ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

# ACMLA NEWS

## CARTO-ACMLA/ACACC President's Report

It has been a strange year, somewhat unexpected that the world is still as it is, but we continue.

Thank you to this year's executive: daniel Brendle-Moczuk has served as a voice of experience as past president; Francine Berish, who volunteered to serve as secretary; Rosa Orlandini, who in concluding her term as VP Communications and Outreach; and Dan Jakubek for his work as Treasurer. Thank you to those who have stepped up or continued on as members of our executive, to Alex for his work as our webmaster, and for Sherri for her ongoing work managing membership.

In the summer of 2020, we – along with OCUL-GEO – were approached by Global Affairs Canada (GAC) about increasing researcher access to Radarsat Constellation Mission (RCM) data. This appeared to be a very interesting and beneficial partnership for researchers, and we kept the membership updated as things progressed. Unfortunately, it was felt that the requirements on GAC's side would require too heavy an extra workload on library workers, and an inability to reach consensus led GAC to pursue a different direction for this access.

One of our new members, Kyla Jemison, expressed an interest in the Bibliographic Control Committee. This committee had not met in some time, and the expression resulted in some discussion among the executive, followed by a call for participants. With several volunteers, and Kyla's leadership, the first meeting has occurred, and the terms of reference have been updated. We look forward to the new group developing its planned projects over the next year, updating ACMLA's cataloguing and bibliographic information.

The conference this year came together wonderfully, thanks to the hard work of the organizing committee. When I called the executive together to discuss, we were uncertain whether anyone would want another virtual event, but the response suggested it would be worthwhile, and with more than 170 registrants, that has certainly proved that planning it was the right choice. Thank you to everyone to made it happen!

It has otherwise been a quiet year. We will be having a discussion shortly on membership types and costs. Some new members from various stages of their career have joined the association, and we remain a modest national association for geospatial information professionals who have met the changes and challenges of these times with poise and panache. Though we worry at times about membership, engagement, or the state of our careers, I think, on the whole, we continue to thrive.

As I noted in my incoming message last year: we cannot know where we are until we're there. Thank you for having me as president this past year, and I look forward to continuing with the association in the years to come.

*Martin Chandler*

## CARTO-ACMLA/ACACC Past President's Report

After more than a year of COVID-19 in Canada and throughout our world, we are not out of the COVID woods yet but getting close in Canada and hope for other parts of our world.

To begin, this report will not repeat or summarise the year 2020-2021 as that is contained within the President's Report. However, a huge thank you to the Executive that stepped up at the CARTO (ACMLA/ACACC) virtual AGM in June 16, 2020. Martin Chandler (McGill) volunteered to be President and Rosa Orlandini, (York) continued to be VP Communications & Outreach. Francine Berish (Queens) volunteered to be Secretary. Dan Jakubek (Ryerson) continued on, or was stuck with, Treasurer for his 3-three year tenure. We thank Alex Guindon (Concordia) for his role as webmaster for the past two years and thank Eva Dodsworth (Waterloo), for recently volunteering to be our new webmaster along with her very important role of Editor of our *Bulletin*.

### CARTO-ACMLA-ACACC Honours Award

This Past President received a nomination of Marcel Fortin for the CARTO-ACMLA-ACACC Honours Award from Cheryl Woods, (Honorary Member; Western, retired) and seconded by Richard Pinnell (Honorary Member; Waterloo, retired), and Colleen Beard, (Honorary Member; Brock, retired). With the newer CARTO model of a lean organisation, the Executive served as Awards Committee and was in unanimous agreement that the nominee Marcel Fortin should receive this award (see separate write-up for Marcel's award).

No nominations were received for the CARTO-ACMLA-ACACC Cathy Moulder Paper Award. As per CARTO-ACMLA-ACACC Bylaws 8.01 & 8.02, emails were sent in March & April 2021 asking for 2-3 members in good standing to join the Nominating Committee to coordinate and carry out the 2021-2022 executive election. As in recent past years, no one volunteered so a call will be made for the Executive at the AGM2021 in June 2021. (This past-president personally communicated with some folks to consider serving.)

Respectively submitted,
daniel Brendle-Moczuk, Past President, 2020-2021

# CARTO (ACMLA/ACACC) AGM 2021 Annual (Online) General Meeting

Attendance (27 participants): Francine Berish, Sherri Sunstrum, Dan Jakubek, Martin Chandler, Andrew Cook, Alex Guindon, Barb Znamirowski, Andrew Nicholson, Cheryl Woods, Christine Homuth, daniel Brendle-Moczuk, Evan Thornberry, Leanne Trimble, Rhys Stevens, Roger Wheate, Wenonah vanHeyst, Zack MacDonald, Kara Handren, Sarah Rutley, Rene Duplain, Rosa Orlandini, Rebecca Bartlett, Sylvie St-Pierre, Erika Reinhardt, Rudolf Traichel, Meg Miller, David Jones

The Agenda

Approval: (moved) (seconded)

1. Honours Award Presentation
    a. Awarded to Marcel – daniel Brendle-Moczuk made presentation – Cheryl Woods spoke about work for the association and OCUL – Francine Berish, Dan Jakubek, Rosa Orlandini added their words
    b. Chat will be captured so we can send email to Marcel
        i. I am newer to CARTO-ACMLA and the GIS community, but Marcel has always made himself available when I've had questions and has been a great support. This recognition is well deserved! I know others - former mentees and collaborators of his at USask - would feel the same way as well.
            - Seconded
        ii. So happy to see Marcel receive this award! So well deserved!
        iii. Marcel has been my mentor since 2004. I didn't know he was receiving this award today, but just want to say how deserving I think he is. I hope we can put together our comments into something (email?) we could share with him later
        iv. Marcel has been long time champion of Map and GIS Librarianship. He was a big part of my moving to UTM from Oregon!
    c. ACTION: Revisit at 2022 AGM when we're able to gather again (Fran Moved – seconded Dan J)

2. Reports
    - President (delivered)
    - Past president (delivered)
        - Encouraging new members to step up to executive
    - Treasurer (delivered)
        - Reports presented
    - Approved (Wenonah VH, seconded Sherri S.)

3. AGM Executive & Webmaster volunteers

a. VP – Rene Duplain & Francine Berish stepped up
b. Webmaster – Alex G. stepping down Eva D. will be stepping up
c. Secretary – Zack MacDonald
d. Treasurer – Dan J. volunteering for another 3-year team
    i. Approved (Andrew N moved, DBM seconded)
e. President – Martin Chandler continuing on

4. Memberships
    a. A proposal to create a second membership type for those members not institutionally funded (including, but not limited to, students, technicians, and retirees), at a cost of $10.
        i. Retiree rate welcomed
        ii. Add under-employed category
        iii. 20$ proposed – seconded by Wenonah, daniel Brendle-Moczuk, Evan Thornberry, Kara Handren, Dan Jakubek
        iv. Financial impact?
        v. We used to income from facsimiles and also had a SSHRC travel grant (2500$) and admin grant – disappeared during harper government
            - Connection grant requires at least 7000$ spending
            -
    b. ACTION pending research – will put out to 20$ to membership

5. Other business
    a. Next year – check in with UVic and Mun who had offered back at the AGM in 2020

6. Adjournment

For reference, last year's minutes:

https://openjournals.uwaterloo.ca/index.php/acmla/article/view/1901/2140

# Association of Canadian Map Libraries and Archives Awards

## ACMLA Honours Award: Marcel Fortin, University of Toronto

The Association of Canadian Map Libraries and Archives (ACMLA) recognizes individuals who have made significant contributions to map librarianship at the local, regional, national, and international levels through their granting of the Honours Award for outstanding achievement.

Marcel's work, as a student, at the (then) National Archives' Cartographic and Architectural Archives Division in the summer of 1991, was the beginning of his involvement with the Association of Canadian Map Libraries and Archives. Many of the division's staff were ACMLA members who planned the annual ACMLA conference which was hosted by the National Archives of Canada in 1991.

The first paper Marcel submitted to the ACMLA *Bulletin* is dated 1992 and outlined an independent study that he completed as a student in the Graduate School of Library and Information Science at Western University. That study was to compile a union list of Canadian fire insurance plans held in Ontario university map libraries (OCUL Map Group). Working with Lorraine Dubreuil and Cheryl Woods, that union list was later expanded to include holdings of the National Archives of Canada, Archives of Ontario and some city and county archives, and public libraries in Ontario, and was published by ACMLA in 1995.

After holding a few librarian positions outside of Ontario, Marcel was hired in 1998 as Head, Map and Data Library at the University of Toronto, where he continues to be very active in many GIS projects.

He has held positions on the executive of ACMLA, including president (2003/4-2004/5, 2017/18), and served as chair (2002/3-2003/4) of the Ontario Council of University Libraries (OCUL) Map Group. He coordinated the hosting of an ACMLA conference in 2002, at the University of Toronto and has been involved in several conferences as a presenter/panel member. He received the ACMLA Paper Award in 2002.

Marcel has presented at numerous conferences that include: TRY (Toronto, York and Ryerson) Library Staff conference and Ontario Library Association Super conference. He has also served on the Ontario Geographic Names Board.

Marcel's involvement with the DMTI- SMART Consortial Agreement of licensed geospatial data to Canadian universities and its distribution has been a major achievement that has made data sets available to authorized users (generally current students, faculty, and staff at the licensed universities) for authorized use (academic teaching, research, and publishing), under certain license conditions.

He served as a member of the OCUL Map Group's Geospatial Data Access Committee, whose mandate was to support initiatives which broaden the Map Group's access to geospatial data with particular emphasis on data provided through the Land Information Ontario Geospatial Digital Exchange (OGDE) program (by Ontario Ministry of Natural Resources). The committee was

mandated (in June 2006) to investigate and make recommendations on a centralized, web-based data access and delivery system for geospatial data to OCUL institutions with discovery and browse tools based on metadata that is collaboratively created and shared. The outcome of this mandate was the creation and launch of the OCUL Scholars GeoPortal.

A major accomplishment of Marcel's is a first of its kind publication *Historical GIS Research in Canada*. It brought to the forefront the GIS activity of Canadian scholars across various disciplines and remains a stellar display and example of HGIS research excellence. Subsequently, he initiated a SSHRC-funded project in 2015 as the principal investigator. "The vision of the Canadian Historical GIS Partnership (www.geohist.ca) is to provide a forum for academic and public researchers and institutions, in Canada and beyond, to share data and best practices for mapping Canadian historical subjects on the web." Its 'news & notes' link directs one to a variety of projects. Two HGIS projects that Marcel has played a key role in creating are: the Don River Valley Historical Mapping Project, and the Ontario Historical County Map Project.

A selection of Marcel's publications/papers includes:

"On Partnerships."
M. Fortin - *Journal of Map & Geography Libraries* 12 (2), 223-227, 2016.

Historical GIS Research in Canada.
J. Bonnell, M. Fortin. University of Calgary Press. 2014.

"The library as research partner and data creator: The Don Valley historical mapping project."
M. Fortin, J. Mueller - *Journal of Map & Geography Libraries* 9 (1-2), 157-174, 2013.

"Putting Literacy into Geographic Information."
J. Marvin, M. Fortin – *Bulletin*, Association of Canadian Map Libraries and Archives 125, 3-9. 2006.

"Nineteenth Century Canadian County Maps GIS Project."
C. Woods, M. Fortin, L. Dubreuil - *Bulletin*, Association of Canadian Map Libraries and Archives 123, 25-26. 2005.

"Online GIS: Solutions for Dissemination of Geospatial Data in a Library Setting."
M. Fortin - *Bulletin*, Association of Canadian Map Libraries and Archives 120, 5-12. 2004.

"Whither Canadian Map Libraries? : 1967-2003."
M. Fortin - *Bulletin*, Association of Canadian Map Libraries and Archives 117, 3-9. 2003.

"Displaying (and Using) High-Resolution Images of Maps on the World Wide Web."
M. Fortin - *Bulletin*, Association of Canadian Map Libraries and Archives 112, 3-7. 2001.

Canadian Fire Insurance Plans in Ontario Collections, 1876-1973.

Fortin, Marcel, Lorraine Dubreuil, and Cheryl A. Woods. Occasional Papers of the Association of Canadian Map Libraries and Archives, no. 5. Ottawa: Association of Canadian Map Libraries and Archives, 1995.

"Union List of Canadian Fire Insurance Plans Held in Ontario University Map Libraries."
M. Fortin - *Bulletin*, Association of Canadian Map Libraries and Archives 84, 1-4, 1992.

Nominator: Cheryl Woods
Seconders: Richard Pinnell, Colleen Beard


The 54th CARTO-ACMLA/ACACC conference, Old is New is Old, happened this year to great success, either because or in spite of the ongoing pandemic. With no set location, the executive was able to solicit volunteer organizers from members across the country, who worked hard to ensure the conference was smooth and educative for all. In something of a change from standard practice, the events took place in a restricted time frame of 2.5 hours per day over 3 days, scheduled to ensure accessibility for participants from the Atlantic to the Pacific time zones. This proved a popular schedule, particularly in a time of Zoom fatigue.

Feedback on the conference was exceptionally positive, and overall attendance was quite high, with more than 120 registrants overall. These included current and past members, as well as new individuals from around the world. Thank you to everyone who made the conference happen, and we look forward to seeing you next year! - *Martin Chandler*

*Monday, June 14, 2021*

**Drones in Libraries: The Development of an Interdisciplinary Research Service Using Drones and 3D Modeling Technologies at Ryerson University Library**

Dan Jakubek, Ryerson University

On June 1, 2019, new rules for flying a Remotely Piloted Aircraft System (RPAS) or "drone" 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 Ryerson Library has developed a research service dedicated to supporting the use of drones and 3D modelling

technologies. This presentation will highlight our progress to date, existing collaborations and future directions for our research and service.

### University of Manitoba GISHub: ESRI Site License Integration using ArcGIS Online, Hub, and Enterprise

Meg Miller & Mullai Manickavalli, University of Manitoba

The University of Manitoba Libraries has been working to add a geospatial data repository to its suite of service offerings. Initially this project was conceived to be a secure local storage solution for geospatial data, but upon stepping back and looking at the tools we have access to under our ESRI site license the project was re-imagined to encompass the following:

1. Semi-automated management and integration of UM ESRI site license;
2. Discovery and access point for proprietary and open researcher data;
3. Secure local environment for active-use geospatial datasets.

This session will discuss our experience and outcomes based on our roles as the project librarian and systems analyst and answer any questions the audience might have on implementation at their own institution.

### From Coast to Coast to Coast with NetCDF files

daniel Brendle-Moczuk, University of Victoria

While the multidimensional open source NetCDF data file format has been around since c.1990s, some users, including geospatial librarians, are not familiar, and/or are frustrated with this data format. NetCDFs are used to store and disseminate data such as climatic, (climate modelling, precipitation, temperature, wind, etc) oceanic, (bathymetry, currents, temperature, etc) and usually in time series. This session will provide a brief overview of the history of NetCDFs, their changes over the years, and how to interact with NetCDFs within a GIS environment, specifically QGIS and ArcGIS. In addition researchers want to deposit their NetCDFs into data repositories. Finally, this session will highlight real life uses of various NetCDF data.

### Retrieving geographic information from historical Ottawa texts

Rebecca Bartlett, Carleton University

The Ottawa Resource Collection in the Carleton University Library's Archives & Special Collections contains rich details about the history of Ottawa locations, from specific buildings to entire neighbourhoods. The digitization of the collection introduced the possibility of facilitating local-area research by extracting those locations from the texts and linking corresponding geospatial data (such as latitude-longitude coordinates). Limitations with existing geoparsers led to the development of a geographic information retrieval tool for identifying and geolocating Ottawa locations, and successes and challenges will be discussed.

### Mapping Loyalist Migrations

Liz Sutherland & Jordan Fuller, Western University

The American Revolution displaced approximately 60,000 people between 1775 and 1783. Loyalist Migrations (loyalistmigrations.ca) is a spatial history project that aims to digitize and visualize the journeys of these individuals in an interactive GIS dashboard, hosted on the project's open data site. It is also an experiment in collaborative public history research and GIS data entry. The project is a partnership between the Huron Community History Centre, the Map and Data Centre at Western Libraries, and the United Empire Loyalist Association of Canada (UELAC). The project team is drawing upon a variety of archival, scholarly, and genealogical sources, to visualize the scope and diversity of the migrations. In the years to come, we will provide new research and analysis based on this data.

This presentation will focus on the GIS components of Loyalist Migrations. From data cleaning (QA/QC) to data sharing (open data site and dashboard) and research collaboration (public survey).

### A Shifting Landscape: A StoryMap of the 1993 Lemieux Landslide

René Duplain & Pierre Leblanc, Université d'Ottawa

In this StoryMap, we will explore the 1993 Lemieux landslide event and present complementary resources gathered by the University of Ottawa Library staff.

## *Tuesday, June 15, 2021*

### Preserving Government Records and Canada's Cartographic Heritage: The Role of the Archives

Erika Reinhardt, Library & Archives Canada

Library and Archives Canada (LAC) serves as the official repository of records of the Government of Canada, preserving and providing access to Canada's documentary heritage for the benefit of present and future generations. To fulfill its mandate, LAC makes decisions about the archival and historical value of government records, including federal maps, cartographic records and geospatial data from federal institutions. When looking at the vast machinery of government, you may have wondered who decides which government records to preserve and which to dispose of. What considerations go into those decisions and how have these notions evolved over time. How has new and rapidly evolving technology created challenges for archives to preserve geospatial data? This presentation examines the role of archivists as influencers in the record lifecycle. It explains how archives interact with federal map and data creators, gives an overview of the Government Records Disposition Program and outlines the process for appraising, selecting and preserving Canada's federal maps, cartographic materials and geospatial datasets. Understanding the role of the archives and the mechanics of records disposition benefits researchers searching and discovering geographic information and historical context behind government decision-making, surveying, mapping and data collection activities.

## Mapping maps in map collections. The development and implementation of a shared print archive for Western Canadian topographic maps

COPPUL Span Phase 6 Working Group

In this lightning talk, members of the COPPUL SPAN Phase 6 Working Group will speak to the process of evaluating and considering maps for shared print programs (SPPs). The group will explore how maps, compiled drawn and printed, contents deposited and containers configured within libraries and archives could be drawn into new projects aimed at their coordinated preservation and long-term access.

The Council of Prairie and Pacific Libraries' (COPPUL) Shared Print Archive Network (SPAN) aims to develop and maintain a decentralized shared print archive across its 22 participating libraries. SPAN is currently developing Phase 6: Western Canadian maps. Because of the unique nature of map collections within academic libraries, a working group of COPPUL librarians familiar with cartographic materials was struck to develop and oversee this phase. The working group will be responsible for defining the parameters of the phase, identifying materials for inclusion, and developing procedures for inventory.

## Copyright in Fire Insurance Plans

Jean Dryden

The fire insurance plans preserved in Canadian repositories are among the most valuable records documenting the development of Canada’s communities during the late nineteenth and twentieth centuries. However, for nearly three decades, making copies for researchers and (more recently) digitizing for online access, has been subject to a copyright “chill” as a result of the copyright claims of the companies that created these plans and their successors. This presentation establishes their current term of copyright protection, explores the extent to which the copyright concerns are justified, and offers possible solutions.

## Using GIS to develop a vaccine pharmacy locator app to support COVID-19 vaccine distribution in Ontario

Carina Luo, University of Windsor

The spread of infectious disease is inherently a spatial process; therefore, geographic information system (GIS) technologies are playing a critical role in understanding and responding to the COVID-19 pandemic. In particular, web-based mapping applications have been developed by organizations around the world to support the dissemination and provision of information on COVID-19. Inspired by those common efforts against pandemic, a GIS web application was developed by the Geospatial Data Analyst at Leddy Library, University of Windsor to help Ontario residents to locate COVID-19 vaccine pharmacy providers close to them. The app allows users to search for an address or click on the map to view pharmacies within a specified search radius, along with their detailed information including addresses, phone numbers, operating hours, and

website links. Users also have the option to overlay the locations of vaccine pharmacies with the distributions of target population groups at the neighbourhood level to see if there are any service gaps that may help improve the vaccine distribution planning and implementation. The presentation will demonstrate the main features of the app and discuss the potential role of academic libraries can play in supporting the local community as well as the opportunities they encountered during pandemic.

### Mapping at scale: Putting McMaster's community-engaged research on the map with collaboration and shared infrastructure

Jay Brodeur, Christine Homuth & Leora Sas van der Linden, McMaster University

For those working in libraries and archives, some of the most exciting and rewarding work involves collaborating with campus partners to perform new analyses, create new visualizations, and develop new systems and services. At the same time, building new things also prompts an assortment of questions around how to (and who should) scale and sustain them into the future. Given their long history of stewarding information, linking systems, and providing services, academic libraries and archives are well-suited to occupy the nexus of these two interests and help develop novel but robust, maintainable solutions.

In late 2019, the McMaster University Library partnered with the Faculty of Social Sciences on a project to highlight and visualize the community-engaged research work of Social Science faculty members at local, regional, and international scales. Over the following year, the project team collaborated to build systems and workflows to collect these activities as structured data in McMaster's Research Information Management System and dynamically populate an ArcGIS Story Map that disseminates this information to audiences within and beyond the university. By offering their subject matter and systems expertise, the Library helped the Faculty of Social Sciences realize its goals, while developing the underlying workflows and infrastructure that is scalable and sustainable in the long-term.

In this talk, we will provide an overview of our collaborative work to map community-engaged research activities within the Faculty of Social Sciences, and reflect on the role of the Library to facilitate and steward these kinds of projects.

### Building a virtual lab: connecting students to Carleton's map & GIS collection

Meaghan Kenny, Mike Reynolds & Sherri Sunstrum, Carleton University

Carleton Library's map and gis specialists provide both reference and instructional services related to the cartographic collection, in both print and digital formats. Each term we go into the classroom to demo GIS software and show students how to access geospatial data; we also invite classes into the map library, to learn about print maps and how to use them in research. Our maps and GIS services are widely used by student and faculty alike, in many disciplines. In January 2021, we were approached by a Geomatics faculty member to provide a map and GIS lab, that we would normally present in person. Due to other commitments, the lab would have to be given asynchronously. This would be our first asynchronous virtual map/GIS lab.

This presentation will show what worked, what did not work as well and lessons learned from those challenges. Meaghan Kenny will discuss her experience pre-recording the GIS component. Sherri will discuss the process of building a virtual lab with print maps; part of that process involved bringing in Mike Reynolds, the library's communication officer and videographer extraordinaire, who will discuss his experience with recording and editing the map lab video.

## *Wednesday, June 16, 2021*

### Land Information Ontario Imagery Acquisition Program Updates

Bryce Matthews, Ontario Ministry of Natural Resources and Forestry

This presentation will provide a detailed update on recent and upcoming high resolution imagery acquisitions by Land Information Ontario as well as recent activities in the program implemented to improve data access.

### Ontario Ministry of Natural Resources Forestry, Provincial Mapping Unit Elevation Project Update

Craig Onafychuk, Ontario Ministry of Natural Resources and Forestry

This presentation will provide a detailed update on recent and upcoming high resolution and high quality elevation acquisitions by the Provincial Mapping Unit of the Ontario Ministry of Natural Resources and Forestry and an overview of data discovery and access mechanisms from Ontario GeoHub.

### Scholars GeoPortal and LIO: Supporting the dissemination and archiving of provincial imagery products in Ontario university libraries

Kara Handren & Amber Leahey, University of Toronto

Scholars GeoPortal (https://geo.scholarsportal.info) is a province-wide geospatial data repository maintained by Ontario academic university libraries. Built in 2012 and developed and hosted at Scholars Portal (Ontario Council of University Libraries), the GeoPortal's collections include provincially licensed imagery data from the Ministry of Natural Resources via Land Information Ontario. Through the GeoPortal, researchers across Ontario academic institutions can access and download hundreds of thousands of individual image tiles from over 106 MNR image services spanning 20 years. As this data becomes increasingly in demand and grows in size and complexity, developing new processes and workflows to ensure continued, effective access remains essential. With the GeoPortal embarking on a redevelopment, this unique relationship between Ontario University libraries and LIO will also play a central role in considerations for the future. This presentation will discuss this relationship, recent infrastructure developments to support big data transfers, as well as current redevelopment considerations and data management strategies at Scholars Portal for the archiving and dissemination of large-volume imagery series.

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES
BULLETIN

# Geospatial Data and Software Reviews

## University of Manitoba GISHub: ESRI Site License Integration using ArcGIS Online, Hub and Enterprise

*Meg Miller & Mullai Manickavalli*
*University of Manitoba*

## Abstract

This review provides an outline of the solution the University of Manitoba Libraries has implemented to integrate their ESRI Educational Site License. In looking at the tools available the project came to encompass the following:

1. Semi-automated management and integration of UM ESRI site license using campus authentication methods
2. Discovery and access point for proprietary and open researcher data
3. Secure local environment for active-use geospatial datasets using ArcGIS Enterprise

The following discusses the software specifics, use cases, and lessons learned in a Canadian academic library context.

## Tags

ESRI, ArcGIS Online, ArcGIS Hub, ArcGIS Enterprise, authentication, data, repository, academic library, proprietary license, OCAP, data management

## Background

The following examines the integration of the University of Manitoba's ESRI Educational Site License into what is referred to as UM GISHub. The major impetus for this project was the current push for research to contain a formal data management plan and there was a gap in campus infrastructure needed to support it. Campus Libraries put a plan forward to the University IT Advisory Committee with a request for funding to support a local geospatial data repository. While the project began as a solution to address the lack of storage and management options for active-use geospatial data on campus, upon stepping back, it evolved into a solution for the semi-automated management and integration of the university's site license, a discovery and access point for proprietary and open researcher data as well as that secure local environment piece.

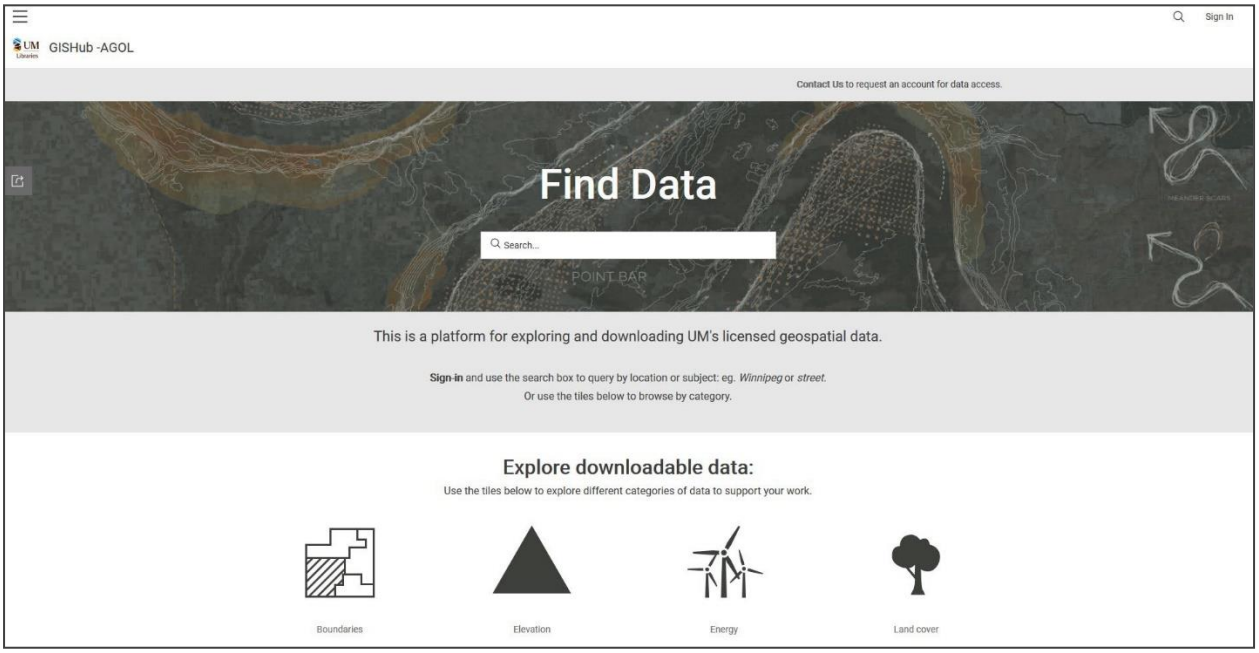


*Figure 1: Landing page for University of Manitoba GIS Hub*

## Project Goals

### *Account Management*

Previously access and accounts were being managed manually, which as campus usage grew became unsustainable. Tying into campus authentication allows users to sign-in with their university credentials, it also ensures that when they depart from the institution software access is removed. Some legacy accounts had been created using partial university credentials. Before the campus authentication gateway could be opened these user accounts and content needed to be manually migrated with proper system mapping, which was a very labour intensive process.

### *Secure Local Data Environment*

The locally hosted Enterprise portion of the Hub allows researchers to honor their data management plans and keep data on university servers while making use of ESRI analysis tools. Direct connections can be established with ArcGIS Pro or users can also make use of the analysis options available in the virtual environment itself (think a locally hosted version of ArcGIS Online with some additional features and analytics capabilities). Users require institutional credentials to access the system and have the ability to restrict and share their data at many different levels. Additionally, Hub administrators can facilitate collaboration between other organizations with ESRI licenses outside of the university to create secure shared workspaces for cross-institutional work.

### *Discovery and Access*

The final goal of the system was to create a portal for the discovery and access of proprietary data Libraries purchases and, in the future, open researcher data.

By making use of the ability to set up distributed collaboration between ArcGIS Online and Enterprise instances we are able to host proprietary datasets in Enterprise and share them with our ArcGIS Online organizations for our users to link to no matter the platform they are logged into. This gives Libraries a hands-off way of distributing data while staying within the terms of the data sharing agreements we have with different vendors. The system also has the ability to track usage of these datasets which is useful for institutional reporting. This sharing can be done at an organizational level (all members of the UM community) or at a group level (members of a certain lab group).

An ArcGIS Hub page was set up to act as a landing page to tie all these components together. Researchers can search for data by location or keyword or use category tiles to browse (municipal and DMTI datasets have been tagged) for data in which they are interested. Links are provided to popular open government portals, as well as to the organizational tools and documentation available.

## Technology

The University of Manitoba is part of a provincial consortium for purchasing their institutional site license (MEGIC). As such, Libraries access their licenses from the institutional representative who is part of a separate department (Faculty of Environment, Earth, and Resources). The diagram below illustrates the software components as well as faculty owners.

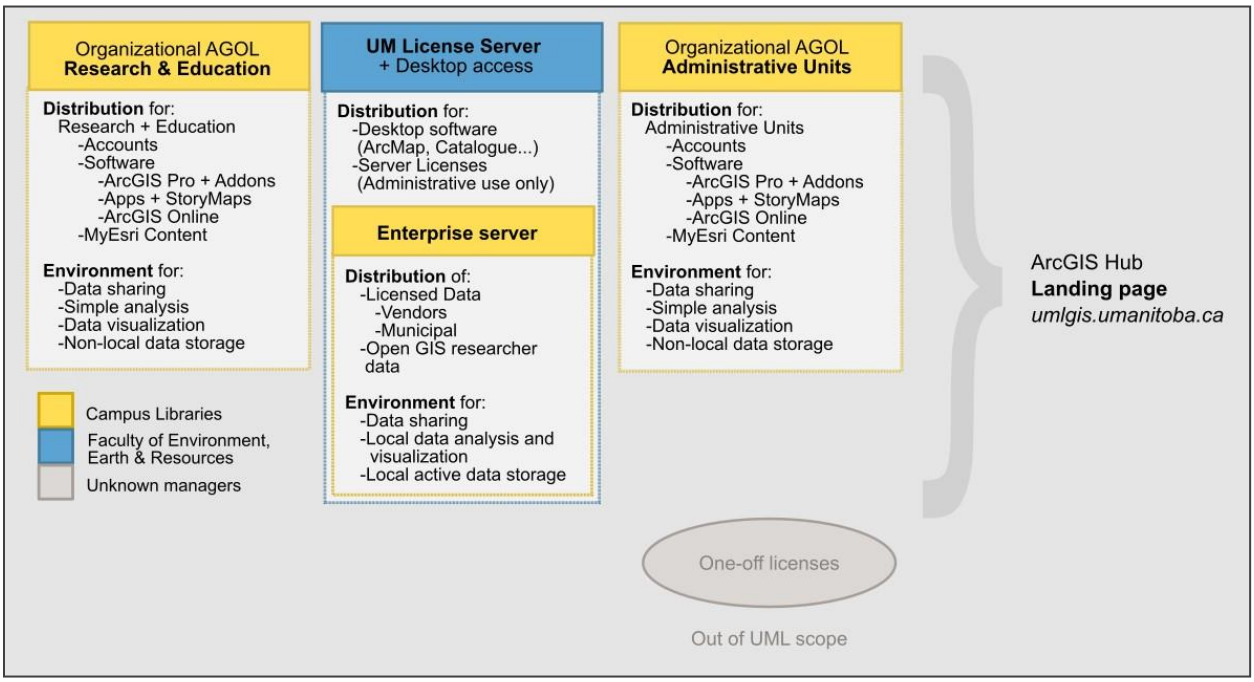


*Figure 2: Software and managers at the University of Manitoba*

To summarize, Libraries is responsible for all software/systems that are tied to ArcGIS Online accounts as well as the Enterprise Server. Users can access these systems by authenticating with university credentials. To tie everything together ArcGIS Hub was used to create a landing page for the service.

## Implementation details

### *UM-ESRI Integration*

Our end users are UM patrons and MEGIC consortium users. These two groups access the GIS Hub through Desktop apps, Web browsers or the Field Data Collector tools. Based on the methods they use to access; institutional users are authenticated by LDAP or SAML and other MEGIC users are provided with manually created individual logins.

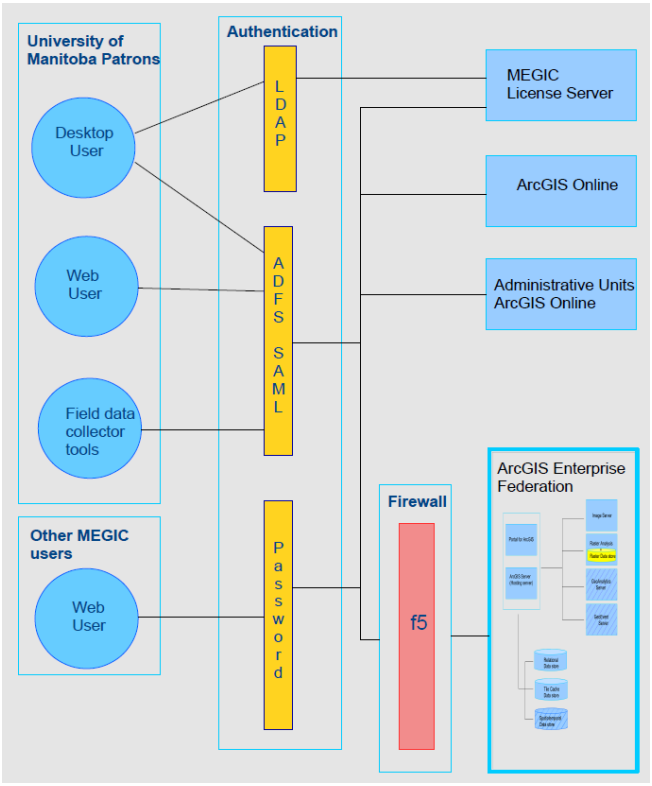


*Figure 3: University of Manitoba- ESRI integration*

When a university patron signs in for the first time, they would use the SAML method, this creates an account automatically using university credentials and by default, they are assigned a Viewer role. The user then must contact Libraries to obtain any other role other than the default Viewer role in the system. Additionally, with the SAML method login the user login session is preserved between ArcGIS Online and the Enterprise Federation. This also facilitates a single sign-on experience with other UM provided web services. Implementing this process has freed

up a significant portion of staff time which was previously spent on creating and managing accounts.

### *ArcGIS Enterprise Federation:*

Our current ArcGIS Enterprise architecture consists of one Portal for ArcGIS, one GIS Server which is also the hosting server, an Image Server, Raster Server, Raster Datastore, Relational Datastore and one Tile Cache Datastore. All components are at ArcGIS Enterprise version 10.7.1 for Linux. RHEL7 is the current operating system and the F5 campus firewall.

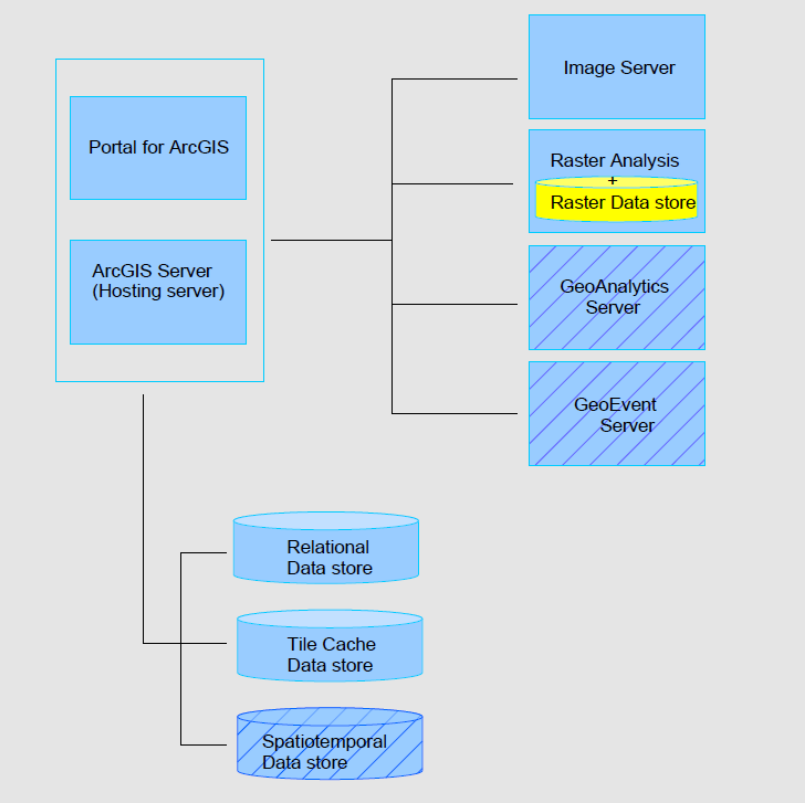


*Figure 4: ArcGIS Enterprise federation*

Except for the Raster Datastore, all the above components are installed on separate virtual machines. In terms of resource allocation, the hosting server which is the workhorse of the federation is given 16 CPUs and 64GB of RAM, whereas other virtual machines are given 8 CPUs and 32GB of RAM and 50GB of local disk space each. All VMs share a common network volume of 5TB for the uploaded files.

| ArcGIS Enterprise Components | Virtual Machine Resource Allocation |
|---|---|
| **ArcGIS Server (GIS Server + Hosting Server)** | 16 CPU, 64Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |
| **Portal for ArcGIS** | 8 CPU, 32Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |
| **Image server** | 8 CPU, 32Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |
| **Raster server** | 8 CPU, 32Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |
| **Relational Datastore** | 8 CPU, 32Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |
| **Tile Cache Datastore** | 8 CPU, 32Gb Ram, 50Gb local storage, 5Tb of shared storage volume. |

For automating the installation, deployment, and configuration process, ESRI recommends using Chef Infra. In terms of how the UM computing environment is set up, it ended up being necessary to take a hybrid approach to this recommendation. Chef Infra cookbooks were referenced for deploying the major software like ArcGIS packages, web adaptors, licenses, iptables and Tomcat. For other components like SSL certificates, LDAP & SAML login, Hostname aliases etc. individual configuration was necessary. Also, instead of deploying all components with a single Chef Infra automation script, one VM at a time was targeted.

For the most part, ESRI documentation was helpful, however, putting it all together as a federation and making them work in our campus environment was a challenge. ESRI support was able to give some guidance when approached for clarification along the way. Good knowledge of the campus IT environment is an asset if the reader is considering a similar setup at their local institution.

## Users

The Hub is being piloted as a connected whole over the summer semester. The four groups were identified based on their needs:

1. Faculty to student data sharing
2. Campus administrative users
3. Researcher data collection/sharing
4. New GIS users

The Faculty to Student group uses a workflow that is very similar to the one Libraries use to share proprietary data with the rest of campus, but instead is for a small subset of users for a finite amount of time. These users identified having adequate documentation and training for themselves and their students as being the main priorities. The hands-on portion for this type of user for Libraries moving forward will be to set up the data sharing group from Enterprise, the rest can be administered by the Faculty member.

The administrative unit group came from Campus Planning. They require a dynamic connection to update their inventories as well as had more interest in reporting functionality than other user groups. Functionality and training were identified as being critical for this group to adopt the platform. Aside from initial training and set- up this group will not require much ongoing library support.

The team selected to trial the Hub for data collection purposes brought out what the author considers to be the greatest weakness of the system. This specific group is involved in many

indigenous knowledge projects, and while the Hub is appropriate for some of this work, this proprietary system does not allow for the First Nations Principles of OCAP to be adhered to in terms of much of the collection, ownership and control process. The ethics of this extends beyond this group to any researcher who is conducting work with external (especially marginalized) groups. These users identified having adequate documentation and training for themselves and their students as being their main priorities. Libraries will be heavily involved providing regular training sessions.

The final pilot group is from Nursing and were new to GIS as a whole. They will require the most support out of all groups but have been extremely useful in terms of being able to articulate what starting documentation is necessary, and the overall user experience of navigating the system.

Each pilot group is working through a small project over the course of the semester and changes and suggestions are being implemented as they come up. These tasks cover the range of basic activities that are expected to take place in the GIS Hub. In the coming semester the system will be opened to all university accounts, with feedback being solicited regularly.

## Scope

As this is a new piece of infrastructure on campus, one of the main priorities has been to articulate and communicate the scope of the project to our stakeholders. This is broken down in terms of capacity, licensing, and policy.

Discussing the GISHub in terms of computing capacity allows researchers to more easily understand if it is the correct solution for their work. We are framing it as a service for active research and teaching, not a platform for long-term data hosting and archiving.

In terms of policy, discussion and documentation are centered around data management planning and sharing. While ESRI vocabulary includes the word ‘open’, having a dataset in the GISHub with this option selected does not mean the researcher is satisfying tri-agency open data requirements. Additionally, it is up to the researcher to put appropriate sharing restrictions on their research data, University of Manitoba Libraries staff does not do housekeeping in this area.

The final scope note is ensuring that we communicate the licensing terms of the software to our users. When manually setting up accounts we could ensure researchers were aware use of the product was for research and education only (no profit generating activities). When campus authentication gateway is open to UM members in the fall, having this documentation in a variety of places including with the central IT branch will ensure we are doing our due diligence to not violate the terms of our license.

## Conclusion

There are many future plans associated with the GIS Hub, but current priorities include adding the GeoAnalytics, GeoEvent and Spatiotemporal servers to Enterprise for increased analytics capacity. Also, growing the GIS Hub as a repository for open geospatial research data from the University of Manitoba has been identified as a priority.

For other institutions considering ways of integrating their site license, in our experience main points to consider are:

- *Understand your campus needs*: who are your users, what are they doing? If you only have one program with 30 users who make use of the software, this might not be necessary for you.
- *Have a team member with in-depth knowledge of the campus IT environment*: this is more valuable than any ESRI experience.
- *Start small and build a strong base*: by stepping back and breaking things into smaller components, we cleaned up legacy problems, and were able to demonstrate consistent progress to management.
- *Communication- you are not an island-:* Keeping stakeholders in the loop builds trust and goodwill and improves the chances of adoption.

This project has been a massive undertaking and both authors (Librarian and Systems Analyst) have many other components to their jobs. Taking the time to step back and maintaining good relationships with contacts in central IT and the Faculty of Environment Earth & Resources have been critical to the success of the project.

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# GIS Trends

*Barbara Znamirowski*

## Esri UC2021: Reporting from the world's biggest GIS event

## Abstract

*In this issue of GIS Trends we review the Esri User Conference (July 12-15, 2021), offered for a second year as a virtual event.*

This year's Esri International User Conference (#EsriUC) was an excellent opportunity to get up to speed with technologies, take stock of where our institutions stand with GIS, set some goals, and enjoy many fascinating sessions.

The conference theme "GIS - Creating a Sustainable Future" no doubt hit home to most of us given recent extreme climate events across the globe.

The conference had 71,723 registered attendees from over 200 countries, with almost half (47%) from outside the United States. Over 2,500 Esri staff were in attendance, and the conference hosted 153 technical workshops, 251 user videos, 181 exhibitors, and 57 Special Interest Groups (SIGs).[i] The plenaries were open and technical workshops were free to students and Esri account holders. For those who registered for the conference, session recordings will be accessible at the UC web site for 90 days.

**These were the top 10 favourite technical workshops, as reported by the conference organizers:**

- ArcGIS API for Python: An Introduction
- ArcGIS Arcade: An Introduction
- ArcGIS Field Maps: An Introduction & What's New
- ArcGIS Field Maps: Migrating to Field Maps
- ArcGIS Online: Choosing the Right App
- ArcGIS Online: The New Map Viewer
- ArcGIS Pro Editing: An Overview
- ArcGIS Pro: Mapping and Visualization
- ArcGIS & Microsoft 365: Better Together
- Spatial Data Science in ArcGIS

**These were the top 10 User Presentations:**

- 30 Years of Census Block Geography and Data, by U.S. Census Bureau

- A First-of-Its-Kind Intelligent Water Network in Australia, by North East Water
- AI Training and Inferencing Processes for LiDAR Classification, by Exelon Utilities and ComED
- Asking the Right Questions: Framing a GIS Business Model for the Organization, by Clark Nexsen
- Best Practices for Biodiversity Mapping and Analytics, by NatureServe
- Bringing Sea Level Rise to Life using GIS and Python, by NOAA, NOS and CO-OPS
- Converting to the Utility Network at Chelan County PUD, by Chelan Public Utility District and Power Engineers
- Death to PowerPoint, In with Esri!, by US Army Corps of Engineers
- Detecting the Invisible: AI-Based Wetland Mapping, by Chesapeake Conservancy and Defenders of Wildlife
- Expanding ArcGIS Hub with Experience Builder, HTML and Illustrative Techniques, by Cobb County Government
- Flood Inundation Mapping Using GIS & Remote Sensing Techniques, by National Water Supply and Drainage Board

I was able to take in only a fraction of the conference sessions and workshops. Those interested in a comprehensive overview should check out the conference plenaries[ii] with Jack Dangermond, Esri staff and guests, and the "ArcGIS 2021: Technology Advances and Roadmap"[iii] session with Sud Menon.

Here are a few observations from the sessions I viewed. These are by no means representative of the entire conference.

**ArcGIS Online New Map Viewer:**

The new Map Viewer (formerly known as Map Viewer Beta) is out of beta as of its April release; Map Viewer Classic (formerly known as Map Viewer) is still available; AOL administrators can choose either as the default setting for their organization's primary viewer (worth keeping this in mind when planning for the fall term). The App launcher offers both so users can switch if they wish. Maps can be read in either viewer, but options that don't exist in Map Viewer Classic won't show up on the map.

There are lots of impressive enhancements in the new Map viewer, such as dot density styling, multi-element pop-ups, layer blending, group layers, vector symbols, charts (beta), map rotation, enhanced bookmarks, Sketch layers, label filters and classes, labels for clusters, clustering for more than 50,000 feature points, floor-aware map visualization, and more. Some functionality remains to be added to the new Map Viewer. For example, we were advised that Classic Map Viewer is still better for work with OGC WMS and WMTS layers and performing analysis.[iv] For more information on which map viewer to use check: https://doc.arcgis.com/en/arcgis-online/reference/faq.htm#anchor36.

**ArcGIS Pro:** There were many sessions on ArcGIS Pro, ranging from introductions to reviews of layouts and visualizations, 3D analysis, data analysis, geoprocessing, migrating from ArcMap,

using BIM data, using CAD data, cartographic production, defense mapping, editing, tips and tricks, the road ahead, and more.

The "Road Ahead" session and conference plenaries reviewed some of the ArcGIS Pro 2.8 enhancements (ArcGIS Pro 2.8 first released in May 2021). We were advised that this release focuses largely on performance and productivity as well as introducing some new capabilities. Some of the performance improvements listed include the 3D Terrain system, vector tiles in layout view, saving and opening large projects, geoprocessing improvements, multiple portal connections and sharing pane, working with Revit files, Feature Service initialization and append as well as numerous enhancements across the UI, drawing and analysis.

New feature functions for ArcGIS Pro 2.8 include the introduction of command search, support for image change detection using deep learning tools, new support to big data connections, data engineering, SAS-ArcGIS Bridge (allows integration of SAS statistical package) and tools to support PDF Accessibility.[v]

ArcGIS Pro 2.9 is due at the end of year and the release after that will be 3.0. The ArcGIS Pro Roadmap provides more information about near-term, mid-term and long-term enhancements.

I enjoyed the "ArcGIS Pro: Layouts and Maps Series"[vi] session: it reviewed new cartographic enhancements for layouts including options for blending, formatting legends, formatting map frames (including the ability to edit the vertices of map frames), and the ability to use the eyedropper selection tool for colour selection and to covert grids to features. The session also reviewed accessibility options for PDF layouts including the ability to add Alt Text information to map frames, chart frames, and pictures, export tagged pdfs, and add metadata. Other major functionality reviewed included building multiple pages from one layout (including demonstrations of spatial and bookmark options), and options for layout automation using Python and the ArcPy site-package.

**ArcGIS Story Maps:** "*ArcGIS Story Maps: What's New and What's Coming"*[vii] reviewed what's new in Stories, Collections and Themes. Within stories, we looked at the Story Map Builder including the Express Maps option which supports the creation of basic maps, and includes some nice drawing tools such as an annotation tool which offers the ability to curve arrows when labelling maps. The Story Maps Builder now includes many of the features once available only separately as individual classic templates as well as new options. Notably, sidecar, slide show, map tour, swipe and timeline (beta) are now available within one builder. The ability to include different style options within one story is huge! Also available for inclusion are an audio block and imagery gallery. Finally, new accessibility options for story maps were reviewed including the ability to set language of a story for screen reader detection.

Collections bring together stories, apps and files and are ideal for portfolios or when a story is too big and would be more effective if separated into parts. The theme builder was introduced in 2020, and supports customization of themes for stories – for example, in order to align with organization branding. Theme customization options include the ability to choose colour, an expanded list of fonts (this has gone from originally offering 14 fonts to now including the Google fonts library),

and other design elements such as buttons, quotes and links, and theme separators. It is also now possible to add organization logos to themes.

**ArcGIS Field Maps:** There were several excellent sessions on ArcGIS Field maps, and conference statistics showed that these were well received. By way of introduction, we learned that ArcGIS Field maps combines map viewing, data collection and editing, and location tracking into a single app replacing the functionality of ArcGIS Collector, ArcGIS Explorer, and ArcGIS Tracker (all to be retired in December 2021). ArcGIS Workforce and ArcGIS Navigator are to be incorporated over time. An overall product goal is to avoid organizations having to deploy multiple applications to complete a workflow. ArcGIS Survey123 and ArcGIS QuickCapture will remain as distinct apps.[viii]

**ArcGIS Indoors**: First released in 2019, this product caught my attention at last year's conference. It has many potential uses within universities, including wayfinding, location sharing, workspace sharing, facility asset management, back-to-work management and more. It would be wonderful to introduce the potential of Indoor GIS to university administration by showing them what we can do with this product in our library buildings. Note, however, that at this time if the product is to be used for administrative purposes (such as building operations), it needs to be purchased and licensed separately, outside of EIL agreements.[ix, x]

**ArcGIS Arcade:** Described as a "portable, lightweight, and secure expression language" Arcade is designed to use across ArcGIS applications including ArcGIS Pro, ArcGIS Online, ArcGIS Runtime API's and the ArcGIS API for JavaScript. It is especially used for visualization, labeling, pop-ups and calculations. It is not intended for building applications, running analyses, or automating tasks.[xi] I've referenced two blogs I found helpful which describe Arcade further and provide use cases.[xii]

**ArcGIS Maps SDK for game engines:** Check this out if you wish to use ArcGIS within game engines. ArcGIS Maps SDK integrates with Unity and Unreal Engine, the two major gaming software engines. This opens new doors for VR and ArcGIS including lots of possibilities for on campus. For example, it can support faculty interested in including immersive experiences in their curriculum.[xiii]

**Esri Accessibility Special Interest Group (SIG):** This was an excellent presentation[xiv] which summarized a great deal of information in one hour, including the status of Accessibility Conformance Reports (ACR) for a variety of Esri products and as well as examples of accessibility options added to ArcGIS Pro, Field Operations and Field Apps, ArcGIS Online. More information can be found here: https://www.esri.com/en-us/accessibility/overview.

**Cartography**: For those who have not experienced the conference's cartography sessions, they are an absolute must! They left me inspired and with lots of ideas. I looked forward to end-of-day "Mappy Hour" discussions with cartographers Edie Punt, Kenneth Field, Nathan Sheperd and their special guests. I also watched the "ArcGIS: Map Wizardry" technical workshop[xv] given by John Nelson and Kenneth Field. Just as in last year's 2020 session, the abstract began with a line worth quoting: "Sit back, and enjoy this inspiring cartographic ride!"

[i] Conference statistics, Top 10 Technical Workshops, Top 10 User Presentations taken from slides presented at Closing Session, Esri UC 2021 15 July 2021 and also provided at: https://community.esri.com/t5/user-conference-blog/esri-uc-closing-session-conference-stats-esri/ba-p/1079554.
[ii] Plenaries are linked to the Esri UC 2021 conference web site and also on the Esri Events YouTube channel.
[iii] *ArcGIS 2021: Technology Advances and RoadMap*, Sud Menon, Esri UC2021, 14 July 2021.
[iv] Information derived from: *ArcGIS Online: The New Map Viewer*, Chris Whitmore, Lauren Ballantyne, Zara Matheson, Esri UC 2021, Tuesday, 13 July 2021.
[v] Information on performance improvements and new feature functions derived from: *ArcGIS Pro: The Road Ahead* Craig Williams, Jim McKinney, Prashant Mangtani, Ty Fitzpatrick, Orhun Aydin, David Watkins, Nathan Shephard, Stefan Balbo, Aubri Kinghorn, Esri UC 2021, 12 July 2021.
[vi] *ArcGIS Pro: Layouts and Map Series*, Aubri Kinghorn and Jeff Barrette, Esri UC 2021, 14 July 2021.
[vii] Information derived from from: *ArcGIS Story Maps: What's New and What's Coming*. Aravind Sivasailam, Ashley Du, Jennifer Bell, Esri UC 2021, Wednesday, 14 July 2021.
[viii] *ArcGIS Field Maps: An Introduction & What's New*, Brent Pierce, Jeff Shaner, D'Maia Curry, Esri UC 2021, 12 July 2021.
[ix] License information was obtained outside the conference, and applies to Canadian higher education Esri Education Institution License (EIL) agreements. License terms are subject to change (check with your Esri representative).
[x] There were several sessions on ArcGIS Indoors. For an introductions see "ArcGIS Indoors: An Introduction" Andy Steward, William Isley, Beau Ryck, Esri UC 2021, 12 July 2021.
[xi] Information derived from *ArcGIS Arcade: An Introduction*, Allison Rost and Rudy Prosser, Esri UC 2021 12 July 2021.
[xii] https://www.esri.com/arcgis-blog/products/arcgis-online/data-management/your-arcade-questions-answered/#what-is-arcade and https://www.esri.com/arcgis-blog/?s=#arcade.
[xiii] For further information see: *ArcGIS Maps SDK for Game Engines: An Introduction*, *Adrien Meriaux and Rex Hansen, Esri UC 2021, 13 July 2021*
[xiv] *Esri Accessibility Special Interest Group (SIG)*. Panel: Arjav Badjatiya, Aubri Kinghorn, Charmel Menzel, Karl Frantz, Klara Schmitt, Roanan Harris, Jessica McCall, Esri UC 2021, Thursday, 15 July 2021.
[xv] ArcGIS: *Map Wizardry* John Nelson and Kenneth Field, Esri UC 2021, 14 July 2021.

## GIS Trends: Note from the Editor

### Submissions and Feedback

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

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

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