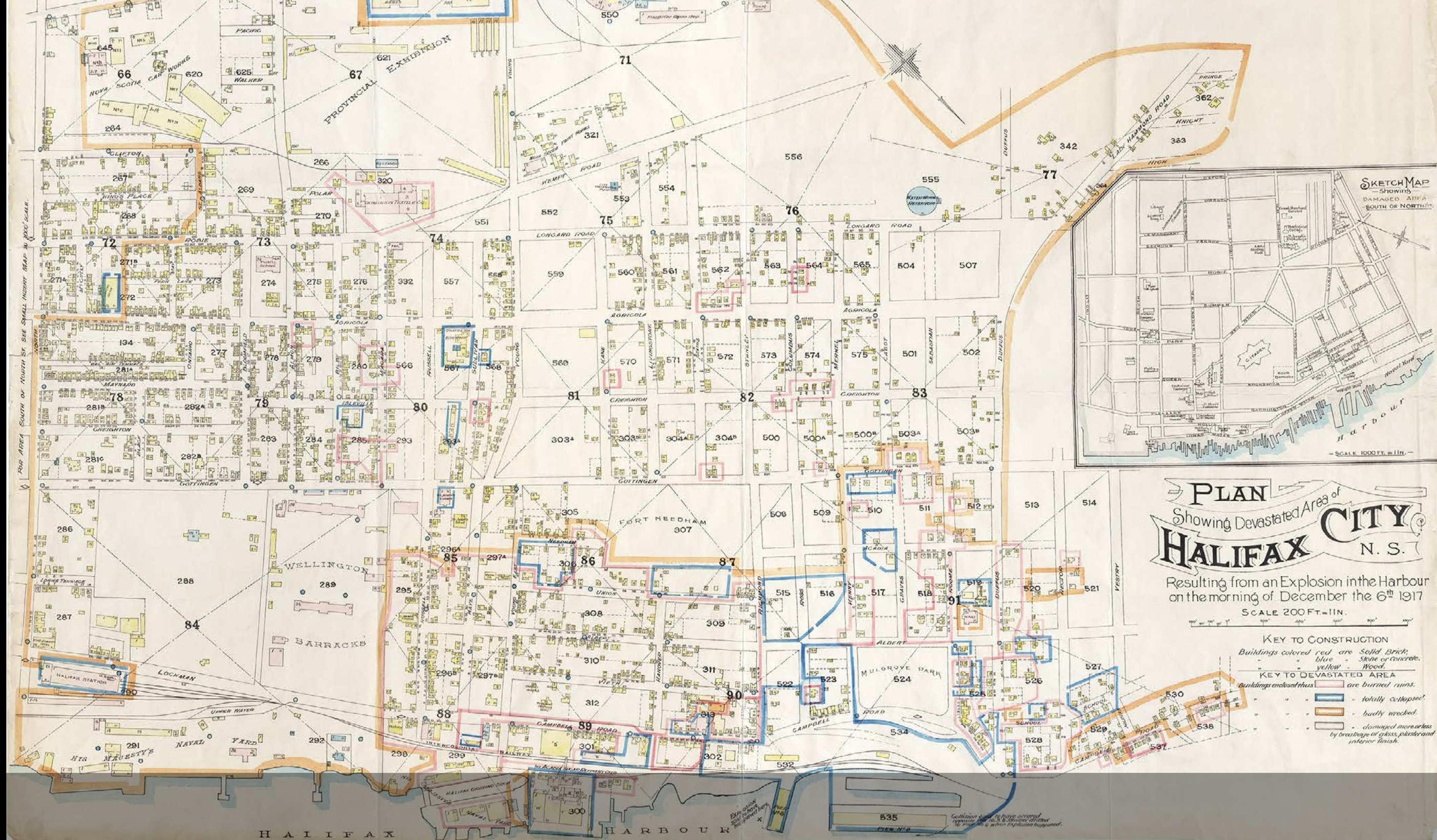


Layers



A Dalhousie newsletter about GIS & Data



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IN THIS ISSUE



Enhancing the Impact of the Halifax Explosion with 3D Mapping

The Dalhousie Libraries' GIS Centre invites you to explore the geography of Halifax's past with their recreation of historic images in 2- and 3-D to mark 100 years since the Halifax Explosion.

Curated by James Boxall, the exhibit in the Dalhousie Art Gallery, *From 2D to 3D: Mapping Halifax Over Time*, allows you to view streets, buildings, and other topographic features depicting the north-end of Halifax after the explosion on December 6, 1917.

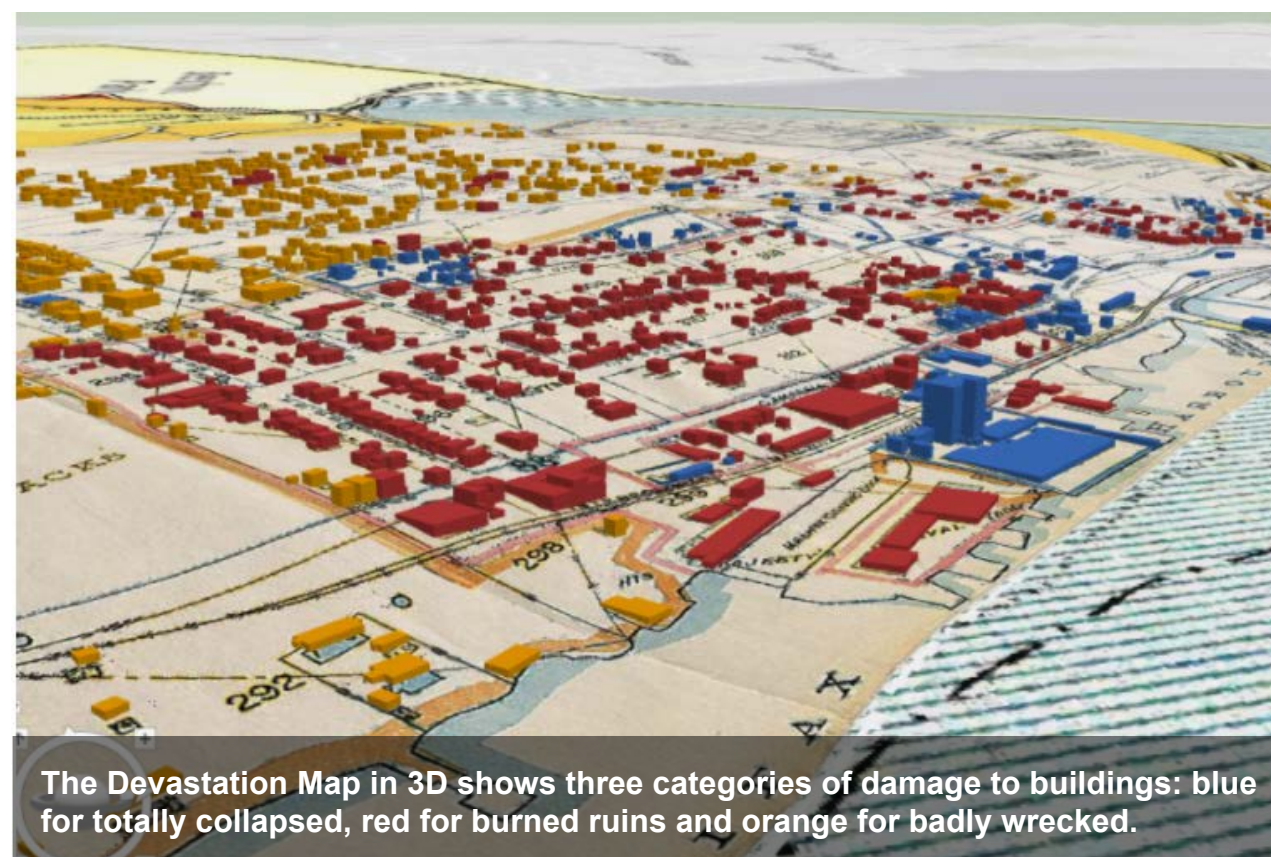
The three dimensional image of the Halifax Explosion site was created using the original fire insurance plans from 1914. These were reformatted in ArcGIS to create building and road footprints. The maps were then 'joined' to the 'real' world, forming a database which included street addresses and building heights. The time to generate new data from the original map was two months of painstaking work by student interns Cam Robertson (MPLAN) and Shanni Bale (MREM).

The structures were then georeferenced and attached to the Devastation Map (cover image), where the outlines of buildings that were either totally or partially destroyed could be seen. Once the maps were joined into one database, the GIS Centre was able to use building heights and locations to match with the full digital elevation model (DEM) which uses bare earth altitude from LiDAR Data (light detection/lasers from aircraft surveys). That gave the GIS Centre a 3D form to attach all data sources.

Other researchers added data which expanded the benefits of what was being created within the GIS Centre (e.g. information related to the Halifax Explosion Relief Commission). This project was also the GIS Centre's first Historical GIS under the rubric of providing information and data access, and knowledge translation within digital scholarship, so adding other users/creators was a welcomed outcome.

Additionally, the project gave students the opportunity to test new software and data formats along with historical images, maps and recreated data. At completion, the students involved saw this effort as the beginning of a historic atlas framework for Halifax.

From now until December 17, 2017, this map visualization can be seen in the Dalhousie Art Gallery from 11 a.m.-5 p.m. Tuesday-Friday, and noon-5 p.m. on Saturday and Sunday.



The Devastation Map in 3D shows three categories of damage to buildings: blue for totally collapsed, red for burned ruins and orange for badly wrecked.

Dalhousie Spatial Community Welcomes New Faculty

Dr. Brandon Heung
*Assistant Professor,
Geospatial Informatics & Soil Science
Faculty of Agriculture*



Brandon is a soil scientist with a passion for solving geospatial problems. He received his PhD from the Department of Geography at Simon Fraser University where his dissertation proposed a suite of machine-learning techniques to produce regional-scale digital soil maps for Southern British Columbia.

Brandon is a member of the Canadian Digital Soil Mapping Working Group. His research interests are in the field of digital soil mapping (DSM) – which he describes as being the intersection of GIS, spatial analysis, and soil science. He has collaborated with Agriculture and Agri-Food Canada (AAFC) to produce provincial-scale DSMs and has helped develop DSM approaches for an enhanced forest resource inventory in Ontario. He is now looking forward to bringing his DSM skills to Atlantic Canada.

Dr. Amy Mui
*Instructor,
Environmental Science Program
Faculty of Science*

Amy is a conservation biologist using remote sensing, GIS, and spatial analytical methods to examine critical habitat and connectivity for wildlife across disturbed landscapes. She earned her MSc from the University of Sydney studying dispersal patterns of juvenile wombats and her PhD from the University of Toronto examining changes in critical turtle habitat over time through satellite imagery and machine learning models.

Amy's passion for biodiversity and GIScience is being fulfilled through the development of a new field course which will use local green spaces as the classroom, bringing students closer to nature while also building skills in data visualization and spatial pattern analysis to support biodiversity research. She hopes to incorporate LiDAR-based processing modules into upper year courses and will continue to pursue opportunities for teaching, research, and collaboration in wildlife research.



Dr. Christopher Greene
*GIS Instructor & GIS Lab Manager
Earth Sciences Department
Faculty of Science*



Chris is interested in urban forest management and has used spatial analysis to predict the vulnerability of trees to insect pests. He received his PhD in Environmental Applied Science and Management from Ryerson University where he studied how past tree planting decisions within the City of Toronto made the trees more susceptible to an infestation of the emerald ash borer (*Agrilus planipennis*). He demonstrated on a regional scale that decisions about where and what tree species to plant have both short and long-term consequences for the future function and resilience of city trees.

Chris is happy to be returning to his home province and teaching core courses for the GIS Certificate in the Faculty of Science. His research uses geospatial tools and methods to examine the tradeoffs implicit to environmental decision making. He will focus on urban forestry as his primary area of study due to the strong ecological, social, and economic dimensions of urban trees.

Tips from Jen Strang for the GIS Community

Tech Corner

Did you know if you are a student, staff, or faculty member at Dalhousie you can download and use ArcGIS for educational purposes? We have a document to walk you through the process: https://cdn.dal.ca/content/dam/dalhousie/pdf/library/gis/InstallingArcGIS10_5AtHome.pdf

This could save you from having to spend many hours in a campus computer lab. The most common issue people have using ArcGIS at home is remembering to connect to VPN before starting the software (it is in the step-by-step document). Remember, ArcGIS can only be run on machines with a Windows operating system.

What happens if you leave Dalhousie but still want to keep your GIS skills fresh? You can check out the ArcGIS for Personal Use Program offered through Esri Canada, for a relatively low annual price: <https://esri.ca/en/products/arcgis-for-personal-use-program>. If you are on a really tight budget, you have a Mac without a windows emulator (like Bootcamp or VirtualBox), or you like to use open source software, then you may want to consider an open source GIS like QGIS: <http://www.qgis.org/en/site/> or Whitebox: <http://www.uoguelph.ca/~hydrogeo/Whitebox/>

Happy GIS'ing!

Datasets to Check out

We are planning on sharing a few datasets in every issue of *Layers*. If you know of any datasets that may be useful but not commonly known about, let us know and we will share it!

Remote Sensing Data – Sentinel-2 Data

<https://earthexplorer.usgs.gov/>
Multispectral bands (13 different bands) with resolutions from 10m to 60m. The data is freely available through the USGS Earth Explorer but you must have an account. The original data is from the European Space Agency. For more information: https://lta.cr.usgs.gov/sentinel_2

Nova Scotia Data – DataZone

<https://www.thedatazone.ca/browse/>
Data Catalogue from Property Valuation Service Corp with many datasets including Property sales, residential dwelling characteristics, and parcel sizes to name a few. Most are tabular datasets that have an X and Y coordinate that can be mapped.

Marine Data – Marine Regions

<http://www.marineregions.org/downloads.php>
Contains numerous marine boundary files (Exclusive Economic Zones (EEZ), FAO Fishing zones, ecoregions etc.) as well as other marine datasets. The datasets indicate original data source, known issues and other metadata.



Contact Jen: jennifer.strang@dal.ca
GIS Analyst

Tips from Julie Marcoux for the Data Community

Spotlight on ICPSR

Dalhousie subscribes to ICPSR, the Inter-university Consortium for Political and Social Research, which is a rich repository of social survey microdata. It contains a lot of American content, and also includes global and international datasets. Explore data from a variety of surveys such as the Chinese Household Income Project, the United States' National Health and Nutrition Examination Survey, or the Global Digital Activism Data Set.

To access some of the content hosted on ICPSR, you will first need to create an account.

<https://www.icpsr.umich.edu/icpsrweb/>

Tutorials

A new "Exercises, Tutorials, Learning Material" page about retrieving data in various interfaces (with a focus on Canadian data) has been shared on the Data for the Social Sciences research guide:

<http://dal.ca.libguides.com/data/tutorials>

Self-teaching files about Excel (everything from simple filtering to modifying macros in Visual Basic) are also available:

<http://dal.ca.libguides.com/data/excel>

Census Program Release Schedule

Looking for data from the 2016 Canadian census? Immigration, ethnocultural diversity, housing, and Aboriginal Peoples variables were released on October 25, 2017. Education, labour, journey to work, language of work, and mobility and migration variables were released on November 29, 2017.

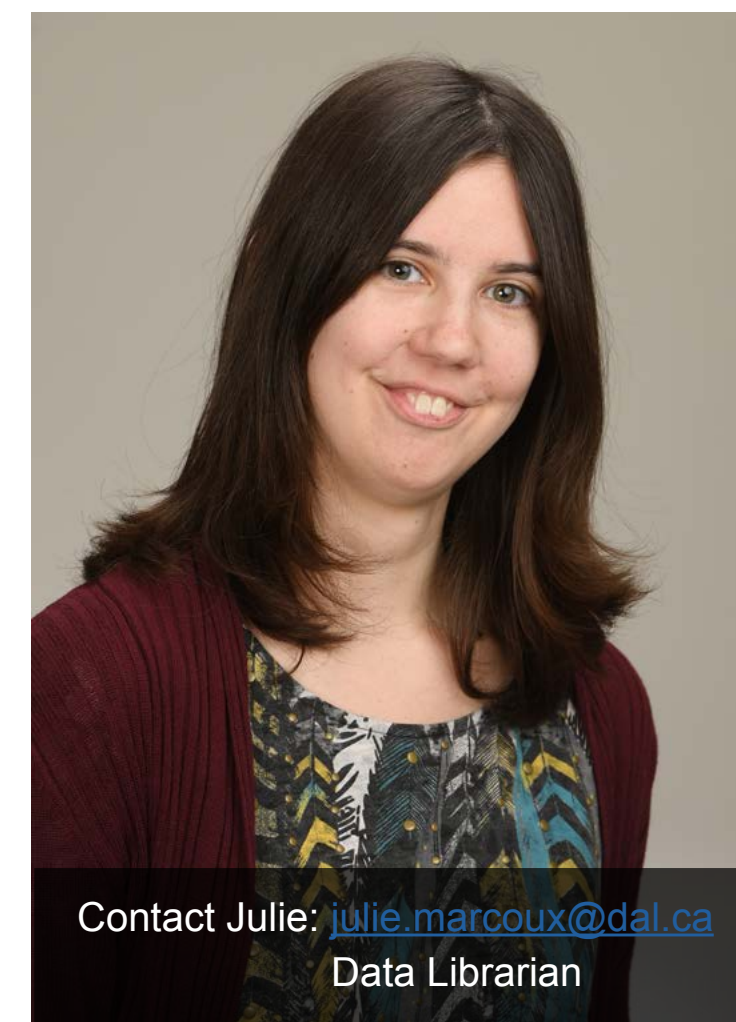
These variables and other census variables already released by Statistics Canada (income, language, families, age and gender, population counts) are accessible in the [census profiles](#) and [census tables](#) on Statistics Canada's website (www.statcan.gc.ca), and profile data is gradually being loaded into the Canadian Census Analyser.

<http://dal.ca.libguides.com/censusanalyser>

Canada & the World Statistics Hub

Statistics Canada has a new interactive viewer that highlights information related to Canada's economic and financial activity with other countries. The first release describes the trading relationship between Canada and the United States. Data is displayed using charts, graphs and tables for trade, investment, employment and travel.

<https://www.statcan.gc.ca/eng/stathub>



Contact Julie: julie.marcoux@dal.ca
Data Librarian

Opportunities to Participate

Strengthening Our GIS Curriculum

The GIS Centre will be hosting a discussion-oriented brainstorming session in December and we'd like you to participate. To give you some context for the discussion, here's what we're doing now:

- we offer courses that introduce GIS concepts and show how to use the software;
- we have a university-wide license that supports using ArcGIS for teaching, learning and research activities;
- we offer a GIS Certificate at the undergraduate level, within the Faculty of Science;
- we participate in an ESRI App Challenge, where students work in teams and have one week to produce a spatial app; and
- we sponsor a poster competition open to any student, where the prize for one or two winners is \$2,000.

These are all great opportunities and efforts, but can we do more to collaborate and push the use of spatial data and analytic software further than this? Could we offer a GIS Certificate at the graduate level? Should we include an opportunity to develop spatial programming skills? We will discuss these possibilities and whatever ideas you come with.

This event will take place in December — on a morning or afternoon — between December 6 and 15. If you want to participate, contact Gwen MacNairn, Coordinator of GIS & Data Services at g.macnairn@dal.ca

Once we have identified who is interested, we will set the specific date and time. All are welcome!

Using Postal Codes

Our next issue of *Layers* will explore the use of postal codes to support your spatial analysis. Are you already using postal codes, but have encountered some difficulties? Are you thinking about using postal codes in your analyses but don't know where to begin?

Do you know what the difference between the postal code conversion file (PCCF) and the postal code conversion file plus (PCCF+) is? Or how to effectively use the forward sortation areas (FSAs) and postal code conversion files?

Send us your comments, concerns and questions and we'll do our best to respond to them. Contact Gwen at (902)494-1320 or g.macnairn@dal.ca



Events

Ongoing/Upcoming

Halifax Explosion Exhibit
From 2D to 3D: Mapping Halifax Over Time,
October 11–December 17
Dalhousie Art Gallery



GIS Curriculum Symposium
December, in the GIS Centre,
Killam Memorial Library

Contact Gwen MacNairn, Coordinator of GIS & Data
Services at g.macnairn@dal.ca

Once we have identified who is interested, we'll set the
specific date and time. All are welcome!

Completed

GIS Lunchless Learn Sessions:

Intro: first encounters of the GIS kind

Data: so you want to make a map – where and how to find data

Raster: how to become a raster master

Carto: maps — the good, the bad, and the ugly

ArcGIS Online – GIS that's in the cloud(s)

This series of five workshops will run again in the fall of 2018.

ESRI Regional User Conference (in Halifax)

November 14–15

This conference will be held in Fredericton next year.

GIS & Data Day at the Agricultural Campus

November 21

GIS & Data staff travelled to the Agricultural Campus to give
workshops and presentations, as well as offer appointments to
those wanting to discuss the use of GIS and data in their courses and
research projects.

Find past issues of *Layers* [here](#)



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