more, starting in university. When I started as a genealogy librarian forty years ago, there was (essentially) no Internet. Now there is, and the same ease of communication that we have become accustomed to aids in the deployment of many different kinds of communication, data and provides far easier access to fairly high end mapping and georeferencing tools that did not exist just a few decades ago.

This availability along with more convenient sharing and ease of collaboration has made the use of maps by genealogists and family historians much easier to accomplish. For example, people in upstate New York often have relatives or family that originated or at least lived in Canada. But they are not very aware of the geography of the neighbouring country. The level of geographic unawareness or illiteracy is quite apparent once one starts to talk to lay researchers. To a large extent, searchers still do the same things, such as limiting their searches to census and church records, and not taking advantage of clues and history that maps may afford. This is why it is good to get more genealogy searchers into using GIS and maps. They can be helped into thinking as local historians and expand their found data to help others.

I mentioned local historians. As far as I know New York is the only US state to require under state education law that every incorporated place have an officially appointed historian. There are at this writing about 1700 of them, greatly supported by a new state historian.

But one also has to know how to use the available tools. As should be obvious, there is a glaring difference between knowledge and information. Knowledge is having items hardwired into your brain, while information is more likely what you can look up on your phone. What do you think is likely to be more useful? And what helps to explain your ancestor's life decisions and movements? If people are alive, they exist in a physical world. (If not, they tend to stay stationary – though not always, as many cemeteries are moved!).

So what kinds of maps should genealogists be exposed to and learn to use? I use the term genealogists to encompass those searching for religious reasons, such as the LDS (Latter Day

Saints, or Mormons), but this also includes family historians and researchers, local historians medical history researchers, language and history teachers, sociologists, political scientists and so on.

Giving talks to them is a good start, and one can mention the standard town and county plat maps. But there can also be included topographic maps (the United States Geological Survey has recently released PDF versions of them all for free); railroad maps; parish maps, from religious organizations; provincial maps (Canadians and other countries have those instead of states); historical atlases; military maps (considering what the average person can now get from Google for free, one has to wonder what quality is available to those in the military); land ownership maps (metes and bounds software is easily available to plot out lands using verbal descriptions); maps done by various levels of government and even businesses, and the ever useful Sanborn insurance maps, just to start out. I particularly like the Sanborn Fire Insurance maps. They give the shape and size of the buildings appearing on them, interior details, and of course street information. They are ideal to use as a base for a community based research project, described later.

It is important to mention that while many places such as libraries, historical societies, and historians have map collections, that they very often are not cataloged in any meaningful way. As opposed to large collections available online elsewhere, I am aware of institutions that have thousands of maps described if at all only on a handwritten 3 by 5 card in a file drawer. If they are hidden as such, they are far from useful and accessible. Some of these collections have been partially digitized and made available to all users on the web. There are some attempts to make comprehensive guides, but it is usually necessary to remind such genealogical users to find and use more than one source.

Maps can help genealogy researchers and others pin down their people of interest in a certain place and time. That could enable them to accurately determine where to find more information. For example, near where I live there is a house that has been in three counties in the past 200 years. The land hasn't moved – it's not in an earthquake zone! – but the fact that counties divided and records are to be found in separate county seats does make a difference. If one went by the latest census available (in the US, that is the 1940 Federal) one would look in Rochester (the county seat) but before then it was in Ontario County, whose county seat is Canandaigua. That is just since 1820, when Ontario was set off from earlier counties. New York was originally settled by native peoples, and over a period of more than 200 years as European people came into the state more counties were set off. Finding those early records is made somewhat easier by knowing controlled a piece of land and at what time. Before that time, much of NY State was in yet other parent counties (or even other US states), or under Dutch control, as the English took over from them in the 1660s. So depending on where you look and on how far back you wish to go, using a map will help the searcher determine where to most productively look for records. And that is just the tip of the iceberg. And yes, some early New York records are still found in Holland.

I will describe some projects of which I am aware. These can be used not only for genealogical research, but also for local history, for mapping medical occurrences, for seeing political and religious trends, for immigration analysis and so on.

There are other reasons to use maps and put amplifying information onto them. Thomas Hyder, a teacher on Long Island NY, has had his classes study immigration to the Cortland NY area for almost 20 years. These students carry that knowledge with them for a long time after high school.

As far back as 2008 Dr. Robert Jones of Skidmore College presented at the Conference on NY state history in Saratoga Springs NY. He gave a Geographic Information Systems (GIS) Practicum, showing how to work with historic maps in new ways, manipulating them and interpreting the results to shed new light on a community's history. He presented a Saratoga NY map overlaid upon an older colonial American map showing where the old church burying yard was – it is now under a parking lot - and where other important features of early settlements in that region were located. I remember him saying that one could use ArcGIS, an expensive desktop software, or use maps found on the web and Google Earth (at that time it was still a paid subscription for the Pro version) for free. Considering that most of us have financial constraints, especially those of the general public who do genealogy as a hobby and pastime, this is of some interest.

Other projects that are being worked on are the community-generated databases exemplified by the past work of people like Thomas Barss of the FamilySearch organization.  He put together a study of western Nova Scotia, linking families and maps with information on that area. It was an effort to gather and publish the genealogy for a whole town or community. The information also includes the supporting sources. Each "Community Tree" is a searchable database with views of individuals, families, ancestors and descendants, as well as printing options. The goal can be to identify and reconstitute all families of a particular place from a village, county, or even a country. Mr. Barss is still with FamilySearch where he was the supervisor of the Canada Reference Unit for three years. His work includes audio recordings, pictures of the interviewees, transcripts of audio materials, and individual lineage charges or a family tree for that person.

This is important because using maps to research where and when, and then to append supporting documentation and information to such projects allows a place to be examined in greater depth and with more initial understanding than just looking at a chart or spreadsheet.

These kinds of projects can be helped along with genealogical societies members' contributions of their own research findings – with the proviso that nearly all of such members are not trained academics, librarians or archivists. They are the general public, and as such any contributions should be taken with a grain of salt. Still, it is better to have amateur contributions than to let information wither. Witness the steady cutbacks in staff at many societies and libraries, and even academic institutions. I have been writing a column entitled Doing It Ourselves for an online magazine (The In Depth Genealogist) for the last four years, and it highlights these kinds of projects.

There are other projects underway using maps. Our own society (the Rochester NY Genealogical Society) has an incipient project at: http://www.rcip.info/census/, which attempts to flesh out underlying settlement in a Polish neighborhood of Rochester. And this is related to what is next mentioned.

What kinds of data can be superimposed on a map? Such things as found in projects like HistoryForge in Ithaca, NY, https://thehistorycenter.net/historyforge or the Cayuga Heights

History Project, http://www.cayugaheightshistory.org/ also in Ithaca. A map can be generated and various information layers applied to it – such as the location of a now gone salt mine, and the locations (taken from census information) of the people who worked there.

A plat book in a town hall or county courthouse or an old fire insurance map may show an outline of your ancestor's house and its placement on your ancestor's property. Such maps should help you picture where your relatives were born, resided, attended school, worked, shopped, voted, traveled over land or water, courted, married, raised families, and were laid to rest. You may need later maps of the same area or other places to track down ensuing generations.

Maps usually suggest some patterns of settlement and movement and might eliminate others. For example, topographic and other relief maps may show hills or mountains that impeded migration or access to certain areas. Rivers that are bridged now may not have been when one's ancestors lived in that area. In NY, the building of the well documented and well mapped Erie Canal helped commercial and migratory travel because sometimes it is easier to travel on water than through thick forests on a muddy early pathway.

As there is an increase in the popularity of genealogy, its devotees are learning to use sources other than the main commercial or free data based web sites. Many map librarians, archivists and the like are reporting more non academic users coming in to their locations or web sites, and using such materials to extend their research and amplify the stories that they can find about their subjects.  Their societies are encouraging the use of such material as aerial photos gazetteers and historical maps with their known shortcomings such as lack of details or even topography. They are attending training courses given by their own societies or libraries on such tools as ESRI's ArcGIS software.
In sum, many more genealogists and amateur historical researchers are learning more about geographical and GIS related resources which can add to the understanding of their ancestors lives.



**References, books and useful web sites**: Many of these are included to show the wide acceptance of using maps and geospatial techniques in genealogical research.

http://viewshare.org/ - A now–shuttered project, Viewshare from the Library of Congress, allowed people to upload locations and have them plotted by the online program for free

Discovering and Using Historical Geographic Resources on the Web: A Practical Guide for Librarians: Rowman & Littlefield Publishers; Eva H. Dodsworth, L. W. Laliberté

https://github.com/CartoDB; Location Intelligence & Data Visualization tool for the cloud

https://www.nysgis.net/' New York State GIS Association, which sponsors events including a "Mappy Hour"

https://www.nps.gov/history/mwac/storymaps.html; United State National Park Service; Story Maps program

http://gis-sig.org/; Geographic Information Sharing Special Interest Group; covers the Rochester NY /Finger Lakes region. A local group which sponsors informative programs such as How to use ArcMap and Google Earth Together to Create Powerful Mapping and The Use of 3D and GIS Technologies

http://www.highlandparkfuneralcentre.com/. Little Lake Cemetery. Created in conjunction with students from Fleming College's Geographic Information Systems program, the web mapping application displays a range of historical data about the mentioned cemetery in Peterborough ON. Users can search the grave marker inventory by Surname and/or Death Date. The search results include records containing family names, the oldest date on the monument and an image of the marker. At any point, the user can freely search the map and click on any grave marker to view corresponding information.

https://blogs.loc.gov/teachers/2017/11/learning-beyond-the-original-purpose-with-sanborn-fire-insurance-maps/?loclr=eatlcb; Learning Beyond the Original Purpose with Sanborn Fire Insurance Maps; Cheryl Lederle

https://www.mapbox.com/; a commercial site; Mapbox is the location data platform for mobile and web applications.

http://www.genealogyintime.com/; from their web site: "The Genealogist [a subscription web site] has started the process of putting online a very detailed street survey of London, England from 1910. Known as the *Lloyd George Domesday Survey*, it is a series of maps of where people lived in the city. The maps go right down to showing individual street addresses. Trying to trace an ancestor's London address using modern maps is a major challenge that can often lead to incorrect results. Vast parts of the city were destroyed and rebuilt after World War II"

http://www.ox.ac.uk/news/2017-06-23-online-hillforts-atlas-maps-all-4147-britain-and-ireland-first-time; A research team based at the universities of Oxford, Edinburgh and University College Cork has been helped by citizen scientists from across England, Wales, Northern Ireland, Scotland and Ireland.

https://www.familysearch.org/blog/en/whats-map-ancestors/; a blog post; mentions a mobile app for users of FamilySearch.org

http://www.qualifiedgenealogists.org/RQGNews/general/using-maps-in-genealogy; link to a YouTube video talk about using maps in genealogical research.

http://www.archives.com/experts/ortega-gena/genealogy-maps.html; professional speaker Gena Philibert Ortega's article on the subject of using maps in genealogical research

https://www.amyjohnsoncrow.com/5-types-maps-every-genealogist-know/; professional speaker Amy Johnson Crow's take in the subject of using maps for genealogical research

https://www.familytreemagazine.com/premium/best-mapping-websites-2014/; David Fryxell's take on using maps for genealogical research

https://www.cyndislist.com/maps/interactive/; a major free genealogical hub site for research, with leave links maintained.

http://ancestornews.com/maps-genealogy/; Nancy Hendrickson's take on using maps for research

https://genealogyadventures.wordpress.com/2017/09/13/using-maps-in-your-genealogy-research/; a personal take from Brian Sheffey, which also includes maps dealing with DNA research.

https://progenygenealogy.com/Products/Family-Maps/Research-Features; reviews and illustrations of a commercial software program for Windows.

http://digital.library.mcgill.ca/countyatlas/searchmapframes.php; the In Search of Your Canadian Past project from McGill University (Montreal.

http://genealogysstar.blogspot.com/2015/01/use-cadastral-mapping-to-find-your.html; James Tanner from (FamilySearch.org) useful suggestions on how to use cadastral maps

https://www.routledge.com/Geography-and-Genealogy-Locating-Personal-Pasts /; Geography and Genealogy Locating Personal Pasts, by Jeanne Kay Guile; Routledge

http://www.avotaynuonline.com/2010/04/geospatial-genealogy-visualizing-and-exploring-ancestral-places-by-stephen-l-egbert-and-karen-g-r-roekard/; presented in 2010, showing an Eastern European experience is using maps for research. Also available at Brigham Young University as a PDF document (https://fhtw.byu.edu/static/conf/2010/egbert-geospatial-fhtw2010.pdf)

https://canadiangis.com/historic-cartography; the Canadian GIS and Geomatics site; contains very useful links

http://newyorkhistoryblog.org/2017/11/07/initiatives-for-putting-history-to-work/, by Bruce Dearstyne; mentions maps as part of the Bunkhistory project at the University of Richmond (Virginia)

https://magirt.github.io/ALA2017/; presentations at the 2017 American Library Association Conference in Chicago. Includes links to several interesting presentations on using maps for genealogical research.

https://www.thoughtco.com/map-adventures-with-google-1421977; contains links and how to's for creating maps.

http://www.genealogy.com/articles/research/56_donna.html; Maps in Family Research; the very experienced professional genealogist Donna Przecha's take of mapping.

https://pubs.usgs.gov/fs/2002/0099/report.pdf; Using Maps in Genealogy, from the United State Geological Survey

https://www.raogk.org/us-map/; a useful guide for beginners from the web site of Random Acts of Genealogical Kindness.

https://familyhistorydaily.com/free-genealogy-resources/travel-back-in-time-with-historic-sanborn-maps/; These Old Fire Insurance Maps Reveal a Surprising Amount of Genealogy Data; from the Family History Daily web site

Journal of Map & Geography Libraries ; Advances in Geospatial Information, Collections & Archives

Turning Genealogists onto GIS, Michele D. Shular, of the Science and Engineering Library University at Buffalo; a good article on  librarians being able to help genealogists with maps.

https://www.familysearch.org/wiki/en/United_States_Maps; the Familysearch.org wiki article on maps and genealogy.

http://psych.fullerton.edu/genealogy/ - Findings from the Fullerton Genealogy Study; A Master's Thesis Project by Pamela J. Drake


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## ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
# BULLETIN

## ACMLA NEWS

*English to follow.*



IASSIST & CARTO 2018
Once Upon a Data Point: Sustaining our Data Storytellers

## Venez-nous joindre à Montréal du 29 mai au 1 juin!

Les comités du colloque pour IASSIST & CARTO 2018 ont travaillé avec diligence pour sécuriser les équipements et les présentateurs et nous sommes fiers de vous présenter un avant-programme sur le site web de la conférence. Veuillez noter qu'il pourrait avoir des modifications au programme, mais que ces modifications seront mineures. L'inscription est maintenant ouverte, et le tarif de l'inscription hâtive sera disponible jusqu'au 29 avril.

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## Please join us in Montréal from May 29 to June 1!

The IASSIST & CARTO 2018 conference organizers are happy to announce that registration is now open, and a draft program has been made available on the conference website. Early-bird rates are available until April 29.

## Association of Canadian Map Libraries and Archives Awards

The ACMLA Awards Committee is responsible for three awards given by the Association. We invite nominations for these awards and encourage members to participate in the selection of the awards for outstanding accomplishments in our field.

**ACMLA Honours Award**
The Awards Committee invites nominations for the ACMLA Honours Award. According to the guidelines for the award, the nominee should be a person who has made an outstanding contribution in the field of map/GIS librarianship. The contribution may either be for a specific

activity or for general services and contributions such as continued membership in the Association with active participation either as an executive officer, committee chairperson, or committee member.  Normally, membership in ACMLA is a prerequisite; however, that does not preclude considering outstanding non-members.
Deadline : 30 April 2018

**ACMLA Cathy Moulder Paper Award**
To be eligible for the Paper Award, which carries a $200 monetary prize, a feature article of at least three pages in length, by one or more authors, must have appeared the ACMLA Bulletin during 2017.  We are looking for articles that make a solid contribution to map librarianship, including carto bibliographies. Originality, uniqueness of subject matter and depth of research will be taken into consideration.
Deadline : 30 April 2018

**ACMLA Student Paper Award**
As a reminder, the ACMLA Awards Committee would like you to encourage students to submit their papers for the Student Paper Award. The Association of Canadian Map Libraries and Archives encourages and supports activities which further the awareness, use and understanding of geographic information by Canadians. To this end, post- secondary students are encouraged to submit a paper for the ACMLA Student Paper Award competition.

The Student Paper Award will consist of a prize of $250 and free membership in the Association for one year.  The award includes an invitation to present the winning paper at the Annual Conference.  The Association will waive registration fees and provide a travel stipend of up to $250. The award will normally be given on an annual basis to a student from Canada or studying in Canada currently enrolled in a post-secondary institution (college or university).  The essay will be original and unpublished and of no more than 3000 words.  Primary consideration for the award will be given to the essay's originality and its contribution to new knowledge and insight. 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.
Deadline : 30 April 2018

For more complete details regarding the awards, please see the ACMLA Awards web page <http://acmla-acacc.ca/awards.php> or contact: Deena Yanofsky, ACMLA Awards Committee, past-president@acmla-acacc.ca.

**Prix de l'ACACC**
Le Comité des prix et mérites ACACC est responsable de trois prix décernés par l'Association. Nous invitons les nominations pour ces prix et encourager les membres à participer à la sélection des prix pour réalisations exceptionnelles dans notre domaine.

**Prix d'excellence de l'ACACC**
Le comité des prix et mérites invite les membres de l'ACACC à soumettre la candidature du membre qui, à leurs avis, est admissible au Prix d'excellence. Selon les régles du concours, l'heureux(se) élu(e) sera toute personne dont le nom a été retenue en vertu de sa participation considerable au développement de la profession de cartothécaire. Sa contribution peut se quantifier de différentes façons: activités particulières ou générales, participation soutenue au sein de l'Association en tant que membre d'autres comités. Bien que ce concours s'adresse surtout et avant tout aux adhérents de l'Association, cependant, non-adhérent exceptionneles peuvent être considéré pour le prix.
Date limite pour soumettre votre rédaction : le 30 avril 2018

**Cathy Moulder ACMLA Prix d'essai**
Selon les règles du concours, l'heureux(se) élu(e), qui recevra une bourse de 200 $, devra avoir publié un article d'au moins trois pages au sein d'une édition du Bulletin de l'ACACC en 2017. Le comité recherché principalement les articles ou les carto-bibliographies, qui alimentent et soutiennent le développement de la discipline Les articles seront jugés selon les critères d'originalité du thème choisi et du niveau de recherche.
Date limite pour soumettre votre rédaction : le 30 avril 2018

**Prix annuel de l'ACACC pour article étudiant**
Le comité des prix et mérites de l'ACACC tenons à vous pour encourager les étudiants à participer dans le Prix annuel de l'ACACC pour article étudiant.   Le concours est admissible à toute personne originaire du Canada ou qui étudie au Canada et qui est présentement inscrite à un etablissement post-secondaire (collège ou université). Les articles doivent être rédigés durant l'année scolaire en cours.

Le prix annuel de l'ACACC pour article étudiant et se composera d'un montant de 250.00 $ et les droits d'adhésion à l'Association pour une année. Le prix inclus également une invitation présenter la communication lors de la conférence annuelle de l'ACACC tenue à la fin mai ou au début juin. Si le récipiendaire répond à cette invitation, il sera dispensé des frais d'inscription au congrès et l'Association lui allouera un montant jusqu' à 250.00$, avec recettes, pour couvrir les frais de voyage. L'article doit être original et ne jamais avoir été publié. Il doit comporter moins de 3 000 mots. Les juges porteront l'attention en premier lieu sur l'originalité du sujet et sur son apport en nouvelles connaissances et idées novatrices. L'article sera également jugé sur la façon don't l'auteur démontre la pertinence du sujet, sur la qualité générale de la présentation et de la documentation ainsi que sur la qualité littéraire du texte.

Date limite pour soumettre votre rédaction : le 30 avril 2018

Pour obtenir des détails complets sur les prix vous pouvez consulter les lignes directrices (en anglais) sur notre site web : http://www.acmla-acacc.ca/awards_committee.php ou contactez

Deena Yanofsky
Comité des prix et mérites de l'ACACC
past-president@acmla-acacc.ca

**ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES**
# BULLETIN

# Book Reviews

Compiled by Sarah Simpkin

**Books Reviewed in this Issue:**

*GIS and the Social Sciences: Theory and Applications*
by Dimitris Ballas, Graham Clarke, Rachel S. Franklin and Andy Newing
Reviewed by Carina Xue Luo

*Exploring Africa with Ancient Maps*
by Wulf Bodenstein
Reviewed by Rhys Stevens

*GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook*
by Gorr L. Wilpen, and Kristen S. Kurland
Reviewed by Siobhan Hanratty

## *GIS and the Social Sciences: Theory and Applications*
*Carina Xue Luo*
*University of Windsor*

Ballas, Dimitris, Graham Clarke, Rachel S. Franklin, and Andy Newing. ***GIS and the Social Sciences: Theory and Applications.*** First edition. New York: Routledge, 2018. 280p. $59.95 USD. (pbk) ISBN 978-1-138-78512-0. (pbk)

The use of GIS techniques has become increasingly common in social sciences in the last two decades. However, compared to the wealth of established literature on the application of GIS in physical sciences, a textbook designed specifically for social science disciplines are relatively scarce on the market. ***GIS and the Social Sciences: Theory and Applications***, co-written by four geography scholars in the UK and USA, addresses the rapidly growing demand for spatial approaches in social sciences. The purpose of this book is to offer a useful guide to a social science approach on the theory and application of GIS. It provides both the fundamentals of GIS and a variety of modern examples in social sciences with associated practical activities to work through, and demonstrates how GIS and spatial analysis can be applied to a wide range of public and private sectors. The target audience of this book are novice or more casual GIS users from a social science background who would like to become more capable with GIS techniques rather than those proposing to become GIS developers and specialists. The emphasis of this book, therefore, is the application of GIS in social sciences rather than the "nuts and bolts" of GIS tools and techniques.

The book has been divided into two parts. The first part consists of four chapters, introducing basic GIS concepts and functionality. Those who have read any well-known GIS textbook will be familiar with the materials covered in these chapters. However, in the words of the authors, these fundamentals are provided to help the book "to be 'self-contained' in that students and researchers new to GIS can get the mixture of theory and application in one publication". Furthermore, these chapters discuss key GIS methods in a social science context. For example, the authors outline some typical social science research questions and link them with appropriate GIS functionality, which the reader might find difficult to locate elsewhere in the literature. The second part of the book -- the remaining nine chapters -- discuss extensively how GIS and spatial analysis techniques have been applied in various fields of social science, including geodemographics, income inequalities and well-being, crime analysis and prevention, retail analysis, health care analysis, emergency planning, education planning, transportation planning and environmental justice analysis. The case studies covered in these chapters provide the reader with a variety of interesting yet challenging real problems in both the private and public sectors. It should be noted that most of the examples and specific datasets cited in this book are from Europe (especially the UK) and the U.S., due to the authors' backgrounds and the wealth of freely available data in these contexts. Nevertheless, the examples can still motivate the reader to explore datasets for their own country or region and replicate the examples in the book with comparable datasets.

One particular strength of this book is that it has a dedicated webpage (eResources), where each chapter is supplemented with hands-on practical activities and datasets that are linked to the techniques and application areas discussed within the text. Using Esri's ArcGIS software, each practical activity contains comprehensive step-by-step instructions that readers who have little experience with GIS software can easily follow to understand and apply the techniques. Furthermore, all the accompanying datasets have been derived from publicly accessible data sources and are well-documented, thereby enabling readers to explore and retrieve spatial data from such sources themselves later on in their own projects.

In general, the book has been carefully structured and well-written in a clear, logical and succinct manner. Each chapter has been designed to stay largely alone, but the authors did endeavour to provide linkages between different chapters to establish coherence and flow between them. Therefore, readers with different backgrounds and experience levels will all likely find something useful from it. For instance, novice GIS users may start with working through the first four chapters (Part I of the book) to become familiar with basic GIS concepts and tools before jumping into more sophisticated GIS applications. More advanced users can skip the first part of the book, and pick and choose from the individual application chapters in part II that are most suited to their needs.

Despite the above advantages, however, there are features that could be added or improved if the book goes into subsequent editions. First, although the book covers a wide range of social science disciplines, it perhaps should also include GIS applications in history and anthropology given the rapidly growing interest in using GIS in these fields. Second, some of the figures provided are not very clear. Take Figure 12.8 as a particular example, the sub-maps are so small that the symbols for certain features cannot be read easily.

Overall, I would strongly recommend this book to all social science students, researchers and practitioners who are interested in using GIS and spatial analysis in their fields. The diversity of case studies and the broad range of spatial data offered in this book enable readers from different social science backgrounds to easily move from the examples and exercises of the book to using similar materials and techniques in their own project. The examples and accompanying practical activities provided in this book offer valuable instructional materials for GIS instructors/librarians too, which they can adapt and incorporate into different classrooms. Therefore, the book can serve as a strong companion and supplement to any other GIS books in the library collections.

## *Exploring Africa with Ancient Maps*
*Rhys Stevens*
*University of Lethbridge*

Bodenstein, Wulf. *Exploring Africa with Ancient Maps*. Tervuren, Belgium: Royal Museum for Central Africa, 2017. 296p. 19,50 €. ISBN 978-9-4922-4479-6.

The Royal Museum of Central Africa (RMCA) is located in Tervuren, Belgium and it's known for being one of the world's most beautiful and impressive museums devoted to Africa. Amongst its many treasures are approximately 3,500 maps of the continent of European origin. Of these maps, the museum has 600 published from the late 15th century to the early 20th century and which the RMCA designates as being "ancient." Curator Wulf Bodenstein, himself an avid map collector and historian, selected 80 of the museum's most significant ancient maps which were reproduced and contextualized in *Exploring Africa With Ancient Maps*.

The book contains six main chapters that are arranged chronologically by the century in which the maps were published. Bodenstein provides short, fascinating introductions to these chapters, which serve to familiarize the reader with cartographic techniques commonly employed during each epoch. They also illuminate for readers other noteworthy developments useful for understanding the mapping and exploration of the African continent (e.g., the founding of Portugal's El Mina settlement in 1482, which served to support the transatlantic slave trade). Following chapter introductions are colour reproductions and commentaries about the 80 representative maps from each of the centuries. The small physical dimensions of the book (18 cm by 15.5 cm) occasionally make map details difficult to discern. Fortunately, the accompanying DVD provides high-resolution versions of all maps illustrated in the print edition as well as additional regional maps, short atlases, and map versos.

Bibliographic details used to identify and describe maps include titles (in original language and translation), names of mapmakers, places of publication, and dates of publication to the extent known. All maps included in the work are also assigned reference numbers that are handy when flipping back and forth between specific map examples. More importantly, Bodenstein provides his insightful commentary detailing the geo-political events, cartographic conventions and scientific explorations that influenced mapmakers whilst creating each of these maps.  He also describes seminal ancient maps (e.g., Ptolemy's African maps in *Cosmographia,* also known as *Geographia*) and how mapmakers frequently gleaned information from them to be incorporated into their own efforts to distinguish Africa's known geography from 'Terra Incognita.' Throughout

**MAP 29.** *Carel Allard, The latest and most perfect map of Africa according to Carel Allard. In Amsterdam-Holland: with the privilege of the most powerful Lords of the States of Holland and West-Friesland, Amsterdam, ca. 1696. Copperplate engraving, 50 x 59 cm. HO.1975.18.1, RMCA Collection, Tervuren.*

the text, Bodenstein explains "new" details that appear on African maps over time, and he specifically highlights the unusual, erroneous or enigmatic details that make each of them worthy of study.

In his introduction, Bodenstein mentions that the purpose of this book to provide, "…a leisurely stimulating journey through time, in the company of [African] maps of all sorts, shapes and sizes, many of the them an immediate artistic appeal…." ***Exploring Africa with Ancient Maps*** certainly succeeds in taking the reader on an informative guided tour of the mapping of the content of Africa through a lens of historical European cartography. A recommended resource for those interested in exploring African history through maps as well as the history of cartography more generally.

## *GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook*
*Siobhan Hanratty*
*University of New Brunswick*

Gorr, Wilpen L, and Kristen S. Kurland. *GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook*. Redlands, CA: Esri Press, 2017. 480p. 99.99 USD. ISBN Print: 9781589484665 ISBN Digital: 9781589484931.

As with their earlier GIS Tutorial publications, Wilpen Gorr and Kristen Kurland combine easy-to-follow lessons and tutorials with a judicious use of illustrations to introduce novices to GIS concepts using Esri software, in this case ArcGIS Pro. Presented in thirteen chapters, the book is divided into four parts, each of which becomes successively more complex. Part 1 introduces the reader to the ArcGIS Pro platform, introduces basic elements of map design and explores other outputs for GIS projects. Part 2 focuses on file geodatabases, spatial data (with considerable attention paid to map projections), geoprocessing, digitizing, and geocoding. Part 3 finds the reader working with more advanced GIS technologies, such as spatial analysis, raster data, and 3D data. Part 4 concludes the volume with two chapters pertaining to managing operation systems with GIS.

Given the title, it should come as no surprise that this volume is not meant to be an in-depth reference volume on GIS. The authors suggest that it is suitable for in-class as well as self-taught learning and for secondary students all the way up to doctoral candidates, as well as non-students who want to learn how to make, use, analyze, and share maps. I would agree that this book requires no background in GIS, and is easily followed by anyone who has a desire to learn. Gorr and Kurland are clear in their objectives for each chapter and provide a reasonable amount of background before taking readers through exercises. A separate set of assignments is available for further learning.

For anyone hoping for a resource to help make the transition from ArcGIS Desktop to ArcGIS Pro, this may not be the volume for you. The emphasis is on learning new concepts and skills. In fact, the authors do not take anything for granted with respect to users' familiarity with modern computing environments, and are almost excruciatingly explicit with their directions at times. This level of detail is great for users who are new to using GIS software, and is entirely appropriate in an introductory workbook.

In *GIS Tutorial 1 for ArcGIS Pro*, Wilpen Gorr and Kristen Kurland have taken their previous successful GIS Tutorial workbooks, which originally featured ArcView 9 and later ArcGIS 10, and updated the contents to reflect the ArcGIS Pro environment. Unsurprisingly ArcGIS Online also features prominently, as do a number of other Esri apps. Tutorial data and companion assignments and data are downloadable from the esri.com website, which begs the question, how long does Esri intend to support this title? If the publishing cycle of their previous editions is any indication, I would expect the next iteration of this title to be forthcoming in two to three years.

Overall, all I would say that as with its predecessors, *GIS Tutorial 1 for ArcGIS Pro* is a great resource for the classroom and for beginners who want to learn on their own.

**From the Book 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:

**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*

**ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES**
# BULLETIN

## New Cartographic Resources

Cheryl Woods

## MAPS

National Parks of the United States
National Geographic Society Maps
2018
ISBN: 9781566957519

Argentina South/Patagonia/Uruguay
Nelles Verlag
2017
ISBN: 9783865746375

Egypt
Reise Know-How
2017
ISBN: 9783831774081

Baltic Sea
Reise Know-How
2017
ISBN: 978-3831774074

Peru/Ecuador Galapagos Islands-Cusco-
Machu Picchu
Nelles Verlag
2017
ISBN: 9783865746405

Milan
Mairdumont (Marco Polo)
2018
ISBN: 9783829759168

Barcelona
Mairdumont (Marco Polo)
2018
ISBN: 9783829759021

Buenos Aires
National Geographic Society Maps
2018
ISBN: 9781566957724

Mallorca-Majorque
Freytag Berndt
2018
ISBN: 9783707917536

Catalonia-Catalunya
Geoestel
2018
ISBN: 9788415237273

Mauritius
Freytag Berndt
2018
ISBN: 9783707916867

Singapore
Mairdumont
2018
ISBN: 9783829759243

Central and South America, Caribbean map
GM Johnson Maps
2018
ISBN: 9781770687301

## ATLASES

*Lesotho: land cover atlas*
Food and Agriculture Organization
2017
ISBN: 9789251097274

**19**

*Nowherelands: an atlas of vanished countries: 1840-1975*
Thames & Hudson
2017
ISBN: 9780500519905

*The state of Germany atlas*
Routledge, Taylor & Francis
2017
ISBN: 9781138459335

*Third coast atlas: prelude to a plan*
Actar
2017
ISBN: 9781940291918

*Qué tanto es tantito: Atlas de la corrupción en México 2000 - 2018/How Much Is Just a Little? Atlas of Corruption in Mexico 2000 – 2018*
Grijalbo
2018
ISBN: 9786073161411

*Atlas du Bresil*
Autrement
2018
ISBN: 9782746746633

*Atlas des vins de France*
Monza
2017
ISBN: 9782916231464

*Historical Atlas of Early Railways*
Douglas & McIntyre
2017
ISBN: 9781771621755

*Atlas of refugees, displaced populations, and epidemic diseases: Decoding global geographical patterns and processes since 1901*
Oxford University Press
2018
ISBN: 9780199676316

*Election atlas of India: parliamentary elections 1952-2014*
Datanet India
2017
ISBN: 9789386683922

*The Women's Atlas*
Myriad Editions
2018
ISBN: October publication

## BOOKS

*Emerging Trends in Open Source Geographic Information Systems*
IGI Global
2018
ISBN: 9781522550396
EISBN: 9781522550402

*Singapore's permanent territorial revolution: fifty years in fifty maps*
Rodolphe De Koninck
2017
ISBN: 9789814722353

*GIS Tutorial 1 for ArcGIS Pro: A Platform Workbook*
*(with Instructor DVD)*
Wilpen L. Gorr and Kristen S. Kurland
2017
ISBN: 9781589484665

*A History of Canada in Ten Maps: Epic Stories of Charting a Mysterious Land*
Adam Shoalts
2017
ISBN: 9780670069460

*The ArcGIS Book: 10 Big Ideas about Applying the Science of Where*
Christian Harder and Clint Brown
2017
ISBN: 9781589484870

**ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES**
# BULLETIN

## Regional News

Compiled by Marilyn Andrews

# Alberta

**Edmonton Map Society**
**David Jones**

Glaciation | GIS, Low Birthweight and Gestational Age

The Edmonton Map Society's Winter Meeting was held on March 14th, 2018 with approximately 15 members in attendance. They gathered together to hear two highly interesting presentations on PhD research at the University of Alberta.

**Sophie Norris** received her MSc degree from Durham University (UK) before moving to the University of Alberta to complete a PhD. Dr. Norris' research focussed on reconstructing Late Wisconsin glacial activity in northern Alberta and Saskatchewan using both geomorphology and subsurface analysis.

**Abstract:** The Interior Plains of northern Alberta and Saskatchewan hosted the Laurentide-Cordilleran ice saddle and the south-western slopes of the Keewatin Ice Dome at the peak of the Late Wisconsinan glaciation. Subsequently, the western margin of the Laurentide Ice Sheet passed over this region during the deglaciation, opening the north-western drainage route for Lake Agassiz. The north-western Agassiz outlet and the associated flooding event(s) have received great attention and continue to be a subject of debate. However, the detailed ice dynamics in the region, the understanding of which is crucial for inferences of meltwater drainage, is still poorly understood. This applies both for the ice sheet geometry at the Last Glacial Maximum (LGM) and for the pattern of ice margin retreat.

We focus on a 26, 680 km$^2$ region of northeast Alberta and northwest Saskatchewan centered on the Clearwater-Athabasca Spillway, the assumed north-western Agassiz outlet. Using mapping from high-resolution digital elevation data, we reconstruct the glacial landform record comprising attenuated bedforms, eskers, moraines and meltwater channels. These data permit the classification of 62 flowsets that indicate multiple cross cutting ice flow directions. We tie the reconstructed ice flow direction with moraines and meltwater landforms to derive the ice margin configuration. Based on this mapping we present a preliminary five-stage model of ice sheet evolution in the form of palaeo-geographic maps spanning from the LGM through to deglaciation (~21-9.5 cal ka BP). This reconstruction reveals three major changes in ice stream configuration and indicates that margin retreat was complex and dominated by the dynamic spatial and temporal evolution of ice streams. Overall, this project provides the foundations to improve the knowledge of one of the focal points of the last North American deglaciation.

**Charlene Nielsen,** an interdisciplinary Ph.D. candidate in Earth and Atmospheric Sciences & Pediatrics at the University of Alberta working on the Data Mining and Neonatal Outcomes (DoMiNO) project that she calls 'Born too small' was the second presenter.

**Abstract:** The goal of my research is to better understand the relationships of the shared exposures on pregnant women and adverse birth outcomes. Infants born small for gestational age (SGA) and low birth weight at term (LBWT) are important markers of survival, development, and future health – childhood as well as adult diseases. I use Geographical Information Systems (GIS) and spatial statistics to recognize where and how environmental factors coincide with SGA and LBWT. In this presentation I show the many ways of mapping babies born too small from secondary health databases using: choropleth, Bayes rates, double kernel density, and emerging hot spots.

Lively discussion ensued.

The Edmonton Map Society will next convene on May 7th when they will have the privilege of hearing Dan Duda, Map Librarian (and ACMLA member!) from Memorial University, speak.

# New Brunswick

**University of New Brunswick**
**Siobhan Hanratty**

Stories of the New Brunswick Loyalists

UNB Libraries was recognized by Esri for its work using story maps by declaring New Brunswick Loyalist Journeys the Esri story map for January 2018. The project was a collaborative effort among staff and students in the University of New Brunswick Libraries system.  By mining the wealth of material in the UNB Libraries' Loyalist Collection, researchers were able to find interesting subjects for whom documentary evidence existed and tell their stories in a compelling fashion. Esri Story Maps were used to visualize the varied life experiences of refugees of the American Revolution who ultimately settled in York County, New Brunswick.

# Ontario

**University of Waterloo**
**Eva Dodsworth**

Research Guide! | SWOOP, COOP, and DMTI

Staff at the Geospatial Centre has spent some time lately updating datasets. We now have SWOOP 2015, COOP 2016, DMTI 2017, and we're negotiating to purchase some Infrared imagery. We have had quite a few questions from students about geomorphic analysis, so we have been using

the Geomorphic Change Detection Add-on for ArcGIS to study minute changes in high resolution rasters.

After an eighteen month (part-time) study leave, I am back to work full-time. I have completed my book *A Research Guide to Cartographic Resources,* available for pre-order.

Now, I am now learning OJS (Open Journal System) and look forward to the inaugural issue of the digital *Bulletin* (this issue!)
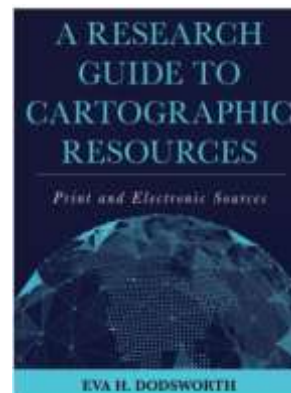
# Quebec

**Centre GéoStat, Bibliothèque, Université Laval**
**Stéfano Biondo**

Projet de plateforme partagée de données géospatiales (PPDG) | Exposition cartographique au Musée maritime de Charlevoix (MMC)

Le projet de refonte de Géoindex+ afin d'héberger certaines données du Ministère des Ressources naturelles du Québec (MERN) et de les rendre disponibles à l'ensemble des établissements universitaires du Québec va bon train. La partie cartographique permettant la visualisation et l'extraction des données, ainsi que celle de la gestion des métadonnées ont été développées au cours de la dernière année. Un comité de pilotage a été mis sur pied en décembre 2017 pour valider et tester les phases de développement, prioriser les améliorations et modifications aux développements existants et futurs, et effectuer des recommandations pour le design. Ce comité réuni Stéfano Biondo de l'Université Laval, Kati Brown de l'Université du Québec à Rimouski (UQAR), Alex Guindon de l'Université Concordia, Anne Hakier de l'Université de Montréal (UdeM), Sylvie Saint-Pierre de l'Université du Québec à Montréal (UQAM), Simon Trottier de l'Université de Sherbrooke, ainsi que de Nadia Villeneuve de l'Université du Québec à Chicoutimi (UQAC). L'état d'avancement de l'élaboration de la nouvelle plateforme sera présenté lors de CARTO 2018.

Le Centre GéoStat collabore à la réalisation de l'exposition *Jeu de cartes — Cinq siècles d'hydrographie* qui débutera le 18 mai prochain au Musée maritime de Charlevoix (MMC). L'exposition porte sur les cartes marines et l'hydrographie. Elle vise à faire connaître la conception des cartes marines, de leurs relevés à leur publication, depuis l'époque de la Nouvelle-France jusqu'à aujourd'hui. Une visite dans Charlevoix pourrait être un prolongement intéressant de notre rencontre à Montréal en juin.

**ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES**
# BULLETIN

# Geospatial Data and Software Reviews

Tomasz Mrozewski

## Movebank

As GIS librarian at a university with a strong Biology program, species range and habitat data is probably the single largest topic for data requests. As a result, I'm constantly on the lookout for a reliable, high-quality source of detailed digital data on a variety of species. Recently this search led me to Movebank ([www.movebank.org/](www.movebank.org/)), "a free online infrastructure created to help researchers manage, share, analyze and archive animal movement data"[1].

Movebank is an international project led by the Max Planck Institute for Ornithology in Switzerland and coordinates with the North Carolina Museum of Natural Sciences, Ohio State University, and the University of Konstanz with funding from the National Science Foundation, the German Aerospace Center, the German Science Foundation, and NASA. Notably and promisingly, Movebank boasts "long-term (>20 years) funding through the Max Planck Society and the University of Konstanz" with the goal of serving as "a global data archive for animal movement data."[2]

Initiated in 2007, Movebank has been collecting data since 2012. As of January 2018, Movebank data comprises "over 600 million animal locations and over 1.1 billion measurements from non-location sensors such as acceleration bursts and light levels from geolocators [from] nearly 4,200 studies and [representing] movements of 756 taxa all over the world"[3]. Several published papers describe the Movebank infrastructure and many more describe datasets hosted on the platform, dating back to 1975 - a comprehensive bibliography may be found on Movebank's "Literature" page.[4]

The base unit of Movebank's data model is the study - a research project or observation program[5]. A study dataset includes tag (a tracking device or sensor), animal (the individual to which a tag is attached), deployment (the time a tag is deployed), and event (each individual observation of a tag, featuring a time and location) and follows a custom metadata schema described in the Movebank Attribute Dictionary ([www.movebank.org/node/2381](www.movebank.org/node/2381)). As a result, all datasets on the site have a consistent structure that allows for spatial representation in the Tracking Data Map and linkage through the Env-DATA System, both described below. Figure 1 illustrates the Movebank Study data model.

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[1] "About Movebank," [https://www.movebank.org/node/2](https://www.movebank.org/node/2) - all URLs last retrieved March 20, 2018.

[2] Ibid.

[3] Ibid.

[4] "Literature," [https://www.movebank.org/node/63062](https://www.movebank.org/node/63062).

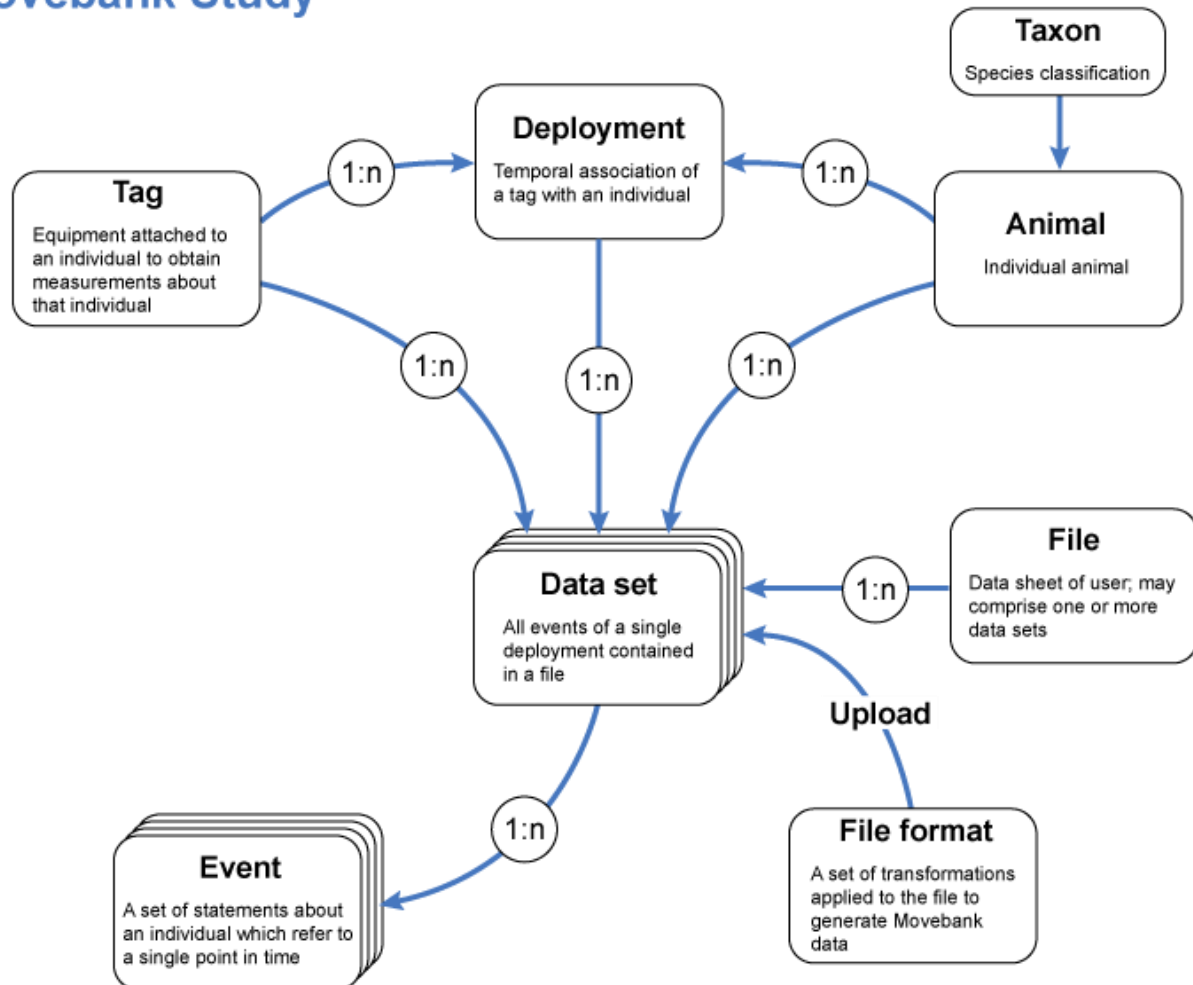[5] "The Movebank data model," [https://www.movebank.org/node/9](https://www.movebank.org/node/9).

*Figure 1. The Movebank Study data model*

Movebank's Tracking Data Map (www.movebank.org/panel_embedded_movebank_webapp) will be the site's most interesting feature for most data users. The Tracking Data Map is the primary interface for accessing tracking data. There are two ways to discover datasets: a search/browse panel and a map window. The map displays Study Markers - points coloured green or grey, depending on whether they are openly accessible - representing each study with a single point. Studies can be selected by clicking Study Markers in the map or by clicking them in the search/browse results pane. When a study is selected, the map will display all events associated with that study. It is also possible to toggle the display of lines that connect events from trackers in order to represent the tracks taken by individual animals. Once selected, a study's entry will also expand in the search/browse panel to allow users to highlight individual animals tagged in a study on the map. Selecting a study through the search/browse panel or through the map allows the user to then click through to the link animal, tracking device, and study metadata associated with it, as well as to download the datasets in CSV, SHP, or other formats. The map may also generate custom URLs for specific map views.

The Tracking Data Map is a fascinating tool but does have some drawbacks. It appears to be a custom web app embedded in the Drupal CMS on which the site is built. When viewing study data through the Tracking Data Map, it appears in an HTML window within the map pane of the app with poor navigation features. It is difficult to return to same map view from a data window and I had to use the right mouse button menu to access the Back and Forward buttons to navigate between animal, tracker, and study data pages. Data discovery may also be problematic for some users since, as a single point, the Study Marker is inadequate for representing the range of a study. The search function also lacks the ability to search locations. To illustrate the problem: a study of adult Golden Eagles included events ranging from the far Northwest extremity of Alaska to the state of Durango in Mexico to the South to Arizona in the West; the Study Marker for this study was placed over central Montana, which may be the centroid of the events according to some map projection but not for the one used as a base map. Although this study contains events in British Columbia, for example, neither the search function nor Study Markers allow for the identification of events in that province - the user may only see that there are events in BC for the study by selecting the study to visualize its contents. Finally, in testing, I found that the web app was prone to stalling when switching between or zooming to selected datasets. Although it never actually crashed, it sometimes took a minute or longer to view a study on the map.

Movebank also hosts the Movebank Data Repository (www.datarepository.movebank.org/) hosted by the Library of the University of Konstanz. The Repository allows for data publication in compliance with journal and/or funder data sharing and publication requirements. It publishes datasets under a CC0 license with DOIs that are registered with Datacite. As of March 2018 it contains 102 datasets and 272 data files. Publication is free but all datasets must first be entered as studies in Movebank using the standard data model and metadata schema and must be curated by staff from the Max Planck Institute for Ornithology and University of Konstanz Library - although this may be seen as a barrier by some researchers, it does guarantee data cleanliness.
Unfortunately, the Data Repository suffers from some glaring omission of discovery functions. The only way to discover data in the Repository is through an Atom feed of the 10 most recent datasets on the front page or through the Author Browse feature - there is no search function or title or subject browse. It seems that the Data Repository is meant to be accessed via direct DOI link to the datasets rather than as a tool for data discovery itself, which is perhaps unsurprising if its main goal is to host replication data for published papers rather than to support discovery for novel, secondary reuse.

Movebank also provides a suite of tools that will be of more use to the researcher than to the data user since they support the collection, management, and analysis of data. Movebank supports the creation and management of live feeds from common tracking hardware which enable direct download and near-live updating of studies (Movebank boasts 800 live studies as of January 2018[6]). It also features a deployment tracker and a collection of community-developed software libraries for common data analysis platforms such as R and Java. However, the perhaps the most interesting tool is the Env-DATA System, which stands for Environmental Data Automated Track Annotation System[7]. The Env-DATA System harvests environmental data from 19 different data sources from providers including NASA, ESA, USGS, and others and allows the data to be linked

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[6] "January 2018 Newsletter," https://www.movebank.org/node/90724.
[7] "The Env-DATA System," https://www.movebank.org/node/6607.

to events in a study. This greatly facilitates the correlation of environmental parameters to animal behaviours.

Although Movebank provides many useful and interesting features for researchers and data consumers alike, it remains to be seen whether it will succeed in being taken up as the premier repository for global animal tracking data by researchers. As a repository, its main competition will be institutional repositories or discipline-specific repositories such as Dryad (after which the Movebank Data Repository is modeled[8]). To try to gauge uptake of Movebank vis-à-vis Dryad, I conducted a brief comparison by searching Dryad for keywords commonly appearing in Movebank datasets. Although there did appear to be some location-based datasets in Dryad, searches seemed to result in a number of non-tracking datasets and datasets without geographic references. Unfortunately, a systematic and quantitative comparison is beyond the scope of this review so I was unable to ascertain how many datasets eligible for Movebank were published in Dryad instead. From a data user's perspective, Movebank is the more attractive of the two repositories due to the narrow focus and standardized data format. However, it may not have the same reputation as Dryad and some researchers may find the data format onerous.

During the comparison of repositories, I did make an illustrative discovery when I searched Dryad for the title of one recent dataset in the Movebank Data Repository ("Data from: Correcting for missing and irregular data in home-range estimation").
The study and article[9] compares tracking data for three individual animals of different species. The dataset in the Movebank Data Repository[10] was deposited by two of the eleven co-authors, covering one of the three species and conforming to Movebank metadata standards. However, a different dataset appears under the same title[11] in Dryad, attributed to all eleven co-authors, covering a different one of the three species and containing sparse, undocumented data. While this may seem an individual case of inconsistency within a research team, I see it as exemplary of the tension between data managers who create repositories and promote adherence to standards that will lead to robust, usable data collections, and busy researchers with competing priorities who want their papers and data published as smoothly as possible. In other words: data managers propose, researchers dispose.

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[8] "Movebank Data Repository FAQ: Are there other repositories like this?"
https://www.movebank.org/node/2220#other_repositories.
[9] Fleming, C. H., Sheldon, D. , Fagan, W. F., Leimgruber, P. , Mueller, T. , Nandintsetseg, D. , Noonan, M. J., Olson, K. A., Setyawan, E. , Sianipar, A. and Calabrese, J. M. (2018), Correcting for missing and irregular data in home-range estimation. *Ecol Appl.* Accepted Author Manuscript. doi:10.1002/eap.1704.
[10] Setyawan E, Sianipar A (2018) Data from: Correcting for missing and irregular data in home-range estimation. Movebank Data Repository. doi:10.5441/001/1.3gj67c2k.
[11] Fleming CH, Sheldon D, Fagan WF, Leimgruber P, Mueller T, Nandintsetseg D, Noonan MJ, Olson KA, Setyawan E, Sianipar A, Calabrese JM (2018) Data from: Correcting for missing and irregular data in home-range estimation. Dryad Digital Repository. https://doi.org/10.5061/dryad.n42h0.

**ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES**
# BULLETIN

# GIS Trends

## Editor's Introduction

As anyone who has a smart phone knows, people's use of map-based information is being transformed. Increasingly, access to this information is not only through conventional maps and atlases in a library, but through apps accessed on the go. This presents new opportunities for map and GIS librarians: to provide novel ways of enabling access to maps, and also to collaborate with other campus stakeholders. Recently, our library took the plunge into the world of mobile maps, by exploring how an app could provide accurate and useful GIS-based information to our campus community. In response to an invitation from our parking office, we developed an app to help visitors, staff and students navigate the campus. It was an opportunity to redefine how we provide spatial information, one made possible by the range of technical skills and talents of Greg Young, our GIS developer.

*Barbara Znamirowski, Editor, GIS Trends*

## Where's My Parking Lot?
*Greg Young*

### What It Does

The Maps, Data, and Government Information Centre (MaDGIC) at Trent University, at the request of the University's Parking Services department, has created a unique web mapping application with a specific focus: connecting people with the right parking lots to suit their on-campus destination and budget. The student population at Trent has been swelling in recent years, with a commensurate increase in cars on campus. Popular parking lots fill up quickly, sometimes leading to frustration for students, staff, faculty, and guests. But what if they knew that there was another lot nearby that would get them to their destination within the same amount of time? Or perhaps one a few minutes further away that costs significantly less? The aim of this app is to assist people in making smart parking decisions. Users can select or search for any main building (or room within it) on campus and generate a list of estimated walk times to that building from every parking lot on campus. They can then pull up more details about each lot (i.e. pass type, hours) to help make their decision.
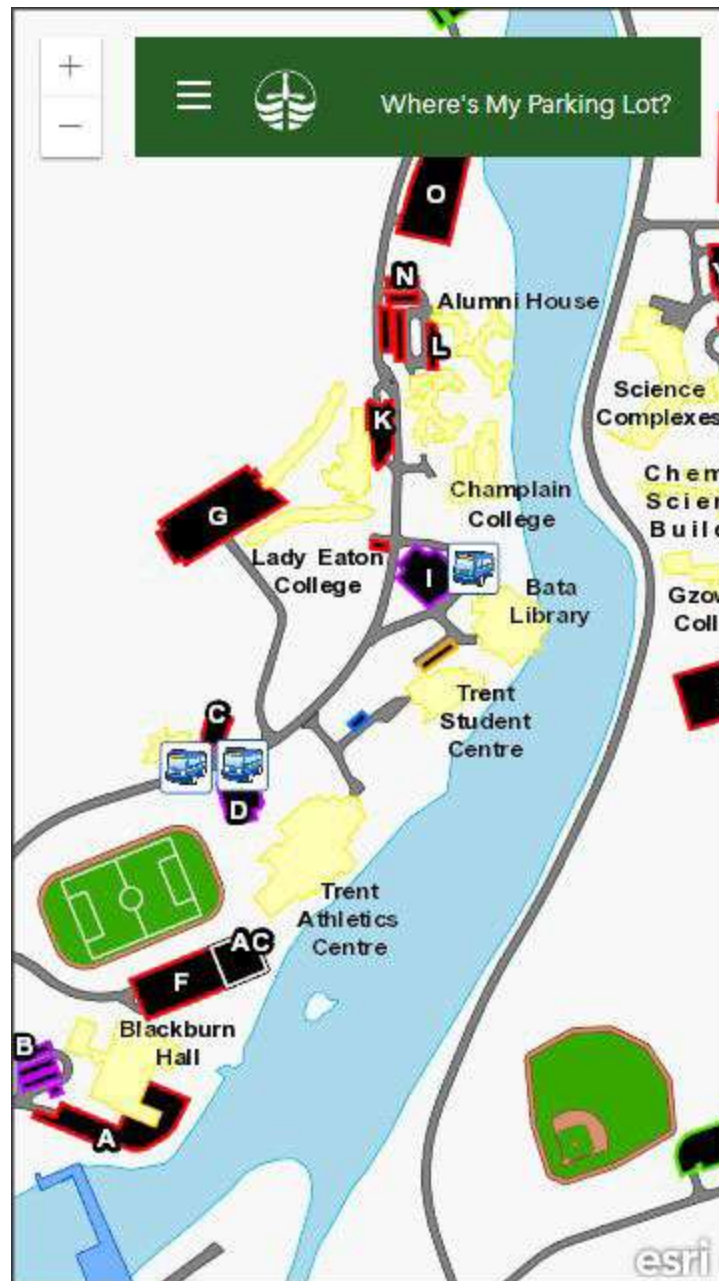
*Figure 1.  Default view of the app on a mobile browser*

## How It Works

The app was built using Esri's *Calcite Maps* as a base, a "theme for Bootstrap for designing, styling and creating modern maps apps" (https://esri.github.io/calcite-maps/samples/index.html). This library utilizes Bootstrap (a mobile-first JavaScript and CSS library designed by the folks at Twitter), the ArcGIS API for JavaScript, and Dojo (or JQuery) JavaScript libraries. The result is clean and responsive, working well on screens both large and small. Some customizations were made to the base functionality, enhancing keyboard navigability for accessibility purposes. Custom JavaScript was also written to handle the search, map identify, and walk time retrieval operations.  All of this was done within *Visual Studio Code*, a free coding tool from Microsoft.

The app is hosted using Microsoft Internet Information Services (IIS) on a Windows Server host (v 2012 R2). The map was designed in Esri ArcMap (v 10.5.1) and published as cached map services to Esri ArcGIS Enterprise Server (v 10.5.1). Special attention was paid to fonts and colour contrast to conform as best as possible to Ontario's accessibility regulations.

The walking paths on Trent's Symons Campus were digitized and used to create a Network Dataset which could be used to generate routes. A Closest Facility analysis was run to calculate the walk time between all parking lots and all buildings on campus, using a walking speed of 4 km/h (according to Wikipedia, the average human walking speed is 5 km/h – we chose a slower pace to account for people with disabilities, toting baggage, leading small children, or simply enjoying a leisurely stroll). A custom Python script was written to retrieve a sorted list of parking lots from the resultant table based on a supplied building identifier which was then published to Enterprise Server as a geoprocessing service, to be called on demand by the web app.

The app was tested in several different browsers (e.g. IE, Google Chrome, Firefox, Microsoft Edge). Responsiveness testing was performed using Chrome's Developer Tools. The ChromeVox extension (screen reader tool) for Chrome was also used to perform keyboard navigation tests and validate spoken output from the app, improving usability for keyboard-only users and users with a visual disability.
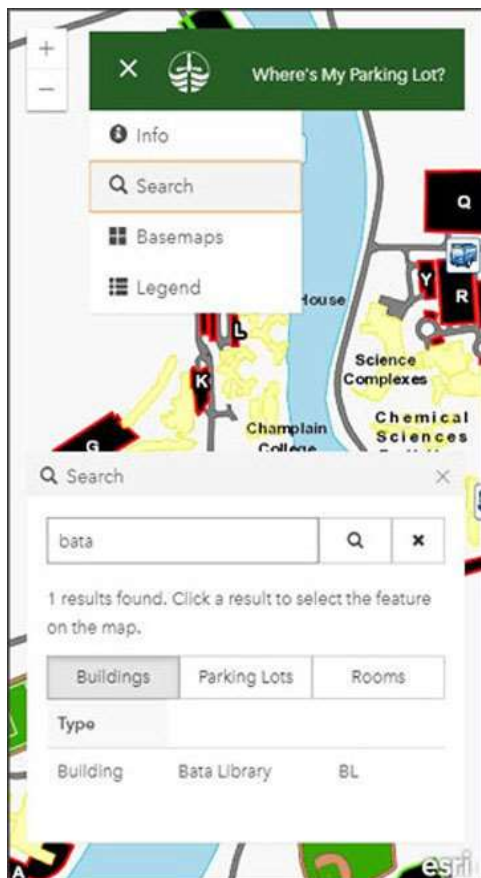


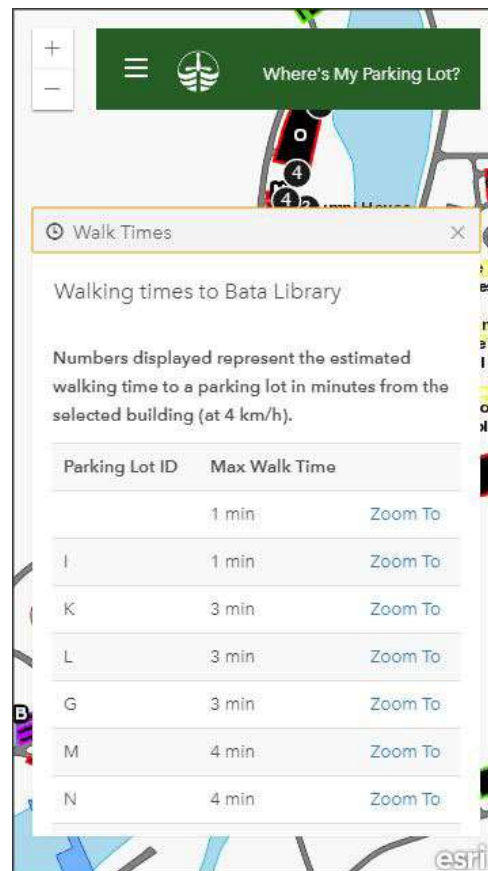*Figure 2. A depiction of the app's search functionality*



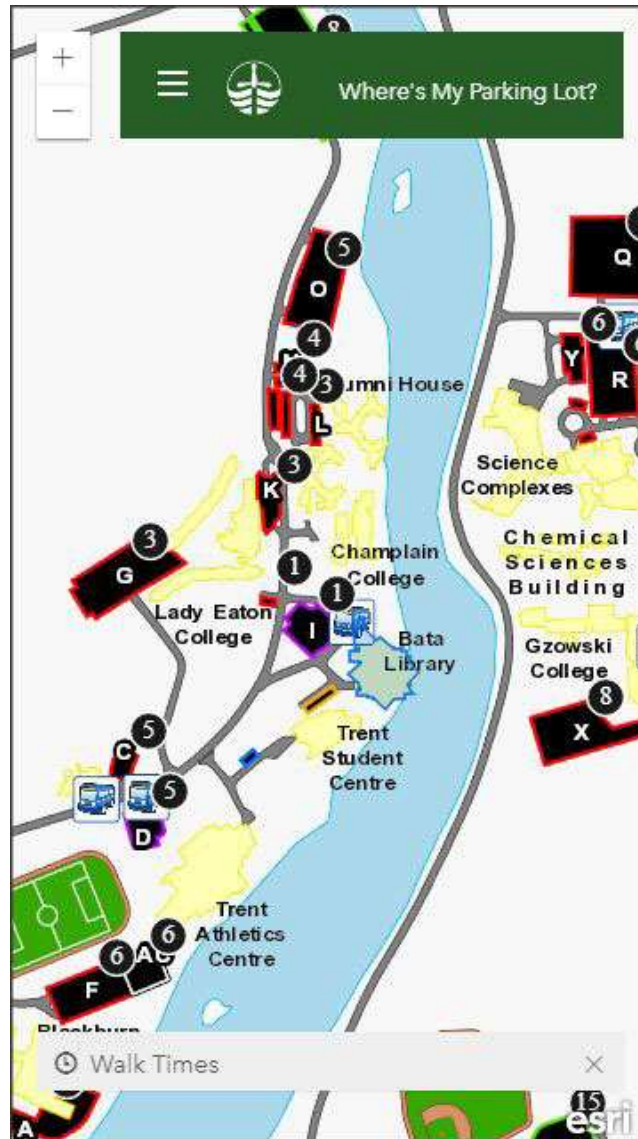*Figure 3. A view of the textual walk time search results generated by the app*

*Figure 4.  A graphic view of the walk time search results.*
*Walk times are represented by the white numbers inside the black circles.*

**What's Next?**

Possible upgrades for the app in the future include:

- Add routing from bus stops to buildings, or between any two points on campus for that matter, using real-time network analysis (instead of a static table).  This would also allow for users to select different walking speeds and choose other route options.
- Add 3D renderings of campus features, with interior floor plans of the buildings.
- Include within-building routing.
- Enable real-time location tracking and routing.

This app was designed by GIS professionals, however future maintenance of map features and attributes may well be done by someone with little or no GIS knowledge. To make it easier for them, it may be valuable to move the app's data into ArcGIS Online and create a simple editing app, which could be used from any device with a web browser to change features. Combined with the addition of real-time network analysis, this would allow feature changes to be represented immediately in the app and the routing would change accordingly.

The app is currently in the final testing stages and has generated a lot of positive feedback from those who have used it.  We look forward to feedback from more users when it is released to the public.  Look for it on the Trent University website in the coming months.

*About the Author*

Greg Young is a GIS Programmer and Developer with the Trent University Maps, Data and Government Information Centre (MaDGIC). He enjoys creating custom solutions that have practical applications.

*GIS Trends: Note from the Editor*
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Thanks for reading and contributing!
Barbara Znamirowski,
Editor, GIS Trends