ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

Going Global: GIS Day(s) 2020

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Introduction

GIS day events have been taking place around the world since 1999. As a GIS professional Liz has been participating in GIS Day planning for the past 8 years. Due mainly to the founding of the London GIS Working Group, the last 4 GIS Day events have been in the format of a drop-in, interactive open house. The in-person event features interactive displays from GIS companies, research groups and professionals. Learn more about the GIS Day Open House on Western University's 2019 event page.

In light of COVID-19, when Liz started brainstorming what GIS Day 2020 would look like, she couldn't bear the possibility of cancelling it altogether. GIS lends itself so well to the virtual environment, that she started to plan for an entirely online event. With the help of Veronica and Sarah, the planning process began. The most important, and ultimately most challenging aspect of the event was that we wanted to keep it open to everybody. A virtual open house. Because of this goal, we also wanted to encourage collaboration across Ontario and extend the invitation to join the planning group to members of the OCUL geo-community, bringing together our normally disparate GIS Day events into one, online, virtual conference. In this initial call, GIS Day(s) began to take shape, with over 30 volunteers from 8 institutions, and 47 presenters from 23 companies and institutions. The following are the institutions that made up the core of the planning team:

- Brock University Maps, Data and GIS / Digital Scholarship Lab
- Carleton University Library
- Queen's University Library
- Trent University Library and Archives, Maps, Data and Government Information Centre
- Bibliothèque de l'Université d'Ottawa | University of Ottawa Library
- University of Waterloo, Geospatial Centre
- Western University, Department of Geography and Environment

The expressions of interest we received from prospective presenters were awe-inspiring. Not only that, but the variety and breadth of the presentation topics were impressive. We had researchers from public history and digital humanities to engineering and the sciences; GIS professionals from new to the field to veterans of digital mapping; projects using open-source to commercially available software; and everything in between. One day didn't seem like enough time to highlight the breadth and scope of presenters and projects. Our 6 lightning talks from 2019, became the 33 lightning talks of 2020. Suddenly, GIS Day became GIS Day(s) – a mini-conference.

The Planning Process

Liz Sutherland, Sarah Woloschuk, and Veronica Berry constituted the core planning group for administrative decision-making and handling key logistics and deliverables. We also involved a larger planning group, with members from across Ontario, to cover panelist and volunteer roles for the event. We used this team to discuss promotion, onboarding, scheduling, ideas and brainstorming for the sessions, and outreach to other institutions (both academic and professional) in two main planning meetings leading up to the event. We assumed that during the pandemic people would already be operating at 100% capacity emotionally or otherwise; as a result, having the three of us taking on core responsibilities made sense to maximize the number of volunteers we'd receive. This also ensured a range of roles, from more involved, to less involved, so that volunteers could take part no matter their schedule. It also allowed us to make decisions quickly, smoothly, and efficiently and then communicate those out to others involved.

In our first planning meeting, we discussed options for format of the event and brainstormed ideas for promotion and outreach. The core planning team also shared our expectations of the group and the various volunteer roles that were available to members of the team. In our second planning meeting, we finalized the schedule; determined gaps so we could pitch a last-call for presentations; requested volunteers to fill various roles; introduced our moderator guide and lightning talks guide; finalized the budget; and launched our website. The larger planning group was essential in filling out our schedule, planning the themes and focuses of each session, and distributing the workload for running the event. The larger planning committee did an amazing job facilitating the sessions during the event, managing technological situations and troubleshooting, and ensuring that panelists were supported while giving their presentations. Meanwhile, our core planning trio made it our responsibility to keep track of all essential files, and to create and maintain any documentation related to the event.

In order to help the event run smoothly and support volunteers in their roles as host or moderator for the event, we created a Moderator's Guide. This guide included details about Zoom Webinar functionality, since we had purchased a license to use during the event above and beyond what Zoom Meetings could afford us. Zoom Webinar had a number of features which were different from Meetings, so the Moderator's Guide aimed to summarize these; highlight key features that hosts and moderators could use while facilitating each GIS Day(s) session; and outline specifics for each role, including checklists for before, during, and after each session as well as canned messages to read from or copy into the chat as needed.

The contents of the guide were planned, and then further refined and expanded based on feedback during some of the planning meetings to ensure that all content desired by the guide's users (volunteers for the event) was included. Once a final version of the guide existed, it was distributed to all volunteers. We hosted two training sessions for volunteers to attend, to outline what they could expect for the sessions they were hosting and moderating and to review the contents of the Moderator's Guide. The sessions also included live opportunities for testing out special features in Zoom Webinar, such as the Q&A window and promoting/demoting users to different roles.

Delivery

The event itself comprised of several different types of presentations and sessions. Short, 7-minute lightning talks, longer 20-minute demonstrations, and full 1-hour hands-on tutorials. We supported synchronous and asynchronous delivery methods while encouraging presenters to participate in

the live Q&A. Sessions were recorded with the permission of presenters, and are in the process of being edited for upload to Western University's Institutional Repository, Scholarship@Western.

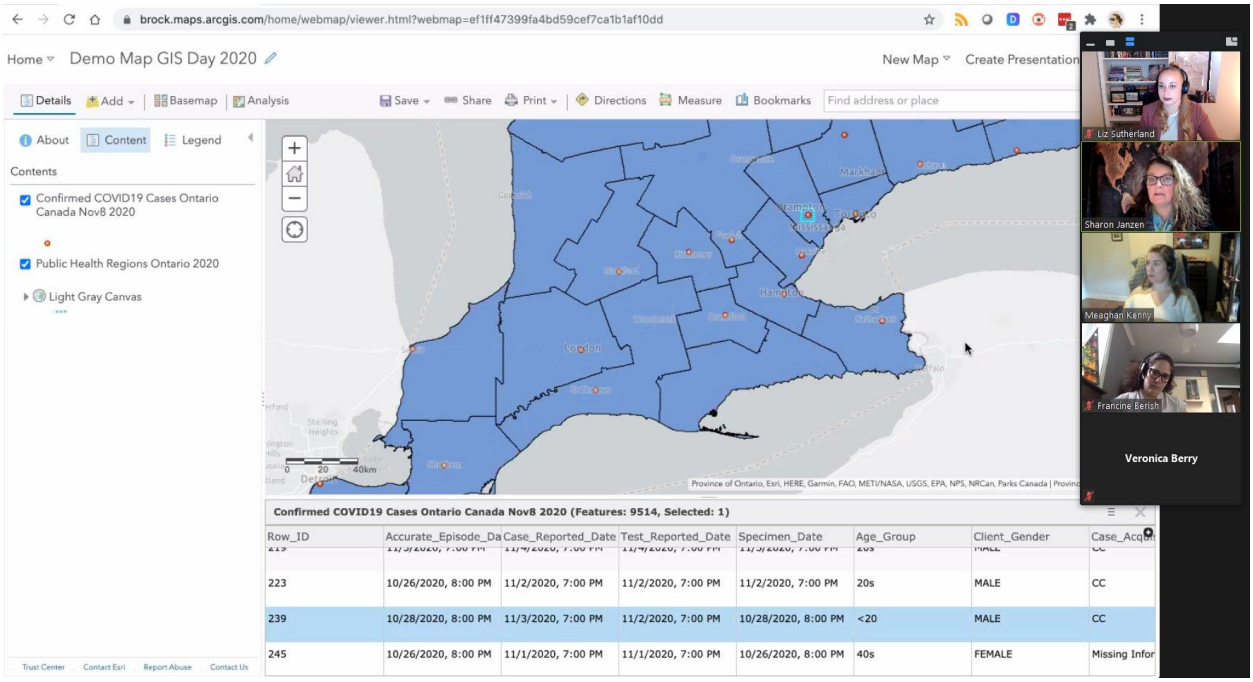

Figure 1. Sharon Janzen from Brock University Maps, Data and GIS / Digital Scholarship Lab presenting her tutorial "Introduction to ArcGIS Online (Classic)" mapping COVID-19 cases in Peel Region.

Session Summaries (from Presenter Dash)

GIS Day(s) included a total of 33 lightning talks, 2 networking sessions, 1 professional meeting, 2 tutorials, and 8 demonstrations (and one virtual geography-themed trivia evening). Details for all sessions are available in Appendix 2 and through the interactive program (built using ArcGIS Dashboards and Survey123). By popular vote from our feedback form, the top sessions were:

The Geography of Pokémon GO by Vivian Kong (Lightning Talk)

- This presentation will talk about the history of Pokémon GO and the different GIS processes that are used to create the widely successful augmented reality mobile game, as well as a brief discussion on the use of GIS in other video games. A live demonstration of Pokémon GO will also be presented (technology permitting).

Using Survey123 and Portal for ArcGIS to manage a large team for COVID-19 economic recovery research by Alexander (AJ) Wray (Lightning Talk)

- The Food Retail Environment Study for Health and Economic Resiliency (FRESHER) is tracking the impacts of COVID-19 on the retail food industry in Ontario, Canada. FRESHER involves mapping businesses that existed prior to the state of emergency announced in March 2020, and then tracking their operating status over the course of the

pandemic situation. To organize this 'big data' project, Survey123 and Portal for ArcGIS was deployed to manage a team of ~60 people. This lightning talk will provide an overview of the FRESHER mapping process, and lessons learned from our experiences over the past 6 months.

Employing the density and distribution of wild turkeys across Ontario by Jennifer Baici (Lightning Talk)

- I am using community-collected wild turkey observations and MaxEnt modelling to produce estimates of wild turkey density across Ontario. Wild turkey observations were collected using eBird and iNaturalist. In Ontario, turkeys are a reintroduced and harvested species. Thus, understanding current turkey densities and developing robust methodology to monitor population changes over time is essential in ensuring that wild turkeys continue to persist in Ontario, in sustainable numbers, for many years to come. I will highlight my use of eBird and iNaturalist, MaxEnt, ArcMap, and RStudio.

How a Kiwi surveyor ends up doing GIS in Scotland by Craig MacDonell (Lightning Talk)

- A brief insight into how a young Kiwi ends up working at a prestigious Scottish academic institution in GIS!! The presentation will cover numerous projects he has covered whilst working here, what he does on a day to day basis, some tips and tricks he has picked up both in Scotland and also New Zealand related to both teaching and research, as well as what he hopes to achieve going forward both personally and for his current institution.

Mapping the Loyalist Migration by Tim Compeau and Natalie Boros (Lightning Talk)

- Dr. Tim Compeau and Natalie Boros will discuss Loyalist Migrations, a SSHRC-funded partnership between the Huron Community History Centre, the United Empire Loyalist Association of Canada, and Western Library's Map and Data Centre. This project aims to visualize the migrations of thousands of individuals, free and enslaved, wealthy and poor, who left the United States during and after the American Revolution.

Getting Started with Story Maps by Catherine-Anne Currie (Demonstration)

- Story Maps is a software that is available to all Western Staff, Faculty and Students that combines narrative text, images, maps and media into an online web application! Story Maps can be used for a multitude of different purposes but it is a really great way to visualize any data that you have and allows you to tell a story with it! This demonstration will go over the basic functions of Story Maps to get you started with your first one!

Hidden Histories of Southwestern Ontario by Thomas Peace (Lightning Talk)

- History is about community. It is easier for some communities to share their histories than others. The Hidden Histories of Southwestern Ontario project aims to mitigate some of those challenges by using the tools of ArcGIS Online to tell a more diverse and complex history of our region.

The Northern Tornadoes Project - Mapping Canada's Tornadoes by Aaron Jaffe (Lightning Talk)

- The Northern Tornadoes Project is a collaboration between Western University, ImpactWX, and several other parties that aims to improve the detection, prediction, and mitigation of tornadoes across Canada. Many of the captured tornadoes are documented via interactive online maps in ArcGIS Online, with data collected from various sources, including Survey123.

Execution

GIS Day(s) saw attendees from around the world, volunteers from across Ontario and presenters from as far as Glasgow, Scotland and the Netherlands.

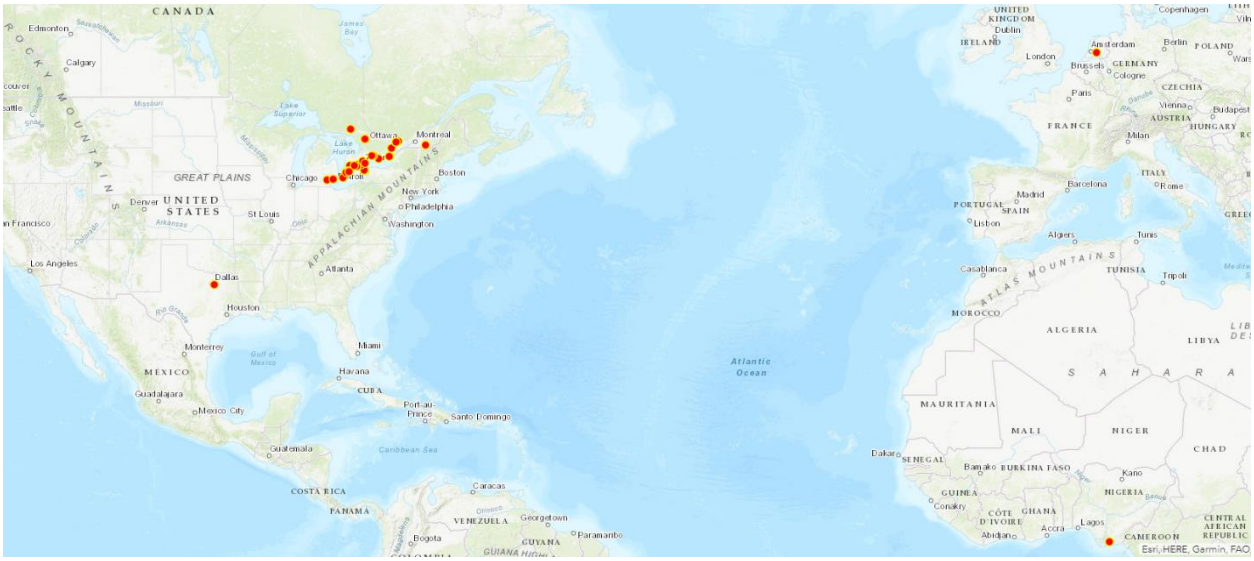

Figure 2. Distribution of responses received in the feedback form out of a total of 86 respondents, ranging from Nigeria to the Netherlands to Texas. This map was retrieved from the Esri Survey123 page for the feedback form.

Session attendance numbers ranged broadly across sessions and within the sessions themselves. Ranging from 9 attendees at the networking lunch, to 52 attendees at the GIS & Libraries Lightning Talk Session. The sense of community and collaboration during the sessions made it clear an event like this wasn't merely an extra webinar, but a way of connecting our disconnected world through GIS.

We turned to the attendees' insightful comments to assess the high points of our GIS Day(s) mini-conference. Through this assessment three consistent themes emerged from attendees' feedback. The first theme concerned the access to our conference. We found that attendees enjoyed the ease with which they could find the information for our conference, that the conference was free and that the sessions were open to all regardless of their experience (or lack thereof) with GIS. The second theme that emerged from attendees' feedback dealt with the variety of the sessions offered. Attendees enjoyed the range of topics as it gave them the chance to learn about many different areas of GIS in a short, bite-sized, presentation. Finally, the third theme was how easily the

attendees could comprehend and follow along with the presentations. This third theme emerged specifically in comments about the lightning talks as attendees understood the presentation even if they were not GIS practitioners. Below are some examples of comments we received from attendees:

- The sessions were really interactive and the 7-minute lightning sessions were my favourite part for sure!
- As someone not actively researching for a living I am very happy with these "Lightning" presentations. Succinct, pithy, and seeing everyone grin ear to ear at least once during their presentations is also heart warming to see. It can be very intimidating to someone outside academia to learn from professional scientists but there were only a few words I needed to google afterwards as opposed to what I had originally assumed might be entire presentations haha. Great Job everyone!
- I really liked the lightening talks that were informative on various topics and relatively simple to understand.

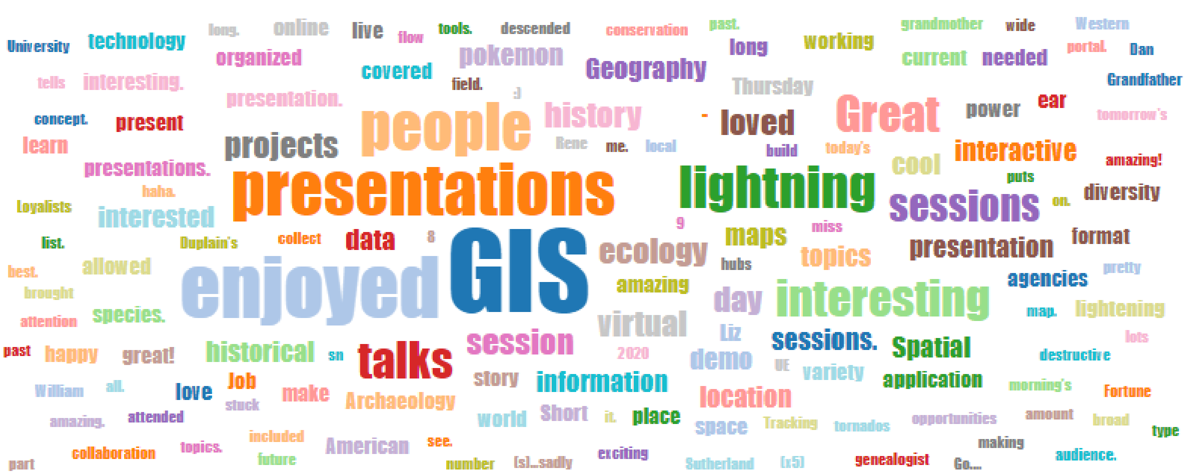

Figure 3. Word cloud built using Survey123 in answer to the question "What did you find most memorable about GIS Day(s) 2020?"

Several recommendations for virtual conference hosting emerged during our review of the event.

- Think about security, but don't let security limit accessibility to the conference.
  - Despite having open, public-facing links, and an 'everyone is welcome' policy, we only had one "zoom bomber". We suspect our success was partly due to the controls set up in advance to prevent these incidents from occurring.
- Think about using the Q&A feature but be aware of its limitations.
  - Although the Q&A function was a huge asset to using Zoom Webinar, it wasn't saved with the recordings, which meant we couldn't review questions asked during the discussion period.
  - We supported Q&A during the presentations, but participants tended to wait to the end of the presentations to ask their questions. Most likely, this tendency was due to many of them watching on a single monitor.

    - Having moderators for each session helped facilitate discussion.
- Test your technology in advance but be aware that even though you prepare things will still surprise you the day of.
    - For instance, we only had one license for the Webinar feature, and this meant that we could not start a new session without ending the previous one since the person with the license attended all sessions.
    - We also had to start broadcasting our webinar early in many cases in order to allow all panelists in.
    - That said, we would absolutely use Zoom's webinar feature again. It definitely simplified concerns around privacy, security, and virtual presentation logistics.

Summary

Who knows where the world will be by this time next year. Even if things 'return to normal' you can't deny the success of this years' GIS Day(s) and we think it's safe to say we'll be offering some combination of in-person and virtual next year.

We look forward to GIS Day each year. It gives members of the GIS community opportunities to share their knowledge, to discuss new possibilities and to generally nerd-out over digital mapping. The purpose? To share, delight and dazzle our audiences with the best and brightest of the GIS world. And isn't anything mapped, brighter anyway?

We look forward to seeing how we improve next year, please reach out if you'd like to get involved and a special thanks to all those that made this event possible. To Sarah and Veronica for helping Liz make the tough decisions. To the GIS Day(s) Planning Team, who stepped up from across Ontario to put this event turned mini-conference into a reality. To the presenters and attendees who brought top-notch presentations and discussions to each day of the event. As always, happy mapping!

Acknowledgements

Thank-you to all our event volunteers (many of whom also provided presentations!): Veronica Berry (Western University), Sarah Woloschuk (Western University), Meaghan Kenny (Carleton University), Sharon Janzen (Brock University), Jed Long (Western University), Rebecca Bartlett (Carleton University), Kathy Tang (Western University), Jinfei Wang (Western University), Amanda Oliver (Western university), René Duplain (University of Ottawa), Liz Hill (Western University), Jo Paterson (Western University), Francine Berish (Queens University), Kate Hodge (Trent University), Lyndsey Janzen (Western University), Sherri Sunstrum (Carleton University), Kara Handren (Scholars Portal), Tom Belton (Western University), Christine Moffat (Western University), Erin Johnson (Western University), Nina Nouwens (Western University), Joy Tigchelaar (Western University), Evans Batung (Western University), Sara Wilson (Western University), Sara Clarke (Western University)

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Authority), Terry Chapman (Upper Thames River Conservation Authority), Heather Peacock (Western University), Jack McIlraith (Western University), Natalie Boros (Huron University College), Tom Peace (Huron University College), Tim Compeau (Huron University College), Scott Smalley (Huron University College), Ben Harris (Huron University College), AJ Wray (Western University), Caroline Kayko (University of Michigan), Malcolm Little (Western University), Aaron Jaffe (Western University), Al Proulx (Simcoe County), Debbie Jenkins (Trent University), Jennifer Baici (Trent University), Graeme Smith (Trent University), Aiden Poole (Bluewater Power), Daniel Kpienbaareh (Western University), Jody Yu (Western University), Robin Kwik (Western University), Nolan Frew (Western University), Catherine-Anne Currie (Western University), Martin Chandler (McGill University), Amber Leahy (Scholars Portal), Jonathan Murphy (Go Geomatics), Dan Jakubek (Ryerson University), Zack Macdonald (Western University), Michael Leahy (Esri Canada), Tom Petrella (Western University), Eva Dodsworth (University of Waterloo), Markus Wieland (University of Waterloo), Chimira Andres (European Space Agency), Marikka Williams (Fleming College), Collin Branton (Upper Thames River Conservation Authority), Beth Wrona (Upper Thames River Conservation Authority), Philip Simm (Upper Thames River Conservation Authority), Roxanne Lafleur (University of Ottawa)

Liz Sutherland *is the GIS Specialist for Western Libraries. She holds a B.Sc. in Geographic Information Science (2016) from Western University and has led the planning of GIS Day for various organizations over the last 8 years. Her passion for GIS and digital mapping permeates her role at Western as she connects researchers to the data, software and expertise they need to incorporate GIS in their projects.*

Sarah Woloschuk *is Library Assistant to the Research and Scholarly Communications Team at Western Libraries! Holding an MLIS (2019) from Western University and her B. Ed (2015) from University of Saskatchewan, she was thrilled to assist with planning GIS Day(s) 2020. Some of her favourite maps include the map of the Old Kingdom from Garth Nix's "Abhorsen Chronicles" and the bathymetric depth map of Lake Superior hanging in her wife's apartment.*

Veronica Berry *is the Digital Preservation & Digital Collections Co-op Assistant at Western Libraries for the 2020 Summer and Fall terms. She has a B.A. in History from Carleton University (2019) and is currently completing her MLIS at Western University. She was entirely new to GIS prior to her co-op in May 2020 but through her experience assisting with digitally preserving GIS data in Scholars Portal's Permafrost service she's learned a lot! Her favourite map memory is flipping through an Ontario atlas to try and pass the time on long family car rides.*

Appendix 1: Notable Feedback

- Variety, shortness of talks and accessibility.
- Thursday morning's lightning talks were all amazing! As someone interested in conservation and GIS, it was really exciting to see all of the opportunities within the field.
- This was an amazing GIS day (s)...sadly, I will miss tomorrow's sessions. I descended from UE Loyalists and during the demo, I brought up the map. My great (x5) Grandfather William Fortune was included on that list. My grandmother, a genealogist would have have loved this interactive portal. All of the presentations I attended were amazing.
- The wide amount of topics. Allowed for lots of cool topics to be covered while not making it take too long.
- The sessions were really interactive and the 7-minute lightning sessions were my favourite part for sure!
- The quick rotation provided many cool talks on many different topics, kept the flow going but also gave enough time for people to present.
- Short lightning talk format was great! Very organized event. Spatial ecology block was very well done and interesting. Loved that there were representatives from many different organizations. Collector tutorial was very informative. I enjoyed the trivia.
- I really liked the lightening talks that were informative on various topics and relatively simple to understand.
- I really enjoyed the accessibility of the virtual sessions.
- I really enjoyed that on the Thursday 10:00 AM session, 8 of the 9 people on screen were women. It is great to see so much powerful female energy in science.
- I really appreciate the chances to see projects in motion, to see how people are really using this technology and these techniques in real world problems.
- I liked the fact that GIS Day was organized and did take place in this the 2020 year of Covid-19. Furthermore that the virtual disadvantage was flipped to sn advantage, extending the Day fourfold and expanding the space of the venue to the virtual 'world' space, bringing in people from further afield. Go Liz - Excellent Job!!!
- I enjoyed the format of the the presentations, the perfect length to allow the presentations to be engaging and long enough to get the basic information of the projects.
- Covid research struck me as so relevant for our current environment. Even when back to'normal' should continue to offer virtual sessions for those who can't attend local event and broaden participation.
- As someone not actively researching for a living I am very happy with these "Lightning" presentations. Succinct, pithy, and seeing everyone grin ear to ear at least once during their presentations is also heart warming to see. It can be very intimidating to someone outside academia to learn from professional scientists but there were only a few words I needed to google afterwards as opposed to what I had originally assumed might be entire presentations haha. Great Job everyone!

Appendix 2: Session Summaries

For information about the presenters, please review the interactive-map based program.

A Brief Introduction to QGIS by Martin Chandler (Demonstration)

ArcGIS is so powerful, why would we ever need to look at QGIS? In this demonstration, I will give a brief tour of QGIS, and show how it is just as powerful (if a little less reliable) as ArcGIS, and discuss why it's worth giving a bit of time to in both shorter and longer term learning and working.

Building an Open Data Site by Nolan Frew (Demonstration)

Learn the basics of building an open data site using ArcGIS Hub. With the Huron Community History Centre's Collaborative Mapping site as an example, this demonstration will cover how to tailor Hub templates to fit the purpose of your organization. We will also touch on the ArcGIS Hub interface, the embedding of Arc Experiences, and the integration of surveys built in Survey123.

Contribute to an Open-Source Web Mapping Project by Al Proulx (Lightning Talk)

You'll get a crash course and how to contribute to our open-source web mapping project on GitHub or simply use it to learn. It's built using React/OpenLayers/Geoserver. If you have zero experience, there will be resources on how to get you started. All software described is FREE for anybody. Visit opengis.simcoe.ca to see the live beta.

Creating a Richness-Risk Index for Conservation Prioritization by Heather Peacock (Lightning Talk)

Where should we focus conservation efforts? Where there are the most species or where species are most at risk? These do not always overlap, and focusing on areas with high total richness won't necessarily include species most at risk. Here I present a new richness-risk index, a composite measure of species richness and extinction risk, to better show global conservation priorities for primates. Using a combination of methods - google earth engine, r and ArcMap, I have mapped primate species richness-risk and highlight key areas to focus conservation efforts.

Data fusion approaches for studying geomagnetic navigation in migratory animals by Jed Long (Lightning Talk)

Many species of wildlife are believed to use the earths geomagnetic field to assist in navigation during migration. In this Lightning Talk, I will introduce a new tool we are developing to enable scientists to combine satellite-based measurements of the earths geomagnetic field with animal tracking data to answer new and exciting questions in movement ecology.

Data transformation and geo-location of historical Vernon directories by Eva Dodsworth & Markus Wieland (Demonstration)

This session will summarize the journey from printed historical text to a discoverable and mappable Leaflet project. Starting with 100 year old Vernon city directories, the speakers will share their project progress so far highlighting some of the conversion, geolocator and presentation tools used to develop the historical GIS product.

Delineating Top of Valley Slope on a Watershed Scale Using ArcGIS Pro by Beth Wrona **(**Lightning Talk)

Top of Valley Slope delineation using 3D capabilities in ArcGIS Pro for Development Regulation Boundary updates on a watershed scale.

Drones in libraries: the development of an interdisciplinary research service using drones and 3D modeling technologies at Ryerson University Library by Dan Jakubek **(**Demonstration)

At Ryerson University Library, we collaborate with researchers across a variety of disciplines that require capturing and modeling the real world in 3 dimensions (3D). To do so, several 3D reconstruction technologies have been applied, varying in cost and ease of use. Some applications require capturing large areas for which a Remotely Piloted Aircraft System (RPAS) or "drone" presents a cost effective option for data acquisition. On June 1, 2019, new rules for flying a RPAS in Canada came into effect, requiring drone pilot certification to operate any drone between 250 g and 25 kg. In response to new regulations and the needs of our researchers, the Library has initiated the development of a research service dedicated to supporting the use of drones and 3D modelling technologies. This presentation will highlight our progress to date and introduce future directions for our research and service.

Employing the density and distribution of wild turkeys across Ontario by Jennifer Baici (Lightning Talk)

I am using community-collected wild turkey observations and MaxEnt modelling to produce estimates of wild turkey density across Ontario. Wild turkey observations were collected using eBird and iNaturalist. In Ontario, turkeys are a reintroduced and harvested species. Thus, understanding current turkey densities and developing robust methodology to monitor population changes over time is essential in ensuring that wild turkeys continue to persist in Ontario, in sustainable numbers, for many years to come. I will highlight my use of eBird and iNaturalist, MaxEnt, ArcMap, and RStudio.

Estimating yield of household groundnut fields in rural smallholder farming systems and its implication for food security by Daniel Kpienbaareh (Lightning Talk)

The study used random forest regression analysis to predict groundnut yields based on yield data, in-situ leaf area index and vegetation indices. I used ArcGIS Pro and ArcMap for computing vegetation indices and creating yield prediction maps.

Follow me closely: Developing a plan for digital preservation of GIS data by Leanne Olson & Veronica Berry (Lightning Talk)

We hope you're ready for a digital preservation adventure! As with any journey we'll come across some dangers (oh no bit rot!) but don't fret. Leanne and Veronica have some digital preservation solutions that will help overcome these dangers. In this lightning talk, we'll cover three common challenges to keeping your data safe and how to plan for them. So pack your bags, follow us closely and get ready for our GIS-digital preservation exploration.

Geospatial Data Collection for Agriculture Research by Jody Yu (Lightning Talk)

As technology rapidly advances, agriculture research has shifted to make use of new geospatial data collection methods. Unmanned Aerial Vehicles (UAVs, a.k.a. drones) can provide cost-

effective, high spatial and temporal resolution data compared to traditional satellite or aerial-based platforms. This presentation will cover how UAVs can be used in the farms of the future - more resilient, higher quality crops at lower costs for people and the environment.

Getting Started with Story Maps by Catherine-Anne Currie (Demonstration)

Story Maps is a software that is available to all Western Staff, Faculty and Students that combines narrative text, images, maps and media into an online web application! Story Maps can be used for a multitude of different purposes but it is a really great way to visualize any data that you have and allows you to tell a story with it! This demonstration will go over the basic functions of Story Maps to get you started with your first one!

Girls Don't Go: A geospatial analysis of mobility in the Emergency Medicine Residency match by gender by Caroline Kayko (Lightning Talk)

This lightning talk will outline the Girls Don't Go project, using ArcMap to investigate factors that may influence how far a medical student in the United States will travel for their residency program.

GIS applications in Astronomy by Robin Kwik (Lightning Talk)

My presentation will explore similarities between geography and astronomy as well as applications of GIS/remote sensing in the field of astronomy. I will present on a particular method of georeferencing telescope imagery using SAOImageDS9, an astronomy-based software, and open-source QGIS.

GPS in GIS: Merging tracks into spatial objects for analysis by Malcolm Little (Lightning Talk)

Presentation will briefly delve into the integration of GPS-recorded data with spatial objects, and how to analyze the weighted objects using space-time pattern mining tools available in ESRI's ArcGIS Pro. Example using children volunteer's GPS tracks, and personal tracks of presenter in mall venue will be utilized.

Hidden Histories of Southwestern Ontario by Thomas Peace (Lightning Talk)

History is about community. It is easier for some communities to share their histories than others. The Hidden Histories of Southwestern Ontario project aims to mitigate some of those challenges by using the tools of ARCgis online to tell a more diverse and complex history of our region.

Historical GIS and Virtual Environments for Immersive Gamed Pedagogy by Zack MacDonald (Lightning Talk)

The Environments of Change SSHRC Partnership Grant brings together a multi-disciplinary team of scholars to study and recreate virtually the built and natural environments of late medieval England. This lightning talk highlights how our team has used Historic maps, remote sensing data, and GIS to analyze and reconstruct the historical environment around Herstmonceux Castle and the Pevensey Levels in East Sussex, England. To begin, it showcases the medieval, archival, and born-digital source materials that have been used to inform our reconstructions. It provides examples how these materials have informed the reconstruction of lost medieval structures, and landscape reconstructions. Finally, it provides a brief preview of the Augmented Reality game currently under development, and future project goals.

How a Kiwi surveyor ends up doing GIS in Scotland by Craig MacDonell (Lightning Talk)

A brief insight into how a young Kiwi ends up working at a prestigious Scottish academic institution in GIS!! The presentation will cover numerous projects he has covered whilst working here, what he does on a day to day basis, some tips and tricks he has picked up both in Scotland and also New Zealand related to both teaching and research, as well as what he hopes to achieve going forward both personally and for his current institution.

How to find your first Geospatial Job by Jonathan Murphy (Tutorial)

Jonathan Murphy, Canada's geospatial career coach will be sharing his experiences working as a GIS specialist and geomatics manager in Canada and abroad. Some of the projects Jonathan has worked on include crisis mapping for the Ebola response with the UN in Switzerland, wind and solar farms in Ontario, Oil & Gas in Alberta, and in Italy on archaeological projects such as mapping Rome. This special geospatial career talk only presented for the occasion of GIS day will cover topics of particular interest to students and new graduates. Jonathan has worked with some of the largest geomatics companies in Canada helping them find talented individuals so he will also be sharing his insights from the other side of the interview table. If you are interested in learning more about the geospatial job market in Canada and the best ways to find a dream job in GIS and remote sensing we hope you will join us for this special event.

Identifying suitable habitat and movement corridors for endangered salamanders on Pelee Island by Graeme Smith (Lightning Talk)

Habitat loss has caused a severe decline in amphibian populations globally. Pelee Island, Ontario is home to at-risk populations of Small-mouthed Salamanders (A. texanum) and Unisexual Ambystoma (Small-mouthed Salamander dependent population). We assessed salamander habitat suitability (using MaxEnt) and connectivity (using Circuitscape) across the island, working with the Spatial Analyst and Data Management toolkits to create and analyze rasters and shapefiles. The Linkage Mapper toolkit was also added to identify habitat corridors. Ultimately, we found that these populations are not well connected and there is a limited range of suitable habitat conditions. Based on these findings, the protection and enhancement of habitat to create dispersal corridors should be prioritized by conservation groups.

Insulin 100: Sir Frederick Banting by Scott Smalley (Lightning Talk)

My presentation is on my experience curating a digital exhibit that commemorates the life and times of the discoverer of Insulin, Sir Frederick Banting. This work has been a collaboration between the Huron Community History Centre and Defining Moments Canada, a Canadian heritage organization that commemorates moments in Canada's history. The exhibit has been built on the Arc GIS platform.

Introduction to ArcGIS Online (Classic) by Sharon Janzen (Tutorial)

Using the classic version of ArcGIS Online, we will explore the interface, access a few data sources, perform analysis, create some funky maps and set it all in motion using the presentation module of the website! It may be a lot to cram into a short 1-hour introductory tutorial but how long is a roller coaster ride? And don't you just love the thrill of it all? Attendees should have the equivalent of an Esri organizational account. Or sign up for a free Esri Developer's Subscription! No experience necessary.

Landscape connectivity among island-dwelling caribou by Debbie Jenkins (Lightning Talk)

Connectivity is important to the persistence of wildlife. It facilitates movement and geneflow, and is critical to the maintenance of genetic diversity and metapopulations. Yet, wildlife connectivity is increasingly threatened by environmental degradation. Opportunities to protect natural habitats and their linkages exist, but are quickly vanishing. Here, we evaluate the implications of natural and anthropogenic features on the genetics of Arctic Island caribou. A vagile and wide-ranging species, caribou are a meaningful test case to assess and map connectivity at broad spatial extents. In ArcGIS, Circuitscape and R, we use genetic fingerprinting and a suite of landscape variables to model the importance of sea ice, land cover, and topography to caribou geneflow. Ultimately, these results will permit species-specific mapping of habitat connectivity for this iconic Arctic species. As human interests advance north, the implications for conservation are profound.

Lidar DEM to contours...I'll just click this by Philip Simm (Lightning Talk)

This presentation will discuss some of the details about creating contours from a high-resolution DEM using ArcGIS.

Mapping the Loyalist Migration by Tim Compeau and Natalie Boros (Lightning Talk)

Dr. Tim Compeau and Natalie Boros will discuss Loyalist Migrations, a SSHRC-funded partnership between the Huron Community History Centre, the United Empire Loyalist Association of Canada, and Western Library's Map and Data Centre. This project aims to visualize the migrations of thousands of individuals, free and enslaved, wealthy and poor, who left the United States during and after the American Revolution.

Navigating the Scholars GeoPortal by Amber Leahey (Demonstration)

Scholars GeoPortal provides researchers across Ontario with access to a variety of local, provincial, and national geospatial datasets. The interactive map display allows users to search for data, preview data, and download data directly. In this presentation, I will highlight some of the ways you can navigate in the portal to find and use data for research and teaching. Scholars GeoPortal is open and accessible to anyone, affiliated Ontario researchers can login to access the full collection (http://geo.scholarsportal.info/).

Nitrate contamination in southern Ontario groundwater: using data mining and subsequent field sampling to inform catchment-scale biogeochemistry by Michael Schmidt (Lightning Talk)

My presentation will examine the use of ArcPro (ESRI GIS software) to integrate publicly-available datasets. Building on previous work, land-use/land-cover will be examined within a circular buffer about water wellheads. In this manner, relationships between groundwater geochemistry and surficial land uses can be examined.

Our Experience with ArcGIS Collector & Dashboard for Agricultural Windshield Surveys by Tom Dufour (Lightning Talk)

In support a water quality project requirement for windshield surveys of agricultural fields, GIS staff at ERCA looked to leverage ArcGIS Collector to replace traditional paper maps in the field. The successful experience working with Collector and ArcGIS Online will be outlined as well as the survey results which are being complied for visualization using ArcGIS Dashboards.

Randomizing GPS Tracking Trajectories to Model Social Structure in Feral Swine by Jack McIlraith (Lightning Talk)

Using GPS tracking, researchers can detect contacts between animals, which can be used to quantify and describe associations between animals in networks or graphs. However, animals may come in contact with each other for a variety of reasons, such as the distribution of resources, or social behaviour. From the GPS tracking data, we can develop null-model association networks to test for various reasons for association rates between individuals. Here, we randomize the GPS tracking data of individual feral swine by day, while preserving the within-day trajectories to generate null models where movement is still affected by the distribution of resources or barriers on the landscape, but synchronous movement is disrupted by the reordering of days. Using this method, we find evidence to support the existence of previously identified social groups, as well as unidentified social groups in the study population. We perform and present our analyses in R.

Reporting on the Demarest Rescue by Benjamin Harris (Lightning Talk)

This presentation focuses on the global news coverage of a rescue of a boy being kidnapped by a slaver in Chatham, Ontario. I will explain how the arc-GIS software helped in making a collection of random newspaper clippings into a easy to navigate resource, that I could link together as a story

Scaling Back: Mapping Restrictive Public Health Measures by Tom Petrella (Lightning Talk)

Our project aims to analyze the ways in which various jurisdictions across Canada and Ontario have responded to the COVID-19 pandemic and its subsequent impacts. Specifically, we are examining the legal, ethical and policy dimensions that must be considered when enacting restrictive public health measures such as physical distancing, stay home orders, and masks, among others. We hope to use GIS to make an interactive map and timeline of the measures identified above. With this data and timeline, our end goal is to analyze the legal, ethical, and policy dimensions that must be considered when "scaling back" We hope that this tool can inform public health decisions for future pandemic preparedness and response.

Story maps, web apps and mobile apps to safely deliver a field-based course during COVID-19 by Marikka WIlliams (Lightning Talk)

I will share how I utilized ArcGIS Story Maps, Web Apps and an ArcGIS Collector Mobile App to virtually prep for and safely deliver an in-person physically distanced Geomatics in Surveying Boot Camp during the COVID-19 pandemic.

The Geography of Pokémon GO by Vivian Kong (Lightning Talk)

This presentation will talk about the history of Pokémon GO and the different GIS processes that are used to create the widely successful augmented reality mobile game, as well as a brief discussion on the use of GIS in other video games. A live demonstration of Pokémon GO will also be presented (technology permitting)

The impact of climate change on Canadian archives by Amanda Oliver (Lightning Talk)

This study aims to identify Canadian archives that are at risk for climate change threats and to present a snapshot of current practices around disaster planning, sustainability, and climate adaptation. These objectives were achieved by analyzing the geographic locations of Canadian

archives in relation to projected climate data and by analyzing the results of a survey distributed to staff at Canadian archival repositories. All Canadian archives will be impacted by projected changes in both annual mean temperatures and precipitation to the year 2080. This research underscores the importance of developing climate adaptation strategies, considering the sustainability of archival professional practice, increasing the resilience of archival facilities and collections, and strengthening our disaster planning and recovery methods.

The Northern Tornadoes Project - Mapping Canada's Tornadoes by Aaron Jaffe (Lightning Talk)

The Northern Tornadoes Project is a collaboration between Western University, ImpactWX, and several other parties that aims to improve the detection, prediction, and mitigation of tornadoes across Canada. Many of the captured tornadoes are documented via interactive online maps in ArcGIS Online, with data collected from various sources, including Survey123.

Using GIS data to find and extract locations in historic texts by Rebecca Bartlett (Lightning Talk)

Researchers consulting Carleton University Library's Ottawa Resource Collection are often looking for information on specific locations such as neighbourhoods, buildings, or addresses. When the Collection began to be digitized, an opportunity arose to build a software tool to extract geographic locations within the City of Ottawa. The resulting tool outputs geospatial coordinates (points, lines, and polygons) for each found location, utilizing openly available GIS datasets to build a lexicon of locations to extract from the texts.

Using Lidar DTM for Hydrology by Collin Branton **(**Lightning Talk)

The presentation will highlight how a high-resolution digital terrain model (DTM) can significantly improve the delineation of watercourse lines, watershed boundaries, and help improve the accuracy of flood plain mapping. The work is primarily done using ArcGIS and the ArcHydro tools, with flood plain mapping using HEC-RAS and the Arc HEC-GeoRAS plugin.

Using Survey123 and Portal for ArcGIS to manage a large team for COVID-19 economic recovery research by Alexander (AJ) Wray (Lightning Talk)

The Food Retail Environment Study for Health and Economic Resiliency (FRESHER) is tracking the impacts of COVID-19 on the retail food industry in Ontario, Canada. FRESHER involves mapping businesses that existed prior to the state of emergency announced in March 2020, and then tracking their operating status over the course of the pandemic situation. To organize this 'big data' project, Survey123 and Portal for ArcGIS was deployed to manage a team of ~60 people. This lightning talk will provide an overview of the FRESHER mapping process, and lessons learned from our experiences over the past 6 months.

Utility GIS in action: Sarnia oversized load corridor by Aiden Poole (Lightning Talk)

The Oversized Load Corridor (OLC) is a designated protected route on existing roadways connecting fabricators to the Port of Sarnia for the unimpeded import/export and trans-shipment of oversized products to and from fabricators' locations and Sarnia-Lambton's industrial base. Bluewater Power's job is to clear a path that can accommodate a vessel that is 9m wide, 9m high and 45 m long over 26kms of roadway. My job is to capture the changes our engineers have made to accommodate this size in GIS. Using ArcFM & the OLC project, this lightning talk will show

you what a typical electrical GIS system looks like and how it is utilized. For more information on the OLC project please visit: www.sarnia.ca/oversized-load-corridor/

Utility of hyper-resolution Lidar as a tool for planetary geomorphology in the Canadian High Arctic by Chimira Andres (Lightning Talk)

Permafrost underlies 50% of the Canada's terrain and underlies 24% of the world land area. It is one of the major driving forces in the generation and evolution of patterned ground landforms (i.e. polygons, stone circles, mud boils, stripes, etc.) that are seen on both the surface of the Earth and other planetary bodies specifically in periglacial domains. The Canadian High Arctic, particularly Axel Heiberg Island (ᐅᒥᖕᒪᑦ ᓄᓈᑦ) and Devon Island (ᑕᓪᓗᕈᑎᑦ) are unique domains that host a variety of patterned ground landforms. Looking at these areas, we want to better understand the mechanisms and evolution of permafrost in the high arctic as well as quantify periglacial patterned ground geomorphology using GIS (i.e. KDE analysis, ArcGIS, CloudCompare). This research gives insight to periglacial landsystems and their significance not only for arctic and planetary analogue science, but also as a tool for hazard analysis and freshwater resources for communities in high arctic regions.

Where "To be, or not to be": 150 Years of Shakespeare in Ottawa by René Duplain & Roxanne Lafleur (Lightning Talk)

This talk will focus on the "Shakespeare in Ottawa: 1867-2017" project, a distinctive example of the application of GIS in the Digital Humanities. As part of this work, we produced an ArcGIS Online Story Map pinpointing the locations, by venue, where productions of Shakespeare plays were held in Ottawa over the span of 150 years since Confederation. Each entry provides an image of the venue, the date range and number of productions held there, as well as open access to more detailed data collected about the productions. The venues range by type, such as theatre, park, educational institution, and more. This endeavour was part of the greater "Shakespeare in Canada: A Cultural Map" project, which was directed by Dr. Irena R. Makaryk at the University of Ottawa, and is "intended to systematically record and subsequently analyse the presence of the Bard and the way in which his works have shaped -- and continue to shape -- Canadian culture."

You CAN Handle the Truth... and Reconciliation! Decolonizing your world with maps by Francine Berish (Lightning Talk)

This presentation will demonstrate the deeply embedded colonial biases in traditional mapping practices. Using indigenous examples, we will venture outside of the traditional western cartographic tradition to enable a deeper understanding of different indigenous worldviews.

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

My Protracted Stay in New Zealand 2019-2020; So Far!

Alberta Auringer Wood
Memorial University Libraries, Retired

I arrived in Wellington, NZ, on New Year's Eve, December 31, 2019. As I write it is now November 14, 2020. With me I brought a few winter things, but mostly warmer weather clothing, as I was arriving in mid-summer. The plan was to spend about 3 months with my daughter and her husband in Wadestown, a suburb of Wellington. It is very hilly in Wellington but it is a beautiful city clustered on hills around an enclosed harbour that has some reminiscence to St. John's. The steep streets mean the houses are often seemingly precariously perched on hillsides. Access to the house from the street involves about 70 paces of an uphill footpath plus about 20 steps to the front door. This type of access is quite common all over the city and some houses even have their own cable cars. The brilliant sun and views from their house are offset by the frequent strong wind, which is not unusual in this blustery city!

Among our adventures was taking a trip to Sydney, Australia, on March 1 along with my daughter and her husband. The main purpose of this visit was to see two maps of Newfoundland harbours drawn about 1763 by James Cook. One of these was of St. John's, where my family had lived for 28 years. Our house was on Ordnance Street, named for the location of the Ordnance Depot for Fort William, which was located roughly across the street from our house. I ran across this map in early 2019, unexpectedly, on page 90 as I was reading through a book called "Explorers' Sketchbooks: The Art of Discovery & Adventure," by Huw Lewis-Jones and Kari Herbert and published by Chronicle Books LLC in 2017. The map was not in my online bibliography nor in listings of maps by Captain Cook prepared by Andrew David, a noted English historian of cartography. It referenced the location of the map, and I was able to see a digital image online on the web site of the State Library of New South Wales in Sydney, Australia. This whetted my appetite to know more!

I corresponded with staff at the State Library of New South Wales (Figure 1) over several months, and eventually an appointment was made for me and my daughter to see these maps on March 3, 2020. These maps/plans had been included among materials about the South Pacific that were held by this library. It is still unclear to me how these maps came to be there. Julie Sweeten, a librarian, and Glenn Wells, a cataloguer, were the supervisors of our visit. *Figure 2* shows me looking at the maps while holding a Map Scale Indicator that the State Library owns. They were amazed and delighted to learn that my late husband, Clifford H. Wood, was the one who created the indicator and from whom they obtained it several years ago. It seemed to make them much more interested in the maps. When we left after jotting notes, making measurements, and taking photos, Glen planned to fully catalogue the maps, as it had not been done previously. I have just recently

received that information from him and plan to update The Newfoundland and Labrador Map Bibliography with it very soon. The bibliography is online at https://capelin.library.mun.ca/v/map.

Figure 1. Inside the State Library of New South Wales. Photo Credit: Jennifer G. Cauchi, 2020.

Figure 2. Alberta Auringer Wood at State Library of New South Wales, standing over a James Cook map holding a Map Scale Indicator.

Photo Credit: Jennifer G. Cauchi, 2020.

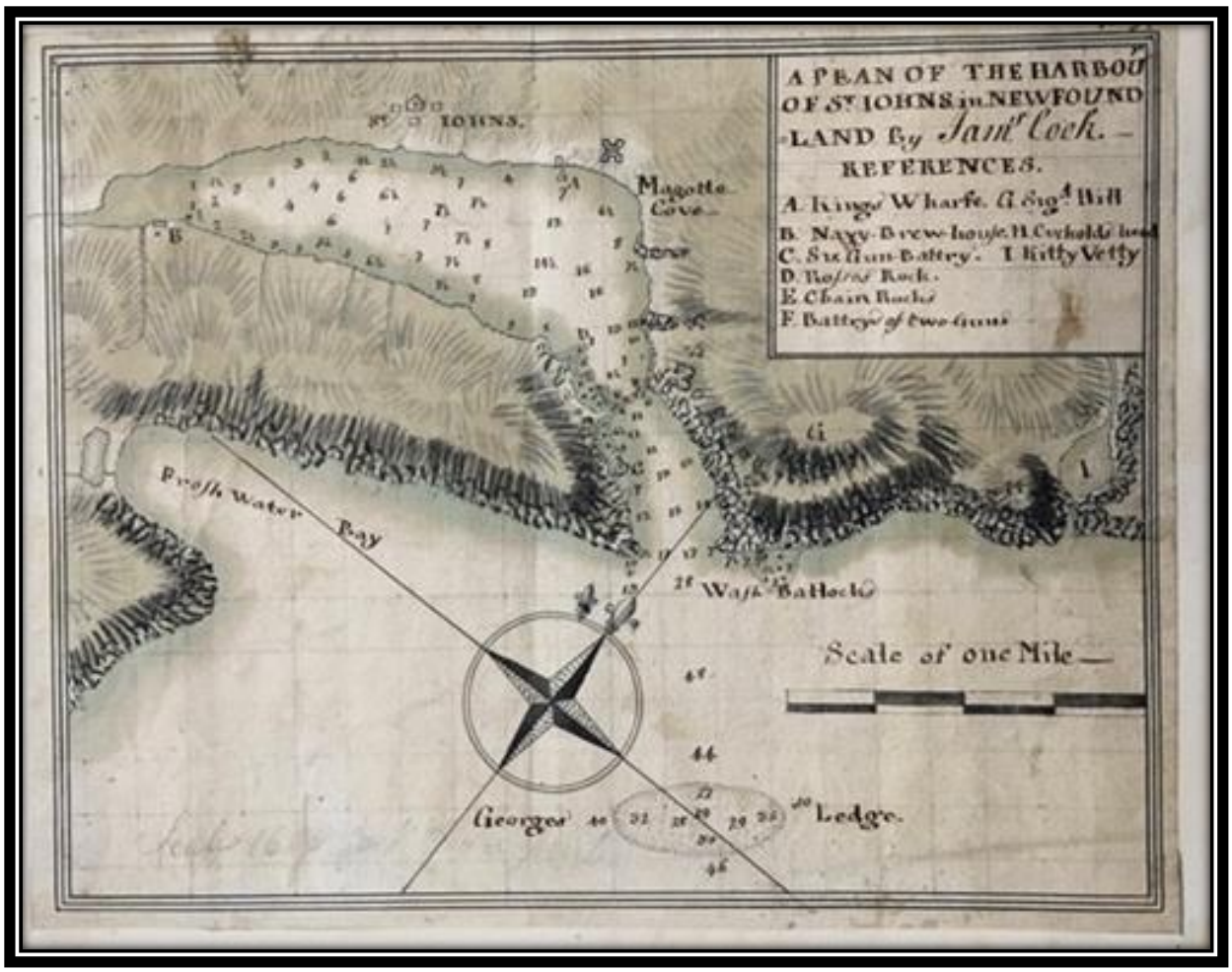
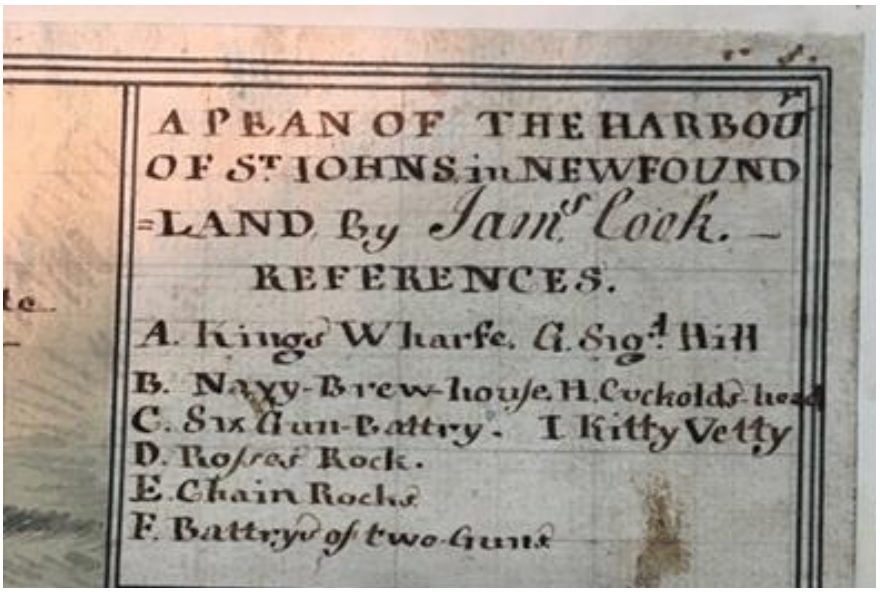


Figure 3. A Plan of the Harbour of St John's in Newfoundland, by James Cook (magnified section below). Photo Credit: Jennifer G. Cauchi, 2020.



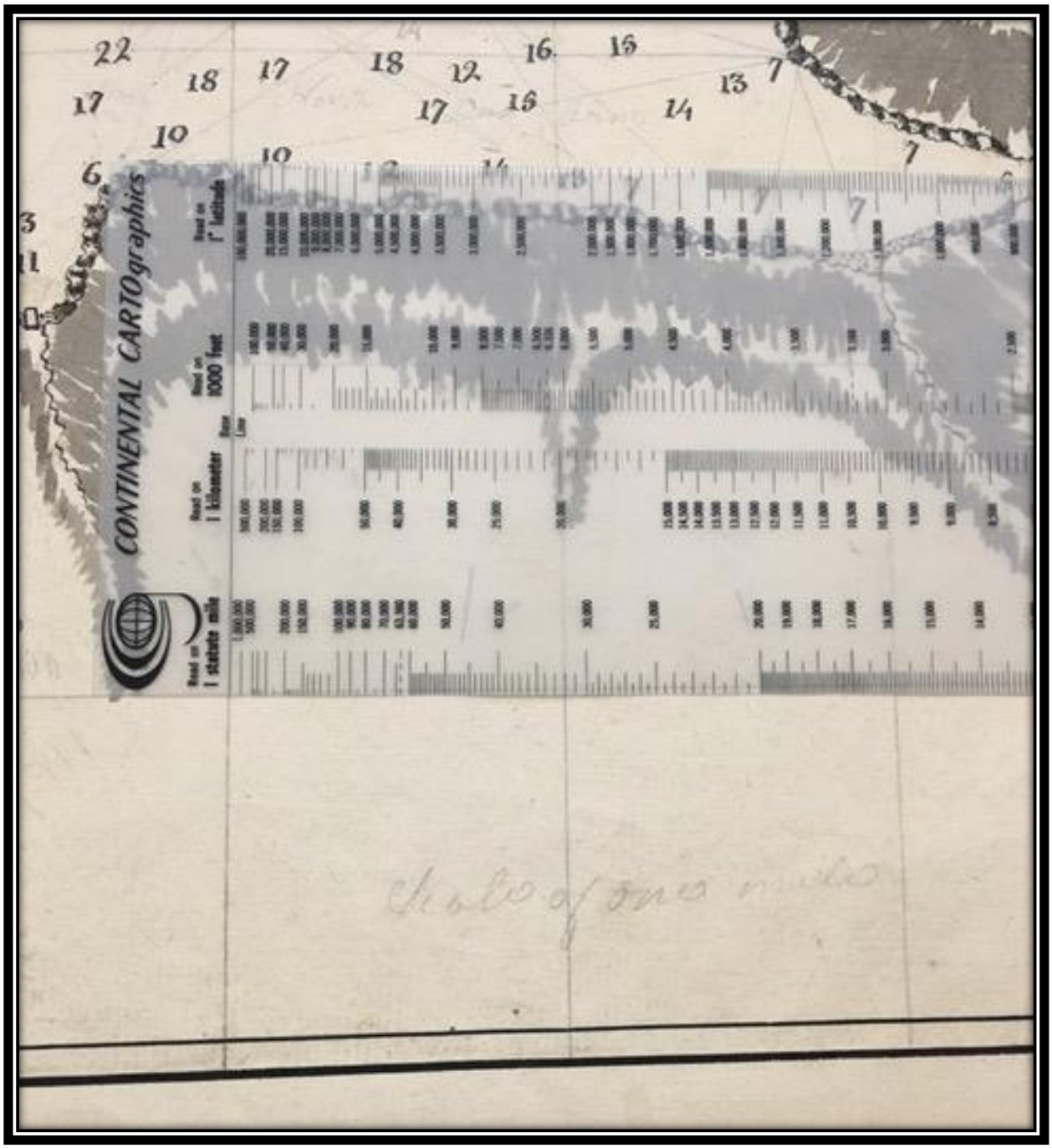


Figure 4. Map Scale Indicator in use. Photo Credit: Jennifer G. Cauchi, 2020.

After enjoying other scenic sites and sights of Sydney, we arrived home on March 6. Shortly after our return home, the Covid-19 lockdown occurred in New Zealand; maybe more in earnest than in other parts of the world. This meant my visitor visa was extended until September 25, and I was a Covid-19 refugee like many other travellers. During this time, my daughter and her husband worked from home, until control of the virus spread was more contained. We did not go anyplace without our masks during the Level 3 (some restrictions in place) and Level 4 Lockdown. I was able to take walks around our neighbourhood that involved some up and some down hills, with not much just on a level. Gradually, we reached Level 2 where most people could return to work and finally Level 1, where most activities were almost back to normal. While there have been several smaller outbreaks in Auckland that have resulted in some return to higher alert levels for that region, the government here has done an admirable job of working swiftly to close borders, while still supporting returning Kiwis with a network of managed isolation facilities in hotels, and encouraging everyone to use a contact tracing app as well as hygiene measures (masks, hand washing, and social distancing).

As of the end of November, 2020, the country is all at Level 1 now, and with some exceptions, no foreigners are allowed in as of this date. There have been a few minor new virus cases, which are all related to those who are in managed isolation. Fortunately we have been able to remain at Level 1, which means we can mostly live normally, and we don't take it for granted. The country was in full lockdown for about 6 weeks which did have a severe economic impact, especially on small businesses and the tourism industry. The government stepped in to provide a wage subsidy for those affected as well as other forms of economic assistance and there has been some positive rebounding already in some areas. However, tourism is still likely to be quite adversely affected for some time, even with Kiwis travelling and vacationing locally as much as possible.

I enjoy this country and Wellington: its climate, scenery, and people. I keep busy with reading, writing emails, taking walks, doing bus trips downtown, which is very walkable and vibrant. Since we've been able to (and I am very conscious how lucky we are to be able to do these things), I've been going regularly to movies and lunches with a next door neighbour, visiting with my son-in-law's family, staying in touch via video chats with family and friends in Port Huron and elsewhere, or going shopping or out to eat with my daughter and son-in-law. I've been working on puzzles (a 1594 double-hemisphere world map by Petrus Plancius is the current one), and doing some small things around the house, like trying to make friends with Bitta the resident Siamese cat. Time has flown by!

Alberta Auringer Wood Graduated from The University of Michigan with BA and MA degrees in Geography and MA in Library Science. Worked for more than 40 years in various libraries, primarily in a capacity related to maps, including over 27 years at Memorial University of Newfoundland. Member of various cartography and map library related associations including the now defunct American Congress on Surveying and Mapping (a Past President), the Canadian Cartographic Association (Honorary Member and a past Secretary) and ACMLA (a Past President). In addition to over 40 articles, co-editing of six books, writing numerous reviews and compiling many listings of new books and atlases, she is the author of four books and an ongoing carto bibliographic database.

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

Regional News

Compiled by Martin Chandler

Quebec

Université de Sherbrooke
Léon Robichaud

SCHEMA

Le numérique est une thématique transversale des activités de recherche et de mobilisation du Partenariat de recherche *Montréal, plaque tournante des échanges* et du Laboratoire d'histoire et de patrimoine de Montréal. Parallèlement à nos efforts visant à offrir une chronologie illustrée de Montréal, une bibliographie des études et une application de visualisation des environnements 3D, nous participons au tournant géospatial (spatial turn) qui anime présentement les sciences humaines. Principal outil utilisé dans cette approche, les systèmes d'information géographique (SIG) nous permettent de gérer, d'analyser et de visualiser les données. Le développement d'une plateforme en ligne s'imposait alors comme élément essentiel pour la gestion, l'analyse et le partage de nos données qui s'inscrivent dans l'espace montréalais.

En collaboration avec Mapgears, consultant en géomatique, nous avons mis sur pied **S**ystème de **C**artographie de l'**H**istoir**E** de **M**ontré**A**l (SCHEMA). Basé sur leur plateforme entreprise EVouala, SCHEMA nous permet de visualiser et d'héberger nos données historiques géospatialisées de manière sécurisée. En plus de créer des cartes et des applications interactives, notre plateforme nous permet d'éditer en temps réel et à traiter de manière collaborative nos jeux de données, nos cartes et nos applications. Il est aussi possible d'interroger ces données à partir d'une interface conviviale.

Depuis 2015, il nous est donc possible de cartographier et d'interroger de manière spatiale les données historiques associées à nos différents projets. Vous découvrirez dans ce portail certains de ces projets.

Le portail web des projets de SCHEMA, les cartes, les applications et les jeux de données des différents projets sont mis à la disposition du public selon les termes de la licence Creative Commons Attribution – Pas d'Utilisation Commerciale

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Ontario

University of Waterloo
Geospatial Centre
Eva Dodsworth

The Geospatial Centre continues to work remotely from home. Reference questions are answered via email and datasets are transferred using One Drive or WeTransfer. We have been receiving a lot of questions from faculty, requesting regional data as well a large interest in LiDAR data for the GTA. We have made a significant purchase of GTA LiDAR data this month.

We continue to get cartographic questions and thankfully we have scanned many of our significant collections in the years prior to COVID so we have not had the need to enter the building at all. Due to our remote model we no longer need our casual student staff who were used to assist with tier one questions. Instead we have been hiring co-op students to help us with reference and our project work. The main project continues to be geocoding historical city directories. Our geomatics co-op students have been working on the front and back end, using Leaflet to visualize the data. Major hurdles have slowed our progress down – namely discovering that addresses have shifted over the years. So what used to be 15 Park street in the 1930s is 35 Park street today. Because there is no published look-up chart for these changes, we are considering creating one for the City of Kitchener.

As one of the last institutions to make this move, the University of Waterloo IST department now offers and manages campus-wide Esri licenses. For the first time, students across all faculties can freely access ArcGIS software products. Until recently students had to purchase their copies from the book store. We are still learning how this affects ArcGIS Online subscriptions and subsequent credits.

On another note, our long-time staff member that many of you have likely met at conferences, Library Associate, Jon Morgan, is retiring at the end of December. Jon has worked in the Map Library and the Geospatial Centre for over 15 years, providing cartographic and GIS services. We wish Jon well in his future endeavours.

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

Geospatial Data and Software Reviews

Meg Miller
University of Manitoba

GitHub and Jekyll for Publishing GIS Workshop Content

Authors
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Abstract
In this article, we describe GitHub in simple terms and demonstrate its practical value as a platform for delivering workshop instruction. This article stems from a virtual pre-conference workshop we delivered at the 2020 annual meeting of the Western Association of Map Libraries (WAML). We describe an easily replicated workflow for publishing workshop materials and documentation to the web using GitHub Pages and provide a GitHub repository that readers of this article can copy and customize to suit their own workshop needs.

Introduction

Background
During the past year, virtual instruction has moved from being a nice, value-added service to an absolute essential function of most academic libraries. This shift has presented both challenges and opportunities to libraries that routinely deliver workshops on technical topics—including geographic information systems (GIS). In an environment where we are unable to deliver instruction and assist students in person, it is imperative that we provide quality documentation to our learners so they can accomplish workshop objectives with as little friction as possible. We must also recognize our virtual learners' desire to participate in workshops asynchronously and at their own pace. For these reasons, virtual workshop instructors should strive to provide simple-to-follow workshop documentation that exists in an easily-accessed, modular, reproducible, and stable online environment, such as a properly managed website.

Creating dedicated websites for workshop instruction may sound like overkill and intimidating—librarians are not often trained in web-development and might also encounter regular IT barriers for publishing documents online. There may also be concerns about the cost of publishing workshop content to the web. But there are excellent free and flexible options for hosting workshop

content on the web, including the version control and hosting platform GitHub. While many may think of GitHub as a website where developers publish and share computer code, it can in fact be used for a much wider range of things. For example, GitHub's file storing options make it advantageous for hosting static workshop webpages and data files. It also has several built-in project management features which can facilitate the development and management of workshop content across several collaborators.

Demystifying GitHub

With over 55 million users worldwide, GitHub is a popular website with users ranging from beginner coders to seasoned software developers. GitHub is essentially a community of users creating, maintaining and sharing code. GitHub is modelled on the free and open-source version control system Git, and from it borrows several terms and concepts used for creating, collaborating on, and documenting project-based work.

Git uses "repositories" to compartmentalize projects on a file system, and tracks changes to repository files as they are updated. When installed and used on a personal computer, for example, Git can work with file directories (or folders) containing data or to document files related to a project—once Git is initialized inside this directory it becomes a Git repository. When not using Git, files within the folder can be used and edited normally, however when files are changed or modified, Git can record the changes. Using Git, your repository preserves all earlier versions of the files stored in the folder. In the event that you make a mistake or accidentally delete a file, you can leverage the repository to revert back to an earlier iteration and retrieve past versions of your files. This is a basic concept of how Git is used as a version control system.

GitHub extends the functionality of Git by providing free cloud back-up and collaboration tools. Git users only need a free account on GitHub before they can "push" updates to the files from their local repository to a remote repository on GitHub. The owner of the remote repository can grant access to other GitHub users working on the same project, allowing for multiple "contributors" to a single project. Additionally, there are several other GitHub-based project management tools for working collaboratively which are covered below.

GitHub Features and Workflows

GitHub integrates several features and workflows which can be useful for creating and collaborating on content maintenance and development.

Forking and Cloning

Forking and Cloning are two main ways GitHub repositories can be duplicated. Forking someone else's repository will create a copy of it to be used as a foundation for your own work, on your own account (Figure 1). This method for copying a repository stays within the GitHub platform. Cloning a repository will copy an existing repository to a computer, which can be synced with your GitHub account. In either case, once a repository is forked or cloned, you own the copy and can work without disrupting the original.

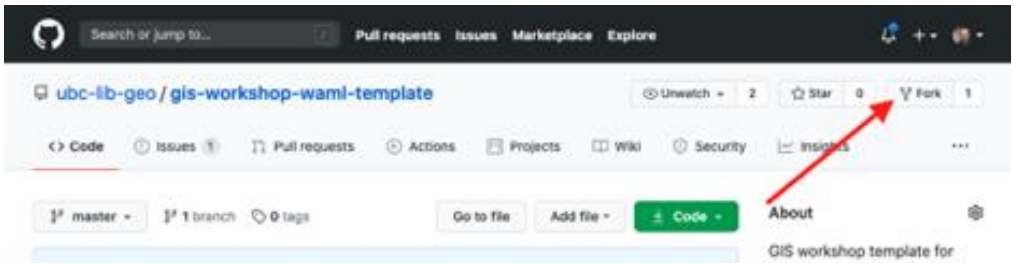

Figure 1. Forking allows one to copy a repository to their own GitHub account.

Pull Requests

A core feature of GitHub is its ability to create several "branches" of a single repository. Branches can be used by specific users to make changes to a workshop without disrupting the "main" production branch. Once work on a branch is completed, it is integrated to the "main" branch through a Pull Request. When submitting a Pull Request, the project owner is required to review work that has been done before accepting the changes.

Pull Requests can be submitted by users not belonging to the repository's collaborators. For example, workshop students can submit Pull Requests they think could be potential improvements to the workshop content. In this case the instructor would be notified of the request, and begin reviewing the improvement to determine if it should be integrated into the workshop.

GitHub Issues

GitHub's task tracking system is called Issues and is used for logging and managing work to be completed (Figure 2). Included in Issues are several "Labels" which can be applied to tasks so they can be organized and assigned, making it apparent what kind of work is in progress, good for beginners, part of a larger project, or considered future work.

Figure 1: GitHub Issues enable tasks to be logged and assigned to a user.

Issues can be logged by any project collaborator—making them a low-barrier entrance for staff or students hoping to learn more. For example, students hoping to learn more about GIS can be added as collaborators to a GIS workshop repository and review the workshop on their own, adding Issues for things that need updating due to changing software versions, improvements in clarity, spelling and grammar, etc. Issues also facilitate a way for assigning work to specific users collaborating on

a GitHub project, so work that is tagged as "good first issue" can be assigned to students or staff who might be less experienced with the subject.

Organizational Accounts

A GitHub Organization is a group of shared accounts that have adequate file permissions to work on several simultaneous projects, making them an option for library departments or units working together on publishing open workshop content. Organizations can have an unlimited number of user accounts and public repositories.

GitHub Pages & Jekyll

One of GitHub's most useful features for publishing open content is GitHub Pages. Pages publishes the content of a GitHub repository as a website by using HTML, CSS, and JavaScript files contained in the project. After updating a small number of GitHub Pages settings, your repository will be published as a public webpage with a standard URL (see Creating a GitHub Pages website). Only publicly viewable repositories can be published online. Public repository files can be viewed and downloaded, but not modified by outside collaborators unless it is approved through a Pull Request.

While one could use "hand coded" website files to create a GitHub Pages website, it can also be avoided by using Jekyll. Jekyll is a static website generator that transforms plain-text documents into web-ready files like HTML. Rather than using a complex markup language like HTML to structure and create web documents, Jekyll uses a simplified markup language called Markdown (Figure 3). Markdown syntax is very logical and easy to read, thus has a very low learning curve when used regularly. Additionally, there are numerous educational resources on the web for creating Markdown, or converting other documents like Excel tables and Word documents into Markdown. This means that GitHub Pages—which is powered by Jekyll—has the ability to create websites out of a collection of easy-to-create Markdown documents stored in a GitHub repository.

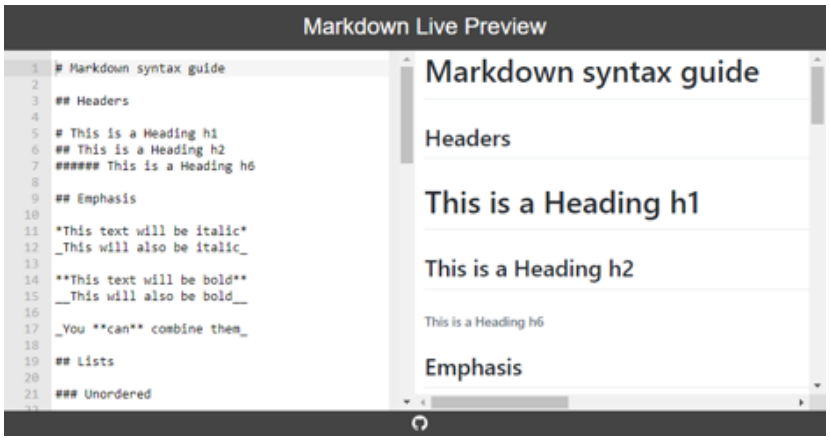

Figure 3. Raw Markdown (left) and its representation on a webpage (right) using markdownlivepreview.com.

Jekyll can also be stylistically and functionally customized by modifying or including several additional website files. However, extensive customization can be avoided through the use of a Jekyll website theme. Jekyll themes are packages of files that can be installed in a repository and used as a turn-key website for specific purposes and style—such as a blog, personal, or documentation website. The easiest method for selecting a theme for a GitHub Pages website is to use the GitHub Pages "Theme Chooser" which provides several basic styles for a website. However, you can also find several user-developed themes, or an openly licensed repository that is being used to generate a Jekyll website to copy and create your own.

Teaching GIS with GitHub and Jekyll Pages

In our example described below from the WAML pre-conference workshop, we provide a GitHub repository which can be used as a Jekyll theme template for delivering virtual GIS workshops. The template is built using the Just The Docs Jekyll theme, which presents a minimalist design and is ideal for focusing viewers on the instruction content. We encourage readers to visit the workshop repository and the GitHub Pages workshop website generated from the repository (Figure 4). We invite you to fork the repository to your own GitHub account and participate in the workshop asynchronously, or modify and adapt the template for your own instruction purposes.

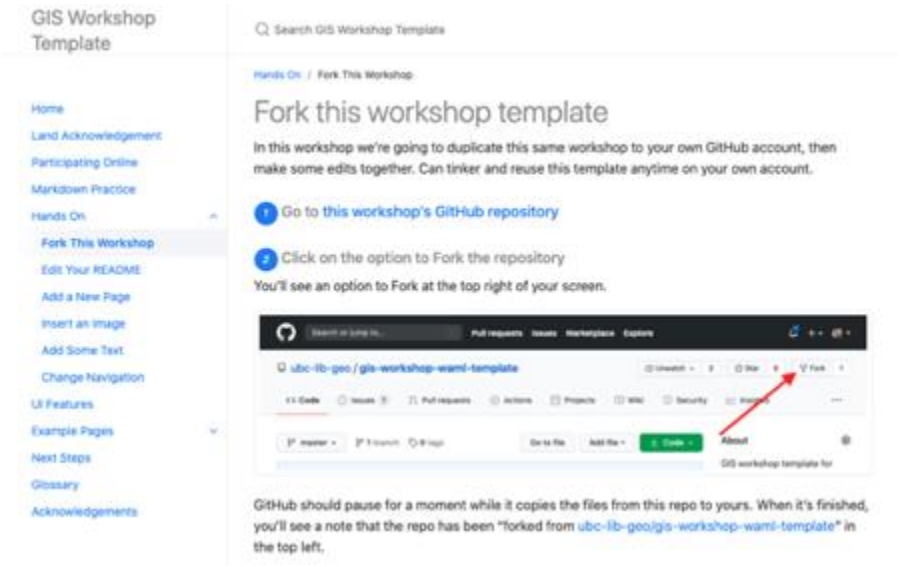

Figure 4. A published GIS Workshop Template website using Jekyll.

WAML Workshop Template

A virtual workshop using GitHub and Jekyll was delivered as part of the program for the Western Association of Map Libraries (WAML) annual meeting in October, 2020. Titled *Teaching Workshops in a Virtual World Using GitHub Workflows*, the session included an introductory section which covered the basic GitHub and GitHub Pages workflows and terminology, and a

hands-on section where students forked a GitHub repository, published a live workshop content website using a premade template, and created customized workshop pages.

The workshop was conducted from a published workshop template, which included a homepage with introductory information, an embedded slide presentation, and a hands-on section with step-by-step instructions. A link to the workshop website was provided to attendees at the beginning of the session for them to follow along with the live instruction. The session also used the workshop website as the template for students to fork and customize on their own GitHub account. This allowed students to tinker with working content, and gave them a usable foundation for a GIS workshop which they could customize further after the session ended.

A detailed summary of the session can be found at https://ubc-lib-geo.github.io/gis-workshop-waml-template/.

Conclusion

The GitHub and Jekyll ecosystem works as a simple and free way to publish open workshop and other educational content and can enhance workshop delivery through the use of web content like links and interactivity. The GitHub platform also includes several features that could ease content maintenance and collaboration, such as Issues, Collaborators, Organizations, and Pull Requests. It embraces openness and demonstrates to workshop participants the means by which they might also make their work open, shareable, and reproducible. GitHub also encourages the collection and use of documentation. Every repository requires a readme file, and Issues and Pull Requests document how a repository has been modified over time. And of course, an obvious benefit is that it is free—mitigating concerns about the cost of hosting instruction content online.

There are a few downsides to using GitHub, but we believe these are minimal. Like all software and technology, GitHub requires some practice to become comfortable with. Although most advanced GitHub users use a command-line shell for working with Git and GitHub, the GitHub web interface provides an easy entry-point for new users. All of the procedures in our workshop can be completed without use of the command-line, and walking through the workshop should help new users gain familiarity with GitHub workflows. GitHub also lends itself well to hosting workshop data. While it is designed to work with plain-text documents, it can also store non-text files like shapefiles and images. GitHub does have file and repository size limits, but we find these limits completely adequate for the purpose of distributing data in the context of a workshop.

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

GIS Trends

Barbara Znamirowski

DLI National Training: Accessing data and building a community

Introduction

"The Data Liberation Initiative (DLI) is a partnership between post-secondary institutions and Statistics Canada for improving access to Canadian data resources. Over the years the focus of the DLI Program has evolved from purchasing access to major Canadian datasets collected by Statistics Canada to providing training services and the continuous support required for the proper understanding and usage of an ever expanding research data collection."[i]

The above quote is taken from the Data Liberation Initiative's (DLI) web site. It's an accurate description of the DLI. However, as with many initiatives and events, to truly understand it, it helps to be there – to have experienced the program and its benefits. Many of our institutions have been members of the DLI since it began in 1996. The DLI has provided a means of accessing products otherwise unaffordable to most researchers and academic institutions – including a range of aggregate data, census geography boundary files, public use microdata files (for example, Census of Population and other surveys such as general social surveys and household income and expenditures surveys) and postal code conversion files.[ii] It has also encouraged formation of a community of experts: the DLI membership of 81 post-secondary institutions, working with a dedicated team of Statistics Canada employees.[iii] The DLI community provides mentorship and support through an active listserv, an External Advisory Committee (EAC) and Professional Development Committee, and regular training initiatives for DLI institutional contacts. I've had the privilege of watching the DLI community evolve since its inception.[iv]

Another successful national training event organized by the DLI Professional Development Committee took place from November 23 to 27, 2020.[v] Training initiatives take place annually, sometimes on a regional level and other times nationally. In response to the COVID pandemic the event was moved for the first time to an all-virtual platform.

[i] Taken from: Statistics Canada web site (https://www.statcan.gc.ca/eng/dli/dli) on 27 November 2020.
[ii] Postal Code Boundary files are obtained through the DLI through an agreement between Statistics Canada and Canada Post. Each DLI institution signs an annual End-Use Agreement with Statistics Canada for these files.
[iii] Number of members is in Data Liberation Initiative Annual Report (Spring 2020).
[iv] Further reading on the history and operation of the DLI: Boyko, Ernie and Wendy Watkins. 2011. "The Canadian Data Liberation Initiative. An Idea Worth Considering?" International Household Survey Network, IHSN Working Paper No 006. Available from: https://ihsn.org/sites/default/files/resources/IHSN-WP006.pdf
[v] Statistics Canada. The membership list is found here: https://dli-training.github.io/en/contact/

In this column I describe some of the themes covered during 2020 national training sessions in the context of trends in data and statistics and associated technologies. I've organized this discussion into six main themes. These are presented in no particular order and often cover more than one session. This summary is by no means a comprehensive account of all presentations. For further information, readers are encouraged to review the links and other follow-up materials at the end of this column. Opinions are my own.

Expansion of the Continuum of Access for Microdata

Almost two decades ago I attended a DLI training session at which Chuck Humphrey presented a graph showing the "Continuum of Access" provided by the dissemination channels used by Statistics Canada. Chuck described three characteristics of this continuum: cost (from free to expensive), restrictions or conditions (from open or no restrictions to very restricted) and type of Information (from statistics to data).[vi] Since then, Statistic Canada's initiatives have often been described in terms of this continuum – most recently to illustrate new models of dissemination of microdata.[vii] Current Statistics Canada data dissemination initiatives (some in pilot mode), and their places on this continuum of access are represented in Figure 1, adapted from the Statistics Canada website.[viii]

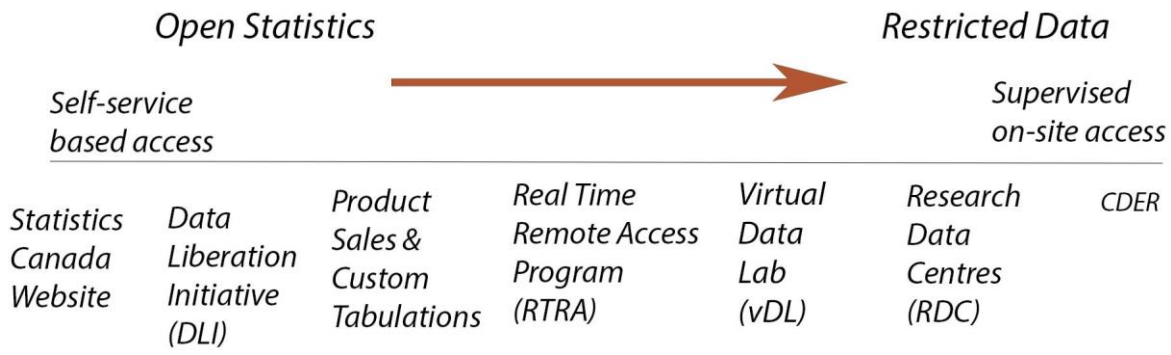

Figure 1. Continuum of Access

This year's DLI Training hosted a panel entitled "From Open to Restricted – Statistics Canada's Continuum of Data Access," with six speakers presenting on the following topics: Public Use Microdata Files at Concordia (Alex Guidon); Advantages and Disadvantages of Public use Microdata (PUMF) (Charles Fleury); ODESI: Reflecting on 10 years of Collaboration in Library Data Services (Amber Leahy); Real Time Remote Access (Paul McDonald); Virtual Data Lab (Sara Tumpane) and Research Data Centres & Centre for Data Development and Economic Research (Grant Gibson)

[vi] Humphrey, Chuck. DLI Orientation: Concepts. A Framework for Thinking about Statistical Information, April 2004.
[vii] For illustration and further information on the Continuum of Access for Microdata Access see: https://www.statcan.gc.ca/eng/help/microdata
[viii] See Statistics Canada, https://www.statcan.gc.ca/eng/help/microdata (accessed 27 November 2020)

This session explored how PUMFs (Public Use Microdata Files) are used within universities, as well as new models of dissemination for other forms of microdata. In considering these models it is important to understand that the level of sensitivity of microdata can vary significantly depending on how a file is processed to minimize participant identification. PUMFs available through the DLI are very different from microdata master files available in RDCs. We look forward to learning more about Real Time Remote Access (RTRA) and Virtual Data Lab (vDL) options in context of their accessibility to our researchers, and to defining our roles in support of these microdata access initiatives.[ix]

Adapting to the pandemic through remote instruction – a panel

In this engaging panel speakers Kelly Schultz, Andrew Nicolson, Marcel Fortin, and Leanne Trimble (moderator), reviewed their experiences with delivering remote workshops to their university communities during the pandemic. There was also considerable audience engagement through the chat function, demonstrating the relevance of this topic and need for our community to share experiences and methodologies.[x] There was general consensus that diverse methods are required, including both asynchronous and synchronous workshops, and sometimes a hybrid of both. The University of Toronto Map and Data Library has also tried (the wonderfully named) "Snacking on Bits and Bytes" as a substitute for some of their open workshops, offering abbreviated sessions meant to introduce a topic (for example, on "R" or Programming with Python in ArcGIS Pro) through approximately 40 minute online live demos, with time for questions.[xi]

There was less consensus on experiences relating to the volume of requests for teaching and support: the chat revealed that some institutions saw a decline, some saw no change, some have experienced more or different requests since the start of the pandemic. Speakers and chat participants noted that virtual workshops require significant preparation time. Some felt synchronous involved less time to prepare than asynchronous, but also noted that synchronous could be more stressful given the uncertain stability of remote connections and / or the ability to provide support or feedback to students during workshops. Access to and knowledge of technologies to support creation of virtual training material was a common thread in panelist presentations and the chat.

[ix] In addition to reviewing the slides from the presentations (all posted at: https://cudo.carleton.ca/dli-training/4360) readers may wish to review the following references for more information: Presentation by the Chief Statistician of Canada to the Canadian Research Data Centre Network (CRDCN) (October 2018) available at: https://crdcn.org/sites/default/files/arora_-_presentation_by_the_chief_statistician_of_canada.pdf. See also: Kelly Cranswick, Virtual data labs - A more flexible approach to access Statistics Canada microdata, presented at UNECE Conference of European Statisticians, Joint UNECE/Eurostat Work Session on Statistical Data Confidentiality Session 1.1 16 September 2019, available at: http://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.46/2019/mtg1/SDC2019_S1.1_Canada_Cranswick_AD.pdf

[x] Chat from training sessions is being transcribed and will be available at: https://cudo.carleton.ca/dli-training/4360

[xi] See: https://mdl.library.utoronto.ca/bits-and-bytes

Kelly Schultz of the University of Toronto Map and Data Library shared an excellent slide on some of the tools she found useful to prepare virtual training (Figure 2).[xii] Chat contributors supplemented some of their own experiences including use of Mentimeter (for keeping students engaged and actively responsive during workshops), pros and cons of students sharing screens during workshops and diverse approaches to doing this, built in metrics for evaluating workshop participants engagement (for example in Quercus), and the introduction of Virtual Computing Commons / Labs on campus to ensure broader availability of software.

Figure 2: Tools for Virtual Training

Kelly also gave a fantastic asynchronous workshop, open to all DLI training participants, on Data Visualization: Theory and Critique (Part 1) and Practice with Tableau (Part 2). I think we all aspire to produce workshops as good as this! Among other things, it has pushed me to explore Tableau mapping capabilities – but that's for another time.

Data Management Planning

James Doiron from the University of Alberta delivered a detailed session on the creation of Data Management Plans (DMP). He reminded participants of the importance of DMPs in the context of the Tri-Agency's draft recommendations.[xiii] He discussed the DMP in terms of key research lifecycle categories, taking participants through the creation of a DMP using Portage's DMP Assistant.[xiv] Portage's DMP Exemplars were noted as good reference points for researchers writing their own DMPs. He also reminded participants of the importance of choosing depositories (such as Dataverse) that assign permanent identifiers (DOI) to datasets.

[xii] Figure presented by Kelly Schultz in her talk given as part of panel "Adapting to the pandemic through remote instruction – a panel" (panel members: Marcel Fortin, Andrew Nicholson, Kelly Schultz, Leanne Trimble) at DLI National Training, 26 November 2020. Figure reproduced with permission.
[xiii] See: http://www.science.gc.ca/eic/site/063.nsf/eng/h_547652FB.html
[xiv] For further information about Portage's DMP Assistant: https://assistant.portagenetwork.ca/

Product Reviews

An important part of DLI Training is the opportunity to engage with data producers directly, hearing from subject divisions within Statistics Canada about survey and other product content, dissemination formats, technologies and deliverables. These sessions are invaluable and serve not only to inform the DLI community, but often function as an opportunity for dialogue where the DLI Community can ask questions and provide feedback to subject divisions on patterns of use and requirements of faculty and students.

This year's sessions included:

- Overview of the content of the 2021 Census, presented by Sarah Franklin and Andrea Levett from the Census Subject Matter Secretariat
- Statistics Canada COVID-19 Data Projects, presented by Kathleen Fowler and Melanie Kowalski from the Centre for Social Data Integration and Development
- The Gender, Diversity and Inclusion Hub, presented by Sylvie Guilmette from the Centre for Gender, Diversity, and Inclusion Statistics
- Key Justice and Victimization Data Sets presented by Kathy AuCoin from the Canadian Centre for Justice and Community Safety Statistics
- Update on DAD/DLI EAC/PDC presented by Gilbert Bede, Alex Cooper, Arden Kayzak

Dataverse, DDI and ODESI

As part of the pre-recorded Lightning Talks, Chantal Ripp from the University of Ottawa presented "Projet visant à faire découvrir les collections de données secondaires dans Scholars Portal Dataverse". She reported on a project designed to evaluate the feasibility of using the University of Ottawa's Scholars Portal Dataverse for discovery of secondary data collections. These would include one-time purchases, including collections that are locally managed and not available on other platforms. The study looked at existing practices used by institutions using Scholars Portal Dataverse, including their pros and cons, such as challenges for geospatial dataset metadata descriptions.

Jane Fry from Carleton University gave a lightning talk on DDI, a standard for documenting data files. In introducing DDI she showed some nice visuals on how she introduces the importance of metadata to students. She also reviewed the elements of the DDI lifecycle and DDI Codebook, providing links for future reference and training. Nesstar or Colectica are the two main tools used to interpret DDI (xml files).

Amber Leahy from Scholar's Portal presented a talk on "ODESI: Reflecting on 10 years of collaboration in library data services" as part of the panel "From Open to Restricted - Statistic Canada's Continuum of Data Access". She reviewed the history of ODESI, including aspects of community development and collaboration such as the OCUL Markit! Program. Slides presenting the evolution of the graphic interface reminded us that we have come a long way in content and design. Future challenges include the evolving research data landscape and data discovery needs, as well as the future of Nesstar.

Postal Codes Conversion files and Geocoding

Pre-recorded lightning talks included a session by Daniel Brendle-Moczuk from the University of Victoria on geocoding options for matching postal codes or addresses to locations (for example to census boundaries). He highlighted key factors to consider when evaluating options, such as whether you have addresses or just postal codes, the number of locations, and cost. Options covered include free and priced solutions such as: the PCCF, PCCF+, BC Address Geocoder (for BC addresses), QGIS with plug-in MMQGIS, US Census Bureau (for US addresses), Esri, DMTI as well as some options for geocoding with browser based online options.

Alex Cooper from Queen's University gave a lightning talk introducing Postal Code Conversion Files: what it is, the differences between the PCCF and PCCF+, licensing and access. She also generously shared Queen's guide to the PCCF, which I recommend to anyone needing assistance with processing the PCCF or PCCF+.[xv]

Conclusion

This year's DLI training had 155 registrants, with an average of 54 to 89 participants at each session. These numbers illustrate the interest in and need for such events. Although many indicated that they looked forward to a return to in-person meetings, initial feedback from participants demonstrated that the event was a resounding success. All participants were given an opportunity to complete surveys on individual sessions which will no doubt inform future training activities. Thanks to everyone involved for such an excellent event!

Further Information

DLI 2020 Training:

Sessions slides and Lightning Talk Videos are available in English and French in the CUDO repository (https://cudo.carleton.ca/dli-training/4360). Responses to questions and chat transcripts will also be provided once ready in CUDO.

DLI Citation Guide: https://www.statcan.gc.ca/eng/dli/guide/section7

DLI EAC: https://www.statcan.gc.ca/eng/dli/eac

DLI Listserv: DLILIST@IDD-DLI.STATCAN.GC.CA

DLI Survival Guide: https://www.statcan.gc.ca/eng/dli/guide/index

DLI Training Repository: https://cudo.carleton.ca/collection/dli

Statistics Canada Real Time Remote Access: https://www.statcan.gc.ca/eng/rtra/rtra

[xv] See https://guides.library.queensu.ca/pccf

GIS Trends: Note from the Editor

Submissions and Feedback

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