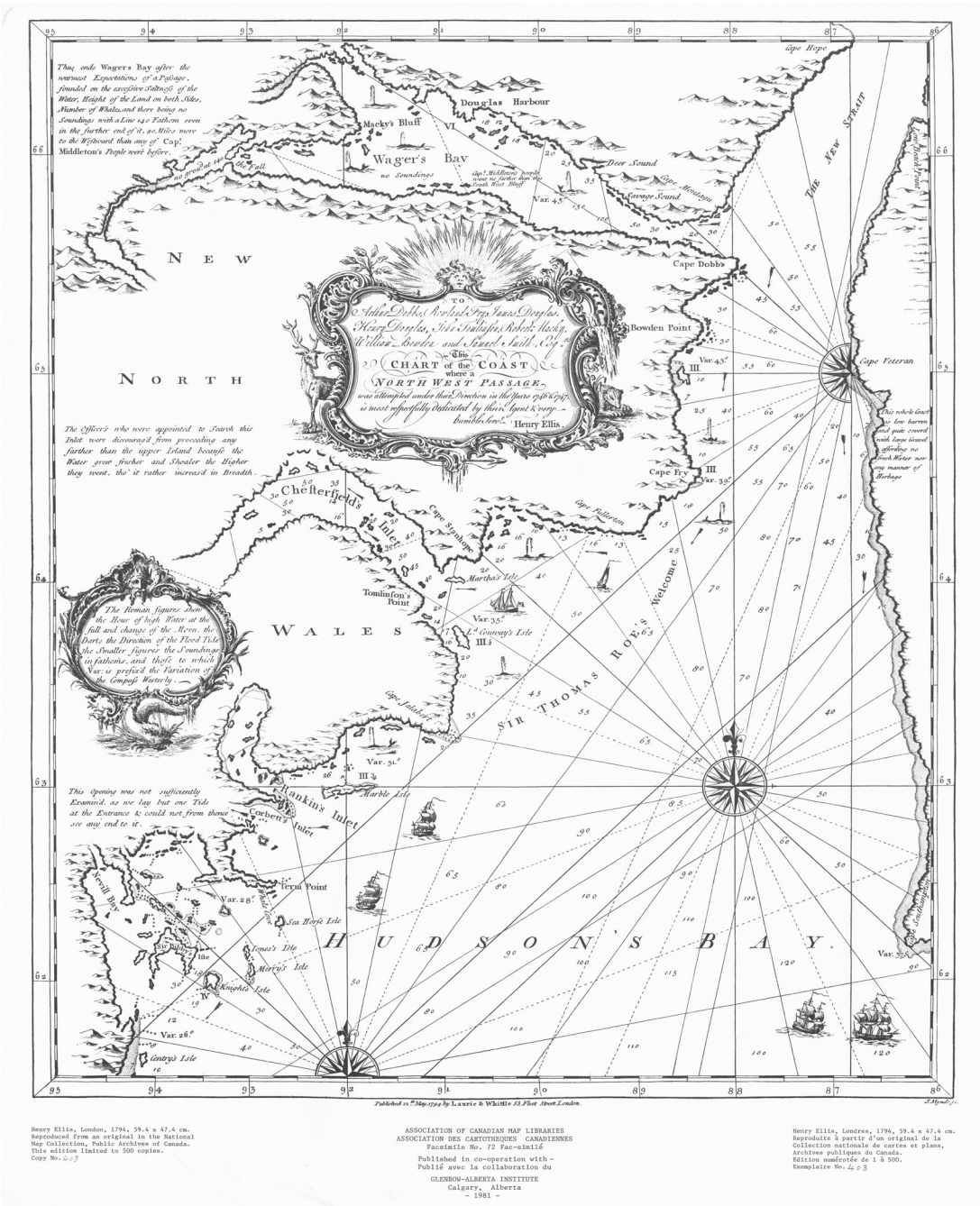
ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES

BULLETIN

ASSOCIATION DES CARTOTHÈQUES ET ARCHIVES CARTOGRAPHIQUES DU CANADA



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Henry Ellis, London, 1794

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PRESIDENT'S MESSAGE

Hello Everyone!

2015 Conference and Annual General Meeting

Mark your calendars! The 49th annual conference and annual general meeting of the Association of Canadian Map Libraries and Archives / Association des cartothèques et archives cartographiques du Canada (ACMLA-ACACC) will be held in Ottawa from June 16th to June 19th, 2015. Our colleagues at Carleton University will be hosting the workshops on June 16th and the conference sessions will be held at the University of Ottawa from June 17th to June 19th. We are looking for volunteers to assist with local arrangements, the website and the program. So if you would like to help, please contact Siobhan Hanratty at vice.president1@acmla-acacc.ca.

New Bylaw and Certificate of Continuance

On July 2, 2014 our new bylaw and Article of Continuance was signed, sealed and delivered to Industry Canada. Much to the relief of our secretary, Courtney Lundrigen, we received the Certificate of Continuance in August. As of July 2nd, 2014 our Association officially continues to exist as a Corporation under the Canada Not-for-Profit Corporations Act. The new bylaw is located on our website. With the legal work completed, the next stage is in progress. In the weeks and months to come, the Executive of the Association with assistance from committee members will be communicating changes based from our new bylaw and revisions to our procedures starting with the implementation of our new membership categories, striking task forces, and transitioning to the new structure of the Board of Directors. If members have any questions, feel free to contact me, president@acmla-acacc.ca, Courtney, secretary@acmla-acacc.ca or any other member of the executive.

Mentorship Program

ACMLA continues to grow and welcome new members each year, especially student members. In this issue of the Bulletin you will find a full list of our current members. It is interesting to note that this year we have 31 new individual members, including 5 student members, most of whom are Library and Information Studies students intrigued by print maps, geospatial data, and geographic information technologies. Courses in GIS and Map Librarianship at the iSchool (UofToronto), Western University and online courses in the United States have generated a renewed interest in our profession. Our association provides a unique opportunity and sandbox for LIS students. With this in mind, we will be launching a new mentoring strategy in December that includes students.

I would like to encourage all experienced members of our association to spread their enthusiasm and knowledge by considering mentoring one of our new members. Of course, if you are a new or returning member, a student member or a full member, and you would like to have a mentor you are most welcome to apply. To find out more about our mentoring program, go to http://www.acmla-acacc.ca/mentoring.php .

In addition, if you want to become more involved in ACMLA-ACACC as a volunteer or a member of a task force or committee, feel free to contact me at president@acmla-acacc.ca .

Best Regards,

Rosa Orlandini
President – ACMLA/ACACC

THE SCARBOROUGH HISTORICAL GIS MAPPING PROJECT

Kim Pham
Digital Projects & Technologies Librarian
University of Toronto's Digital Scholarship Unit

View the map along with additional project documentaiton **http://uoft.me/1UA**

INTRODUCTION

The Scarborough Historical Society and Archives collection houses a number of newspapers, heritage photographs, maps, census data, genealogies and other local history resources. As a historical society their mandate is '*to preserve, promote and stimulate an interest in the history of Scarborough*'(Schofield). Their most notable photo collections can be accessed on their Facebook page Scarborough, Looking Back (facebook.com/scarborough.lookingback). This page provides their members with the opportunity to share interesting stories, past experiences, and knowledge. A popular photo set are the "Then & Now" albums, which shows historical images of Scarborough (from 1900-1990) contrasted with photos of the same scene but in in the present (2010-2013). These photos can also be found on Flickr as well in online forums such as urbantoronto.ca.

The Scarborough Historical GIS Mapping Project was designed to locate and display these images and place them on a map. The map locates where the photo was taken and aims to visualize the changes in Scarborough's geography across photographs, in contrast to viewing these images without any spatial reference on a static webpage.

As of April 2013, the map contains 56 markers that link to photos that provide additional information when the images are clicked. Different template styles can be used to show different views of Scarborough and can be used with the land ownership maps from 1878, 1910, and 1932.

The map was made using open-source tools and mapping libraries, including QGIS, Leaflet, and GDAL. In total the map is comprised of three map overlay layers, four Cloudmade style layers on top of the original OpenStreetMap data, a GeoJSON layer that contains all of the markers, a cluster feature to group markers by proximity, a navigation control to turn layers on and off, and a feature to obtain the coordinates of any point clicked on the map.

PURPOSE

The map allows the user to explore the photos in different parts of Scarborough to see how Scarborough has changed and is still changing today. For instance, looking through these images it was noticed that throughout all of Scarborough south of Sheppard Ave., automobiles have a significant presence in the photographs from the 1960s. Early on from the 1950s and 1960s the infrastructure was in place in Scarborough for "car culture": there are drive-in diners (A&W Santo's), drive-in theatres (Birch Cliff Plaza, Kennedy Theatre), a drive-in church (Cliffside Plaza), gas stations, auto shops, wide paved roads, and spacious parking lots. These photographs also show the transition in the 'Now' photos to the construction of low and high-rise in apartments (taking place between the 80s and 90s but were non-existent two decades earlier)..

The map helps to see what is lost and what is gained, but also where these changes happen. Ideally, the map could eventually be made into a project that allows further engagement by inviting users to collaborate by adding their own stories, comments, and images.

WEB MAPS

The power of GIS lies in its ability to overlay geospatial data and perform complex spatial analysis on data. Web tools, though individually still lacking many of the features found in GIS, can be used to make visually stunning interactive maps. One of the major benefits of creating a web map is its ability to display dynamic data. By letting the user interact with the content, web maps allows the viewer to participate in exploring and discovering information and features. In web maps, information can be hidden and revealed compared and at the user's discretion.

Many web maps have been embraced for disseminating certain information during crisis events, for social media, journalism, and more. Web maps are especially effective at mapping not only space like most GIS applications, but can also show changes in time. They can be updated, added to, and used to show events that are happening from all over the world to just one neighbourhood. Web maps played a large role in updating voting ballots during the last U.S. Presidential elections, used by large news outlets such as the New York Times, CNN, and the Huffington Post.

WEB MAPS AND LIBRARIANSHIP

Colleen Beard discusses the different service levels in libraries for GIS users and the mediation involved in activities from acquiring and preparing data to instruction that provides better learning outcomes (Beard, 118). Librarians can provide the required context needed that goes into making maps as a way of creating and seeking information (Eaves). This can include how to access data, what formats to use to display and disseminate information, and verifying the accuracy of content, and more.

Nowadays, creating digital map content can be made in a number of ways, including using GIS, JavaScript, R, GMT, Google, or 3-d models. These all require different, unique skills and can produce very different results in representing information (Gregorius). In learning these tools and understanding what information needs to be conveyed, librarians can assist users in selecting the appropriate tools to use to discover and convey the information they desire. Web mapping tools will continue to improve, and it should be part of librarian's domain to keep abreast of and utilize the tools that help facilitate knowledge creation (Beard).

Understanding and interpreting web maps entails knowing how individuals might use them, how data is manipulated, what purpose they serve, what resources they use. Librarians with this understanding can assist users to make better-informed decisions for the kind of maps they seek or seek to create.

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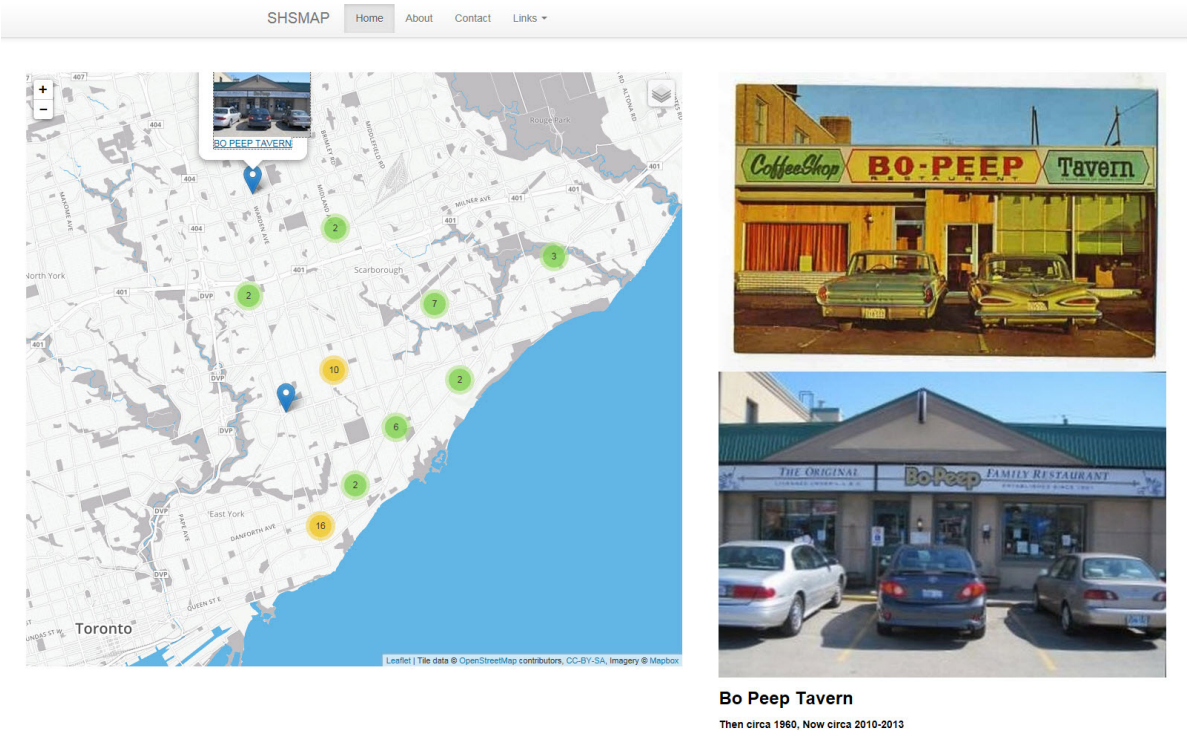

The Scarborough Historical Mapping Project - http://uoft.me/1UA

Kim Pham is a 2014 graduate from the University of Toronto iSchool and has worked at the Map and Data Library in Robarts Library and at OCUL Scholars Portal on their odesi and Dataverse repository. Kim's research interests include applications for data visualization and diital preservation in libraries. She is working as a Digital Projects & Technologies Librarian at the University of Toronto's Digital Scholarship Unit.

A NOTE ON THE HISTORY OF DIGITAL GEOSPATIAL DATA FORMAT STANDARDS: THE ARC/INFO INTERCHANGE FORMAT (E00)

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Geographic Information Systems (GIS) involve data and systems used for digital geographic analysis, and to a greater extent, are built with and dependent on software to capture, store, manipulate, and visualize data. GIS evolved out of the larger quantitative data shift in the 1950s, where data were collected and stored on large mainframes mainly in advanced research or government facilities. Today, personal desktop GIS software and distributed web-based tools make GIS much more accessible, impactful, and versatile for researchers. Given the wide demand for GIS, the adoption and use of standard software and data formats has evolved to enable data sharing. For desktop GIS software, such as ESRI ArcMap, MapInfo, Manifold, even Google, and also, open source software such as QGIS and GRASS, standard file formats are used to facilitate data sharing and reuse. As GIS is adopted by increasingly more researchers across a variety of disciplines, it is important for research and data stewards, including GIS libraries, to take note of the relative sustainability of file formats and systems used to generate, capture, and package geospatial data. The Library of Congress has developed the Sustainability of Digital Formats Planning guide[1], a useful tool that describes the major GIS data standards and file formats in libraries. A long-term digital preservation strategy is required if geospatial data are to remain usable over time (Gregory and Ell, 2007). The approach taken in this brief discussion isn't meant to establish a digital preservation strategy, but rather to open and continue discussion (and, potentially spur more of it!) around some of the history of proprietary (and some open) geospatial data formats, including those that aim to facilitate data sharing, interchange, and reuse. This note focuses specifically on the use of the Arc/Info Interchange format (E00), and the sustainability of this format for use and interchange between software systems and versions over time. This isn't an endorsement of any one standard or software, simply a reflection on the history and current use of this format in GIS libraries.

Given the close alignment between spatial file format specifications and software, the stability of file formats is difficult to manage since software is constantly evolving. Currently, in terms of software, ESRI's ArcGIS software is the largest and most widely used software for GIS in the world. ESRI has a long history in GIS, as a software innovator since the 1970s and 80s with their software Arc/Info. ESRI's Arc/Info and ArcView, with support for a variety of spatial data file formats, was released in the 1990s to facilitate a GUI driven desktop GIS. More recently open source GIS has paved the way for greater transparency, open source development, and low-cost GIS. However, the data standards for spatial data exchange remain relatively unchanged, proprietary, and *not-open* as one might put it. This may or may not be changing; it's not easy to tell at this point. Nevertheless, and this is true in most quantitative research domains where newer versions of

[1]Library of Congress. Sustainability of Digital Formats Planning for Library of Congress Collections. http://www.digitalpreservation.gov/formats/

software used to analyze data, use updated file formats and backward compatibility (and note, the ability to read older data formats does not last long) (Gregory & Ell, 2007). Even worse, propriety formats may disappear altogether if the company that owns them goes out of business (Gregory & Ell, 2007). Given this history and concern, it's reasonable to argue that any format tied so closely to software is vulnerable to change.

The Arc/Info Interchange format (E00) is an interesting example of a proprietary standard that enables the exchange of spatial data to and from older ESRI software (i.e. ArcView, Arc/Info etc.) to share data, even today. For many years, this was the only reliable way to exchange data between ESRI systems. As of 2011, there are effective tools for conversion and exchange in binary form including the use of the ESRI Arc Geodatabase data model that provides easier interoperability among ArcGIS file formats (Library of Congress, 2011). ESRI software is heavily used by government data producers in Canada and in the United States, for some time now. As a result, some of the historical and larger data series are delivered using the E00 format, still today. For example, much of the historical digital collection from Statistics Canada, including the Census Cartographic Boundary Files for Census years 1981 – 2001, are made available and have been maintained as Arc/Info Interchange (E00) files. ESRI's current software products (now at ArcMap version 10.3) can still import E00 format, importing into a coverage or grid using the stand alone conversion tool such as IMPORT71 (there are also other conversion tools now built into ESRI software). Before the use of the ESRI Geodatabase, the Arc/Info Export format (E00) as it's more commonly known, was widely used by GIS professionals and governments as the method to export, share, and deliver data.

It, unlike some other spatial standards, is built using a simple data structure. Data in E00 are represented as simple ASCII text, and are easily opened and viewed in any common text editor (WordPad, Notepad, Notepad ++ etc.). To give you a sense of the typical data structure of an E00 file, an example of an actual ARC file is provided below:

```
ARC  2
         1          2          2          1          1          2          2
 3.4029994E+05 4.1001998E+06 3.4009988E+05 4.1002000E+06
         2          3          3          2          3          2          2
 3.4050000E+05 4.1001998E+06 3.4029994E+05 4.1001998E+06
         3          1          1          4          1          2          4
 3.4009988E+05 4.1002000E+06 3.4040006E+05 4.1003995E+06
 3.4090012E+05 4.1002000E+06 3.4070003E+05 4.1001995E+06
         4          4          4          3          4          2          2
 3.4070003E+05 4.1001995E+06 3.4050000E+05 4.1001998E+06
         5          6          3          4          4          3          3
 3.4050000E+05 4.1001998E+06 3.4059997E+05 4.1001002E+06
 3.4070003E+05 4.1001995E+06
         6          7          4          5          1          3          3
 3.4070003E+05 4.1001995E+06 3.4079997E+05 4.1000002E+06
 3.4019978E+05 4.1000000E+06
         7          5          5          2          1          3          2
 3.4019978E+05 4.1000000E+06 3.4029994E+05 4.1001998E+06
        -1          0          0          0          0          0          0
```

Taken from Daniel Morissette. Arc/Info Export (E00) Format Analysis. 2000-02-24.
http://avce00.maptools.org/docs/v7_e00_cover.html#ARC_FILES

There are several files that come embedded in the E00 file itself, many of these relate to the spatial data coordinates and coverage geometry (coverages are what the E00 data are derived from), including the arc coordinates (ARC), topology, centroid coordinates (CND), label points, file and coverage history, as well as file logs (LOG), projection information (PRJ), spatial indexing and tolerance indicators (TOL), and so on (Morissette, 2000). Care must be taken when an E00 file is created to ensure that the feature type (e.g., coverage) of the data being exchanged is declared so that the import functions of the conversion tools can recreate the proper feature type (Library of Congress, 2011).

Using E00 files data can be a bit difficult. Its use today is dependent on a number of factors mainly to do with the ability of researchers themselves to use this kind of data effectively, and, the management and conversion of this data by third parties that either redistribute data on behalf of the government, or, maintain and preserve this information. The latter of these two scenarios is believed to be an effective solution for improving access to data, and can facilitate better ease-of-use for a wide variety of researchers. Libraries play an important role in enabling this kind of long-term access to resources, especially digital resources.

The Scholars GeoPortal (http://geo.scholarsportal.info), a geospatial data portal project of the Ontario Council of University Libraries (OCUL) is continuously adding data to the shared OCUL repository (the portal). The major sources of government data including Statistics Canada (Data Liberation Initiative – DLI) data, are on the list of priorities to load. To date, the Census boundaries (layers) for the 2011, 2006, and the 2001 Census, have been loaded into the portal. For 2001, the Census Boundary Files were supplied in E00 format directly from the DLI, Statistics Canada. As a third-party distributor, effort was made to convert these data and ingest them into our current GIS system (using ArcGIS Server 10). Given the structure of the E00 format, conversion to coverages and then to shape file format (.shp) was required. The data supplied by Statistics Canada in E00 format provides data as multi-part polygons, and the data appear to be disassociated from their original unique identifiers. In most cases the number of polygons did not adequately represent the number of spatial features (i.e. boundary polygons) in the data set. In order to make the 2001 boundaries consistent in terms of their structure and presentation with other census years, some polygon dissolution was performed on the datasets in order to re-associate the polygons to their specified feature type.

For example the following considerations and steps were taken for the *2001 Economic Regions of Canada, Cartographic Boundary File:*

a. There are only 76 Economic Regions in Canada for the 2001 Census, however, the original imported data amounted to 5057 features;

b. The E00 file represents all land and water polygons (including islands in Canada's north) as features in the dataset, with no associated groupings based on common census geography (i.e. Economic Region boundary);

c. In order to present the ER boundary as the unique features in the data set, a dissolve function was performed on the ERUID (common geographic unique identifier for this data). This dissolved the polygons into the features of interest i.e. ERs;

d. Finally, a merge was performed on the table to join to the original data attributes that were lost during the dissolve process, unnecessary data columns were deleted before saving and publishing.

The process of file conversion requires careful consideration of the existing formats and data structures, as well as an understanding of the intended use of the converted product. In the case of

the 2001 Census boundary files, we intended the data to be used in historical and comparative geospatial analysis and thus we converted the data in order for it to be used alongside more modern GIS datasets and tools. Sometimes this required further data manipulation and standardization, beyond just the regular data loading process of loading data into the GeoPortal. In the future, we intend to load the full series of boundary files back to 1981 (and older if available). It is hoped that conversion of the data will improve access to this historical collection and improve usability of these data for analysis by researchers across OCUL. We've also identified that some similar conversion and value added work has already been done by member libraries (including the University of Western Ontario's Equinox System http://equinox.uwo.ca/), and it is hoped that this will be reused in the Scholars GeoPortal wherever possible.

We welcome comments and feedback about these files, and seek to learn more about file formats in use, as well as, the rich and varied history of software and data standards in GIS.

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A NEW VIEW FROM SPACE: MAKING TERRASAR-X DATA ACCESSIBLE TO THE CANADIAN RESEARCH COMMUNITY

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Maps, Data and Government Information Centre (MaDGIC)
Thomas J. Bata Library, Trent University

Abstract

This paper discusses work with TerraSAR-X data undertaken by the Maps, Data & Government Information Centre of the Trent University Library. It is divided into three sections: the first provides a brief description of TerraSAR-X satellite and imagery options, the second describes German-Canadian agreements for data access, and the third provides a brief overview of the Maps, Data & Government Information Centre's pilot project with imagery. This paper expands on information provided at the Association of Canadian Map Library and Archives (ACMLA) Carto2014 conference in Montreal in June 2014.

Introduction

In their roles as campus centres for spatial data and spatial technologies, libraries have partnered with a number of agencies to make their data and technologies widely available to Canadian universities for research and teaching. One recent and promising partnership, now under development, is that between the Canada Centre for Mapping and Earth Observation (CCMEO) of Natural Resources Canada, the German Aerospace Center (DLR), Airbus Defence and Space, and Canadian universities. Its objective is to further current opportunities in place for accessing one type of satellite imagery: synthetic aperture radar (SAR) data produced by the TerraSAR-X satellite system. A particular focus of this initiative is on how libraries might play a role in facilitating the integration of these data sets into teaching curriculum. Discussions are underway to explore how libraries can facilitate access to data sets, expanding on existing DLR programs that a number of researchers have already made use of. This paper describes work underway at Trent University Library, in collaboration with other colleagues and agencies that explores the potential of this partnership. It, describes the TerraSAR-X satellite system and the imagery options that it provides, reviews background information regarding the German-Canadian agreement for TerraSAR-X imagery and options for obtaining imagery, and, finally, describes a pilot project now underway at Trent Library's Maps, Data & Government Information Centre (MaDGIC) that is examining how library technologies might be used to support the provision of these data.

Section One: Satellite Description[1]

TerraSAR-X (also referred to as TSX or TSX-1) is a German Earth-observation SAR satellite. It was launched on June 15, 2007, and it has been fully operational since January 7, 2008. The satellite is in a near-polar orbit, at an altitude of 514 kilometres and a revisit time of 11 days. In June 2010 TanDEM-X, a virtually identical satellite also owned and operated by the DLR, was launched and operates in close formation. Together they are acquiring data which will result in a variety of imagery and also permit the creation of a highly accurate global Digital Elevation Model.

The radar satellite technologies used by these satellites involve radar antenna which emit pulses of electromagnetic radiation in the microwave part of the spectrum, and then detect and record the reflection "echo" of the pulses from the object in its line of sight. Unlike optical sensors which rely on "passive" energy (such as the sun), a key advantage of "active" radar sensors is that they carry their own radiation source, and are therefore operational both day and night, during (most) inclement weather conditions. They can also penetrate cloud cover. As such they are well suited to a variety of applications including disaster management, agriculture, forestry, marine study and security.

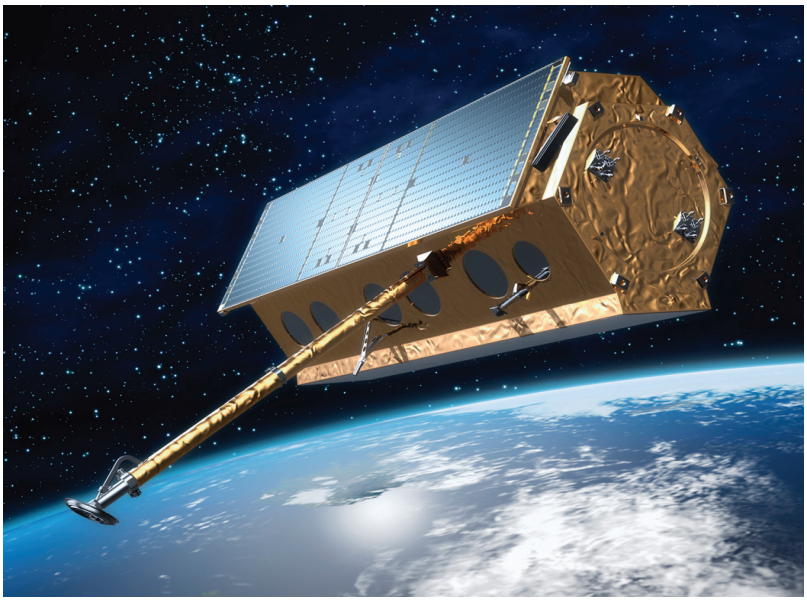

Fig. 1 TerraSAR-X Satellite

Source: Source: German Aerospace Centre (DLR) web site. Taken down on 2 June 2014, from: http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10377/565_read-436/#gallery/350

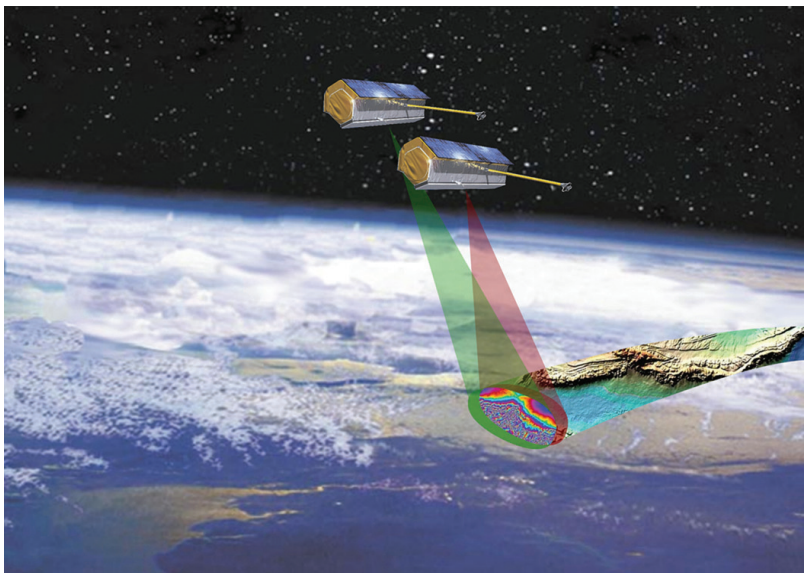

Fig. 2 TerraSAR-X and TanDEM-X: tandem formation

Source: Source: Airbus Defence and Space. Taken down from German Aerospace (DLR) web site on 21 November 2014: http://www.dlr.de/eo/en/desktopdefault.aspx/tabid-5725/9296_read-15979/

The TerraSAR-X satellite carries a high frequency Synthetic Aperture Radar (SAR) X-band sensor which can be steered[2] and programmed to operate in different operational beam modes to obtain recordings of various strip widths, resolutions and polarizations.

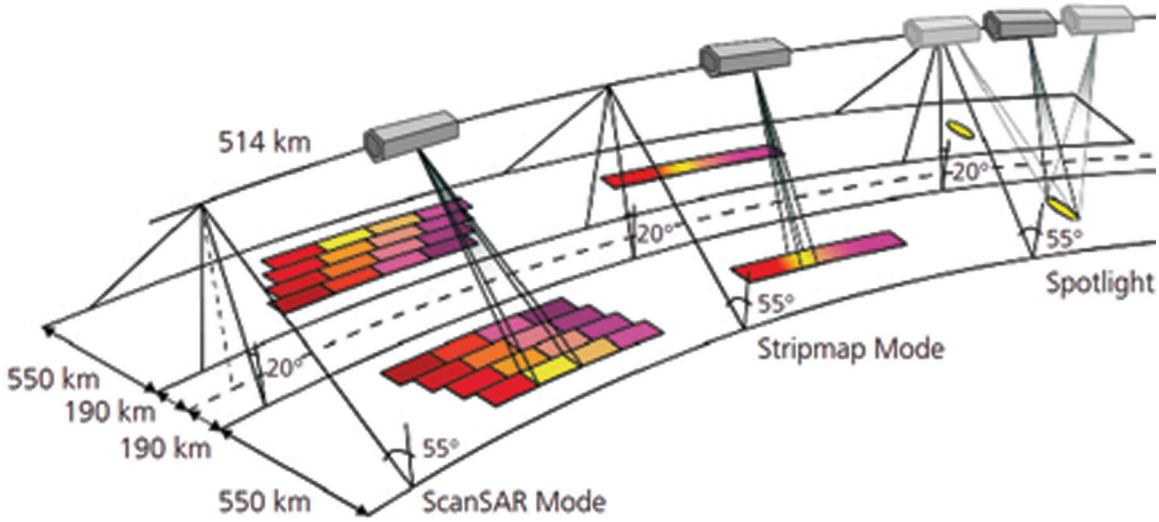

Fig.3 Scanning Modes of TerraSAR-X

Source: From German Aerospace (DLR) website description of TerraSAR-X Synthetic Aperture Radar (SAR) technologies. Taken down on 30 May 2014, from: http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10382/570_read-431/#gallery/356

Some key imaging modes:

Image Products	Scene Size (width x length)	Resolution
Staring SpotLight (ST)	4 x 3.7 km²	up to 0.25 m
High Resolution SpotLight (HS)	10 x 5 km²	up to 1 m
SpotLight (SL)	10 x10 km²	up to 2 m
StripMap (SM)	30 x 50 km²	up to 3 m
ScanSAR (SC)	100 x 150 km²	up to 18.5 m
Wide ScanSAR (WS)	Up to 270 x 200 km ²	up to 40 m

Polarisation Mode:

Single(S) for all modes

Dual (D) for High Resolution SpotLight (HS), SpotLight (SL) and StripMap (SM)

Pass Direction:

Ascending (A) or Descending (D)

The following documents are recommended for further information on the TerraSAR-X satellite and available imagery products:

1. Airbus Defence & Space, TerraSAR-X image Product Guide: Basic and Enhanced Radar Satellite Imagery, Issue 2.0 August 2014. Available from: http://www.geo-airbusds.com/files/pmedia/public/r459_9_201408_tsxx-itd-ma-0009_tsx-productguide_i2.00.pdf

2. DLR German Aerospace Centre TerraSAR-X The German Radar Eye in Space. TerraSAR-X_D-GB_July 20019. Available from: http://www.dlr.de/dlr/en/Portaldata/1/Resources/documents/TSX_brosch.pdf

Section Two: Opportunities for Academic Libraries and Researchers

This section provides some background on the status of the German-Canadian agreement for TerraSAR-X imagery: explaining who is involved in the negotiations, and how imagery for academic research can be obtained at this time.

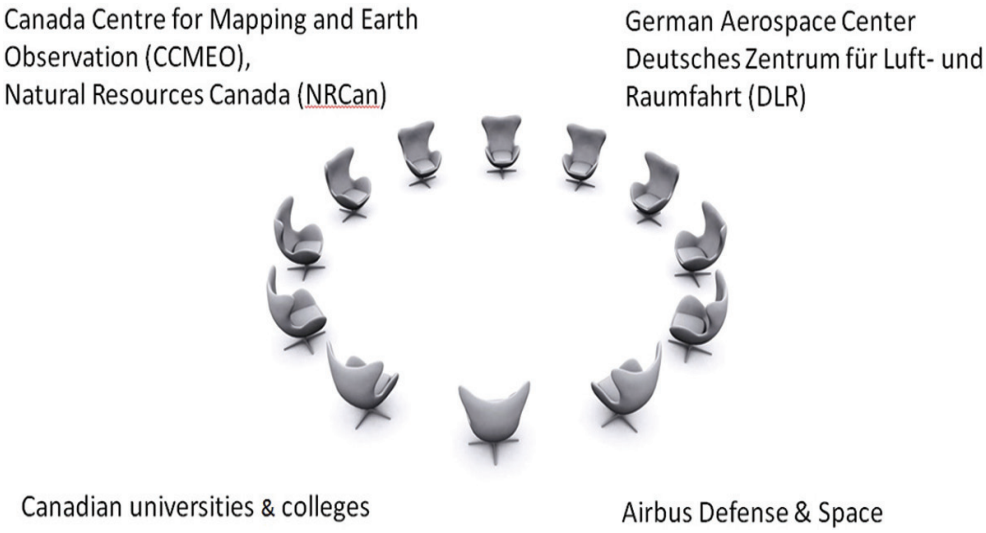

Fig. 4 Participants

Source: Source: Microsoft Office Power Point 2010, Clipart.

The TerraSAR-X project is supported by the BMBF (German Ministry of Education and Science) and managed and operated by the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR). In 2002 Airbus Defence & Space (at the time it was known as EADS Astrium) was awarded a contract to implement the TerraSAR satellite (TerraSAR-X) on the basis of a public-private partnership agreement. Airbus Defence & Space funded part of the implementation cost of the TerraSAR-X system, and successfully developed and tested the satellite system, receiving in exchange exclusive commercial rights for the data. The satellite is owned and operated by DLR, which also retains the scientific and educational data rights[3].

Canada has a long-standing interest in development and use of radar satellite technologies, including the Canadian RADARSAT-1 and RADARSAT-2 initiatives. In 2010 the Government of Canada established the Inuvik Satellite Station Facility (ISSF) in collaboration with a number of partners. Built above the Arctic Circle (a polar location improves reception) the ISSF land is owned by the Government of Canada and managed by the CCMEO. One of the antennas currently hosted by the ISSF belongs to the DLR.

Fig. 5 Inuvik Satellite Station Facility (ISSF)

Source: "Inuvik Satellite Station Facility. Terry Halifax Photography ©2011 downloaded on 3 June 2014, from: http://www.nrcan.gc.ca/earth-sciences/geomatics/satellite-imagery-air-photos/satellite-facilities/ISSF/10953

Sensors on Canadian land are subject to the Remote Sensing Space Systems Act (S.C. 2005, c.45, assented 2005-11-25) which includes provisions for ensuring that raw data collected about a country be shared with that country (Section 4c). In the case of the specific Canadian agreement with the DLR it has been agreed that the CCMEO can access up to 400 scenes per year for each satellite that has had data received at the Inuvik Satellite Station Facility (ISSF). Faculty, librarians and graduate students can apply to obtain data for their research under this agreement following the process described below.

Academic research proposals, including requests for TerraSAR-X imagery, can be submitted to the DLR for evaluation through DLR's TerraSAR Science Service System. Forms and descriptions of different programs are provided at: http://sss.terrasar-x.dlr.de/. While some of the Announcements of Opportunity are time sensitive, applications can also be made at any time under the "General Proposal Submission" process. The DLR archive can be reviewed at any time through DLR's data portal EOWEB at http://centaurus.caf.dlr.de:8080/. Researchers wishing to obtain imagery may also wish to consult the archive maintained by Airbus Defence & Space (located at: http://terrasar-x-archive.infoterra.de/), to identify available imagery before defining their requests for new imagery to be tasked. Both new and archived imagery should be requested through this application process.

In addition to research proposals, the CCMEO, DLR, and Airbus Defence & Space are examining whether it will be possible to introduce TerraSAR-X data more broadly into teaching curriculum at Canadian universities and colleges. Dr. Gordon Deecker, Senior Advisor, Business, Planning and Development, has been consulting with some ACMLA members (including Larry Laliberté, University of Alberta, Simon Trottier from Université de Sherbrooke, and Barbara Znamirowski from Trent University) to see how we might move forward on this initiative, with a goal of implementing a "DLI type"[5] agreement.

A numbers of challenges exist to establishing a model that would allow libraries to dispense imagery to faculty and students for teaching or research under a collective agreement. Most notably, distribution of TerraSAR-X data has to comply with German Satellite Data Security Law (SatDSig) and the Canadian Remote Sensing Space Systems Act (RSSSA).

Canadian libraries wishing to learn more about getting data for a specific academic course should contact the author or Dr. Deecker from the CCMEO regarding options for data access and status of negotiations.[6] We are pleased that a process has been defined for considering individual research proposals from faculty, librarians and graduate students, and we will continue to explore avenues for introducing data through library agreements.

The remainder of this paper discusses Trent University Maps, Data & Government Information Centre's pilot initiative with SAR data.

Section 3: Trent Pilot Project

Application Process, Goals and Methodology

Between January and March 2014 Trent University Library completed the documentation process required for a Technical Evaluation of TerraSAR-X imagery. This included signing a Technical Evaluation License and providing a Certificate of Residence, Proof of ID, and photo ID.[7] Our project goals were to become familiar with the TerraSAR products, and to explore best practices for managing and introducing the data to faculty and students. We also wanted to evaluate how our existing technical framework and use of GIS web technologies could be adapted to support these goals.

In identifying an area of interest, it was suggested that we supply a shp extent file of our boundary comprising an area of not more than 6 to 8 km^2. A smaller area would keep overall file size reasonable for a test, and would ensure that the higher resolution imagery could be obtained in a single pass. The area we defined was Jackson Park, in Peterborough (Fig. 6), an area familiar to course instructors and many students.

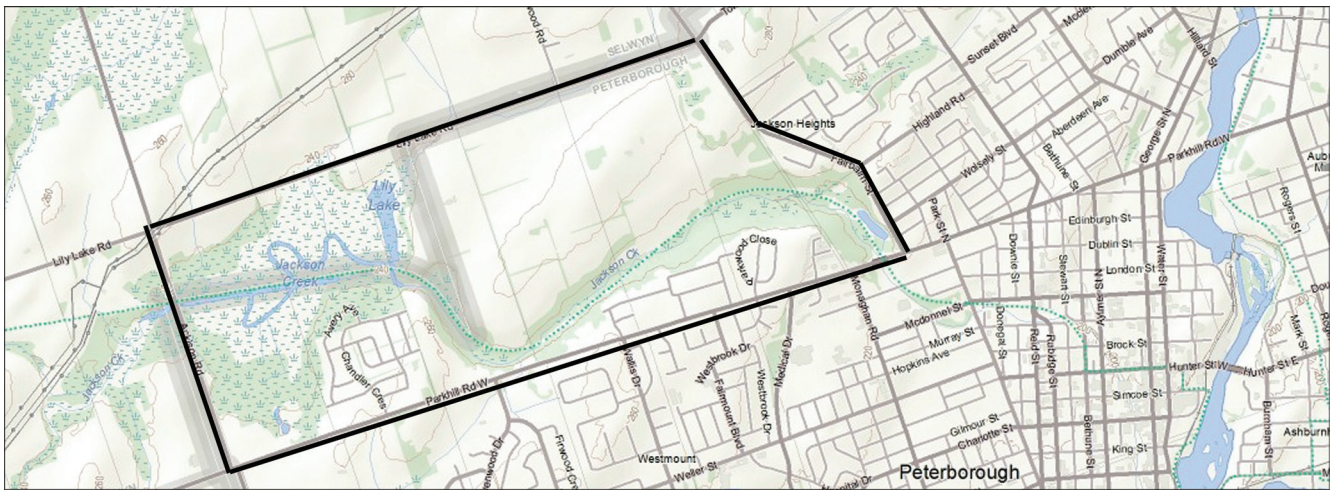

Fig. 6: Study Boundary: Jackson Park, Peterborough, Ontario, Canada

Source: Image Credit: Ontario. Make a Topographic Map. Powered by Land Information Ontario.©Queen's Printer for Ontario, 2014 Downloaded on 23 November 2014, from: http://www.giscoeapp.lrc.gov.on.ca/web/mnr/gib/basedata/viewer/viewer.html?

Several factors make the Jackson Park area an appropriate site for this trial. This area includes several habitats: forests, stream, wetlands and open fields, as well as urban development, providing a basis for analysis of imagery of several land use types. The presence of diverse ecological habitats and hydrological

regimes provides an opportunity for analysis of, for example, habitat change over time and patterns of water flow and snow melt. The area is also facing pressures related to urban development, such as a proposed highway bridge across a natural area and a new suburban neighborhood planned adjacent to a significant wetland; images of these developments could provide a basis for analysis of their impacts.

We requested and received six images at different imaging modes of the same area.

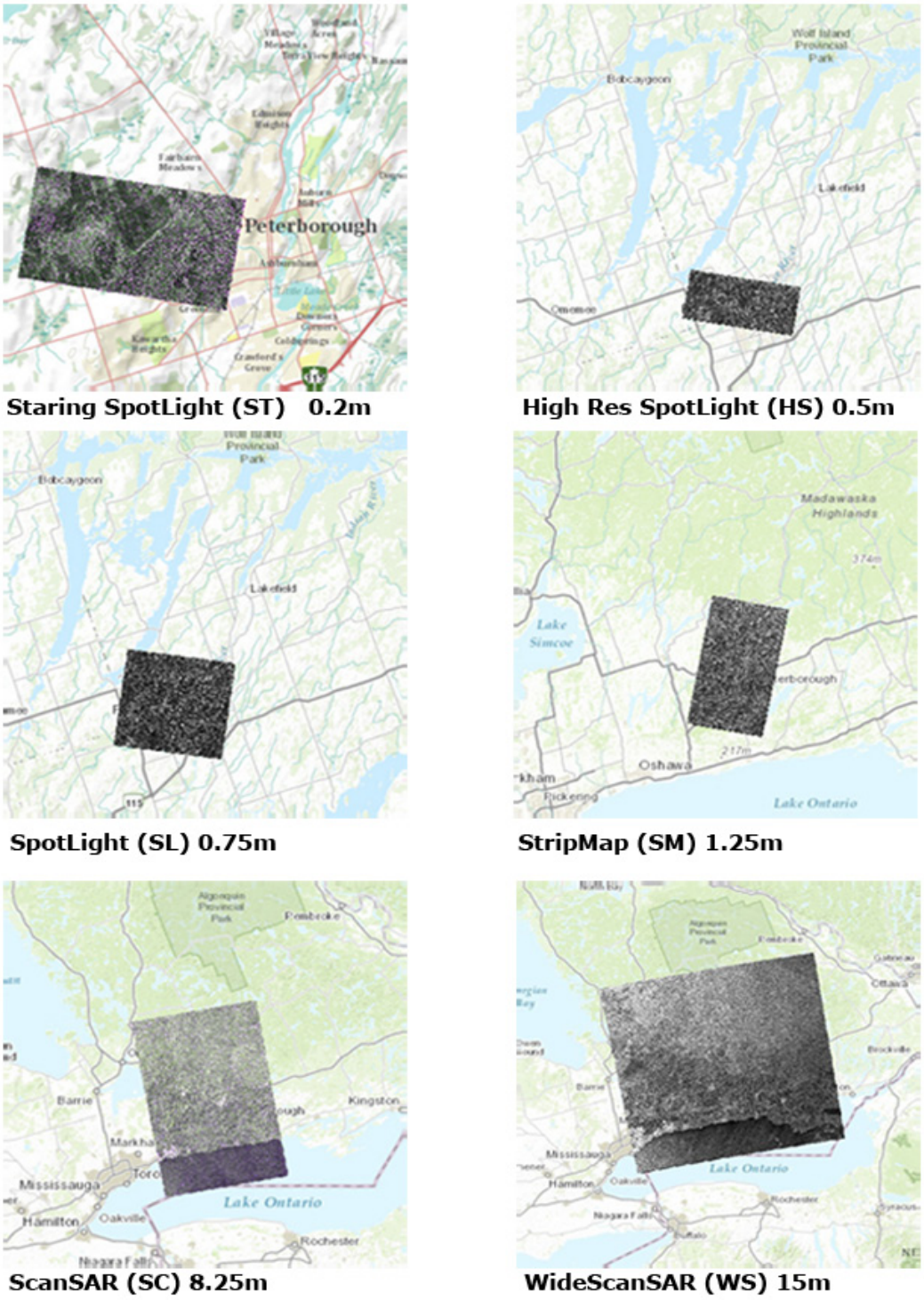

Fig. 7: Areas covered by imagery at six different imaging modes

Source: Imagery: TerraSAR-X imagery; Airbus Defence & Space and German Aerospace Center (DLR), Base Map: ESRI World Topographic Map Software: ESRI ArcGIS for Server 10.1

The download process was quick and intuitive, involving FTP transfer from Airbus Defence & Space.

Technical Procedures

We are publishing web services on a Windows 2008 server using ESRI ArcGIS for Server 10.1 and IIS. For the initial test, all development work was restricted to a Virtual Machine (VM) accessible only to staff of the Maps, Data & Government Information Centre.

Before publishing the data, several processing steps were completed. Initial processing of the data was done on a local machine using ESRI's ArcGIS for Desktop (ArcMap). This involved unbundling the six files we received (one for each imaging mode). We were impressed by the variety of products available for each mode, which included a high resolution TIFF file and composite 3-band images as well as extensive metadata.

Before moving the data to our server, we projected the imagery from the original coordinate system (UTM 17 N) to Web Mercator. Web Mercator is not necessarily the best for analytical uses, but it permits speedy reproduction on the web without intermediary caching. For the purposes of this test we have not created tile caches and are rendering images dynamically. This will give us more flexibility in future if we wish to adjust the service, or offer options for activating dynamic processes on the image. Using ArcGIS for Desktop the data was converted to raster pyramids (to increase rendering speed) and stored in file geodatabases. We created six file geodatabases to support the six web services we envisioned, one for each image mode containing five components: the original high resolution SAR image by itself, the composite 3-band image, and each of the single bands from the composite separately.

In addition to using ArcGIS for Server our GIS Developer has written a number of programs to support the web site, including work done in C# for compiled web applications working with IIS (for example, search results, list of services, secure paths that can be authorized), work done in python which interacts with ArcGIS for Server (for example, potentially, downloading of imagery) and work done in HTML 5, CSS and JavaScript for front end web site development (for example, drag and drop menus).

Figure 8 shows the structure of the ArcGIS for Server service directories and geodatabases.

Fig. 8: ArcGIS for Server Services Directory and Geodatabase structure

Source: Trent University Library ArcGIS for Server 10.1 TerraSAR-X directories

The services are called by a custom C# application, which is able read all component web services when the web site is opened, but only renders components visible when selected by the researcher. We did evaluate the feasibility of running separate services for each component of an image, but it was not considered essential for our purposes. We are managing the data deliberately this way to reduce the number of services required for display purposes within ArcGIS for Server. Although these methods require more programming work, there is less impact on server resources for publishing (including memory and CPU time).

For the purposes of this test we have not created tile caches and are rendering images dynamically. This will give us more flexibility in future if we wish to adjust the service, or offer options for activating dynamic processes on the image.

A number of enhancements were added to the graphic interface including drag and drop menus, opacity options, and options for base maps.

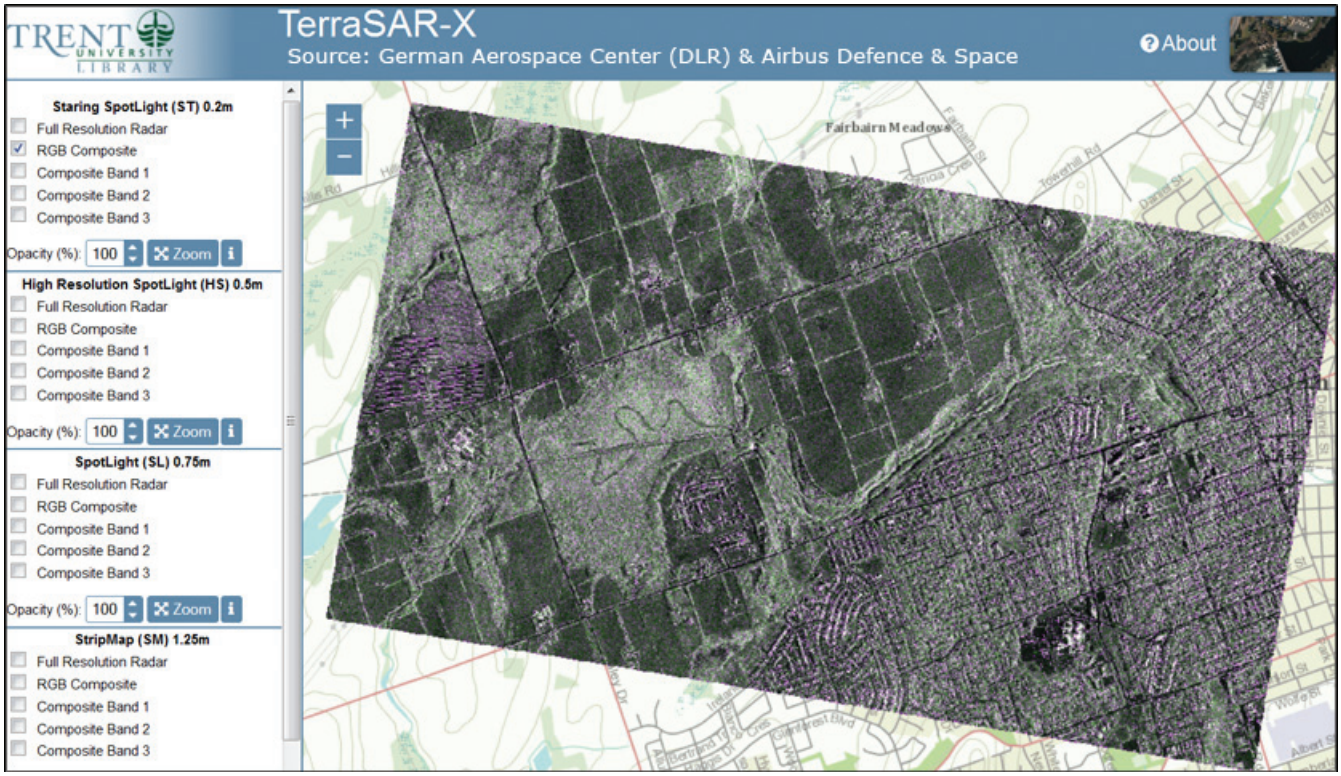

Fig. 9: Trent University Library Web Site for TerraSAR-X imagery showing Staring Spotlight image of Jackson Park

Source: Snapshot from Trent University Library Server, Data: Airbus Defence & Space and German Aerospace Center (DLR), TerraSAR-X Staring SpoLight (ST) 0.2m Composite, dims_op_oc_dfd2_372764075, 16 Februrary 2016, Production date: 3 March 2014 ©Airbus Defence and Space

Software: ESRI ArcGIS for Server 10.1

We received extensive metadata for each image, which came packaged as a large XML file, which then also linked to other XML files. At this time we have copied the file as one long xml page and made the information available from our web site through clicking on an "i" information button on the options menu. Eventually we would like to do further work on presentation of metadata, such as potentially writing a program to parse out essential fields from metadata and introducing different options for viewing the entire metadata file.

We are still evaluating options for download including authentication, but anticipate that the methodology would include something similar to what we currently use for aerial photography. This involves authenticating with Trent User ID and password through use of EZ Proxy and LDAP. During this process the researcher is also prompted to complete a brief online form which includes acceptance of license conditions. For download, images would be offered following our standard practice of delivering products in their original coordinate system, calling the image using a script (most likely python). We would also like to experiment with implementation of some of the analytical features available within ArcGIS for Server, such as, for example, applying high-pass or low-pass filters.

Conclusion and Acknowledgements:

Web GIS development work for this project was completed by Mike Kyffin, GIS Programmer and Developer, Trent Library Maps, Data & Government Information Centre.

Trent University Library is extremely grateful for the opportunity to participate in the Technical Evaluation of TerraSAR-X imagery. We wish to thank all persons and institutions involved in providing us with access to TerraSAR-X imagery, including Gordon Deecker, CCMEO, Alexander Kaptein, Airbus Defence & Space, Marchus Jochum, Airbus Defence & Space and Achim Roth, DLR. We look forward to making continued progress on a model library partnership agreement for all Canadian university libraries, and to further introducing TerraSAR-X imagery to our university communities and academic programs.

All inaccuracies or omissions within this article are the responsibility of the author.

[1]Information for this Section 1 of this paper has been taken from:

1. Airbus Defence & Space, TerraSAR-X image Product Guide: Basic and Enhanced Radar Satellite Imagery, Issue 2.0 August 2014. Available from: http://www.geo-airbusds.com/files/pmedia/public/r459_9_201408_tsxx-itd-ma-0009_tsx-productguide_i2.00.pdf

2. DLR German Aerospace Centre TerraSAR-X The German Radar Eye in Space. TerraSAR-X_D-GB_July 20019. Available from: http://www.dlr.de/dlr/en/Portaldata/1/Resources/documents/TSX_brosch.pdf

3. eoPortal Directory, TSX (TerraSAR-X) Mission https://directory.eoportal.org/web/eoportal/satellite-missions/t/terrasar-x. Credit note on web site: "The information compiled and edited in this article was provided by Herbert J. Kramer from his documentation of:"Observation of the Earth and Its Environment: Survey of Missions and Sensors" (Springer Verlag) as well as many other sources after the publication of the 4th edition in 2002. - Comments and corrections to this article are always welcome for further updates (herb.kramer@gmx.net)" Available from: https://directory.eoportal.org/web/eoportal/satellite-missions/t/terrasar-x

[2]The DLR web sites expands on this key advantage as follows: "The radar beam can be electronically tilted within a range of 20 to 60 degrees perpendicular to the flight direction, without having to move the satellite itself. This has an obvious advantage: it allows the radar to zoom in on many more ground targets from the satellite's orbit than would be possible using a 'non-steerable' radar." http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10377/565_read-436/#/gallery/350, accessed on: November 8, 2014

[3]EO Sharing Earth Observations Resources, https://directory.eoportal.org/web/eoportal/satellite-missions/t/terrasar-x#footback109%29 and TerraSAR-X The German Radar Eye in Space, http://www.dlr.de/dlr/en/Portaldata/1/Resources/documents/TSX_brosch.pdf

[4] "(c) that raw data and remote sensing products from the system about the territory of any country — but not including data or products that have been enhanced or to which some value has been added — be made available to the government of that country within a reasonable time, on reasonable terms and for so long as the data or products have not been disposed of, but subject to any licence conditions under subsection (6) or (7) applicable to their communication or provision" From: Remote Sensing Space Systems Ace S.C. 2005, c.45 Assented to 2005-11-25

[5]Agreement modeled after the Data Liberation Initiative (DLI) held between Canadian universities and Statistics Canada.

[6]Barbara Znamirowski, Head, Maps, Data & Government Information Centre, Trent University Library: bznamirowski@trentu.ca ; Dr. Gordon Deecker, Senior Advisor, Canada Centre for Earth Observation, Canada Centre for Mapping and Earth Observation, Earth Sciences Sector, Natural Resources Canada: Gordon.Deecker@NRCan-RNCan.gc.ca

[7] The Certificate of Residence is an official document available from Canada Revenue Agency and required for European Union Tax Law; Proof of ID is an official letter confirming institutional identity and affiliation of researcher, photo ID must including citizenship information. It should be noted that research applications and technical evaluation applications vary in what forms are required.

Bibliography

Web Sites:

Airbus Defence & Space Archive, "TerraSAR-X Archive" http://terrasar-x-archive.infoterra.de/

Airbus Defence & Space, "TerraSAR-X Documentation" http://www.geo-airbusds.com/en/228-terrasar-x-technical-documents

DLR German Aerospace Center Web Site and brochures on TerraSAR-X http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10377/565_read-436/#/gallery/350

DLR TerraSAR Science Service System http://sss.terrasar-x.dlr.de/

EO Sharing Earth Observation Resources eoPortalDirectory, https://directory.eoportal.org/web/eoportal/satellite-missions/t/terrasar-x

Natural Resources Canada Inuvik Satellite Station Facility http://www.nrcan.gc.ca/earth-sciences/geomatics/satellite-imagery-air-photos/satellite-facilities/ISSF/10953

Articles:

Helko Breit, Thomas Fritz, Ulrich Balss, Marie Lachaise, Andreas Niedermeier, and Martin Vonavka, T*erraSAR-X SAR Processing and Products*, IEEE Transaction On Geoscience And Remote Sensing, VOL. 48, NO. 2, February 2010,727-740.

Jürgen Janoth, Steffen Gantert, Thomas Schrage, Alexander Kaptein, TerraSAR Next Generation – Mission Capabilities, Geoscience and Remote Sensing Symposium (IGARSS), 2013 IEEE International, 2297 - 2300.

Naomi Short, Brian Brisco, Nicole Couture, Wayne Pollard, Kevin Murnaghan, Paul Budkewitsch, *A comparison of TerraSAR-X, RADARSAT-2 and ALOS-PALSAR interferometry for monitoring permafrost environments, case study from Herschel Island*, Canada Remote Sensing of Environment, 115 (2011) 3491-3506Pages 3491-3506.

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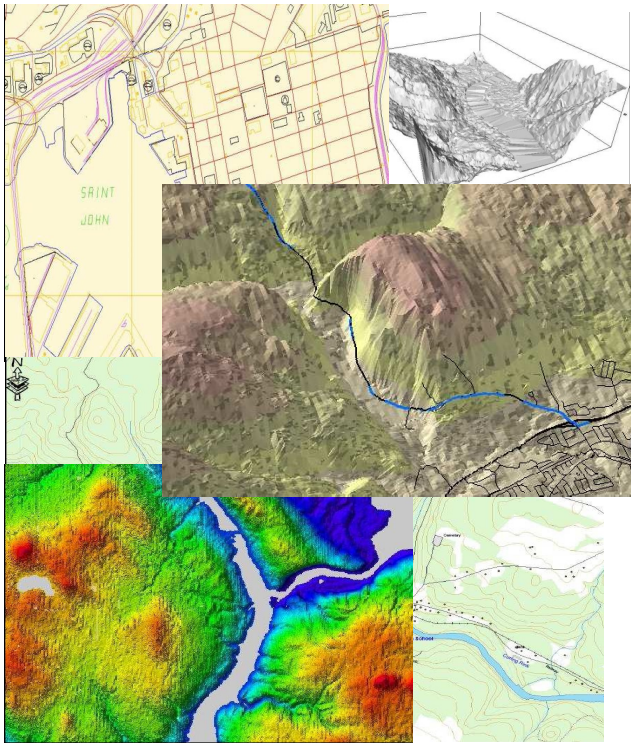
Association of Canadian Map Libraries and Archives

Eleventh Annual

ACMLA Student Paper Award

The Association of Canadian Map Libraries and Archives (ACMLA) announces its annual student paper contest. Essays may deal with access to and information about geospatial data, cartography, cartographic materials, map information, map data, GIS data and geo-referenced information.



Eligibility
A student from Canada or studying in Canada currently enrolled in a post-secondary institution (college or university) is eligible to apply to enter the contest. All papers shall be prepared during the 2014-2015 school year

Essay
The essay shall be original and unpublished, and of no more than 3,000 words. Judging of the papers will give primary consideration to the essay's originality and its contribution to new knowledge and insights. Other considerations will be the author's demonstration of the relevance of the subject, the quality of presentation and documentation, and the literary merits of the essay.

Award
$250.00 and free membership in the Association for one year. The award includes an invitation to present the paper at the ACMLA annual conference, normally held at the end of May/early June. If the winner chooses to attend the conference, the Association will waive registration fees and provide a travel stipend of $250.00.

Deadline: 15 April 2015

Eva Dodsworth, ACMLA Awards Committee,
Geospatial Centre, University of Waterloo Library,
Waterloo, ON N2L 3G1
edodsworth@uwaterloo.ca

Submit a paper to the Contest!

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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.

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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 : April 15th, 2015**

ACMLA Cathy Moulder Paper Award

To be nominated for the Paper Award, which carries a $200 monetary prize, a feature article by one or more authors consisting of at least three pages in length must have appeared in issues 143-145 of the ACMLA Bulletin.

- **Deadline : April 15th, 2015**

ACMLA Student Paper Award

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 stipent of $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 shall be original and unpublished and of no more than 3000 words. Priimary consideration for the award will be given to the essay's originality and its contribution to new knowledge and inight. 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: April 15th, 2015**

For more information on ACMLA Awards, contact:

Eva Dodsworth
Chair, ACMLA Awards Committee
edodsworth@uwaterloo.ca

GEOSPATIAL DATA AND SOFTWARE REVIEWS

LandScan Global Population Database

Reviewed by Eva Dodsworth
Geospatial Data Services Librarian
University of Waterloo

Developed at the U.S. Department of Energy's Oak Ridge National Laboratory, LandScan features the highest-accuracy global population data available on the market offering three levels of population data : countries, first-level administrative boundaries (provinces, states), and square-kilometre cells. LandScan is distributed by East View Information Services and is available through a yearly subscription (representing data collected in the previous year). East View also offers The LandScan Global Archive, a compilation of the historical LandScan data sets.

Description
LandScan offers world-wide ambient population distribution (average over 24 hours) at one-kilometer resolution (30" x 30") and can be customized to define individual pixel points. Using GIS and remote sensing, LandScan uses spatial data and imagery analysis to disaggregate census counts within an administrative boundary.

LandScan consists of raw data files in raster format, including:

Population - A subdirectory containing the ArcGIS grid of the population. There is also a "Layer" for ArcGIS. Each cell value represents the number of people in that 30 arc-second cell.

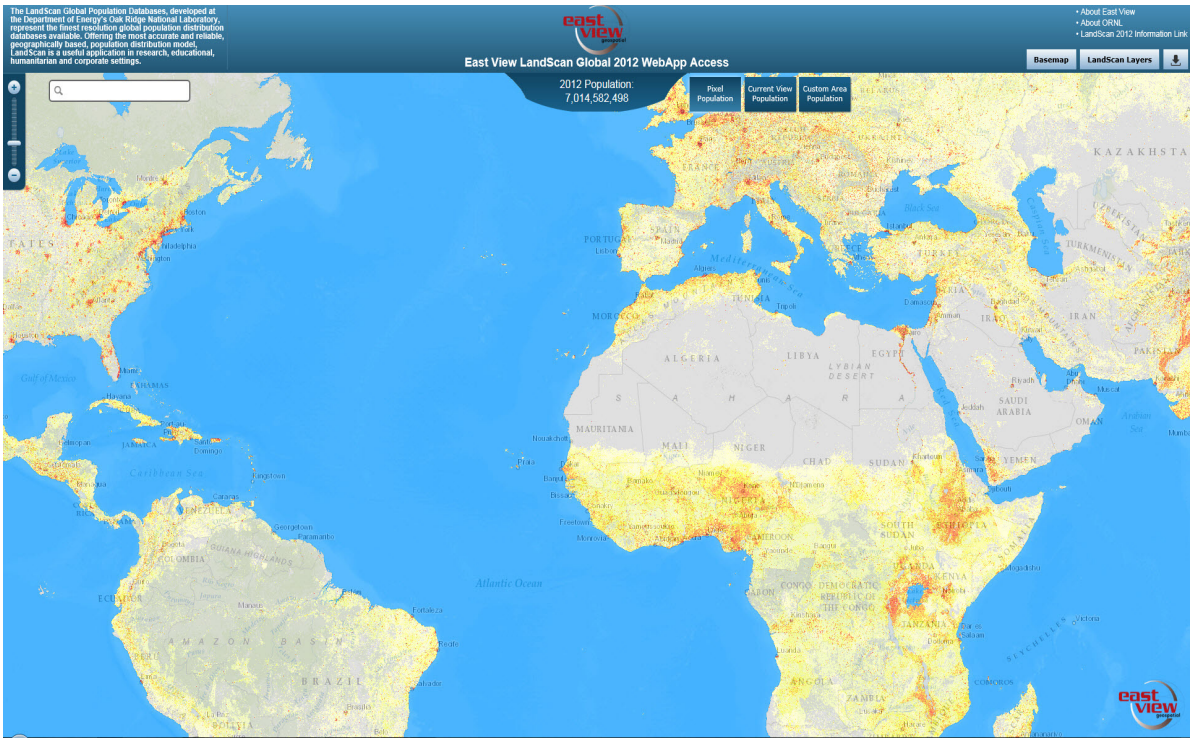
Admin1 with Demographic Boundaries - A subdirectory containing the ArcGIS grid of the countries/sub-countries. These are the standard Level 1 Administrative Boundaries. The attribute table for this grid contains the age-sex factors for the "admin1" units. The factors can be used to create various demographic grids for your own needs.

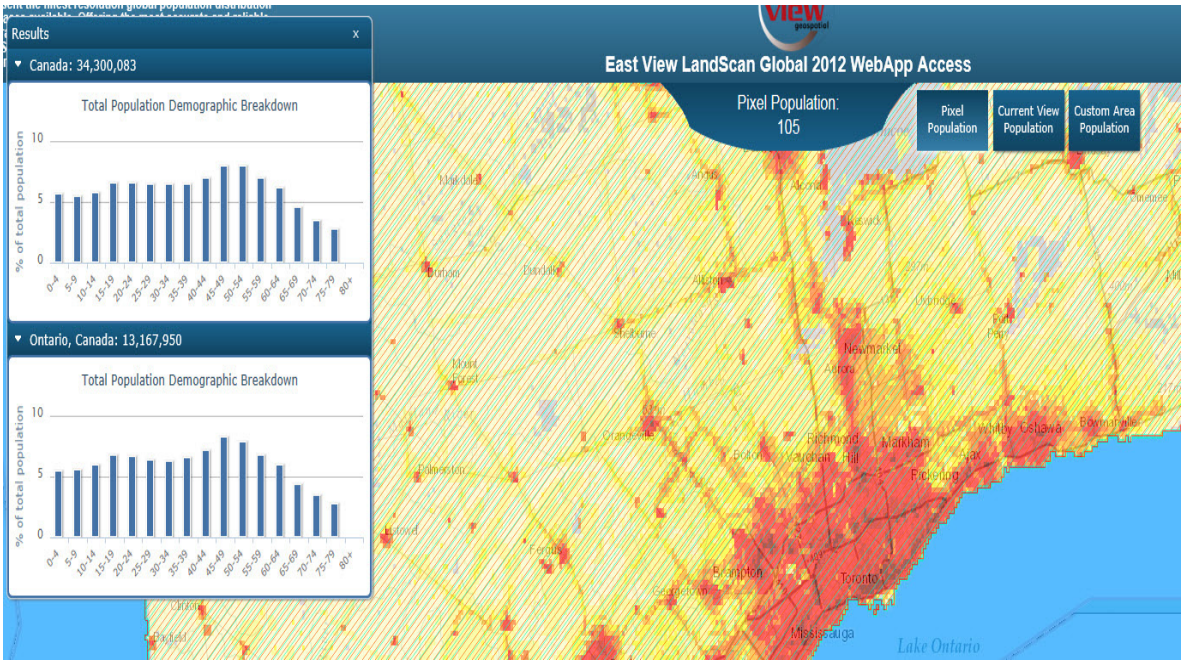
For example, to produce a population grid for females, ages 5-9 you would use the Map Calculator in the Analysis Menu with the command: ([lspop2012] * [world_admin1 . Pf5_9]) Also contains a DBF for the demography factors of each admin1 area.

Country - A subdirectory containing the ArcGIS grid of the countries. These are the standard Country Boundaries. Also contains a DBF giving the country name for each country "number" in the grid and has demographic factors similar to the Admin1 table.

AreaGrid - A subdirectory containing a grid of areas of 30 arc-second cells. The data table contains the cell areas. The units are square kilometers.

Additionally, LandScan is also available as a cloud-based web mapping service. This is an ideal option for casual users and for quick access to the information and tools. Population counts can be accessed, however population density can only be calculated using GIS software. Population counts are available for areas visible on the map by using the "Current View Population" button, as well as for "Custom Area Populations" which provides a unique population count within a user-defined boundary. Additional tools allow users to download population data by country or by custom area in a raster data file that can be used with GIS software.





Figures 1 and 2 : LandScan via Web Mapping Program

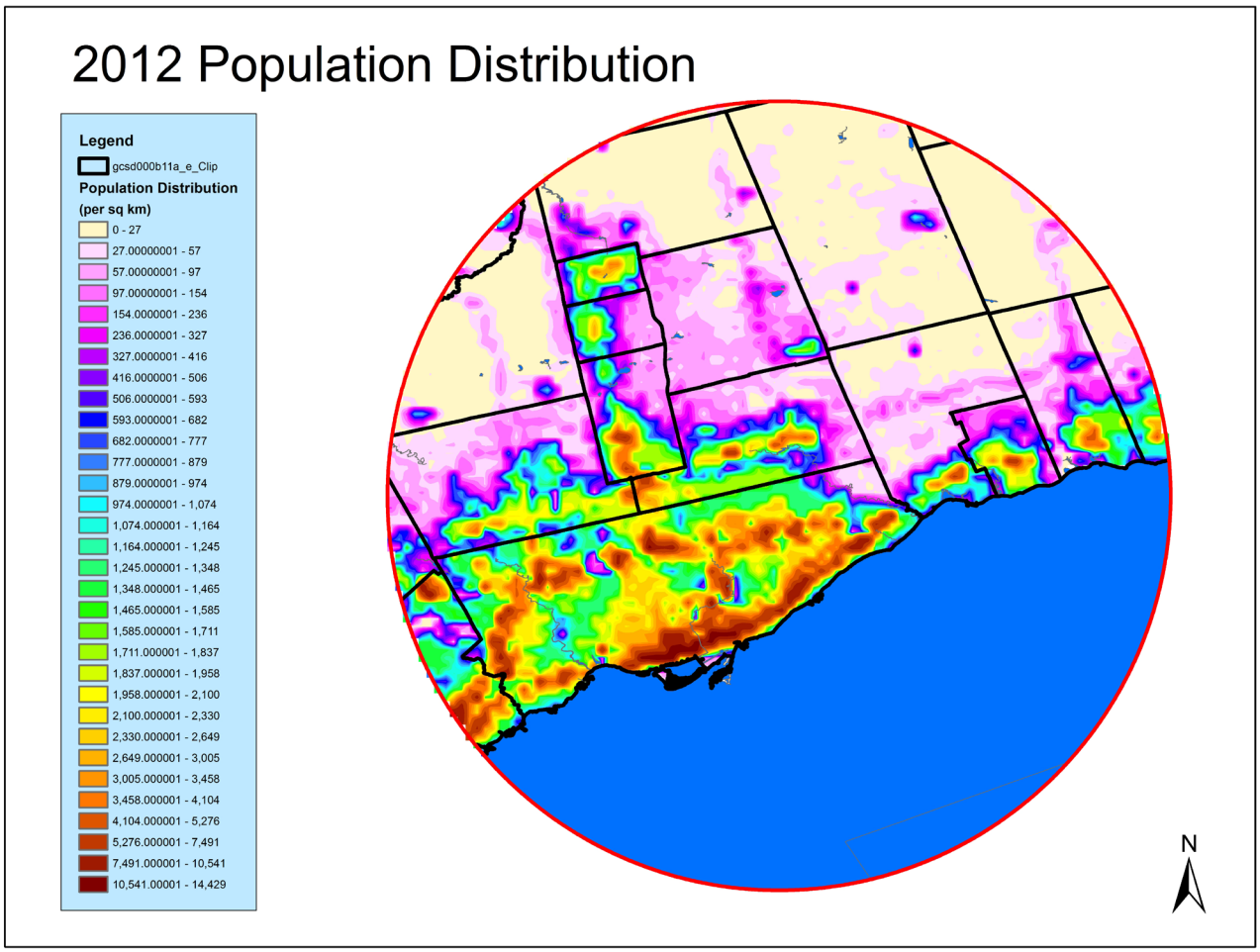


Figure 3 – Landscan via ArcGIS; Map courtesy Jon Morgan

countries

OID	VALUE	COUNT	COUNTRY	POP_2012	TOT_0_4	TOT_5_9	TOT_10_14	TOT_15_19	TOT_20_24	TOT_25_29	TOT_30_34
0	1	900709	Afghanistan	30419928	0.156786	0.136023	0.135503	0.118921	0.096165	0.073114	0.059594
1	2	44503	Albania	3002859	0.05607	0.066546	0.083757	0.09747	0.098356	0.084543	0.065749
2	3	3066729	Algeria	37367226	0.078792	0.077991	0.081216	0.096373	0.101041	0.102254	0.095037
3	4	322	American Samoa	54947	0.106482	0.103775	0.102873	0.11063	0.092549	0.074255	0.065683
4	5	736	Andorra	85082	0.047921	0.051137	0.054935	0.049686	0.050738	0.063308	0.086145
5	6	1493958	Angola	18056072	0.162939	0.143488	0.129691	0.110584	0.090188	0.075198	0.063291
6	7	133	Anguilla	15423	0.077198	0.078905	0.08049	0.072818	0.074703	0.070697	0.063588

Figure 4 – Attribute table via ArcGIS

The LandScan Global Archive

The LandScan Global Archive was released in March 2013 and is a compilation of the historical LandScan data sets from 2000 up to the prior year of current release. The level of detail and accuracy varies for early years due to the improvements of imaging and analytical algorithms applied. The data are available in the original GIS format and online.

Technical Aspects

The data are distributed in both Esri grid format and an Esri binary raster format and can be downloaded by FTP or via a OGC Web Service. Additionally a Web Application is also available, developed by East View. The Web application can be linked from the library's website offering users an easy way to view the population levels, as well as charts which represent population distribution by age and sex. Basic topographic base layers are available as well, including land cover and buildings in the more densely populated areas.

Terms

• Permissions: Display / download / print limited portions. Scholarly sharing.

• Restrictions: No systematic downloading / systematic printing / distribution. No commercial use. No removal / modification of copyright notice or disclaimer.

• Authorized users: Faculty, staff, students, and on-site public users

Conclusion

The uses of LandScan data are varied and extensive with a wide range of applications across numerous fields like business, planning, health, humanitarianism, homeland security, emergency planning and management, urban sprawl analysis and much more. National and international organizations including the United Nations (UN), the World Health Organization (WHO), the Food and Agricultural Organization (FAO), and several federal agencies in the U.S. and other countries currently employ this data in their analyses. East View and the U.S. Department of Energy's Oak Ridge National Laboratory note that LandScan is a valuable resource for academic research, and in instruction for courses that use census and geographic information. With East View's Web Mapping program, the data and experiences are much more user friendly and appeal to a wider audience.

Eva Dodsworth
Geospatial Data Services Librarian
Geospatial Centre
University of Waterloo

REVIEWS

Compiled by Sarah Simpkin

Books Reviewed in this Issue:

The Map Thief by Michael Blanding
Reviewed by Jordan Hale

Mapping Time: Illustrated by Minard's Map of Napoleon's Russian Campaign of 1812 by Menno-Jan Kraak
Reviewed by Larry Laliberté

Web Cartography: Web Design for Interactive and Mobile Devices by Ian Muehlenhaus
Reviewed by Ryan Nayler

The Map Thief by Michael Blanding
Reviewed by Jordan Hale

Blanding, Michael. The Map Thief. New York: Gotham Books, 2014. 300p. $32.00 CAD. ISBN 978-1-592-40817-7

Much like a theatrical script, The Map Thief begins with a cast of characters, detailing the relationships between the title villain, E. Forbes Smiley III, and his family members, associates in the rare map trade, and the cartographers of the early modern era whose creations he targeted. Beyond setting the stage for this work of true crime, this listing enumerates the victims of his exploits, and provides a historical lens to the extent of his many acts of library larceny.

The exposé, written by investigative journalist Michael Blanding, begins with a compelling reconstruction of Smiley's criminal undoing in the Beinecke Rare Book and Manuscript Library at Yale University, when he failed to notice a spare knife blade fall from his pocket while attempting to make off with several maps bound in rare books. Over the course of the text, the protagonist's personality unfolds through extended biographical anecdotes as well as vivid descriptions of crime scenes and court appearances, juxtaposed with historical vignettes that convey the importance of the items seized within broader histories of cartography and exploration.

The Map Thief follows in the footsteps of Miles Harvey's The Island of Lost Maps (2001), the precedent book about thievery from cartographic collections – indeed, some of the same characters make an appearance in both. The most significant difference between the two texts is that Blanding was able to secure the cooperation of his subject: Smiley provided many interviews over the course of its writing. Despite the many similarities in subject and structure, the narrative of The Map Thief is tighter and the tone more nuanced than The Island of Lost Maps, which I found quite pedantic in places.

Though directed at a wider audience than cartophiles and library personnel, The Map Thief is quite successful in its discussions of issues pertinent to those working with maps, beyond the obvious matter of collection security. Detailed item-level cataloguing ultimately led to the identification and recovery of several of the missing maps – I think wistfully of the many sheets currently stored in drawers and piles in my office, waiting for their turn to be catalogued, hoping that my attention to detail now will never be called upon for a recovery mission in the future. I was also pleased to read of the role

of collaborative problem-solving on library listservs in the investigation of Smiley's crimes. Despite the anxiety-inducing storyline, what makes The Map Thief so appealing to those working in cartographic collections is the evident care Blanding takes in his descriptions of the maps at the heart of the text, and the details of the labour that those working with them put into their jobs. It is very fitting that the book ends with an extended cartobibliography.

Jordan Hale, Original Cataloguer & Reference Specialist
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Mapping Time: Illustrated by Minard's Map of Napoleon's Russian Campaign of 1812 by Menno-Jan Kraak
Reviewed by Larry Laliberté

Kraak, Menno-Jan. Mapping Time : Illustrated by Minard's Map of Napoleon's Russian Campaign of 1812. Redlands: Esri Press, 2014. 159p. $49.99 USD. ISBN 9781589483125.

Minard's map of Napoleon's Russian Campaign, published almost 150 years ago, has the capacity to captivate the imagination of anyone looking at the drastic diminishing line thickness as Napoleon's troops moved west, with every moment along the way linked to dropping temperatures. The map is held in such high regard that Edward Tufte, a leading expert on information design, has stated that "it may well be the best statistical graphic ever drawn" (Tufte, 1983).

The author Menno-Jan Kraak, who has more than 200 publications on cartography and GIS, has crafted a supremely rich narrative, including more than 100 full-color illustrations. The book begins with a brief historical overview of the campaign, followed by a complete overview of Minard's "flow line map". In Chapter Three, Kraak initiates the reader into the central theme of the book, time, by quoting St. Augustine: "Everyone knows what it is, and few can define it". What follows is a very useful outline of both the elements of temporal data visualization, including types of time, events, and change which are then fused with discussions on map basics and design and data analysis, and at every step of the way are illustrated with effective examples pointing back to Minard's map. Chapter Five moves beyond the static map which serves as a temporal snapshot by looking at the map as a narrative and how it can express change. Here the book makes great use of flow diagrams to show the relationships between the nature of change, perceptual properties, visual variables, and the resulting basic symbols. The chapter ends with Kraak running Minard's map through its paces by expressing it as a cartogram, a space-time cube, and a map animation. The book's final chapter, "Maps and Temporal Exploration" looks at how GIS and its tenets: mining, mapping, modeling, analysis, and visualization of data, allow one to move beyond presenting information to exploring information to gain knowledge.

Simply stated, Kraak's book is not only a wonderful recreation and exploration of both the dramatic and subtle elements embedded within Minard's original visualization, but is an extremely instructive text —especially given the recent "spatial turn" in historical studies under the banner of "Historical GIS" (HGIS) —on the critical concepts that need to be addressed when mapping time. Highly recommended!

Larry Laliberté
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Edmonton, AB

Web Cartography: Web Design for Interactive and Mobile Devices by Ian Muehlenhaus
Reviewed by Ryan Nayler

Muehlenhaus, Ian. Web Cartography: Web Design for Interactive and Mobile Devices. Boca Raton: CRC Press, 2014. 240p. $90.00 USD. ISBN 878-1-4398-7622-0.

Web Cartography provides a thorough look into both the function and design of web mapping technologies. Muehlenhaus offers a brief history of web cartography, and looks at various types of mapping technologies, while offering some key suggestions for both experienced and aspiring mapping application developers. The book is not a technical manual and it does not teach readers how to build maps from scratch, although it does provide reviews of some of the best mapping applications currently on the market, and it informs readers which coding and scripting languages would be useful to learn as well as the drawbacks and limitations of each.

Several of the chapters in this book focus on best practices in map design and key considerations, such as colours, symbols and labelling, animations and sounds, and more. Since there is such a wide array of mapping technologies for a user to choose from, Muehlenhaus has presented some crucial elements to consider that apply to most technologies, as opposed to walking readers through how to design for just one.

In terms of the writing style, most readers will find the language to be very accessible, and the author remains succinct and on-topic with very little filler. Full-colour graphics and illustrations also serve as a valuable aid to readers. The author, Ian Muehlenhaus, is a qualified subject expert, possessing a PhD in Geography and teaching courses in web mapping.

Overall, this work serves as a useful starting point to inform new cartographers, or anyone interested in web mapping, what is possible with mapping technologies, which products are currently available, and what industry best practices are. This book would make a great addition to library collections, especially academic libraries who serve students researching geography and web technology.

Ryan Nayler

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:

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 Tom Anderson

Alberta

Edmonton
David Jones
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The Edmonton Map Society held its fall meeting on October 14th. There were two presentations, both regarding WWII maps. John Horrigan discussed three WWII maps produced for home use to inform citizens of the progress of the war. Michael Fisher reported on his research for producing maps in the third edition of War & Genocide: A concise History of the Holocaust by Doris Bergen, using historical period maps of the Second World War in the William C. Wonders Map Collection. These maps were produced by German and American cartographers.

Our next meeting is planned for early in the new year. For further information or to be included in our mailings please contact: david.jones@ualberta.ca.

University of Calgary
Susan McKee
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Spatial and Numeric Data Services is busy downsizing and preparing our map and air photo collection for move to offsite storage, with a very tight six month timeline. Recently we renegotiated our Data License Agreement with the City of Calgary, marking our ten year anniversary with City data. Also, we are very sad to report that Sharon Neary passed away last August. Sharon was the University of Calgary Library's Data Librarian for many years and was a pioneer in the field. We will miss her greatly.

Ontario

Carleton University
Rebecca Bartlett
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Downloading GIS software and local datasets
Thanks to collaboration with the MacOdrum Library's Systems Department (notably Kevin Bowrin), Carleton students, faculty and staff can now download the Student Edition of the ArcGIS Software and the vast majority of our licensed GIS datasets from anywhere with an internet connection by using their MyCarletonOne credentials. The GIS datasets available include aerial images of Ottawa-Gatineau from as early as 1958, detailed Ottawa-Gatineau and Carleton campus topographic datasets, and 3D buildings from several global cities.

The Find GIS page (http://www.library.carleton.ca/find/gis) has been updated to reflect this change, including a custom search box for Scholars GeoPortal created for us by Kevin. This is in line with our goal in making our services more accessible to our users and, to date, this change has been well-received.

Ottawa Room at Carleton's Maps, Data & Government Information Centre (MADGIC)
To further high quality research and cross-disciplinary collaboration, MADGIC has initiated a project to identify and bundle existing local Ottawa area resources from within the Library's collection. By assembling this material under the theme of the Ottawa area we can enhance its use and help promote full utilization of these materials for academic research and teaching needs and to help forge new research links within Carleton's academic community. These resources have a physical presence within the library and include a digital component linking GIS, scanned images, web based resources and eventually include digital displays.

GIS Day

On Wednesday November 19th, the MacOdrum Library's MADGIC in conjunction with the Department of Geography & Environmental Studies hosted GIS Day celebrations. The event was attended by well over 300 hundred participants including Carleton students, faculty, and staff, members of the general public, and students from local high schools. The event involved lightning talks, exhibitor booths, GIS games, geocaching, demonstrations of 3D printing, and opportunities to try out the Oculus Rift, which allowed participants to step into a virtual world.

Ryerson University
Daniel Jakubek
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Creation of a new Geospatial Map & Data Centre (GMDC) website

Rebranding - Consultations with GMDC staff, faculty, and students led to a rebranding of our collections and services. To more clearly link our virtual and physical space, the website was rebranded as the Geospatial Map & Data Centre. Patrons now search the GMDC Inventory to access geospatial data resources exclusive to the Ryerson University Library. Previously, our website was branded as Maps & Data at Ryerson (MADAR).

GMDC Blog – We implemented a **GMDC News** blog to improve communication with our patrons. This blog has replaced the Geospatial Community mailing list in an attempt to reach a larger audience and more effectively highlight our three major collections and services: GIS & Geospatial Data, Paper Maps, and Statistics & Data. In addition, our patrons now have the ability to provide feedback in a public forum that will guide future development of our collections and services.

Navigation – Development of an effective navigation strategy for the GMDC website was developed based on feedback from our patrons and the Student Advisory Committee at Ryerson. In response, original icons were created to help patrons navigate the GMDC website.

Program specific web pages dedicated to GIS & Geospatial Data Support – Investigation of current GIS integration across disciplines led to the development of program specific GIS support pages. Content includes discipline specific information related to key resources and services accessible through our collection and externally e.g. sources for subject specific data, recommended GIS courses and help guides, and software availability. This is just a starting point for these pages. As the Fall and Winter semesters progress, we intend to work with faculty and students to customize these pages e.g. host course and/or assignment level support guides, highlight the integration of GIS by faculty and students in each discipline.

Google Tools for Appointment Booking and File Transfer – Google Forms was implemented to standardize the process for requesting research consultations, workshops, in-class instruction for faculty, data resources and software. Google Drive was implemented as our new tool for transferring data which is governed by data release agreements that do not allow direct download. This solution will increase efficiency by minimizing the need for in-person consultation for data transfer.

GIS Community Outreach

#Maptime Toronto – We collaborated with the Open Source GIS community in Toronto. Specifically, we co-hosted (along with the department of Geography) a #Maptime Toronto event in the library. http://maptime.github.io/toronto/

RULA to Host GIS Day – The GMDC has confirmed collaboration with the department of Geography and the Student Association of Geographic Analysis (SAGA) to host a campus wide GIS Day in the library. We plan to raise awareness of the GMDC and encourage participation from university departments such as Urban & Regional

Planning, Civil Engineering – Geomatics, and the Office of the President. The day will feature a series of keynote presentations from GIS practitioners, live demonstrations, and a poster exhibition.

Univerity of Ottawa
Sarah Simpkin
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It has been a busy semester!

In early November, Talia Chung, Head of the GSG Centre, joined our Health Sciences Library for a one-year appointment as Acting Director. We'll miss her dearly, but know that their team will be in good hands. Our Data Analyst, René Duplain, also became a new dad this semester, welcoming baby Gabrielle on October 28th.

Work is progressing on our many projects, including the digitization of our air photo indexes. We continue to offer drop-in GIS support to students and faculty, and will begin delivering more formal GIS workshops for students through our library's BiblioExpert series in the winter semester.

Government Information Librarian Catherine McGoveran and Talia Chung were instrumental in the success of the second annual Government Information Day, hosted by the University of Ottawa on October 16th. Conference materials are available online in English at: http://bit.ly/GID-EN and in French at: http://bit.ly/GID-FR.

Susan Mowers, Data Librarian, is testing new data service opportunities for accessing detailed microdata. One of these new services is Real Time Remote Access, (RTRA), through Statistics Canada. Thanks to the Faculty of Social Sciences, this fall, research assistant Sarah Roach has been providing SAS and RTRA data support. A number of researchers have been interested in using confidential RTRA data as a complement to public microdata and RDCs.

University of Waterloo
Eva Dodsworth
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The Geospatial Centre at the University of Waterloo has been in a bit of a catch up mode all Fall since Talsan Schulzke, our GIS Specialist resigned for a position in the U.S. Many projects were put on hold (including GIS Day) as we focussed on library instruction classroom sessions (23), GIS workshops (2) and reference/consultations. We've had a surprising amount of undergraduate courses using paper maps in their course assignments, so many NTS map sheets need replacing now. We revised our workshop schedule this term and decided to offer novice and intermediate workshops, with the advanced one pending until the Winter term.

The novice workshop covered:
- Understanding what GIS is and geospatial data are
- Navigating ArcGIS software and tools
- Finding and adding data to a map
- Discovering information and attributes about the data
- Producing a simple map that shares visualization of the data

The Intermediate workshop covered:
- Creating points, lines, and polygons from scratch
- Adding XY coordinate data to your map
- Plotting addresses from a table on your map (geocoding)
- Using the editing templates and tools in ArcMap
- Geo-locating aerial imagery in real space (georeferencing)

The advanced workshop will cover:
- Summarizing data as they relate to other data
- Performing single- and multiple-ring buffers
- Analyzing distance and time proximities
- Identifying hot spots in your data
- Managing spatial relationships between data

We had great turnouts for the first two workshops (between 15-20 students) and we hope to see this pattern continue for future workshops.

Aside from instruction sessions, casual and co-op staff have been working with me on Omeka's Neatline to create a product that will serve as a crowd-sourcing data entry tool for military mapping. Geoff Hayes, a history professor at the University of Waterloo and I have received an internal grant to map both World Wars' memorials and memorabilia present within the Waterloo Region.

Lastly, on November 12th, the Department of History, the Geospatial Centre and the history librarian hosted a History Speaker Series presentation by Dr. Jim Clifford, "Mapping London's Global Hinterlands: Spatial Text Mining Eight Million Pages of Nineteenth Century Texts". Dr. Clifford presented on digital techniques, including text mining, relational databases, geographic information systems mapping (GIS) and information visualization to explore the spread of commodity frontiers, the expansion of global trade and the resulting environmental consequences through the study of nineteenth-century London's global supply chains.

The Geospatial Centre offered a tour after the presentation which featured a display of historical topographic maps, road maps, fire insurance plans, and air photos.

Western University
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All of the fire insurance plans held by the Map and Data Centre will soon be searchable in the Shared Library Catalogue and in Summon. The 400 records represent the more recent (1951-73) small format plans across Canada. For more information about the collection of fire insurance plans, see our website (http://www.lib.uwo.ca/madgic/fips.htm).

Christine Homuth, GIS Technician, has given several GIS workshops this fall: Introduction to GIS (using ArcGIS and QGIS); Data Discovery; Creating Maps with Google Drive; Georeferencing Air Photos; Mobile Mapping. Plans are underway to host GIS Day on Friday, November 21. Events will include a poster session, presentations, and a hands-on workshop using GIS technology.

The Department of Statistical and Actuarial Sciences in cooperation with Western Libraries provides a Data Analytics Help Service which offers statistical consulting, workshops on software and data analysis, and tutoring for statistics courses offered across campus. This service is being provided in the Map and Data Centre area, 15 hours a week.

Two graduate students from the Master of Library and Information Science program have joined the Map and Data Centre team on a part-time basis to work 7 hours each per week for the academic year. They are working on projects that have been awaiting our attention since we moved into our new space over a year ago. Two of the larger projects are to do an inventory check of our historical atlases and reorganize the quick reference atlas shelves.

NEW BOOKS AND ATLASES

Compiled by Peter Genzinger

Abrahart, Robert J. and Linda M. See (eds.). 2014. GeoComputation. 2nd ed. Boca Raton: CRC Press. 455 p. ISBN: 9781466503281.

Acharya, Rajat. 2014. Understanding satellite navigation. San Diego: Elsevier Academic Press. 389 p. $146.08 CDN. ISBN: 9780127999494.

Albu, Emily. 2014. Medieval Peutinger map: imperial Roman revival in a German empire. New York: Cambridge University Press. 169 p. $94.95 CDN. ISBN: 9781107059429.

Allen, David. W. 2014. GIS tutorial for Python scripting. Redlands, CA: ESRI Press. 276 p. $69.99 CDN. ISBN: 9781589483569.

Borradale, Graham. 2014. Understanding geology through maps. Boston, MA: Elsevier. 183 p. &78.81 CDN. ISBN: 9780128008669.

Braatz, Dieter. 2014. Wine atlas of Germany. Translated by Kevin D. Goldberg. Berkeley: University of California Press. 277 p. $66.98 CDN. ISBN: 9780520260672.

Bryars, Tim and Tom Harper. 2014. A history of the twentieth century in 100 maps. Chicago: University of Chicago Press. 224 p. $50.24 CDN. ISBN: 9780226202471.

Canty, Morton John. 2014. Image analysis, classification and change detection in remote sensing: with algorithms for ENVI/IDL and python. Boca Raton: CRC Press. 527 p. $156.24 CDN. ISBN: 9781466570375.

Chen, Ruizhi and Robert Guinness. 2015. Geospatial computing in mobile devices. Norwood, MA: Artech House Publishers. 211 p. $154.95 CDN. ISBN: 9781608075652.

Dale, Peter. 2014. Mathematical techniques in GIS. 2nd ed. Boca Raton: CRC Press. 331 p. $100.42 CDN. ISBN: 9781466595545.

Field, Kenneth and Alexander J. Kent (eds.). 2014. Landmarks in mapping: 50 years of the Cartographic Journal. Leeds, UK: Manley Publishing. 406 p. $139.55 CDN. ISBN: 9781909662384.

ESRI Press. 2014. ESRI map book. Redlands, CA: ESRI Press. 136 p. $24.99 CDN. ISBN: 9781589483576.

Food and Agriculture Organization of the United Nations. 2014. Using spatial information to support decisions on safeguards and multiple benefits for REDD+ in Tanzania. Rome: Food and Agriculture Organization of the United Nations. 48 p. $22.04 CDN. ISBN: 9789251080894.

Knox, Paul. 2014. Atlas of cities. Princeton: Princeton University Press. 256 p. $55.26 CDN. ISBN: 9780691157818.

Kurland, Kristen S. and Wilpen L. Gorr. 2014. GIS tutorial for health. 5th ed. Redlands, CA: ESRI Press. 460 p. $79.99 CDN. ISBN: 9781589483729.

Narangoa, Li and Robert Cribb. 2014. Historical atlas of northeast Asia, 1590 - 2010: Korea, Manchuria, Mongolia, eastern Siberia. New York: Columbia University Press. 336 p. $150.00 CDN. ISBN: 9780231160704.

Panigrahi, Narayan. 2014. Computing in geographic information systems. Boca Raton: CRC Press. 275 p. $133.91 CDN. ISBN: 9781482223149.

Pegg, Richard A. 2014. Cartographic traditions in east Asian maps. Honolulu: University of Hawaii Press. 136 p. $50.00 CDN. ISBN: 9780824847654.

Robinson, Enders A. and Dean Clark. 2014. Remote sensing in action: the curious case of Sherlock Holmes and Albert Einstein. Tulsa, OK: Society of Exploration Geophysicists. 360 p. $99.00 USD. ISBN: 9781560803133.

Treur, Anton. 2014. Atlas of Indian Nations. Washington, DC: National Geographic Society. 320 p. $46.00 CDN. ISBN: 9781426211607.

NEW MAPS

Compiled by Cheryl Woods

Tibet: Township Map & Place Name Index
Scale: 1:1,900,000
Publisher: Tsering Wangyal Shawa
Year of Publication: 2014

Morocco
Scale: 1:1,000,000
Publisher: Michelin
Year of Publication: 2014

Miami metro city map
Scale: NA
Publisher: Rand McNally
Year of Publication: 2014

Kaui travel map
Scale: 1:85,000
Publisher: Phears Maps
Year of Publication: 2014

Maui travel map
Scale: 1:110,000
Publisher: Phears Maps
Year of Publication: 2014

Oahu travel map
Scale: 1:110,000
Publisher: Phears Maps
Year of Publication: 2014

Hawaii (The Big Island) travel map
Scale: 1:233,500
Publisher: Phears Maps
Year of Publication: 2014

Thailand, 9th ed.
Scale: 1:1,500,000
Publisher: Borch Map
Year of Publication: 2015

New Zealand, 9th ed.
Scale: 1:1,300,000
Publisher: Borch Map
Year of Publication: 2015

Las Vegas, 12th ed.
Scale: 1:20,000
Publisher: Borch Map
Year of Publication: 2015

Seattle, 10th, ed.
Scale: 1:10,000
Publisher: Borch Map
Year of Publication: 2015

Venice, 16th ed.
Scale: 1:6,500
Publisher: Borch Map
Year of Publication: 2015

Tuscany, 11th ed.
Scale: 1:400,000
Publisher: Borch Map
Year of Publication: 2014

Virgin Islands, 5th ed.
Scale: 1:80,000
Publisher: Borch Map
Year of Publication: 2014

Ireland, 18th ed.
Scale: 1:700,000
Publisher: Borch Map
Year of Publication: 2014

Eesti [Estonia] road map
Scale: 1:500,000
Publisher: Jana Seta
Year of Publication: 2014

Lietuva [Lithuania] road map
Scale: 1:500,000
Publisher: Jana Seta
Year of Publication: 2014

General Map of the Petroleum Industry of Iran, 4th ed.
Scale: 1:1,650,000
Publisher: Iran Oil Gas
Year of Publication: 2014

Spain and Portugal, Map 734
Scale: 1:1,000,000
Publisher: Michelin
Year of Publication: 2014

Europe road map
Scale: 1:5,000,000
Publisher: HarperCollins
Year of Publication: 2014

Scotland road map
Scale: 1:550,000
Publisher: HarperCollins
Year of Publication: 2015

Chart C12: Eastern English Channel
Scale: 1:300,000
Publisher: Imray, Laurie, Norie & Wilson Ltd.
Year of Publication: 2014

Chart C10: Western English Channel Passage
Scale: 1:400,000
Publisher: Imray, Laurie, Norie & Wilson Ltd.
Year of Publication: 2014

Chart G121: Inland Sea – Ionian
Scale: 1:95,000
Publisher: Imray, Laurie, Norie & Wilson Ltd.
Year of Publication: 2014

Countries of the Mediterranean
Scale: 1:6,957,000
Publisher: National Geographic Society
Year of Publication: 2014

South Africa
Scale: 1:3,044,000
Publisher: National Geographic Society
Year of Publication: 2014

Pacific Crest Trail
Scale: 1:700,000
Publisher: National Geographic Society
Year of Publication: 2014

Namibia-Botswana
Scale: 1:1,500,000
Publisher: Nelles Verlag
Year of Publication: 2015

Afghanistan
Scale: 1:1,500,000
Publisher: Nelles Verlag
Year of Publication: 2014

Central America
Scale: 1:1,750,000
Publisher: Nelles Verlag
Year of Publication: 2014

Myanmar-Burma
Scale: 1:1,500,000
Publisher: Nelles Verlag
Year of Publication: 2014

Tanzania-Rwanda-Burundi
Scale: 1:1,500,000
Publisher: Nelles Verlag
Year of Publication: 2014

Israel, Palestine
Scale: 1:250,000
Publisher: Reise Know-How Verlag
Year of Publication: 2014

Uganda
Scale: 1:600,000
Publisher: Reise Know-How Verlag
Year of Publication: 2014

Brazil
Scale: 1:3,850,000
Publisher: Reise Know-How Verlag
Year of Publication: 2014

Oman
Scale: NA
Publisher: Reise Know-How Verlag
Year of Publication: 2014

GIS TRENDS

ON THE MAP : THE MAP TREND LOCATOR

Courtney Lundrigan
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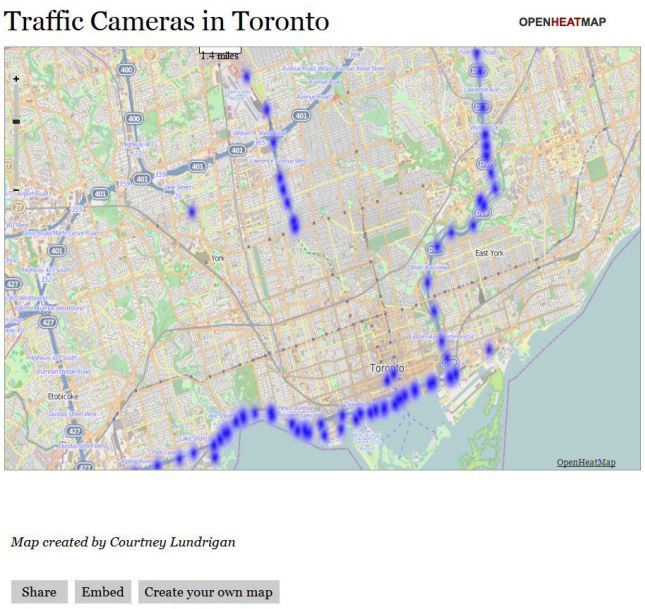
OpenHeatMap
http://www.openheatmap.com/

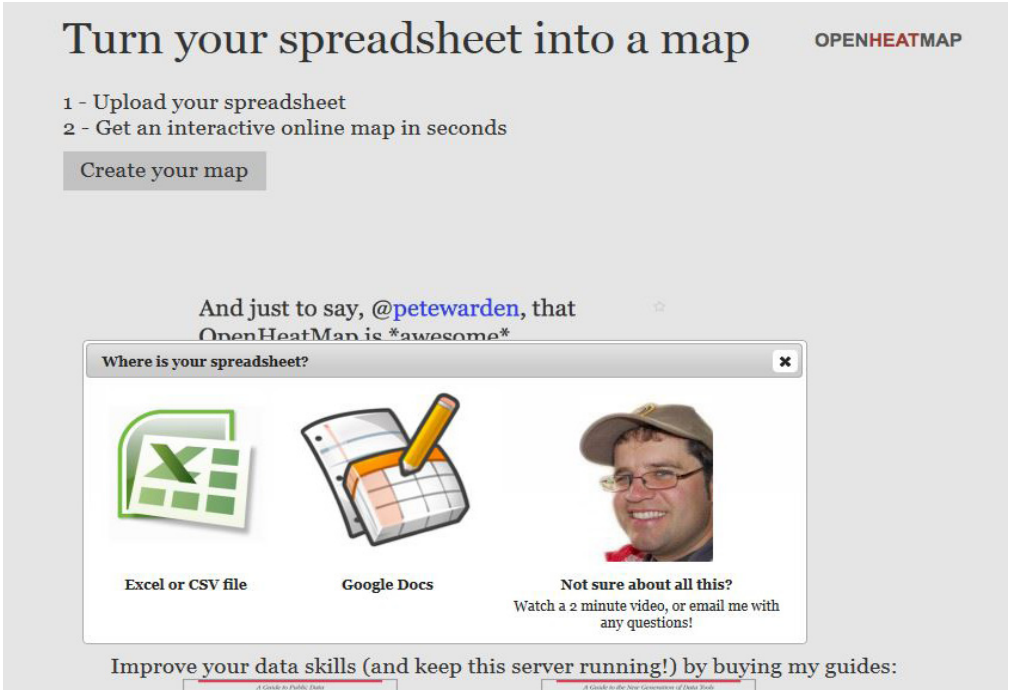
About

OpenHeatMap is a web-based mapping tool that allows users to generate maps instantly with no GIS knowledge required. It creates the maps from spreadsheets (both Excel and Google spreadsheets are accepted), and users can customize their map and embed or share it. Creator Pete Warden says that OpenHeatMap is "a bit like YouTube for geographic visualizations."



Scope

There are no limitations to the subject matter and time periods covered in OpenHeatMap. If the uploaded spreadsheet contains some location information in one of the many accepted value formats, OpenHeatMap will display it on a map.



Strengths
• It generates maps instantly with a single click
• There are many location names and values accepted

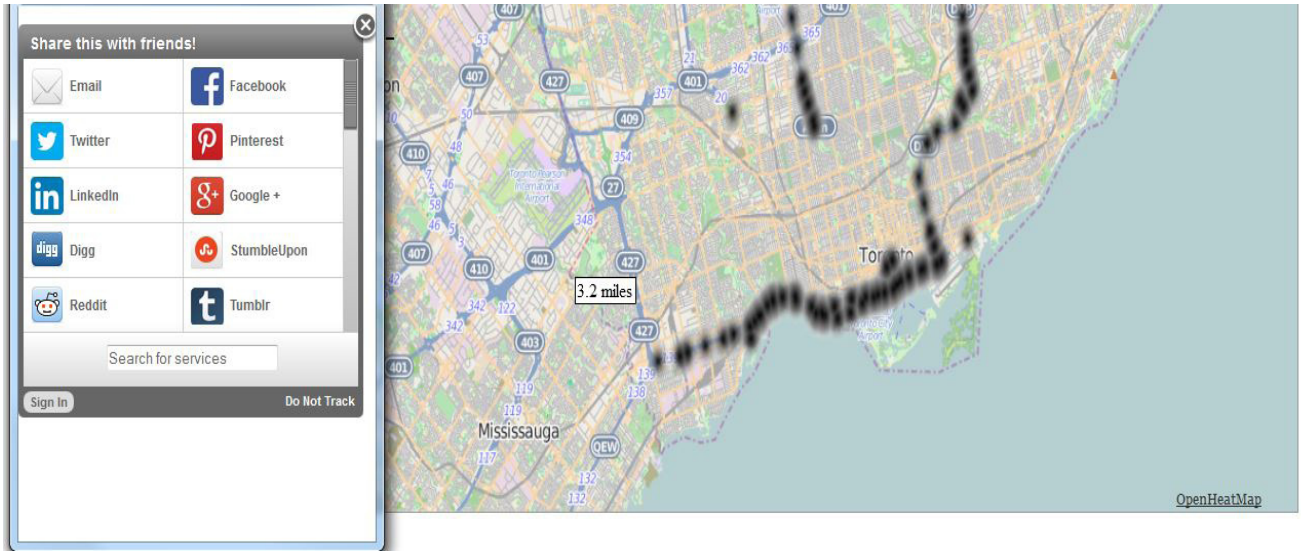
Limitations
• It only accepts spreadsheets

Features
• It has the ability to animate maps by adding a 'time' column to the spreadsheet
• Colour customization available
• A few options to customize markers, including adding images as markers

Connected?
Yes

There is an option for users to embed their maps. They can also be shared via email and on the following social networks:
• Facebook • Twitter
• Pinterest • LinkedIn
• Google + • Digg
• Reddit • Stumble Upon
• Tumblr

Recommended for Users?
Yes, especially beginners and non-specialists. For beginner users with no prior GIS knowledge, OpenHeatMap is a useful tool to visualize spreadsheet data.



From the Editor:
This is Courtney Lundrigan's last *GIS Trends* column. On behalf of all ACMLA *Bulletin* staff and readers, I would like sincerely thank Courtney for developing this column and for contributing such timely content every issue! If anybody is interested in taking over this column, please contact Eva Dodsworth

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This list represents the current membership as of November 10, 2014. An asterisk (*) indicates a new members in 2014

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