



CARTOUCHE

Canadian Cartographic Association



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Canadian Cartographic Association
l'Association canadienne de cartographie

Cover art by Phillip Bailey. Cartouche content compiled and edited by Stephanie Pyne, Marikka Williams, and Jamison Cooper-Leavitt; layout and design by Jamison Cooper-Leavitt and Marikka Williams.

Cartouche is the Association's semiannual publication, featuring updates by the executive committee, news about conferences and events, member submitted articles and much more. CCA members receive Cartouche as part of the membership. Current versions are sent directly to members, and past editions are added to the website: <https://cca-acc.org/cartouche>.

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PRESIDENT'S MESSAGE

PAUL HEERSINK, INDUSTRY MANAGER, ESRI CANADA

OVER THE PAST YEAR, the CCA has continued to focus on the work that matters most to our members: delivering meaningful conferences, strengthening member engagement, supporting publications, managing finances responsibly, and building the volunteer capacity needed to sustain the association. It has been a productive year, marked by steady progress as well as the practical challenges that come with running a national, volunteer-led organization.

Planning for the 2026 annual conference has been a central priority. Work has included venue coordination, program development, logistics, and collaboration with local partners and organizing committees. Early conversations are also underway for future conferences, including 2027, with a focus on earlier planning, clearer communication, and stronger participation.

The CCA continued to connect with members through both virtual and in-person opportunities. Two webinars were held this year, each attracting approximately 40–50 participants. These events have proven to be an effective way to maintain momentum between annual conferences, while also highlighting opportunities to improve promotion, attendance conversion, and technical delivery. In the coming year we hope to host a couple more webinars. Stay tuned for details closer to the dates.

Progress has been made in strengthening the association's publications, particularly through efforts to improve the consistency and structure of *Cartouche*. Establishing a regular schedule of two issues per year remains an important goal. The executive has worked with University of Toronto Press to resolve outstanding matters related to *Cartographica*, including online access and billing.

The association remains financially stable, supported by regular reporting and careful management of operating funds, reserves, and investments. This stability allows the CCA to continue supporting conferences, publications, and member services while maintaining a prudent approach to long-term sustainability.

As a volunteer-led organization, the CCA's strength depends on continued recruitment, leadership continuity, and the willingness of members to contribute their time and expertise. Governance

work continues, including policy modernization in areas such as travel reimbursement. At the same time, the association must address ongoing challenges: lower-than-anticipated conference registration, improved webinar engagement, and sustained volunteer capacity.

Thank you to the executive, volunteers, committee members, partners, and members for your continued support in the work of the CCA. Your contributions make it possible for the association to remain active, relevant, and connected across Canada's cartographic community.



Paul Heersink, President
Canadian Cartographic Association
pheersink@gmail.com

VICE PRESIDENT INTRODUCTION

JEFF CLARK, CLARK GEOMATICS

I AM PLEASED to introduce myself as the incoming vice-president of the CCA. My path to cartography has not been especially linear, but in hindsight it makes a great deal of sense. I began my career as a geophysicist, collecting and interpreting complex data to make subsurface geology understandable. That early work taught me to think carefully about structure, pattern, uncertainty, and the relationship between data and interpretation.

From there, I moved into GIS consulting, where I spent most of my career helping clients organize, analyze, and manage geographic information and assets. GIS gave me a powerful technical foundation: data management, spatial analysis, terrain modeling, coordinate systems, and production workflows. But over time I became increasingly interested in the final step in that process, how geographic information is transformed into something people can actually see, use, and understand.

That interest eventually led me to do a deep dive into cartography. Through *Clark Geomatics*, I have focused on creating reference maps, mostly of British Columbia's landscapes. My work is ground-

ed in the philosophy of essential geography, revealing the landscape, water, and cultural context that give a place its character. In my view, a successful map is not simply accurate or attractive, it should help people understand where they are, what surrounds them, and why a place matters.

I come to the CCA with a strong respect for both the technical and artistic sides of cartography. My career has moved from geoscience to GIS to design-led map making, and I see these as closely connected experiences. I look forward to supporting the CCA's work, learning from its members, and helping strengthen the visibility of Canadian cartography at a time when maps are more abundant than ever, but thoughtful cartographic design remains as important as it has ever been.

Jeff Clark, Vice President
Canadian Cartographic Association
jeff@clarkgeomatics.ca



HISTORY OF CARTOGRAPHY CHAIR

CHRISTOPHER HEWITT, ASSISTANT PROFESSOR, WILFRID LAURIER UNIVERSITY

My name is Christopher Hewitt and I am an Assistant Professor in the Department of Geography and Environmental Studies at Wilfrid Laurier University. I look forward to serving as the History of Cartography chair with the Canadian Cartographic Association.

My doctorate was on applying historical maps and datasets to re-interpret the battle of Hastings from the medieval period. Since graduating, I have contributed to multiple projects including one where I digitized the boundaries of the 1956–66 census tracts as well as edited the federal electoral boundaries back to 1867. These datasets are now publicly available for future mapping projects. My research has been published by the *Cartographic Journal* and *Cartographica* among others. I also developed a workbook on how to access, work with and visualize Canadian data which has been published with Locate Press.

Cristopher Hewitt, History of Cartography Chair
Canadian Cartographic Association
chewitt4@uwo.ca

My future work involves working with not-for-profit organizations such as Airshow London to examine who attends the show or uses their services. Building off of my doctorate, I am interested in developing an atlas of the Anglo-Norman World in the eleventh and twelfth centuries during the reign of William the Conqueror and his sons. I am also interested in examining different battles and campaigns from the medieval and early modern period from a geographic perspective using historical maps and data. Lastly, I have an interest in researching historical maps to investigate environmental patterns through time including coastlines, river networks and land uses.



2025 FINANCIAL REPORT

ANDY BLACK, CCA TREASURER

AS OF DECEMBER 31, 2025, the CCA is in good financial shape. We have total assets of about \$67,000 including cash of around \$19,500. We had accounts payable of about \$10,700 for invoices and expenses from 2025 payable in 2026, including \$7100 for delayed invoices for *Cartographia* printing and shipping.

The tables below include columns for the three previous years for general comparison. Please note that some comparisons are less exact due to differences in calculation methodology, as indicated in the footnotes, as well as delayed invoices and payments.

Over the last few years, we have generally stayed close to break even on an annual basis, while investing in the activities and growth of the association. In 2025, we gained assets due to unrealized interest in our GICs, and on an operating basis, we had net income of about \$5,400 on revenue of about \$12,000. But as mentioned above, we also owed about \$10,700 for expenses from 2025. We published four issues of *Cartographica* (at about \$1,000 per issue). Starting in 2023, membership renewals have mostly shifted

earlier due to when *Membee* sends renewal reminders. This caused a bulge in 2023 membership revenue, which has returned to normal in 2024 and 2025.

Thanks to Glenn Brauen, The University of Toronto Scarborough Campus provided CCA with a grant of \$2,248 to support our 2024 conference which was received in 2025.

We added a new bank account that allows electronic transfer of funds (ETFs) which speeds payments for reimbursements and accounts payable, and saves us on cheque expenses and administration hassle.

Membee continues to be a valuable time-saving investment and well worth the cost. It simplifies issuing membership renewal notices, conference registrations, receipts, and keeping track of financial information.

In the role of CCA treasurer, I am in the process of automating some of the treasurer role via spreadsheet to facilitate financial tracking, annual reporting, and producing data for our tax return in one location.

I will close by again thanking Byron Moldofsky for a smooth and complete handover of the treasurer role. His excellent record-keeping and complete files have made the transition easy. I also want to thank all the members of the Executive, especially Paul Heersink and Glenn Brauen, who have welcomed me into the fold and made the transition easy. It is a pleasure to be working with everyone here at the Canadian Cartographic Association.



Andy Black, Treasurer
Canadian Cartography Association
cartassoctreasurer@gmail.com

Statement of Revenue and Expenditures. Specific revenue and expenses¹ of the Canadian Cartographic Association as of December 31, 2025.

Revenue	2025	2024	2023	2022
Membership fees (balance of year)	\$5,961 ^{2,3}	\$6,361 ^{2,3}	\$11,031 ³	\$6,402
Membership/conference fees	\$3,748 ²	\$6,002 ²	\$1,380 ⁶	\$378
Conference Support	\$2,249 ⁷	\$600 ⁷	\$0	\$0
Interest received on CCA specific term deposits	\$0	\$0	\$2,619	\$793
Total Revenue	\$11,958	\$12,963	\$15,030	\$7,573
Expenditures	2025	2024	2023	2022
Cartographica distribution ⁴	\$2,183	\$2,207	\$5,399	\$3,480
AGM Executive Travel (2022 Online only)	\$2,813	\$3,414	\$2,165	\$0
Website expenses (hosting and domain)	\$0	\$524	\$605	\$0
Conference expenses	\$0	\$4,888	n/a	\$525
Bank service fees ⁵	\$3	\$219	\$327	\$132
ICA Membership for 2 years (CIG shared)	\$0	\$0	n/a	\$457
Administrative/Office Expenses	\$524	\$311	\$226	\$76
Student Awards—President's prize, Web-map, Presentation	\$1,000	\$750	\$750	\$1,500
Management—Membee license	\$0	\$1,329	\$1,329	—
Accountant, for business income tax filing	\$0	\$1,452	\$1,000	—
Total Expenditures	\$6,524	\$15,094	\$11,801	\$6,170
Excess revenue over expenditures	\$5,435	(\$2,131)	\$3,229	\$1,403

1. Association-specific revenues and expenditures are dedicated to the running of the organization. They are not designated to other funds such as Student Awards.

2. Net after Stripe service fees of approximately 3%.

3. The change to Membee shifted membership renewals into the prior year starting in 2023.

4. Cartographica was published four times in 2025, twice in 2024, five times in 2023, and (I believe) three times in 2022 at a cost of about \$1,000–\$1,100 per issue. Some invoicing was delayed and payments were paid in the following year.

5. Bank service fees (not including Stripe processing fees) of approximately 3% on each transaction.

6. In 2023, we received a conference income transfer from ACMLA.

7. Conference support for the 2024 conference from the University of Toronto which was received in 2024 and 2025.

Statement of Other Revenue and Expenses. Designated revenue and expenses¹ of the Canadian Cartographic Association as of December 31, 2025.

Other Designated Revenue	2025	2024	2023	2022
Association CartoQuébec fund interest	\$309 ³	\$638 ³	\$942 ³	\$280 ²
Nicholson scholarship fund interest	\$286 ³	\$462 ³	\$303 ³	\$423
Total Other Designated Revenue	\$595	\$1,100	\$1,245	\$322
Other Designated Expenditures	2025	2024	2023	2022
CartoQuebec award	\$0	\$0	\$0	\$500
Norman Nicholson Scholarship	\$0	\$0	\$500	\$0
ICA Children's Map Competition Awards	\$0	\$0	\$300	\$0
Total Other Designated Expenditures	\$0	\$0	\$800	\$500

1. Revenues and expenditures of designated funds to be used for awards or scholarships, not part of the general operating revenue and expenses of the association.

2. These amounts represent interest on investments (GICs) earned during the reporting year estimated but not yet received.

3. These amounts represent interest on investments (GICs) matured and received during the reporting year shown.

Statement of Financial Position. The specific assets of the Canadian Cartographic Association are as of December 31, 2025. The stated values for all GICs as of year-end include all estimated interests earned but not yet received. The stated values for cash accounts are as of the year-end.

Association-specific Assets	2025	2024	2023	2022
GIC Term Deposits value at year end	\$47,465	\$45,362	\$43,464	\$42,565
Cash account (Association funds) ¹	\$19,552	\$14,118	\$15,749	\$13,794
Total Association Assets	\$67,018	\$59,480	\$59,213	\$56,359
Other Designated Assets	2025	2024	2023	2022
Association Carto Québec Fund GIC ²	\$9,671	\$9,362	\$8,600	\$8,987
Nicholson Scholarship Fund GIC ³	\$8,959	\$8,673	\$8,595	\$8,792
ICA Children's Map Fund ¹	\$1,272	\$1,272	\$1,272	\$1,572
Total	\$19,902	\$19,307	\$18,467	\$19,351

1. The University of Victoria provided us with \$2,172 for the ICA Children's Map Fund in 2012, of which \$1,272 now remains. This is to be disbursed to winning children's map submissions to the ICA. The ICA Children's Map Fund currently sits within the association's general bank account.

2. Association Carto Québec Fund GIC are in a GIC term deposit maturing 24 Nov 2027.

3. Nicholson Scholarship Fund GIC are in a GIC term deposit maturing 24 Nov 2027.

SUMMARY OF THE 2026 AGM

Welcome and President's Report: Paul Heersink. Paul welcomed members and thanked conference organizers, including Martha, Julia and Ted. Paul encouraged volunteers to the CCA executive committee. He reflected upon his first year as President, which included positive initiatives, such as two webinars: (1) *Cartography: Past/Present/Future* and (2) *Women in Cartography*, and also for the publication of *Cartouche 102* (the 50th Anniversary edition). Paul thanked all involved in these initiatives.

Treasurer's Report: Andy Black. Andy shared that the CCA is in a good financial position, provided a brief summary of assets and funds, and commented that Membee has helped to improve administration. In reviewing the Treasurer's Report that was shared with the membership, Andy highlighted information in the membership table, and some discussion was held around the issue of funds for scholarships/awards.

Cartographica: Stephanie Pyne. Stephanie reviewed the 2026 *Cartographica Report* for 2025 (prepared by *University of Toronto Press*), provided an update on the *Maps and Memory Special Issue*—expected to be published in Fall 2026, and commented on aspects of her first year in the *Cartographica* editor role.

Membership Report: Jamison Cooper-Leavitt. Jamison presented membership numbers, which were slightly lower in part due to fewer student members. He suggested tracking graduated students to encourage them to join as regular members.

CCA Conference 2027: Paul Heersink. Paul led a discussion on potential locations for our 2027 CCA conference and AGM. This discussion included a preference for a western province (possibly Vancouver, BC or Regina, SK). Discussion also extended to future locations for 2028 (possible joint conference in Whitehorse, YK with ACMLA).

Awards: Paul Heersink. Paul commented that the *Student Map Competitions & Best Paper Awards* were still in the judging stage. Glenn also presented Ted MacInnon with the *Roger Wheat Award*

of Distinction for Exceptional Contributions to the Canadian Cartographic Association for exceptional contributions to the Canadian Cartographic Association as a long-time executive member.

Closing remarks and adjournment: Paul Heersink. Paul thanked everyone for attending and adjourned the meeting at 1:40 pm Atlantic time.

CCA EXECUTIVE UPDATES

- President—Paul Heersink
- **Incoming Vice President—Jeff Clark (New)**
- Past-President—Glenn Brauen
- **Secretary—Vacant (New)**
- Treasurer—Andy Black

INTEREST GROUP CHAIRS

- **History of Cartography—Christopher Hewitt (New)**
- Education—Stephanie Pyne
- Mapping Technologies & Spatial Data—Marikka Williams
- Geovisualization & Map Design—Thomas Herbreteau

APPOINTEES

- *Cartographica* Editor—Stephanie Pyne
- ICA Delegate—Julia Siemer
- Membership Coordinator—Jamison Cooper-Leavitt
- Communications—Yegane Vahidi and Jessica Murdoch
- **Cartouche Editor—Marikka Williams, Stephanie Pyne, and Jamison Cooper-Leavitt (Layout; New)**
- Co-ordinator, National Map Exhibit—Julia Siemer
- Barbara Petchenik International Children's Map Competition—Vacant; *Stephanie will create a database of schools for outreach on this position.*
- **Student Representative(s)—Alex Young (New)**
- Webmaster—Ted MacKinnon

ROGER WHEATE AWARD

This year, the Canadian Cartographic Association is proud to honor one of its own by presenting the *Roger Wheate Award of Distinction for Exceptional Contributions to the Canadian Cartographic Association* for exceptional contributions to the Association and to the broader geomatics community to Ted MacKinnon.

Ted's career in geomatics began at COGS, where he completed advanced graduate studies in remote sensing and later in Applied Geomatics Research, with a focus on LiDAR. Since then, he has built a distinguished career grounded in both technical excellence and public service. For the past 15 years, he has served as a Senior Geomatics Technologist with *Natural Resources Canada*, and his work includes important contributions to the use of high-resolution LiDAR for flood-zone modeling. Beyond this formal role, Ted has given generously to the wider community through participation in a number of associations, which include the *Geomatics Association of Nova Scotia* and *Canadian Institute of Geomatics*, and by cre-

ating and maintaining CanadianGIS.com, a trusted and widely used resource that connects people across Canada to geospatial data, events, opportunities, and ideas.

Ted has also given many years of dedicated service to the Canadian Cartographic Association. As a long-time member and active volunteer, he served as Vice-President in 2018 and became President in 2020, helping to guide the Association through a challenging period and helping CCA to update how we support our members. After leaving the executive, he has remained involved through his continued work on the CCA website and his support for this conference. Ted's contribution to the Association, and to the wider geomatics community, has been steady, practical, and much appreciated. It is a pleasure to recognize Ted MacKinnon with this award.



Ted MacKinnon receiving the certificate for his *Roger Wheate Award of Distinction for Exceptional Contributions to the Canadian Cartographic Association*.



Presentation given by Jude Keefe



Old maps presentation



Workshop



Executive committee



Presentation given by Phil Bailey



Old maps presentation

PHOTOS OF EARTH BY ASTRONAUTS

EXAMPLES FOR ONLINE MAPS

DAVE MACLEAN, GIS FACULTY, COGS

ONE OF THE MAIN topic areas that I teach is ArcGIS Online maps and applications. Since 2013, I've created many examples for students based on photographs taken by astronauts while onboard the International Space Station (ISS). Each mission has a different-looking application demonstrating various capabilities of online mapping technology. Turns out that presenting these photographs in this [manner](#) is popular by the general public, too. There are 40+ of these applications.

The data is in a single online feature layer; one of the fields contains the mission number to the ISS. Filtering this field is part of the map that customizes the look for a particular mission; that map is consumed by an application for presentation.

Over the years, some application formats have been deprecated, so some additional recent work has been replacing outdated applications with new ones. The *Scott Kelly: Year in Space* application was a Map Series comprised of six components. It can now be viewed as a [gallery](#). The Map Tour—[Pictures of Japan from the ||+||](#) by 若田 光一 Koichi Wakata—had mission-specific pin colors and bilingual popup content; it is now a Basic Instant App.

In both cases, the old existing maps (with subtle modifications) were redeployed within new Instant Apps.

Students, too, have contributed. This application uses a high-resolution scan of the orbital chart that John Glenn took to space during *Friendship 7* on February 20, 1962. (The original is in our map library.) The student added random photos taken near Glenn's orbit, by astronauts on the ISS.

There was an overall *Map Tour* cataloging the various maps and configurable applications; it has been replaced by a StoryMaps Collection. (I'm gradually adding to it as I replace others of the deprecated maps with Instant Apps, Dashboards, StoryMaps, and Experiences). With tens-of-thousands of photos taken during each mission to the ISS, there will continue to be lots of material for new, mission-specific map-apps, each showcasing different capabilities and formats of online maps for students and the public. Out of interest, the two links in the introduction paragraph lead to



Some typical photos here are of Lake Baikal in eastern Russia or parts of the Great Lakes between Canada and the US.

two types of StoryMaps—a briefing and a frame; the first is an ideal format for presentations, whereas the second is designed for a smart phone.



A westward look at the island of Newfoundland



Glint of sunlight on the Paraná River

CREDITS

This material was presented at the CCA2026 Conference at the Centre of Geographic Sciences held between May 27 and 29. That presentation is available online [here](#); there was a follow-along document for attendees that you can access [here](#).

Photos by NASA, CSA, ROSCOSMOS, JAXA, ESA, MBRSpace Astronauts & Cosmonauts, hosted at the [Earth Science and Remote Sensing Unit, NASA Johnson Space Center](#); historic ROSCOSMOS photos now only sourced online on X.

MIND THE GAP

CARTOGRAPHY, DESIGN, AND ESSENTIAL GEOGRAPHY

JEFF CLARK, CLARK GEOMATICS

MY RECENT CCA PRESENTATION, *Mind the Gap*, explored what I described as the cartographic design gap: the space between what modern mapping technology can produce and what well-designed cartography can communicate.

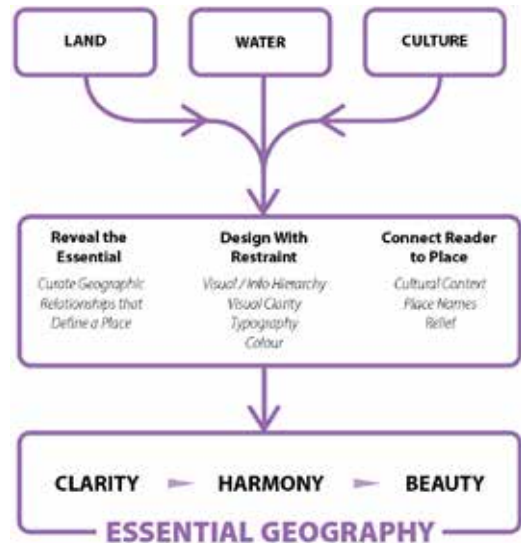
Digital tools have transformed map production. GIS, remote sensing, elevation models, bathymetry, and automated base maps allow us to create maps faster than ever. But speed and automation do not guarantee communication. A map can be technically correct and still fail to explain the place clearly, meaningfully, or beautifully. This is where cartographic design remains essential.

The central argument of the talk was simple: technology should be the helper, not the driver. Technology provides facts and details; cartography gives those facts meaning. Design choices involving hierarchy, typography, colour, line weight, shaded relief, label placement, and visual balance determine whether a map merely displays information or helps the reader understand a landscape.

To address this gap, I discussed my approach to Essential Geography where the goal is not to show everything, but to reveal what is essential to defining a place. In my own work, this usually means organizing the map around three pillars: land, water, and culture. Terrain, hydrography, settlement patterns, transportation, place names, Indigenous geography, historical context all work together as one coherent image. Every map element must earn its place.

A recurring theme in the presentation was the relationship between clarity, visual harmony, and beauty. Clarity means that nothing distracts and everything communicates. Visual harmony means that colour, type, form, and weight are working together. Beauty is not decoration; it is what happens when a map feels right because the geography is understandable, balanced, and emotionally connected to place.

I also emphasized that authentic cartography should look right, feel right, and be right. It should reflect the true character of a landscape, connect the reader to that landscape, and respect its geography, history, culture, and context. In that sense, design is not only an aesthetic act, but also an interpretive and ethical one.



Essential Geography begins with the defining elements of place—land, water, and culture—and through careful curation, restrained design, and attention to cultural context, these elements are shaped into a map that leads to clarity, visual harmony, and beauty.

The talk concluded with a practical summary of Essential Geography: reveal essential geographic relationships, design with restraint, and communicate a sense of place. For me, this is the most difficult part of cartography, but also the most rewarding. High-effort maps require extensive curation, iteration, visual judgment, and patience. The result, at its best, is a map that does more than locate features. It helps people see, understand, and care about the geography in front of them.



A map example from *Essential Geography of Vancouver Island* or *Essential Geography of the Sea-To-Sky* showing the approach in practice. Vancouver Island snippet of Tofino/Pacific Rim NP/Ucluelet area



— Sea To Sky snippet of Squamish/Cheakamus Valley area

MAPPING CIRCULAR FOOD SYSTEMS IN GUELPH, ON

JUDE KEEFE, MA GIS

THIS PRESENTATION IDENTIFIED KEY moments in a timeline covering a variety of projects across approximately 8 years focused around food security and food waste reduction in Guelph-Wellington in Southern Ontario.

It can be viewed [here](#). These featured maps were part of a continuum of linked research efforts to promote food system adaptation to encourage and advance circularity of resources in food products.

This research began in applied coursework at COGS in 2018 as an evaluation of food assets in the Annapolis Valley “food shed”—considering retail, agriculture, and alternative access types like farm stands. A discussion of the NAICS coding methodology linked the topics together as a guiding approach, which provided a framework for understanding the impact of food resources from the perspective of food insecurity and food loss or waste. The maps presented in this lightning talk featured this analysis in consecutive stages, identifying key areas of interest through the *Smart Cities Challenge* project’s four years of *Our Food Future*. Featured elements include symbology that connects to project themes, and balanced scales of display for both print and interactive versions of the design.

This icon design is connected to the NAICS codes of classified categories, as well as the customized groupings related to food waste reclamation opportunities. More details on this circular model, and the related slider of symbology updates, can be found in the [Story Map](#) related to this work.

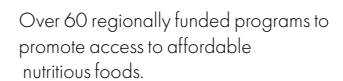
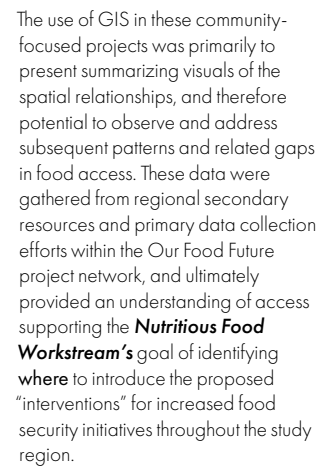
These projects resulted in over 60 funded programs to improve access to affordable nutritious foods in communities-of-need during the program duration, with many continuing today—two years following funding conclusion.

Therein lies the next steps of this work—to apply this classification framework to understand food access and waste reclamation potential within the food security scope in any community study area. In this particular example, the connection between Nova Scotia and Ontario lays the groundwork for adapting to local needs for further adaptation and system redesign to incorporate this understanding.

The lightning talk concluded by identifying an example of this methodology as an assignment in a college-level *GIS Apps in Planning* course (at Mohawk College in Ontario) where this NAICS classification approach helped to filter out food types for an interactive Esri hosted web app of each student’s chosen study area.



Classifying data for hierarchy potential and asset management of agricultural-food places with unique symbols based on NAICS codes.



CARTOGRAPHY MEETS CHATGPT

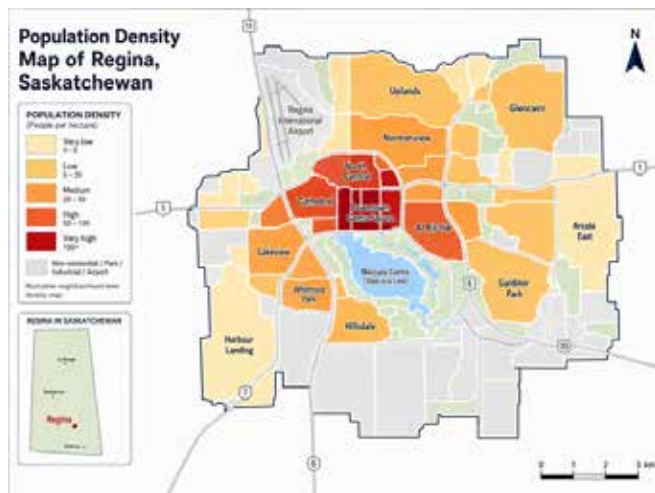
JULIA SIEMER, UNIVERSITY OF REGINA

IN THIS LIGHTNING TALK, I explored how artificial intelligence is beginning to reshape cartography, spatial analysis, and the teaching of mapping. The presentation examined emerging AI tools and their potential to support coding, visualization, data interpretation, and map design, while also raising important questions about accuracy, ethics, and the changing role of cartographers.

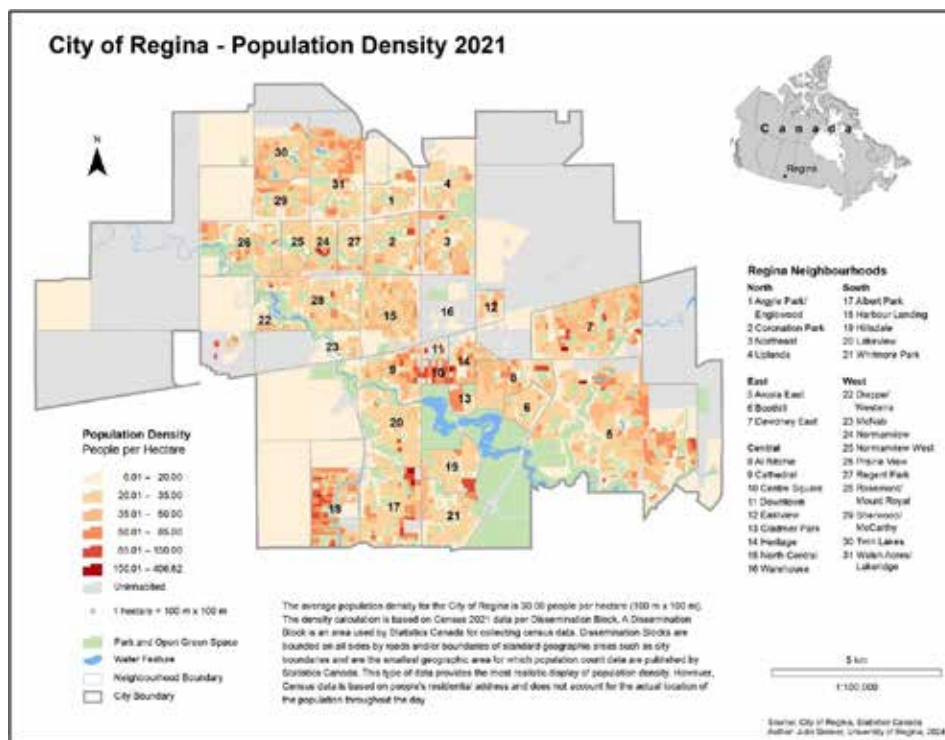
Through practical examples, the presentation demonstrated both the promise and the current limitations of ChatGPT for cartographic work. In one example, ChatGPT was asked to provide critical evaluations of several sample maps. While the tool produced generally useful summaries of map content and visual elements, its critiques tended to remain overly positive and often focused on descriptive features rather than deeper cartographic issues. For instance, an incorrect choropleth map showing absolute rather than standardized values was initially assessed as a “good map”, with the key methodological problem mentioned only at the end of the critique.

A second example asked ChatGPT to create a choropleth map of population density by dissemination block for the city of Regina by using *Statistics Canada’s* data. In its standard mode, ChatGPT generated an image that contained significant “spatial hallucinations”, including invented geography, incorrect population data, and missing map elements. By contrast, when using ChatGPT 5.5 in thinking mode, the same request produced a detailed 15-page report outlining governmental data sources, thematic attributes, mapping techniques, GIS workflows, potential pitfalls, and layout suggestions. While it did not generate the final map, the response provided a much more useful foundation for creating the map in QGIS or ArcGIS Pro.

Overall, this short exploration highlighted that AI is not yet a substitute for cartographic expertise. However, it also showed that tools such as ChatGPT can be valuable as supportive resources, particularly for brainstorming, workflow development, teaching, and helping users better understand the steps involved in producing effective and accurate maps.



Population Density Map of Regina, Saskatchewan.
— Produced by ChatGPT.



Population Density Map of Regina, Saskatchewan, with correct geography and data.
— Produced in ArcGIS Pro

FROM COAST TO COAST TO COAST

MAPPING WITH QGIS, GOOGLE MY MAPS & AVENZA MAPS

MARIKKA WILLIAMS, MSC, GISP, GIS EDUCATOR, CONSULTANT AND CARTOGRAPHER

NOVA SCOTIA IS A Coast to Coast-to-Coast environment with boundaries on every side. It has more than political, cultural and watershed boundaries. It is unique in that it is mostly surrounded by oceanic boundaries.

In the modern era, integrated mapping techniques are often utilized to map. In this presentation, I explore how Nova Scotia can be mapped from Coast to Coast to Coast using QGIS, Google My Maps and Avenza MAPS.

WORKFLOW

In this presentation I explore a series of workflows to demonstrate how QGIS, Google My Maps and Avenza MAPS can be utilized to map Nova Scotia on multiple platforms. The focus is on QGIS methods associated with integrating data, from various sources, in multiple formats, and at multiple scales to map the province of Nova Scotia.

DATA ACQUISITION

Administrative and environmental datasets are acquired from sources including Statistics Canada, OpenStreetMap (OSM) Geofabrik, the University of Maryland, the Council for Environmental Cooperation (CEC), Nova Scotia Open Data, and GPX datasets from Friends of Kej. All datasets were downloaded in their native formats (SHP, FGDB, GPX, GeoTIFF).

DATA PREPARATION IN QGIS

QGIS is utilized to process the various file formats. I summarize the various file formats and related workflows in this section.

Shapefile (.shp) Workflow. Shapefiles are used extensively for administrative boundaries, municipal boundaries, water features, and road networks. These types of features typically have a large number of vertices which creates latency in web maps so it is a best practice to simplify the data to reduce the number of vertices in the geometry. The QGIS workflow that I implemented is summarized as follows:

- Load Shapefile into QGIS via Vector menu.
- Extract by Attribute is used to extract Nova Scotia from the Statistics Canada Provincial Boundary dataset where: "Selection attribute PRENAME = Nova Scotia".

- Multipart to Singlepart enabled me to convert the complex multipart provincial boundaries of Nova Scotia into individual polygons to simplify.
- Add Geometry Attributes enabled me to add area and perimeter fields for evaluation.
- Simplification enabled me to extract the largest polygon geometry for clipping.

File Geodatabase (FGDB/.gdb) Workflow. File Geodatabases are often used for large, structured datasets such as Statistics Canada Census Dissemination Blocks. In this instance I chose this file format due to the way the data is packaged and needs to be processed to extract only data from Nova Scotia to calculate and render population density effectively. The QGIS workflow that I implemented is summarized as follows:

- Load FGDB directory Type: OpenFileGDB.
- Select Items to Add MultiPolygon layer.
- CRS Transformation Required because StatCan uses EPSG:3347.
- Extract by Attribute Filter PRUID values for Nova Scotia.
- Join Attributes by Field Value joins CSV attributes to spatial blocks using DBUID.

CSV (Comma Separated Values) Workflow. Statistics Canada Census Attribute Tables are in a CSV file format and provides non spatial attributes such as population, dwellings, land area that enable population density to be calculated. The QGIS workflow that I implemented to join this non-spatial data to the spatial data and calculated population density is summarized as follows:

- Load CSV as No Geometry Table ("No geometry (attribute only table)").
- Field Calculator Creates DBUID_T field to match spatial DBUID.
- Join Attributes by Field Value Adds census attributes to spatial dissemination blocks.

- Calculate Population Density Formula:
"DBPOP2021_IDPOP2021/DBAREA2021_IDSUP2021".

GeoJSON (.geojson) Workflow. GeoJSON is commonly used for web friendly vector layers and it is the format that QGIS2Web exports. I include it to document the QGIS workflow associated with ingesting and processing this type of data.

- Load GeoJSON.
- Extract by Attribute Used for simplified provincial boundary clipping.
- Flatten Nested Attributes (optional).
- Export to Web (QGIS2Web) GeoJSON is the primary data format for Leaflet.

TIF/GeoTIFF (.tif) Raster Workflow. Raster formats are often used for land cover, tree cover, DEM and hillshade. The QGIS workflow that I implemented is summarized as follows:

- Load Raster.
- Clip Raster by Mask Layer clips tree cover to watershed extent.
- Reproject Raster ensures compatibility with web map (EPSG:3857 or EPSG:4326).
- Raster Symbolology options include singleband gray for quantitative data or palette classification for qualitative data.

KML / KMZ Workflow. KML/KMZ files often store waypoints, routes, tracks for hiking, camping, portages or geocoded points created in Google My Maps or collected in the field with Mobile Apps such as Avenza MAPS. This type of data can be ingested and processed using the following QGIS workflow:

- Import KML/KMZ file.
- Output Point/Line/Polygon Layers creates shapefiles or temporary layers.
- Symbolize according to geometry type.

GPX Workflow. GPX files provide GPS recorded paths and waypoints from recreational GPS devices. This type of data can also be ingested and processed using the following QGIS workflow:

- Load GPX file.
- Separate Layers Track_points, routes, waypoints.
- Symbolize according to geometry type.

XYZ Tiles—Basemaps Workflow. XYZ tiles provide web-based raster basemaps that can be loaded with QGIS Plugins and compatible with the QGIS2Web Leaflet integration.

- Download Base Maps Plugin to Load XYZ Tiles OpenStreet-Map, Esri, CartoDB, OpenTopoMap, Google.
- Use as Basemap Underlays vector layers in appropriate layer order (point, line, polygon, raster layers, basemap).

WMS—Web Mapping Service. WMS provides server rendered map images and can be integrated into maps in the QGIS Desktop environment or html web maps published by QGIS2Web. It is also possible to call data layers from a QGIS project workspace as a QGIS WMS.

- GetCapabilities Request "WMSServer?request=GetCapabilities&service=WMS".
- Add WMS Layer in QGIS Requires correct CRS (EPSG:3978 or EPSG:4326).
- Limitations Raster only, no custom styling.

WEB MAP PREPARATION

Symbology and Scale Dependencies. Layers were styled with scale dependent rendering to ensure clarity at multiple zoom levels. Labels were configured using QGIS's labeling engine, following best practices outlined in the presentation.

QGIS2Web Export. The QGIS2Web plugin can be used to generate Leaflet based web maps. QGIS2Web generates HTML, CSS, and JS files automatically and supports customization of popups, layer toggles, and basemaps. GeoJSON outputs are produced for vector layers, and XYZ/MBTiles were generated for raster layers where appropriate. QGIS2Web exports a complete web map package which includes or contains the following:

- Export to Leaflet/OpenLayers Produces folders: css, js, data, images, markers, web-fonts.
- index.html with Leaflet map initialization: "<div id='map'>".
- Data folder with GeoJSON converted to JavaScript objects.
- Enhancement folder contains Popups, clustering, layer tree, measure tool, search.

HTML Editing—Leaflet Integration. Plain text editors (e.g., Notepad++) can be used to modify the QGIS2Web exported HTML. It is possible to make modifications to change the appearance, functionality or make the web page publicly accessible with the following techniques:

- Define map div height.
- Add Leaflet scripts.
- Add custom interaction functions.
- Host on web server or GitHub Pages.

Mobile Map Preparation (Avenza Maps). GeoPDFs can be exported from QGIS layouts for offline use in Avenza MAPS Mobile App. These maps support field navigation, place mark creation, and GPS track recording. I noted in the presentation that Avenza MAPS enables 100% Offline Navigation even in remote areas without mobile phone cell service but there is a subscription fee.

RESULTS

Geospatial Data Processing Workflows. This presentation covered all major geospatial file formats used in QGIS and demonstrates how each is processed, transformed, symbolized, and integrated into web maps, and mobile apps. The workflow follows a consistent pattern:

1. Acquire data (Shapefile, FGDB, CSV, GeoJSON, TIF, KML, GPX).
2. Prepare data (extract, reproject, clip, simplify, calculate fields).
3. Integrate layers (joins, symbology, scale rules).
4. Render maps (graduated, palette, icons).
5. Export to web (QGIS2Web to HTML/JS/CSS/GeoJSON).
6. Enhance with WMS/XYZ (basemaps, reference layers).

Processed Administrative Boundaries. Data simplification was essential for web performance. The extraction and geometry processing workflow produced a clean, single-part provincial boundary with validated area and perimeter attributes. This enabled strategic selection and generalization based on attributes.

Census Boundary Integration. The dissemination block dataset was successfully transformed to UTM Zone 20N and clipped to the Nova Scotia extent. This produced a high resolution statistical boundary layer suitable for demographic visualization.

Web Map Outputs. The QGIS2Web export generated a fully functional Leaflet web map with:

- Toggle-able layers (roads, waterways, protected areas, census blocks)
- Styled symbology consistent with QGIS
- Interactive popups
- Basemap integration
- Offline capable HTML files

Mobile Map Outputs. GeoPDFs imported into Avenza Maps provide accurate offline navigation. Field users can:

- View real time GPS position
- Drop place marks

- Record tracks
- Attach photos to mapped locations

These capabilities support fieldwork in remote areas, such as Kejimikujik National Park, where GPX datasets can be integrated.

DISCUSSION

These workflows demonstrate the effectiveness of combining open source GIS tools with lightweight web and mobile mapping platforms. QGIS served as the central processing environment, enabling data cleaning, transformation, and symbology configuration. The integration with Leaflet via QGIS2Web provides a path to web deployment without requiring custom JavaScript development.

Avenza MAPS complements the web outputs by enabling offline field navigation. The ability to import GeoPDFs ensures that the same cartographic design used in QGIS is preserved in mobile app data collection environments.

Overall, the workflow supports a full spectrum of geospatial needs—from desktop analysis to public communication to field operations—using accessible, low cost tools. This approach is particularly valuable for organizations operating across large geographic areas with varying connectivity, such as environmental agencies, recreation groups, and emergency response teams.

FROM DESKTOP APPS TO WEBMAPS

CAA 2026 QGIS WORKSHOP

MARIKKA WILLIAMS, MSC, GISP. GIS EDUCATOR, CONSULTANT AND CARTOGRAPHER

IN THIS QGIS WORKSHOP, the focus was on the methods involved in navigating QGIS Desktop to integrate data from a variety of sources and convert a Desktop Map to an interactive HTML Web Map. I provided a template to support both base mapping and census mapping, using cartographic conventions to facilitate the workshop.

WORKFLOW

The mapping workflow that I guided participants through in this two-hour workshop was intended to orient them with navigating around QGIS Desktop, adding plugins (Basemaps and QGIS2Web) and configuring QGIS2Web plugin to publish a QGIS Desktop map into a web format.



QGIS Desktop App to HTML Web Map Workflow (Image generated by Microsoft Copilot 365 sourced from my CCA 2026 Workshop presentation workflow)

Due to time constraints a template was provided. Vector layers were symbolized using categorized and graduated styles, while raster layers were clipped to the study extent to reduce export size. Basemaps were added using XYZ tile services such as OpenStreetMap, Esri, CartoDB, and Google.

The QGIS2Web Plugin enabled workshop participants to convert the symbolized data into a web format (HTML, CSS, JSON) with LeafletJS as the source for the base map and means to access basic GIS functionality (i.e. address geocoding, zoom, layer control, interactive measurement). The output is an integration of QGIS

(desktop GIS tool) with HTML and Leaflet (a lightweight JavaScript library for interactive maps) that provides access to geospatial data on the web.

Data Acquisition. Spatial datasets were downloaded from multiple providers (Nova Scotia Open Data, Friends of Keji, Statistics Canada, University of Maryland, CEC, and OSM Geofabrik) to support multi scale rendering for web map deployment.

All datasets were loaded into QGIS and filtered to retain only layers relevant to the study area. KMZ imports from Google My Maps were included to demonstrate cross platform integration.

Data Preparation and Rendering in QGIS. Data preparation followed the workflow outlined in the workshop presentation:

- Acquire and Load layers.
- Prepare (i.e. filter, generalize, smooth) data in QGIS for Web compatibility.
- Style and label layers.

Workshop participants were oriented with the template and encouraged to make modifications if time permitted. The focus was on loading plug-ins into the Basemaps and QGIS2Web.

QGIS2Web Configuration. The QGIS2Web plugin was used to convert the QGIS project into a Leaflet based web map. The plugin recommended configuration included:

- Layer visibility and grouping
- Popup activation on selected layers
- Leaflet as the export framework
- Address search via Nominatim
- Measure tool units
- Layer list behavior (collapsed/expanded)

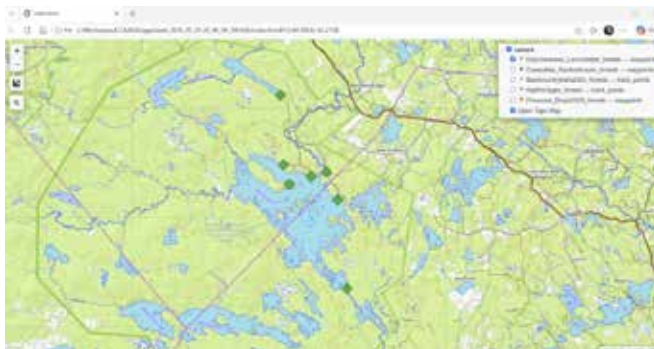
In the workshop I note that QGIS2Web replicates as many aspects of the project as it can, including layers, scale dependencies, spatial extent, styles and labelling but it does not always behave as anticipated. QGIS2Web Export settings are configured to generate the standalone HTML package containing JavaScript, CSS, GeoJSON, Leaflet Maps and tile assets. The webpage and resources can be modified and integrated into an existing website.

Publishing and Validation. The exported HTML package is then opened in a web browser to validate rendering, interactivity, and layer behavior. I noted performance issues with larger study area extents. Troubleshooting steps include removing layers, clipping layers to focus on a smaller study area (I chose Kejimikujik National Park and National Historic Site of Canada for my demo), generalizing data to remove vertices, creating subsets with advanced queries, removing labels, or adjusting plugin settings when performance issues are observed.

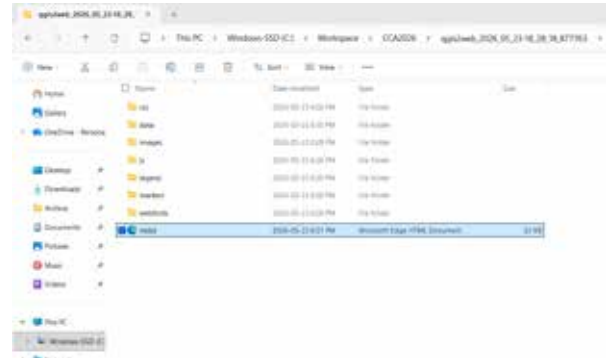
RESULTS

The workflow successfully produced a fully self-contained interactive Leaflet web map that preserved the symbology, layer order, and extent defined in QGIS. The exported map included:

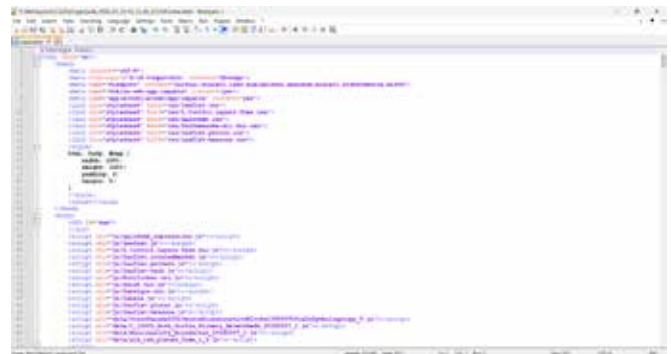
- Multiple thematic layers
- Popups for selected layers
- A collapsible layer list
- Basemap switching
- Address search and measurement tools



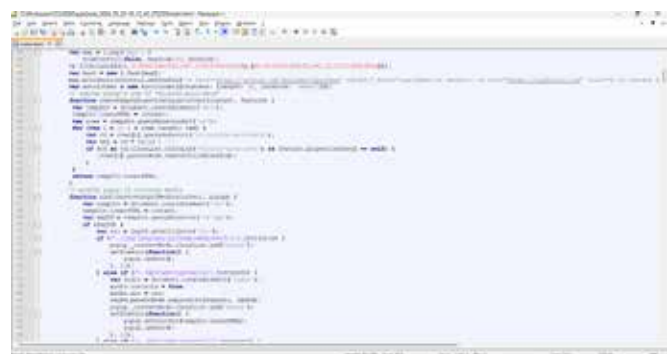
QGIS2Web Plugin Output—HTML Web Page



QGIS2Web Plugin Output—Folder Structure

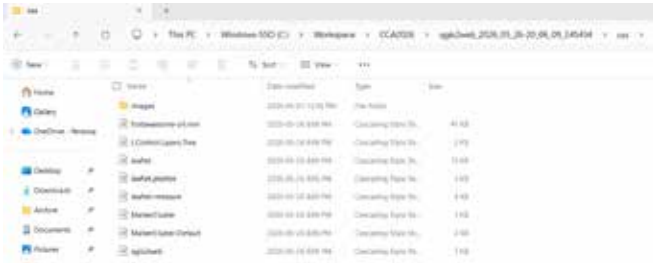


QGIS2Web Plugin Output—HTML Index Page

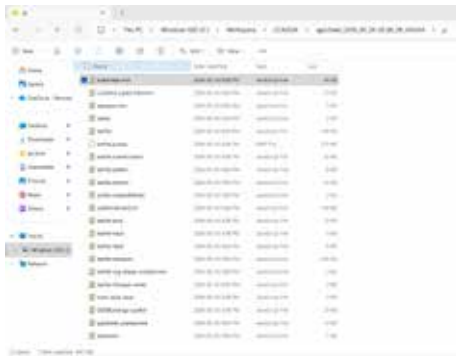


QGIS2Web Plugin Output—Leaflet Integration

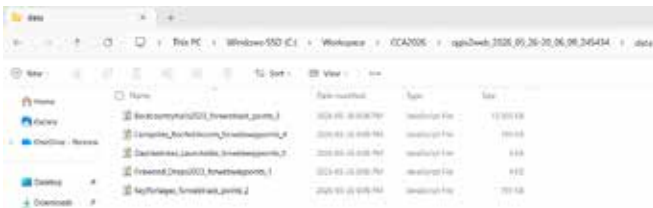
Performance is acceptable for moderate sized datasets, with smooth panning and zooming across the study area. Raster tiles load efficiently, and vector layers render with minimal latency.



QGIS2Web Plugin Output—CSS Files



QGIS2Web Plugin Output—JavaScript Files



QGIS2Web Plugin Output—Data Conversion

DISCUSSION

The workshop demonstrates that QGIS, combined with QGIS2Web, provides an accessible workflow for publishing geospatial web content without specialized web-development expertise. Exporting Leaflet maps from QGIS lowers the barrier for GIS practitioners who need to share interactive maps with stakeholders.

Strengths of the Workflow

- Low technical overhead: Users can produce web maps without writing JavaScript or HTML.
- High fidelity rendering: QGIS symbology translates effectively into Leaflet.
- Cross platform integration: KMZ imports from Google My Maps and Mobile Apps enable seamless incorporation of field collected or user generated data.

Limitations of the Workflow

- Large datasets degrade performance. From the workshop, it is recommended that clipping layers or removing labels improves responsiveness.
- Complex symbology may not fully translate. Some advanced QGIS styles require adjustment in exported web map.
- Limited customization compared to hand coded Leaflet applications. While QGIS2Web provides many options, developers seeking advanced interactivity need to modify the generated JavaScript.

Future Improvements. Future workshops could extend this workflow by:

- Publishing on cloud hosting platforms (GitHub Pages)
- Using vector tiles for large datasets
- Improving mobile responsiveness
- Interacting with the HTML, CSS and JS code to improve the appearance and functionality of the web map
- Automating the workflow using QGIS Processing Models or Python scripts

CARTOGRAPHY OR ART? OR BOTH?

PHILLIP BAILEY, CARTOGRAPHME

AS A CREATOR OF hand-drawn, highly detailed artistic maps, my practice exists at the intersection of historical cartography and fine art. I seek to craft richly layered, imaginative interpretations of geographic knowledge that invite viewers into a deeper exploration of place, meaning, and perception.

My work does not rely on contemporary digital cartographic tools, nor is it grounded in formal academic training in either cartography or the visual arts. Instead, it embraces an alternative approach that draws from historical traditions, observational inquiry, and intuitive

mark-making. As a result, these maps often occupy an ambiguous position—situated between functional artifact and artistic expression—and may challenge conventional expectations within gallery contexts, where immediacy of visual impact is often prioritized over sustained engagement.

While maps have traditionally served as instruments of navigation, guiding us toward physical destinations, my work re-imagines them as contemplative objects. These pieces function as vehicles for holistic reflection, encouraging viewers to consider not only their spatial surroundings but also their psychological and spiritual relationships to the world.

Please use my artwork as an invitation to consider how maps can extend beyond their utilitarian origins to become catalysts for imagination and introspection. My website and social media offer a behind-the-scenes look at my creative process and the intersection of cartography and art that defines my practice.



— Website: <https://www.cartographme.com/>
 — Facebook: <https://www.facebook.com/CartographMe>
 — Instagram: <https://www.instagram.com/cartographme/>

COLONIZING THE FUTURE THROUGH LITERATURE AND MAPS

IMPERIAL POWER THROUGH EAST AFRICAN CARTOGRAPHY AND HUXLEY'S WHITE MAN'S COUNTRY: LORD DELAMERE AND THE MAKING OF KENYA—A SUMMARY

ERIKA KOSS, UNIVERSITY OF NAIROBI; ROBERT SUMMERBY-MURRAY, SAINT MARY'S UNIVERSITY

THE USE OF CARTOGRAPHY in the service of imperialism, colonialism and the control of resources and peoples, including through slavery, is a longstanding technique. Our presentation argues that scholars need to pay more attention to the use of colonial (and postcolonial) cartography in the framing of contemporary constructions of states and nations. We contend that these constructions are projected forward to current readers and we point to the link between cartography and literature, noting how each is mutually reinforcing, demonstrating this in Elspeth Huxley's 1935 biography of Lord Delamere, *White Man's Country: Lord Delamere and the Making of Kenya*.

MAPS AND BIOGRAPHY

Through its narrative text and sporadically interspersed location maps, *White Man's Country* (WMC) is more than just a commissioned biography; instead, it becomes a vehicle for the imperial construction of colonial, social, political and economic relations of British East Africa and what was to later become the Republic of Kenya. The biography is intriguing not only because of its narrative defense of the British colonial enterprise in Kenya, but also because of the maps inserted into the text at publication. Combined, Huxley's text and the publisher-inserted maps represent a colonial legacy into the future, creating an echo of colonization that reverberates to this day. Drawing on concepts of the **colonizing of the mind** (Mignolo, 1995), discussion of **performative pedagogy** (Sparke, 1998), and models of **maps as circulation, sites of transmission and reception** (Edney, 2025), we argue that at the intersection of maps and text in historical literature there remains an active colonial project, not simply an artifact from a past era.

ELSPETH HUXLEY, LORD DELAMERE AND THE COLONIAL EXPERIMENT

Today Elspeth Huxley remains best known for her trilogy of fictionalized autobiography of her childhood in Kenya between World Wars I and II, when her parents having emigrated to Kenya in 1912, established a coffee plantation. Her own circumstances growing

up as a daughter of upper class, (but capital-short) white British settler parents in British East Africa became one of Huxley's key subjects throughout her long and distinguished career. In 1931, at age 24, she was asked by Lady Delamere, the widow of one of Kenya's first British settlers, Lord Delamere (1870–1931), to write his official biography. This was published in 1935 as *White Man's Country: Lord Delamere and the Making of Kenya*. Far more than a chronological biography of Lord Delamere's imperial adventures,



Elspeth Huxley, born in London in 1907, was a prolific writer both of fiction and non-fiction who wrote and published more than 30 books during her lifetime.



Lord Delamere's 1896–97 expedition starting from Berbera on the Gulf of Aden, heading south through British Somaliland, then across Abyssinia, and finally, briefly into Italian Somaliland and southwest into the Kenya Colony.



— East Africa Protectorate in 1900

the two-volume work reads as an *apologia* of white British settlement, with Lord Delamere as the pioneering imperial, masculine hero who often led an unruly, minority white, settler community. Republished in 1953, 1968 and 1980, the biography was received well, so much so that Huxley's obituary in *The Economist* described her as a "fitting memorialist of Imperial Britain's last, belated, and wildly optimistic colonial experiment" (*The Economist*, 18 Jan 1997).

THE MAPS OF WHITE MAN'S COUNTRY

Five maps are interspersed with text across the two volumes, and all are included in each edition. Despite this, Huxley makes no reference to them; it is our contention that the maps were added by the initial publishers, *Macmillan*, in an effort to lend greater geopolitical emphasis and authority (including the implication of state-sanctioned authority) to Huxley's defense of Lord Delamere and the wider intended progress of the *East African Protectorate* (the Kenya Colony under British rule).

As Huxley notes, the object of Delamere's expedition "was not so much to shoot [game] as to explore" (WMC, pg. 23). The map's open space reinforces the sense of a *terra nullius*—an empty land available for the taking by Europeans. The second map, *East Africa Protectorate in 1900*, supports Huxley's analysis of British land allocation in the Protectorate and her discussion of the dispossession of Masai and Kikuyu land, echoing the later *Kenya Land Commis-*

sion and the familiar colonial trope of empty waste land: "It is therefore understandable that there should have appeared to be large tracts of waste land of which it was felt the Government might legitimately dispose" (WMC, pg. 113). Accordingly, the 1900 map reinforces the sense of vast uninhabited land punctuated only by occasional rivers, small settlements, key lakes and mountains.

The third map—*East Africa Campaign 1914–1917*—is inserted in the first few pages of volume II. It is much more closely aligned with Huxley's text and entitled, reflecting the transplanting of the European conflict on to East Africa, but it is not until the inclusion of the fourth map do we begin to see significant detail on land use. While rail lines and the new "aerodromes" are located, the cartographer takes great care to show large areas of *Native Reserves* and *Forest Reserves* in comparison to relatively small allocations of *Alienated Land*—meaning allocated to White settlers. This map responds to the challenges around land allocation and the debate that had simmered over the previous three decades in the transition from "empty wasteland available for settlement" and the findings of the earlier Kenya Land Commission.

The final map (out of order chronologically)—*East Africa 1926*—includes solidified, international boundaries. It also demonstrates the physical extent of the Rift Valley and the continued importance of rail access to the Indian Ocean at Mombasa and Dar Es Salaam. More detail is shown of the small settlements in Kenya, including



— Kenya Colony 1933

those on the railway and on the newly developed *Great North Road* running from Uganda, through Kenya and south through Tanganyika and Northern Rhodesia.

CONCLUSION

Without definitive evidence, we can make only strong conjecture regarding the decisions to include these maps in WMC. We know that the maps were drawn by the two leading cartographic houses in the United Kingdom—*George Philip & Son* and *Stanford's Geography Establishment*—both of which specialized in maps and atlases for imperial purposes. Look carefully on your bookshelf: you will likely find a *Philips School Atlas* somewhere! And we know that the publishers of the 1935 biography—*Macmillan*—were intensely interested in the British colonial project; indeed, Harold Macmillan eventually became prime minister of Great Britain. We argue that these maps were added by the publishers to reinforce an authoritative statement in support of Britain's colonies in East Africa (and more widely, given the frequent references to other "settler dominions" formerly under British control in Huxley's text). But beyond 1935, the reprinting and reissuing into multiple editions (up to 1980) signals a longevity of attitude that we argue has framed the post-colonial conversation. Readers of WMC today are left with an impression of a challenging but successful period of colonization. We argue that these strategic maps continue to colonize the mind of readers, creating a "performative pedagogy" in partnership with the literary text. This continued "circulation" of cartography reminds us of the importance of further interrogation of maps, their materials, and their motives.

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SUPERMARKET CONCENTRATION IN THE URBAN ENVIRONMENT

THE CASE OF ABU DHABI

SONIA FARRUKH, UNIVERSITY OF SOUTH BOHEMIA IN ČESKÉ BUDĚJOVICE, CZECH REPUBLIC

BETWEEN 2010 AND 2025, Abu Dhabi's grocery retail landscape underwent a remarkable transformation—one shaped not by market forces alone, but by sovereign urban planning at an unprecedented scale. This study examines how supermarket concentration evolved across Abu Dhabi's five administrative districts during this period, using GIS mapping and relative entropy analysis to quantify spatial distribution and coverage equity.

The Emirate recorded 39 supermarkets across 11 chains in 2010. By 2025, this had grown to 93 supermarkets under 15 chains—a 138% increase that substantially outpaced population growth of approximately 70% over the same period. This proactive retail expansion reflects Abu Dhabi's deliberate strategy of building commercial infrastructure ahead of residential demand, particularly in master-planned communities such as Khalifa City, Masdar City, Mohammad bin Zayed City, and Al Shamkha.

The relative entropy score rose from 0.942 in 2010 to 0.994 in 2025 (on a scale of 0 to 1, where 1 represents perfectly uniform spatial distribution). This places Abu Dhabi at the highest end of spatial coverage equity among comparable global cities examined, including Bratislava, Cape Town, Riyadh, and Greater London. In 2025, the near-perfect entropy score indicates modern supermarket formats serve every major urbanized district of the emirate.

Field surveys were conducted in two reference periods—January to June 2010, and January to June 2025—and validated against retail chain disclosures, *Abu Dhabi Urban Planning Council* commercial zone data, and satellite imagery. All supermarket

locations were plotted using ArcGIS Pro. Buffer analysis assessed walking accessibility (500 m) and driving accessibility (2 km) for each outlet, overlaid with population distribution data. The *Cliquet Relative Entropy* formula was applied to measure the degree of spatial dispersion across all five administrative districts: Abu Dhabi City, Al Ain, Western Region (Al Dhafra), Khalifa City/Masdar, and the Eastern Suburbs.

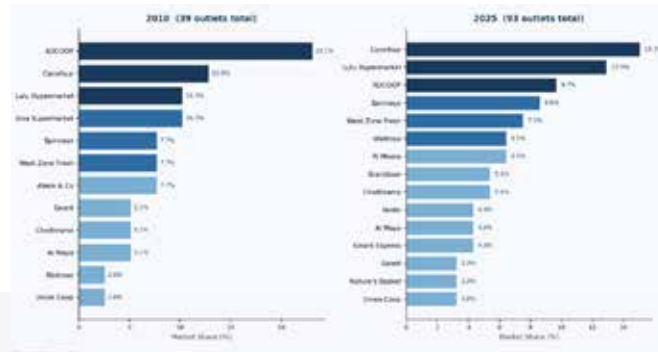
SIGNIFICANCE FOR RETAIL GEOGRAPHY

The Abu Dhabi case presents a distinctive model for urban retail geography. Unlike market-led cities where supermarket expansion follows residential demand organically, Abu Dhabi's grocery retail infrastructure was systematically embedded within mandatory community retail podiums in master-planned developments—an institutional mechanism largely absent in comparable global cities. This state-directed approach produced a level of spatial equity that market-led systems have not consistently achieved, particularly in lower-income zones where, in cities like Cape Town or major US metropolitan areas, food access gaps persist despite geographic proximity to retail outlets.

However, the study also highlights an important qualification: a high relative entropy score measures distributional equity of outlet locations, not the practical food access experienced by all demographic segments. In Abu Dhabi, where the population spans extreme income ranges—from skilled professionals in Khalifa City to low-wage construction workers in Musaffah—geographic proximity to a supermarket does not automatically translate into equitable food access across all groups.

STRUCTURAL MARKET CHANGES

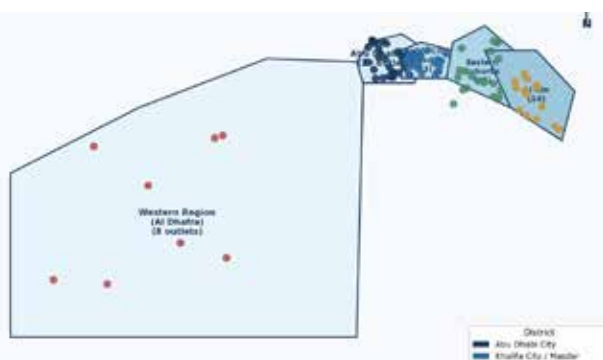
The research also captured significant structural shifts in Abu Dhabi's grocery market. The *Herfindahl–Hirschman Index* (HHI) declined from 1,847 in 2010 to 1,203 in 2025, indicating a transition



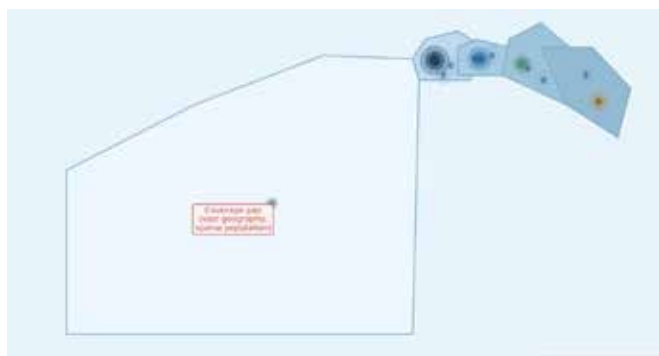
Abu Dhabi grocery retail market share comparison (2010-2025)

from a moderately concentrated market to a competitive one. Dominant players by 2025 include *Carrefour* (Majid Al Futtaim) and *Lulu Hypermarket*, which together represent 28% of total outlets. Emerging chains such as *Grandiose*, *Nesto*, *Nature's Basket*, and *Geant Express* expanded significantly after 2010, while *ADCOOP's* market share declined from 23% to below 10%—mirroring a global *supermarketisation* wave where domestic and cooperative retailers are progressively displaced by international franchise chains.

Looking ahead, Abu Dhabi's supermarket sector is expected to continue evolving through the integration of e-commerce and click-and-collect models, the proliferation of smaller-format convenience supermarkets in new district retail podiums, and the expanded domestic food production under UAE's *National Food Security Strategy 2051*.



Abu Dhabi Emirates grocery retail map of 2025. There are 93 supermarkets across five administrative districts.



Abu Dhabi retail grocery distribution and population density in 2025. Map includes a 2.0 km driving buffer analysis.

CCA 2026 CONFERENCE REVIEW

PAUL HEERSINK, CCA PRESIDENT

The Canadian Cartographic Association held its annual conference at the *Centre of Geographic Sciences* in Lawrencetown, Nova Scotia. The two day event was kicked off with a keynote address by *National Geographic* and *Esri* alumnus Allen Carroll on the topic of storytelling with maps. Carroll took the audience through his own work history beginning with his time as an illustrator with the *Washington Post* that eventually led to his work at National Geographic before coming to Esri to head the storytelling department there. The remainder of the day was rounded out with presentations from other attendees.

Day Two began with a brief overview of the position of geomatics related jobs in the *North American Industry Classification System* and of the work being done to update that. Marikka Williams

led attendees in a QGIS workshop. Attendees also attended a guided tour of COGS's historic map collection. The association's annual general meeting finished the proceedings.

Martha Bostwick organized a field trip the following Saturday to, first, *Annapolis Royal* where the group visited the fort of Port-Royal and the Saturday market and, second, to *Kejimikujik National Park* for some woodland hiking.

There were 11 student paper maps on display that were submitted for the *President's Prize* competition, as well as four submissions for the web map competition. Award winners (each awarded \$250) were announced after the conference.

WEBMAP AWARD

Ulysses Cyrus Kamp—University of British Columbia

[Street Name Stories of North End Halifax](#)

PRESIDENT'S PRIZE FOR COLLEGE MAP-MAKING

Alice Stueck—NSCC-Centre of Geographic Sciences

[Decline: Arctic Sea Ice 1979–2026](#)

PRESIDENT'S PRIZE FOR UNIVERSITY MAP-MAKING

Riza Jayawickrema—Université de Montréal

[Impact of Erosion on Archaeological Site Formation](#)

CARTOGRAPHICA REPORT FOR 2025

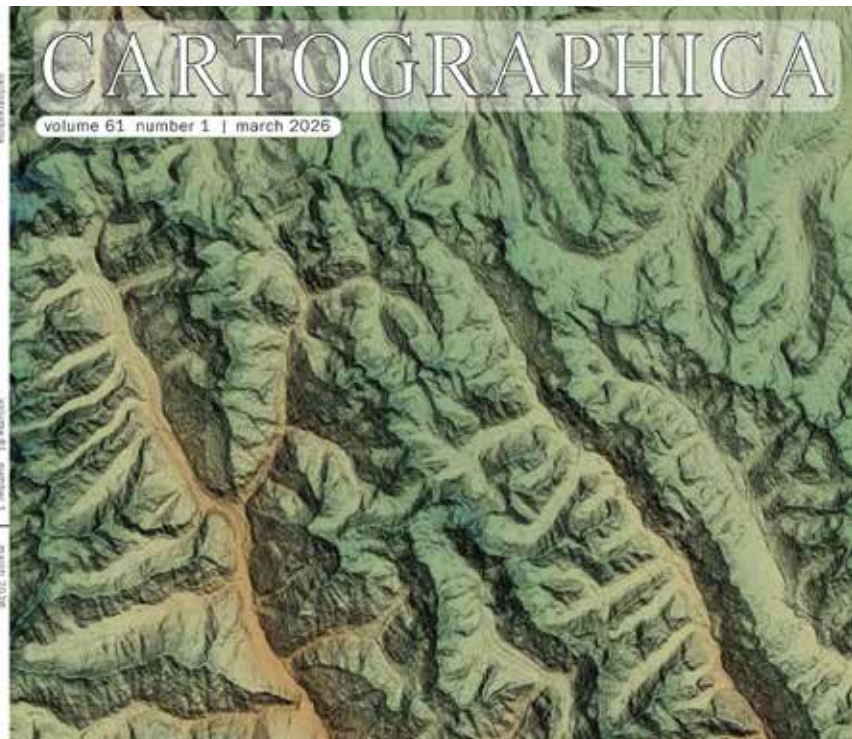
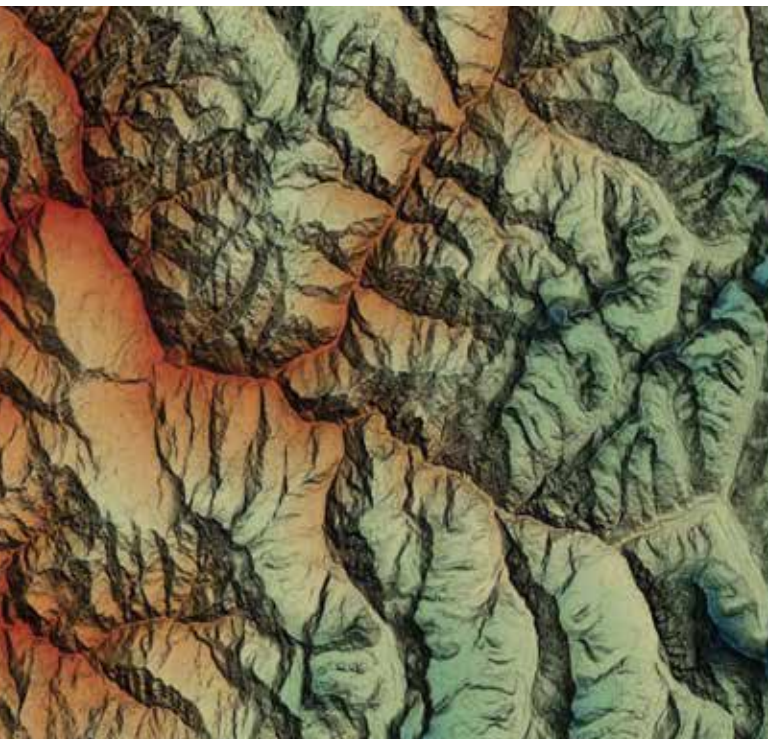
STEPHANIE PYNE

Cartographica IS AN INTERNATIONAL journal for geographic information and geovisualization. It is an interdisciplinary peer-reviewed journal that publishes transformative research, education, and practice contributions to the social, political, technological, and historical aspects of cartography.

As an official publication of the CCA and an original publication of the [International Cartographic Association](https://www.cartographica.org/) (ICA), Cartographica provides a forum for the exchange of original perspectives and innovative findings in the production, design, use, cognitive understanding, and novel applications of maps (broadly understood) in arts, cartography, computer science, economy, engineering, geography, history, medicine, health, and surveying.

Below is a summary of statistics for 2025, which were provided by University of Toronto Press:

- There were 26 manuscript submissions by authors from 15 countries.
- There were 21,235 full-text article downloads by readers from Canada (18%), the United States (28%), the United Kingdom (13%), and other countries (41%).



Top 10 Downloaded Articles—2025

Title	Author(s)	Volumez	Issue	Date	Downloads
Decolonizing the Map: Recentering Indigenous Mappings	Annita Hetoevéhotohke'e Lucchesi, Natchee Blu Barnd, Reuben Rose-Redwood, Sharon Dias, and Wil Patrick	55	3	2020	3663
Spatial Data and (De) colonization: Incorporating Indigenous Data Sovereignty Principles into Cartographic Research	Annita Hetoevéhotohke'e Lucchesi	55	3	2020	1087
Storytelling for Making Cartographic Design Decisions for Climate Change Communication in the United States	Carolyn Fish	55	2	2020	675
New Paradigm in Mapping: A Critique on Cartography and GIS	Bin Jiang	54	3	2019	637
Eight Islands on Four Maps: The Cartographic Renegotiation of Hawai'i, 1876-1959	John Wyatt Greenlee	50	3	2015	526
The Cartography of Kallihirua?: Reassessing Indigenous Mapmaking and Arctic Encounters	Peter R. Martin	57	3	2022	511
Deconstructing the Map	JB Harley	26	2	1989	446
Historical Cartographic Information for Cultural Heritage Applications in a Semantic Framework	Eleni Gkadolou and Poulicos Prastacos	56	4	2021	391
The Geography of Devotion in the British Library Map Psalter	Lauralee Brott	53	3	2018	176
Mapping for Access: A Methodology for Improving Inclusion on University Campuses	Linda Derksen, Victoria Fast, and Zachary Lamoureux	58	1	2023	149

Cartographica invites submissions for upcoming issues. Please see the *Publish with Us* section of the [Cartographica Webpage](#) to find out more about submission guidelines and submit a draft manuscript if you are interested in this opportunity.

CCA—IMIA PARTNERSHIP

The CCA has signed a memorandum of understanding with the International Map Industry Association (IMIA) to promote each other's associations and events. The IMIA seeks to bring together mapping and location-oriented businesses together to connect and share information, primarily on the business side of mapping. The CCA and IMIA, though on different ends of the map production spectrum, share a common interest in mapping.

As president of the CCA, I've been asked to represent the association at an upcoming online session hosted by the IMIA (details available at *Where Cartography Meets Industry* [website](#)). I'll join their representatives with other similarly minded mapping associations. This event is free to attend—be sure to sign up.



CCA WEBINAR SERIES

WOMEN IN CARTOGRAPHY

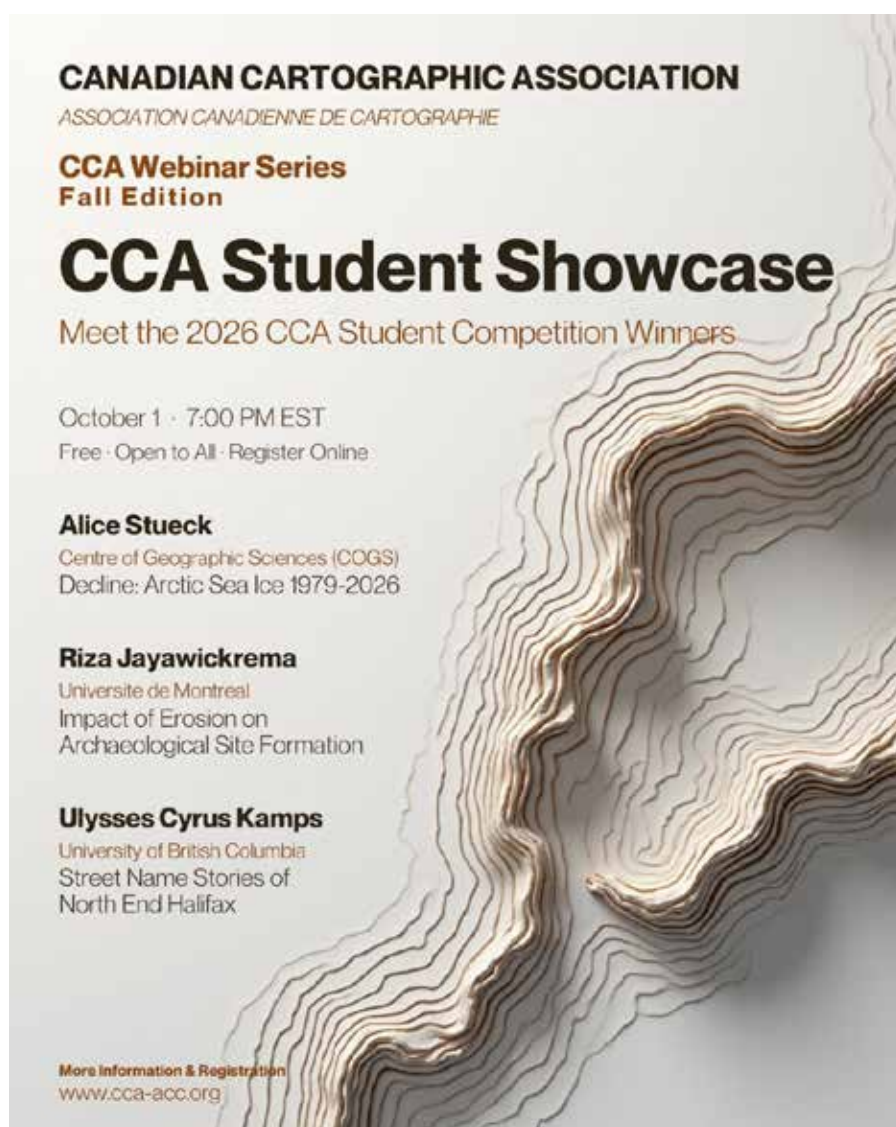
On March 5, 2026, more than 70 geospatial professionals and students convened for a specialized one-hour webinar titled *Women in Cartography*. Offered free-of-charge by the CCA to the cartography and GIS community, the panel event featured a distinguished group of women industry experts:

- Marikka Williams, a GISP-certified professor at the British Columbia Institute of Technology (BCIT)
- Dr. Aileen Buckley, a research cartographer and senior principal GIS engineer on Esri's *Living Atlas of the World* team
- Julie Witmer, an independent cartographer with an international portfolio

The panelists engaged in a comprehensive discussion that balanced practical career guidance with deep, ethical considerations of modern map making. The conversation traced the speakers'

individual entry points into cartography and GIS, highlighting post-secondary pathways and foundational resources available to early-career professionals. Crucially, the webinar addressed systemic and psychological dynamics within the profession, offering candid insights into navigating barriers in a traditionally male-dominated industry. Panelists shared strategies for overcoming imposter syndrome, establishing professional confidence, advocating for career advancement, and leveraging mentorship.

Beyond individual professional development, the panel examined the societal impact of the discipline, exploring the profound responsibility cartographers bear in shaping narrative perspectives and questioning who controls spatial representation. To measure the impact of these discussions and inform future initiatives, a comprehensive feedback survey was distributed to all members following the conclusion of the event.



CANADIAN CARTOGRAPHIC ASSOCIATION
ASSOCIATION CANADIENNE DE CARTOGRAPHIE

CCA Webinar Series
Fall Edition

CCA Student Showcase
Meet the 2026 CCA Student Competition Winners

October 1 · 7:00 PM EST
Free · Open to All · Register Online

Alice Stueck
Centre of Geographic Sciences (COGS)
Decline: Arctic Sea Ice 1979-2026

Riza Jayawickrema
Université de Montréal
Impact of Erosion on
Archaeological Site Formation

Ulysses Cyrus Kamps
University of British Columbia
Street Name Stories of
North End Halifax

More Information & Registration
www.cca-acc.org

The next webinar in our ongoing series is scheduled for October 1, 2026 and will feature the students who won awards at the 2026 CCA conference this past May. To access this webinar, please register at [here](http://www.cca-acc.org) to save a spot and get connection details.

INTERNATIONAL CARTOGRAPHIC ASSOCIATION NEWS

JULIA SIEMER, UNIVERSITY OF REGINA

Please mark your calendars for the upcoming 33rd *International Cartographic Conference* and 21st *General Assembly of the International Cartographic Association (ICA)*. The meeting will take place in Warsaw, Poland, from July 18–23, 2027 with pre conference workshops scheduled for July 17. Hosted on the campuses of the *University of Warsaw* and *Warsaw University of Technology* in Warsaw's historic city centre, ICC 2027 will bring together cartographers, GIS science researchers, geospatial professionals, educators, students, and industry partners from around the world. The conference will highlight emerging directions in cartography, including the growing role of data science and technology, with planned training opportunities in Big Data Cartography and a technical exhibition showcasing innovations in mapping and spatial analysis. ICC 2027 will also emphasize accessibility, inclusion, early-career participation, and international collaboration in shaping the future of cartography. The organizing committee just pub-

lished a call for submissions with the following important deadlines: Full Paper submission—November 20, 2026, and Abstract submission—December 1, 2026. For more information, please consult icc2027.org or follow them on social media.

As part of ICC 2027, Canadian submissions will be invited for the *International Map Exhibition*. Eligible entries include maps and other cartographic products published between September 2025 and June 2027. This exhibition offers an important opportunity to showcase outstanding Canadian work in cartographic design, production, innovation, and communication to an international audience of mapping professionals and researchers. As the Canadian National Delegate to the ICA, I will follow up with a more detailed call for submissions later this year. Watch out for calls by email. Please consider submitting your maps, atlases, or other cartographic products to this conference highlight. General information on the conference and venues can be found online.



Julia Siemer
National Delegate to the ICA
University of Regina



EXECUTIVE LIST DIRECTORY

CCA Executive—Exécutif de l'ACC

President—Président	Paul Heersink Esri Canada 900—12 Concorde Place Toronto, ON M3C 3R8 pheersink@gmail.com
Vice President—Vice-président	Jeff Clark Clark Geomatics jeff@clarkgeomatics.ca
Past President—Président-sortante	Glenn Brauen Department of Human Geography University of Toronto, Scarborough 265 Military Trail Toronto, ON M1C 1A4 glenn.brauen@utoronto.ca
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Communications	Yegane Vahidi Central Lake Ontario Conservation Authority Oshawa, ON yeganevahidi@gmail.com

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History of Cartography—Histoire de la cartographie

Christopher Macdonald Hewitt, PhDAssistant Professor, Department of Geography & Environmental Studies
Wilfrid Laurier University

Adjunct Research Professor

DAN Department of Management & Organizational Studies

Contract Cartographer

GIS and Mapping Solutions

chewitt4@uwo.ca

Education—Éducation

Stephanie Pynesapyne@gmail.comMapping Technologies and Spatial Data—Technol-
ogie cartographiques et données spatiales**Marikka Williams, MSc, GISP**marikkageomatics@gmail.comGeovisualization and Map Design—Géovisualisa-
tion et conception de cartes**Thomas Herbreteau**thomas.herbreteau.gis@gmail.com

Appointees—Personnes nommées

Cartographica (submissions—proposition d'articles)	Stephanie Pyne Geomatics and Cartographic Research Centre (GCRC) Carleton University Ottawa, ON stephanie.pyne@utorontopress.com
ICA Delegate—délégué à l'ACI	Julia Siemer Department of Geography and Environmental Studies University of Regina julia.siemer@uregina.ca
Membership Coordinator—Coordonnateur des adhésions	Jamison Cooper-Leavitt Esri Canada jleavitt@esri.ca
Webmaster	Ted MacKinnon t_mackinnon@yahoo.com
Cartouche Editorial Team—Équipe éditoriale de Cartouche	Marikka Williams Jamison Cooper-Leavitt
Coordinator, National Map Exhibit—Coordonnateur de l'exposition cartographique nationale	Julia Siemer
Barbara Petchenik International Children's Map Competition—Compétition internationale Barbara Petchenik de cartes dessinées par des enfants	Vacant
Student Representative—Représentant des étudiants	Alex Young Center of Geographic Information Sciences (COGS) alexmhyoung@gmail.com