150 Years of Cartography: Past, Present and Future

42nd Annual Conference of the Canadian Cartographic Association

May 31 – June 2, 2017
Carleton University

Welcome to Carleton University

It is our pleasure to be hosting this year's CCA conference. 2017 is an important year both for our country and our university. As we all celebrate our country's 150th anniversary, we at Carleton also celebrate our 75th anniversary.

This makes 2017 a year of reflection. It offers us a moment to look back at our past achievements and contributions, but at the same time to look to the future and the opportunities and challenges facing cartography in the 21st century. It is certainly an exciting time to be cartographers.

We in the Department of Geography and Environmental Studies hope you enjoy your time at this year's conference, on our campus and our nation's capital.

Steve Prashker , Conference Coordinator

Thanks

I would like to express my sincere thanks for the confidence entrusted in me to organize this conference on behalf of the executive of the Canadian Cartographic Association and its members. Almost a year of planning went into this event, and it would have not come together were it not for the gracious input and support of the CCA executive team, and the host department at Carleton University. Without their assistance, the organization of this event would have been a daunting task indeed. Therefore, I would like express my gratitude for the patience and assistance afforded me by these individuals. In no particular order:

Canadian Cartographic Association
Byron Moldofsky; Roger Wheate; Julia Siemer; Monica Lloyd; Claire Gosson; Christopher Storie; and Anna Jasiak

Carleton University
Linda Cruz, Conference Services Coordinator; Larry Munn, Carleton University Events Services; Joel Rivard, MADGIC Centre of the MacOdrum Library; Carys Carrington, MADGIC Centre of the MacOdrum Library; Martin St. Denis, Aramark Food Services; Natalie Pressburger, Administrator, Department of Geography and Environmental Studies; Doug King, Chair, Department of Geography and Environmental Studies; and Mike Brklacich, Associate Dean, Faculty of Arts and Social Sciences

Student Volunteers
Monika Krzywania; Amelia Johnson; Niloofar Alavi-Shoushtari; Ariane Castagner ; and Els Aelvoet

Keynote Speakers
Ian Crain; Chris Brackley; and Fraser Taylor

and all the presenters and participants who made this conference a great success. If I have left anyone out, I apologise.

Plus a special thanks to our sponsors:
Greg Bergeron, Allstate, Ottawa South; Patsy McCarthy, CTM Media Group ; Jo-Anne Mulasz, Details Realty (Orienteering Event); Julie Milton (Icebreaker Event) ; and The Department of Geography and Environmental Studies (Reception) .

Last but not least, I would like to thank my esteemed colleague and friend, John Milton, who provided guidance, wisdom, ideas, support, assistance and calm during the sometimes hectic organization of this conference.

Steve Prashker , Conference Coordinator

Conference Proceedings

Wednesday, May 31

Registration/Icebreaker

2:00 — 4:00 Guided tour of Canadian Museum of History in Gatineau, QC

4:00 — 5:00 Free time

5:00 – 7:00 Icebreaker Welcome — Mike's Place, Room 209, Unicentre
Carleton University
Sponsored by the CCA

Thursday, June 1

8:00 Registration opens
8:45 Conference starts
8:45 – 9:00 Welcome addresses, Chair, DGES; Associate Dean, FASS; and CCA President

Session 1: The Past

Chair: Byron Moldofsky

9:00 – 9:45 *Session Keynote Speaker*
Ian Crain, Principal, The Orbis Institute
The CGIS +50: Origins, Innovation, and Lasting Legacy

9:45 – 10:00 Break

10:00 – 11:00 *Presentations: Historical Mapping and GIS 1*
Roger Wheate, University of Northern British Columbia
A Brief History of 150 Years of Topographic Mapping in Canada
Sarah Simpkin, Interim Digital Scholarship Librarian, University of Ottawa
New Uses for Old Maps – Exploring Transforming Landscapes Online through Historical Topographic Maps
Byron Moldofsky, University of Toronto
Canadian Historical GIS Partnership Development: Taking Steps for Historical Mapping in Canada

11:00 – 11:15 Break

11:15 – 12:35 *Presentations: Historical Mapping and GIS 2*
Giuseppe Filoso, Statistics Canada
1971 Statistics Canada Enumeration Area Restoration Project
Kevin Ballantyne
Mapping Historic Buildings in Ottawa
Wendy Smith, PhD Candidate (Canadian History) York University
The Toronto PARK LOT PROJECT —Mapping the Founding History of Toronto & Upper Canada
Rebecca Bartlett, Carleton University, GIS and Trevor Ford,
Laurier Centre for Military Strategic and Disarmament Studies, Wilfrid Laurier University
Battling Mapping a Battle: Vimy Ridge Front line Movement

12:35 – 1:45 Lunch

Conference Proceedings

Thursday, June 1 (cont.)

Session 2: The Present

Chair: David Broscoe

1:45 – 2:30 *Session Keynote Speaker*
Chris Brackley, As the Crow Flies cARTography and Canadian Geographic
Cartography Today: Drawing Human Experience on a Global Scale

2:30 — 2:40 Break

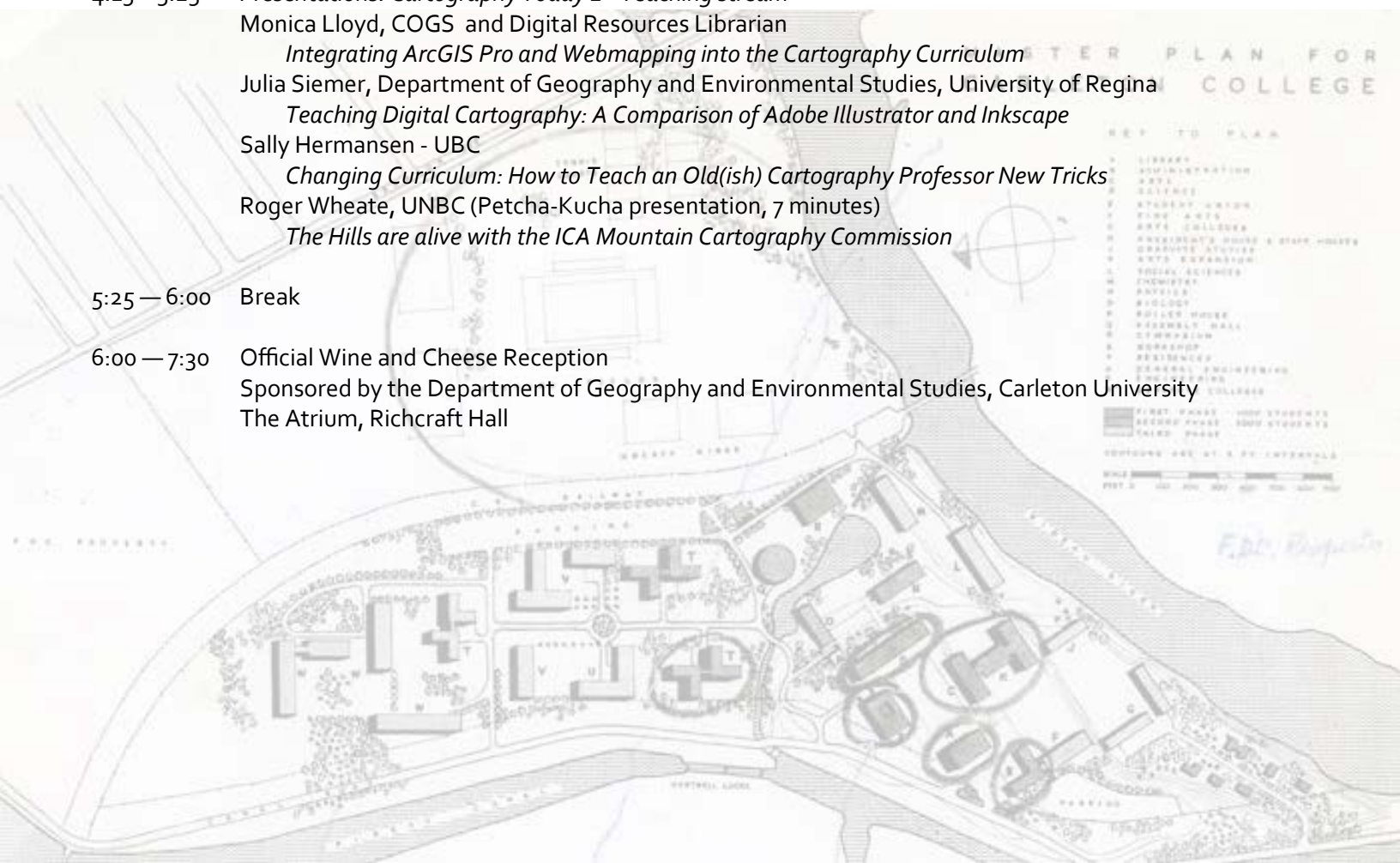
2:40 – 4:00 *Presentations: Cartography Today 1*
Mark Richardson, Geomatics Analyst – Cartography, Canadian Wildlife Service
Using Maps to Present Complex Species and Conservation Information
Scott Tweedy, NRCan
NRCan - The Evolution of our Geospatial Offerings
Mark Richardson, Green Hat Designs
Imaginary Cartography — Building Unreal Worlds for Analogue Games
Amos Hayes, Geomatics and Cartographic Research Centre, Carleton University
Cartography of Data and Stories with Nunaliit

4:00 – 4:15 Break

4:15 – 5:25 *Presentations: Cartography Today 2 - Teaching stream*
Monica Lloyd, COGS and Digital Resources Librarian
Integrating ArcGIS Pro and Webmapping into the Cartography Curriculum
Julia Siemer, Department of Geography and Environmental Studies, University of Regina
Teaching Digital Cartography: A Comparison of Adobe Illustrator and Inkscape
Sally Hermansen - UBC
Changing Curriculum: How to Teach an Old(ish) Cartography Professor New Tricks
Roger Wheate, UNBC (Petcha-Kucha presentation, 7 minutes)
The Hills are alive with the ICA Mountain Cartography Commission

5:25 — 6:00 Break

6:00 — 7:30 Official Wine and Cheese Reception
Sponsored by the Department of Geography and Environmental Studies, Carleton University
The Atrium, Richcraft Hall



Conference Proceedings

Friday, June 2

8:00 Registration opens
8:45 Conference starts

Session 3: The Future

Chair: Emmanuel Stefanakis

8:45 — 9:30 *Session Keynote Speaker*
Fraser Taylor, Carleton University, Director of the Geomatics and Cartographic Research Centre
Rapid Technological Change and the Future of Cartography

9:30 — 9:45 Break

9:45 — 10:45 *Presentations: The Future of Cartography 1*
Uzayr Siddiqui, Geography and Environmental Studies, Carleton University
Enlightenment of Cartography by Drones and UAVs
Laura Thomson, PhD, Postdoctoral Fellow, Department of Earth Sciences, Simon Fraser University
Advances to Glacier and Mountain Cartography using Structure from Motion
Christopher D. Storie, Department of Geography, University of Winnipeg; Christopher Henry, Department of Applied Computer Science, University of Winnipeg; Andrew Curtis, Research Technician, Geospatial Laboratory for Environmental Analysis and Decision Making, Department of Geography, University of Winnipeg
Automated Map Production using Deep Learning Neural Networks

10:45 — 11:00 Break

11:00— 12:20 *Presentations: The Future of Cartography 2*
Nate Wessel, PhD candidate, University of Toronto
Testing Transport Maps for Route Selection Speed and Quality
Jeff Allen, MA candidate, University of Toronto
Comparative Visualizations of Transport Networks in Canadian Cities
Emmanuel Stefanakis, Department of Geodesy and Geomatics Engineering, University of New Brunswick
Simplification of Linear Features for Raster Tile Maps and Discrete Global Grids
Joni Storie, Martine Balcaen and Adrienne Ducharme, The University of Winnipeg
Impact of Restaurant Spatial Proximity on Food Security and Public Health in Winnipeg

12:20 — 2:00 Lunch and Annual General Meeting

Friday, June 2 (cont.)

Session 3: The Future (cont.)

Chair: Emmanuel Stefanakis

2:00 — 3:20 *Presentations: The Future of Cartography*

Sébastien Caquard, Department of Geography, Planning and Environment, Concordia University
Mapping as an Interface for Places and Stories - Examples from the Geomedia Lab

Mo Wang, MSc candidate, Department of Geography, Planning and Environment, Concordia University
Mapping Zika with Twitter – Process, Results, Lessons

Emory Shaw, MSc candidate, Concordia University
Tweeting an Urban Plaza: An Experiment in Geographic Information Retrieval

Thomas McGurk, MSc Candidate, Concordia University
The State of Online Indigenous Mapping in the Canadian Context

3:20 — 4:00 *Technical session*

Emmanuel Stefanakis, Dept. of Geodesy & Geomatics Engineering, University of New Brunswick
Web Mercator Projection and Raster Tile Maps: Two Cornerstones of Online Map Service Providers

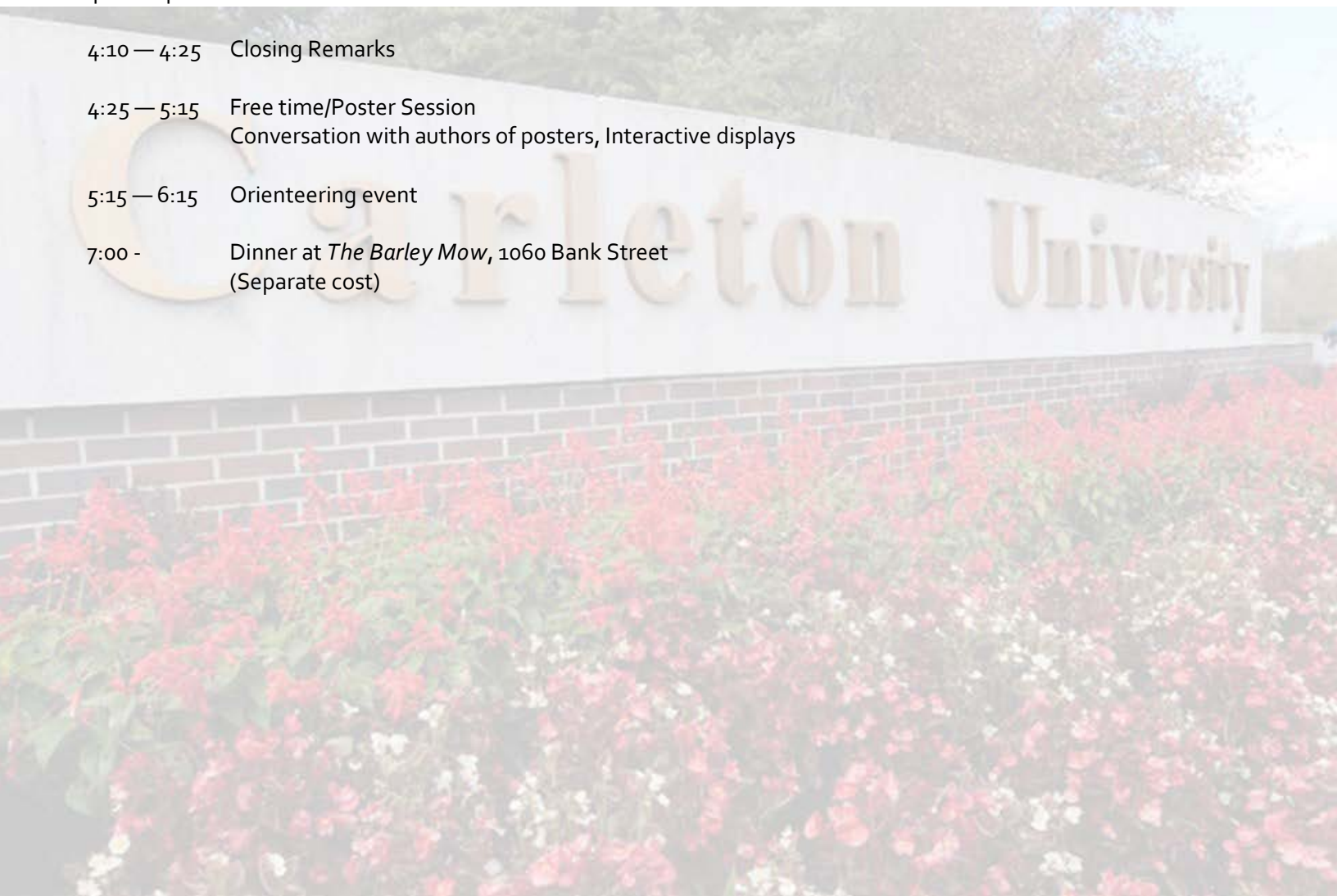
4:00 — 4:10 Break

4:10 — 4:25 Closing Remarks

4:25 — 5:15 Free time/Poster Session
Conversation with authors of posters, Interactive displays

5:15 — 6:15 Orienteering event

7:00 - Dinner at *The Barley Mow*, 1060 Bank Street
(Separate cost)



Programme Finale

Mercredi, 31 mai 2017

Évènements pré-conférence

De 14h à 16h	Visite guidée du Musée Canadien de l'Histoire à Gatineau, QC
16h00 - 15h00	Temps libre
17h00 — à n'importe quel moment	Brouillard informel à Carleton sur le campus à Mike's Pub Place - parrainé par CCA

Jeudi 1er juin 2017

8h00	L'enregistrement s'ouvre
8h45	La conférence débute
8h45 - 9h00	Adresse de bienvenue du président du Département de Géographie , Le Doyen de l'FASS et le Président de l'ACC

Session 1: Cartographie – Le Passée

Président : Byron Moldofsky

9h00 - 9h45 Conférencier principale:
Ian Crain, Institut Orbis
Le CGIS +50: Origines, Innovation et Héritage durable

9h45 - 10h00 Pause

10h00 - 11h00 *Séance de présentation: Cartographie Historique et SIG 1*
Roger Wheate, Université du Nord de la Colombie-Britannique
Une brève histoire de 150 ans de cartographie topographique au Canada
Sarah Simpkin *, bibliothécaire de recherche numérique intérimaire, Université d'Ottawa
Nouvelles utilisations pour les anciennes cartes - Exploration de la transformation des paysages en ligne par des cartes topographiques historiques
Byron Moldofsky, Université de Toronto
Évolution historique du développement du SIG canadien: prendre des mesures pour la Cartographie Historique au Canada

11h00 - 11h15 Pause

11h15 - 12h35 *Séance de présentation: Cartographie Historique et SIG 2*
Giuseppe Filoso, Statistique Canada
1971 Projet de restauration de la zone d'énumération de Statistique Canada
Kevin Ballantyne
Cartographie des bâtiments historiques à Ottawa
Wendy Smith, Candidat au doctorat (Histoire canadienne) Université York
Le projet Toronto PARK LOT - Adopter l'historique fondateur de Toronto et du Haut-Canada
Rebecca Bartlett, Université Carleton, SIG et bibliothécaire de ressources numériques et Trevor Ford, Laurier Centre for Military Strategic and Disarmament Studies, Wilfrid Laurier University
Lutter contre la cartographie d'une bataille: le mouvement de la ligne de front de la crête de Vimy

12h35 - 13h45 Déjeuner

Programme Finale

Jeudi 1er juin 2017 (cont.)

Session 2: Cartographie – Le Présent

Président : David Broscoe

13h45 - 14h30 *Conférencier principale*
Chris Brackley, en tant que Crow Flies cARTography, et Canadian Geographic
Cartographie aujourd'hui: dessiner l'expérience humaine à l'échelle mondiale

14h30 - 14h40 Pause

14h40 -16h00 *Séance de présentation: Cartographie – Le Présent*
Mark Richardson, Analyste en géomatique - Cartographie, Service Canadien de la Faune
Utilisation de cartes pour présenter des espèces complexes et des informations sur la conservation
Scott Tweedy, RNCan
RNCan - L'évolution de nos offres géospatiales
Mark Richardson, Green Hat Designs
Cartographie imaginaire — Construire des mondes irréels pour les jeux analogiques
Amos Hayes, Centre de recherche géomatique et cartographique, Université Carleton
Cartographie des données et des histoires avec Nunaliit

16h00 - 16h15 Pause

14h15- 17h25 *Séance de présentation: Cartographie –Le Présent - Enseignement*
Monica Lloyd - Centre des sciences géographiques (CPV)
Intégrer ArcPro et Webmapping dans le programme de Cartographie
Julia Siemer, Département de géographie et études environnementales, Université de Regina
Enseigner la cartographie numérique: une comparaison d'Adobe Illustrator et Inkscape
Sally Hermansen - Université de la Colombie-Britannique
Modification du curriculum: comment enseigner à un ancien professeur de cartographie de nouvelles astuces
Roger Wheate, Université du Nord de la Colombie-Britannique
« Les Collines Résonnent » avec la commission de Cartographie de la Montagne ACI

17h25 - 17h45 Pause

17h45 - 19h30 *Réception officielle du vin et du fromage*
parrainée par le Département de géographie et d'études environnementales, Université Carleton
dans l'Atrium, Salle Richcraft

Programme Finale

Vendredi, le 2 juin 2017

8h00 L'enregistrement s'ouvre
8h45 La conférence débute

Session 3: Cartographie - Le Futur

Président: Emmanuel Stefanakis

8h45 - 9h30 *Conférencier principale*
Fraser Taylor, Université Carleton, Directeur du Centre de recherche Géomatique et Cartographique
Changement technologique rapide et avenir de la cartographie

9h30 - 9h45 Pause

9h45 - 10h45 *Présentation: Cartographie – Le Futur 1*
Uzayr Siddiqui, Université Carleton
Illumination de la cartographie par Drones et UAVs
Laura Thomson, doctorante, boursière postdoctorale, Département des sciences de la Terre, Université Simon Fraser
Avances à la cartographie des glaciers et des montagnes à l'aide de « Structure from Motion »
Dr Christopher D Storie, Dr Christopher Henry, Andrew Curtis
Production automatisée de cartes utilisant des réseaux de neurones d'apprentissage approfondi

10h45 - 11h00 Pause

11h00 - 12h20 *Séance de présentation: Cartographie – Le Futur 2*
Nate Wessel, candidate au doctorat, Université de Toronto
Test des cartes de transport pour la vitesse et la qualité de sélection de l'itinéraire
Jeff Allen, candidat à l'Université de Toronto, Université de Toronto
Visualisations comparatives des réseaux de transport dans les villes canadiennes
Emmanuel Stefanakis, Département de géodésie et génie géomatique, Université du Nouveau-Brunswick
Simplification des caractéristiques linéaires pour les cartes de carreaux raster et les grilles globales discrètes
Joni Storie, Martine Balcaen et Adrienne Ducharme, Université de Winnipeg
Impact de la proximité spatiale du restaurant sur la sécurité alimentaire et la santé publique à Winnipeg

12h20-14h00 Déjeuner et ACC Assemblée générale annuelle

Programme Finale

Vendredi, le 2 juin 2017 (cont.)

Session 3: Cartographie - Le Futur (cont.)
Président: Emmanuel Stefanakis

14h00-15h20 *Séance de présentation: Cartographie - Le Futur 3*

Sébastien Caquard, Département de géographie, de planification et d'environnement, Université Concordia
Mapping en tant qu'interface pour les lieux et de l'histoires - Exemples du Geomedia Lab

Mo Wang, candidat à la maîtrise, Département de géographie, de planification et d'environnement, Université Concordia
Mapping Zika avec Twitter - Processus, résultats, leçons

Emory Shaw, candidat à la maîtrise, Université Concordia
Tweeting an Urban Plaza: une expérience dans la récupération de l'information géographique

Thomas McGurk, Candidat aux MSc, Université Concordia
L'état de la cartographie indigène en ligne dans le contexte canadien

15h20-16h00 *Session technique*

Emmanuel Stefanakis, Département de génie géodésique et géomatique, Université du Nouveau-Brunswick
Projection Mercator Web Projection et Raster Tile Maps: Deux pierres angulaires des fournisseurs de services de cartes en ligne

16h00 - 16h10 Pause

16h10 - 16h25 Remarques de clôture

16h25 - 17h15 Temps libre / Séance d'affiches
Conversation avec les auteurs d'affiches, Présentoirs interactifs

17h15- 18h00 ACC Course d'orientation

19h30 - Réservation de groupe pour le dîner au restaurant local - TBA

Conference Abstracts

Session 1. The Past

Chair: Byron Moldofsky

Keynote Presentation

The CGIS +50: Origins, Innovation, and Lasting Legacy
Ian Crain, Principal, The Orbis Institute

The development of the Canada Geographic Information System (CGIS) some 50 years ago was an important milestone in the history of Canadian (and world) modern cartography. This innovation introduced the digital era and conceptually integrated maps into flexible multi-purpose spatial decision support systems. In parallel, the 1960s saw computer applications in aerial mapping, geophysical mapping and data management, and a few short years later, satellite remote sensing. With reference, in part, to some "ancient and rare" documents, this presentation will provide first-person insight (and anecdotes) into the origins of the CGIS and other technical advances - the innovations and paradigm shifts required, and outline the amazing story of the rescue and recovery of the entire CGIS data bank. I will then provide further thoughts on the implications for the future preservation and archiving of spatial data.

Presentations: Historical Mapping and GIS 1

A Brief History of 150 years of Topographic Mapping in Canada
Roger Wheate, University of Northern British Columbia

The Confederation of Canada in 1867 was quickly followed by taking control of Hudson Bay Company lands and the beginning of the Dominion Land Survey, as well as the development of photo-lithography which enabled full colour map production. This talk will summarise the sequence of multiple topographic map series that helped cover this northern land, mapping Canada at a variety of scales and special topographic map products such as parks and selected glaciers in the post war years, and concluding with the completion of the 1:50,000 NTS maps in 2012 and the current data product focus.

New Uses for Old Maps – Exploring Transforming Landscapes Online through Historical Topographic Maps
Sarah Simpkin, Interim Digital Scholarship Librarian, University of Ottawa

Just in time for Canada's 150th birthday, the OCUL Historical Topographic Map Digitization Project has digitized and made available for public use a collection of over 1100 topographical maps of Ontario. These detailed maps, published between 1904 and 1977, provide historical snapshots that allow researchers, students and the general public to explore changes to an area over time. The technical specifications for this project involved hard-copy digitization, geo-referencing and making the maps available on the Scholars GeoPortal web application. In this presentation, I will discuss our project workflow and digitization specifications, followed by a live demonstration of the maps and discussion about how they can be used to identify and highlight issues such as erosion, urban sprawl, transportation growth and disappearing waterways.

Conference Abstracts

Session 1. The Past

Chair: Byron Moldofsky

Canadian Historical GIS Partnership Development: Taking Steps for Historical Mapping in Canada
Byron Moldofsky, Manager, The GIS and Cartography Office, Department of Geography and Planning, University of Toronto

The Canadian Historical GIS Partnership Development Project has been gathering together people and building proposals for making research and mapping of historical subjects in Canada easier and better, especially for historians, community groups and other non-expert GIS users. Pilot websites for data finding and dissemination and for web-mapping have been developed, and a proposal for bringing these ideas to full fruition is in the works.

Presentations: Historical Mapping and GIS 2

1971 Statistics Canada Enumeration Area Restoration Project
Giuseppe Filoso, Statistics Canada

The Environment, Energy and Transportation Statistics Division (EETSD) at Statistics Canada periodically conducts analyses of population and dwelling changes over time for environmental geographies. Until now, time series analyses for data prior to 1991 used Census of Population enumeration area (EA) centroids as proxies to compensate for the lack of digital boundary polygons. Motivated by the discovery of scanned images of the 1971 EA boundaries at the national level and a desire to improve on time series analyses, EETSD obtained funding to initiate the recovery of 1971 EA digital polygons within selected areas of Canada. This project digitally restored 23,872 1971 EA boundaries for the 33 census metropolitan areas (CMA) defined by the 2011 census. The EA boundaries represent the smallest census geography used for the release of 1971 statistical data. The restored boundaries include population and dwelling statistics. The main purpose of this work is to provide the public with a historical spatial dataset to be used for reference, mapping, spatial and time-series analysis. For example, the dataset could be used to measure the densification of population between 1971 and 2016. This product will soon be accessible in a shapefile format (ArcGIS®, file extension: .shp) on the Statistics Canada web site. In addition, it will be available as a web service on the Government of Canada Open Maps web site.

Mapping Historic Buildings in Ottawa
Kevin Ballantyne

As Canada's Capital, Ottawa has seen its built landscape change throughout its history. I wanted to geospatially inventory these buildings as an interactive map. For my presentation, I will show the methods I used to map these bygone buildings. I will explain the steps I took in the creation of the final map and the various software I used during the project. The preliminary map source for the project was the fire insurance plans found on the Library and Archives Canada website. The 1912 plans contain the outline of all the buildings in Ottawa for that year. For a building to be included in the final map, a photograph of it must be available and the building must no longer exist. To get the proper locations for the buildings, insurance plans had to be georeferenced using Quantum GIS. In Google Earth, these plans were loaded as KMZs and the buildings were outlined based on their locations on the plans. The information was then added to a database which was used to create the final KML file containing the bygone buildings. The final KML file contains the outline of the buildings, photos and the building's historic information. With this project, my hope has been to illustrate some of Ottawa's history by mapping Ottawa's lost built heritage.

Conference Abstracts

Session 1. The Past

Chair: Byron Moldofsky

Presentations: Historical Mapping and GIS 2 (cont.)

The Toronto PARK LOT PROJECT — Mapping the Founding History of Toronto & Upper Canada
Wendy Smith, PhD Candidate (Canadian History) York University, Toronto; Researcher / writer / webmaster; Winner of Heritage Toronto's 2014 AWARD OF EXCELLENCE (Media Category)

Provide a quick "guided tour" of the online map, showing several layers, as a demonstration of the map as a teaching tool of early Toronto and Ontario history. This will require access to the internet. This map was put together with humble Fusion Tables and KML files, overlaying a Google Map.

Battling Mapping a Battle: Vimy Ridge Front Line Movement
Rebecca Bartlett, Carleton University, GIS and Digital Resources Librarian and Trevor Ford, Laurier Centre for Military Strategic and Disarmament Studies, Wilfrid Laurier University

Rebecca and Trevor have been combining their GIS and military history expertise, respectively, to generate and display the front line movement at the Battle of Vimy Ridge, April 1917. While a sample dataset of three battalions had been tested previously, both the methodology and final product were significantly different when dealing with thirty-seven battalions. The difference between presenting the output in Google Earth versus a JavaScript library will also be discussed, including limitations and opportunities in workflow and design. Further, we will be highlighting the opportunities that abound with GIS when inter-disciplinary cooperation is encouraged.
With this project, my hope has been to illustrate some of Ottawa's history by mapping Ottawa's lost built heritage.

Conference Abstracts

Session 2. The Present

Chair: David Broscoe

Keynote Presentation

Cartography Today: Drawing Human Experience on a Global Scale
Chris Brackley, As the Crow Flies cARTography and Canadian Geographic

Cartography has always been about bringing a world beyond the human scale into view. Through his work with Canadian Geographic and environmentally focused non-profits Chris has developed an approach to map-making that draws connections between our day-to-day experience of the world with the much larger worlds that exist at a regional and a global scale. When maps are designed to look like the place they represent or feel like the story they tell, then map-readers are able to anchor the abstract concept of small scale maps to their human-scale experience of places they know. Chris' talk will deconstruct a wide variety of his maps, highlighting the ways they connect the human and global scales.

Presentations: Cartography Today 1

Cartography of the Canadian Wildlife Service
Mark Richardson, Geomatics Analyst, Cartography, Canadian Wildlife Service, Environment and Climate Change Canada

The Canadian Wildlife Service of Environment and Climate Change Canada is using the power of maps to explain the ever increasing complexities of conservation issues to the public, scientific teams and government officials. Explore how CWS has been using GIS effectively as their lead Cartography presents a guided tour of their projects both big and small. Including: The Nunavut Land Use Plan, Species at Risk (Boreal Caribou, Polar Bear and Critical Habitat), Protected Area Management, Human Footprint Mapping, and providing Maps for Legal Orders.

NRCan - The Evolution of our Geospatial Offerings
Scott Tweedy, NRCan

NRCan's Canada Centre for Mapping and Earth Observation (CCMEO) is the Government of Canada's centre of excellence for Geomatics, mapping and earth observation. CCMEO has taken on a leadership role to make accurate, authoritative, and accessible data available to all Canadians in support of Government priorities. Over time, more and more of our geospatial data has been made available to the public through our GeoGratis website to download and use without any licensing restrictions. Our presentation will focus on the evolution of CCMEO's digital geospatial offerings for both products and delivery over the past few years. There will be a short overview of our work over the past few years, a summary of our present state including our migration to the Open Canada environment, and a short glimpse into what the future holds for NRCan products to be made available to the public.

Conference Abstracts

Session 2. The Present

Chair: David Broscoe

Presentations: Cartography Today 1 (cont.)

Imaginary Cartography, Building Unreal Worlds for Analogue Games
Mark Richardson, Green Hat Designs

At the heart of every great game is the place where it is played, both real and imagined. Examine how modern GIS tools are being used to work with writers and artists in the creation of maps to explain their vision of their worlds to their readers. With a focus on providing high quality Cartography for analogue Role Playing Games and Board Games, explore the worlds of Cyberpunk Dystopias, Alternate Earths, Ancient Empires, and Fantasy Kingdoms. Featuring a detailed look at the Cartography for the incredibly popular Seventh Sea RPG which raised over $1.3 Million on Kickstarter.

Cartography of Data and Stories with Nunaliit
Amos Hayes, Geomatics and Cartographic Research Centre, Carleton University

The Nunaliit Cybercartographic Atlas Framework has been used to capture, organize, develop, present, and preserve knowledge in numerous fields of research including Indigenous knowledge, health and social issues, heritage and history, climate science, and marine management. The combination of cybercartographic process, modern open source mapping and cartography developments, and a novel way of organizing data has allowed Nunaliit to facilitate new cartography with knowledge holders who have often struggled to map their data and effectively tell their stories.

The Geomatics and Cartographic Research Centre develops the open source, web-based software with the support of its many partners who pool development resources. The focus is on enabling knowledge experts who are often not mapping or cartography experts, with the tools to effectively manage their datasets while presenting engaging, effective, and easy to use interactive representations of this knowledge to their audiences. An overview of the framework will be presented along with a diverse handful of examples highlighting specific challenges to producing useful and usable maps. In addition, the centre's work on developing tangible, touch, and virtual reality participatory mapping capabilities in Nunaliit will be previewed.

Presentations: Cartography Today 2

Integrating ArcGIS Pro and Web Mapping in the Cartography Curriculum
Monica Lloyd, COGS

Over the years, COGS has become very good at teaching traditional cartographic processes for print products. Embracing new applications and technology is necessary to remain leaders when teaching technical skills. Projects now have integrated web mapping components and new hardware requirements. Testing applications such as ArcGIS Pro is giving our students an opportunity to explore new cartographic workflows and solidify lessons learned using the ArcGIS Desktop mapping workflow. This presentation will discuss integration of ArcGIS Pro and web mapping tools into our Cartography program and implementation in future projects and curriculum.

Conference Abstracts

Session 2. The Present

Chair: David Broscoe

Presentations: Cartography Today 2 (cont.)

Teaching Digital Cartography: A Comparison of Adobe Illustrator and Inkscape
Julia Siemer, Department of Geography and Environmental Studies, University of Regina, Regina, Saskatchewan

Adobe Illustrator has been the standard software in digital mapping for many years. With the recent move by Adobe to offer its latest version of Illustrator on a subscription only basis, many educational institutions face the problem of increased and continuous licensing cost. This presentation will discuss alternative options to Adobe Illustrator and compare it with free or low-cost design software (e.g., Inkscape) and will examine their suitability for teaching an undergraduate course in Digital Cartography at the University of Regina.

Changing Curriculum: How to Teach an Old(ish) Cartography Professor new tricks
Sally Hermansen – University of British Columbia

For almost 20 years I have been teaching Advanced Cartography to upper year geography students. The course has been a combination of theoretical lecture, independent labs, and student led discussions cumulating in a community based research project. Over the years I have introduced web mapping through some rudimentary programs which in turn decreased the breadth of cartographic design and grossly simplified community based research projects. 2 years ago, the course was completely revised to a 'studio' based course of geospatial data mining and scraping, coding in R, and visualizing through interactive maps and infographics. This paper will reflect on the old and the new, the process, the team, and the results of this cartographic teaching overhaul, and its impact on GIScience curriculum and the department, the students, and, the aging professor.

The Hills are Alive with the ICA Mountain Cartography
Roger Wheate, University of Northern British Columbia

Every two years this group meets in a high mountain location to discuss recent and historic methods and developments in the cartographic representation of some of the world's most scenic locations. Their nationalities include Canada, USA, Austria, Germany, Norway, Romania, Argentina, and New Zealand. This talk will showcase recent workshops and will be delivered in a Petcha-Kucha format: 20 slides shown for 20 seconds each and a total of under seven minutes.

Conference Abstracts

Session 3. The Future

Chair: Emmanuel Stefanakis

Keynote Presentation

Rapid Technological Change and the Future of Cartography
Fraser Taylor, Geomatics and Cartographic Research Centre, Carleton University

Technology and rapid technological change is, as always dominating the rhetoric about the future of cartography. Technology should not drive the cartographic response and cartographers need to take control of their future destiny not let technological imperatives drive their response. This address will consider what responses are open to us.

Presentations: The Future of Cartography 1

Enlightenment of Cartography by Drones/UAVs
Uzayr Siddiqui, Carleton University, Ottawa

This research was directed towards understanding the future and prominent use of drone in the geomatics industry and in particularly the advancements of the cartography methodologies for geographers. Drones/UAVs have enabled geographers to survey and map out the lands at fraction of the cost allowing researchers to spend more time in processing and planning. Also, the drone technology payload system has enabled first person viewability and exploration which significantly adds value and enhances the capability for interpretation on a newer dimension by geographers, environmentalists, urban planners and surveyors which was impossible earlier. It is evident with new software advancements and technology provisions, industry's mode of monitoring and mapping the environmental changes is only going to improve.

Advances to Glacier and Mountain Cartography using Structure from Motion
Laura Thomson, PhD, Postdoctoral Fellow, Department of Earth Sciences, Simon Fraser University

Structure from Motion technology works on the principles of classical photogrammetry, but with the added advantage of computer automated image correlation analysis. This study demonstrates the application of Structure from Motion software to develop a new digital elevation model (DEM) and orthoimage of White Glacier, Axel Heiberg Island, NU, from which a new 1:10,000 glacier map has been produced. White Glacier and other ice masses in the Expedition Fiord region of Axel Heiberg Island were the focus of intensive study in the 1960-1970s, and the early regional maps are iconic in Canadian mountain cartography. Repeat mapping in the region supports measurements of glacier volume change, while also improving the quality of contemporary glacier mass balance measurements. Traditionally, mapping of alpine terrain using remote sensing imagery in the visible spectrum is hindered by low contrast conditions in the accumulation area of glaciers (above the snowline). In this study, Structure from Motion methods are shown to overcome this challenge, even in the snow-covered areas over glaciers, due to the high resolution of the photographs and their subsequent detection of small but distinct features in the surface of the snowpack. While Structure from Motion offers an affordable alternative to LiDAR derived DEMs, there are also pitfalls of using this "grey-box" approach, particularly concerning positioning and "mis-matches" in the correlation analysis between photographs. Approaches to overcoming these challenges will be presented, as well as value of co-registration methods when DEM differencing is the end goal.

Conference Abstracts

Session 3. The Future

Chair: Emmanuel Stefanakis

Presentations: The Future of Cartography 1 (cont.)

Automated Map Production Using Deep Learning Neural Networks

Christopher D Storie, Department of Geography, the University of Winnipeg; Christopher Henry, Department of Applied Computer Science, the University of Winnipeg; Andrew Curtis, Research Technician, Geospatial Laboratory for Environmental Analysis and Decision Making, Department of Geography, the University of Winnipeg

The importance of accurate and timely information describing the nature and extent of land resources and changes over time is increasing. Consequently the accurate production of these land use/land cover maps (LULC) is of critical importance in satisfying this need. The creation of thematic maps, such as those depicting LULC, using an image classification approach is one of the most common applications of remote sensing, however, the accuracy and consistency of the maps can vary over time and between different analysts. As such, the automation of LULC map production is of particular interest to a variety of different stakeholders. This research examines the application of deep learning neural networks (DLNN) to the analysis of satellite imagery. DLNN have made considerable strides in pattern recognition and machine learning over the last several years. However, their application to remote sensing is less well developed as the technology was originally designed for simple photographs and not satellite imagery. This research will present; (1) An overview of the current approaches using DLNN as they relate to remote sensing; (2) The data requirements for a DLNN LULC mapping project, and; (3) the preliminary results of an experimental study underway using DLNN to generate an LULC map the southern agricultural region of Manitoba.

Presentation Session: The Future of Cartography 2

Testing Transport Maps for Route Selection Speed and Quality

Nate Wessel, PhD Candidate, University of Toronto

One of the primary goals of a transport map is to aid users in selecting a suitable route between two locations. All else being equal, a good map should result in quicker route selections and better routes, as determined by whatever selection heuristic the user may apply (e.g. shortest path, lowest cost, etc.). It should be possible to empirically test certain aspects of transport map design by measuring their relation to these outcomes. In this research, I develop a web-based touchscreen application for testing route-finding efficacy. Subjects are presented with a series of maps and asked to navigate between two points by tracing a line on the screen with their finger. The location presented, and certain aspects of the map's design are varied randomly. Subject responses are matched to a route on the map and response times are recorded. Map design variables then enter into a regression analysis to predict response speed and quality. This presentation outlines the testing platform, and describes some preliminary results from a relatively simple case study. Directions for future work are proposed.

Comparative Visualizations of Transport Networks in Canadian Cities

Jeff Allen, MA Candidate, SAUSy Lab, University of Toronto

Travel behaviour in cities is complex. I will share a few maps in which I've attempted to visualize the spatial patterns of urban travel using network graphs built from OpenStreetMap, GTFS, and Statistics Canada data. The presentation will briefly overview the open source tools and cartographic techniques used to make these maps, and then provide examples comparing between different travel modes for several Canadian cities.

Session 3. The Future

Chair: Emmanuel Stefanakis

Presentation Session: The Future of Cartography 2

Simplification of Linear Features for Raster Tile Maps and Discrete Global Grids

Emmanuel Stefanakis, Department of Geodesy and Geomatics Engineering, University of New Brunswick

Linear features (e.g., roads, rivers), outlines of areas (e.g., municipal boundaries, lake banks) or moving objects trajectories (e.g., humans, vehicles) are represented on paper or digital maps with polyline geometries. Sampling, discretization, and generalization processes result in polylines represented by a subset of vertices of the original line. The simplified version of a linear feature may violate some spatial relations (topological, direction, or distance) that apply between the original line and some other objects in space, unless a model that considers the context of the neighbouring space is applied. The latter turns the line simplification into a rather complicated and hard to automate process. This presentation introduces a new method to line simplification that applies well-known geo-processing tasks, such as polyline-to-raster and raster-to-polyline conversions. This method, named mR-V (mnemonic Rasterization followed by a Vectorization of the original linear feature; [1]), can prevent spatial inconsistencies with neighbouring objects in the embedded space without considering these objects in the simplification process. In addition, the method is compliant with the raster tile maps at various zoom levels, being produced by earth browsers (e.g., Google Maps, Bing Maps, and OpenStreeMap), as well as the discrete global grid systems (DGGS).

Impact of Restaurant Spatial Proximity on Food Security and Public Health in Winnipeg

Joni Storie, Associate Professor, Department of Geography, University of Winnipeg; Martine Balcaen, Master of Science in Bioscience, Technology and Public Policy, University of Winnipeg; Adrienne Ducharme, Master of Science in Bioscience, Technology and Public Policy, University of Winnipeg, Winnipeg, Manitoba

Research between food, socioeconomics, health and spatial proximity has become a hot topic for urban and rural policy makers. Research in literature shows that restaurants are physically more or equally accessible to those living in areas of significant socioeconomic deprivation which may contribute to higher rates of obesity. This research explores (a) access patterns within the context of underserved food environments such as food deserts, and (b) economic deprivation and ethnicity tied to census-level, obesogenic environments in Winnipeg, Canada. Distance, hotspots, and density spatial measures were calculated to explore census relationship with restaurant locations using spatial statistics such as Ordinary Least Squares and Geographically Weighted Regression (GWR). Overlapping areas of high socioeconomic deprivation and high restaurant access were identified as at-risk food environments. Results showed that distance to the nearest restaurant decreased as socioeconomic deprivation increased. In addition, a GWR with three variables (visible minority, education level, household income) accounted for 88% of the spatial variability in overweight and obese populations per census tract. Economically-deprived populations in Winnipeg have easier access to restaurant food which correlates with higher rates of obesity compared to populations that are less economically-deprived. These results show that policy action is needed to improve access to nutritious food for socioeconomically deprived populations.

Conference Abstracts

Session 3. The Future

Chair: Emmanuel Stefanakis

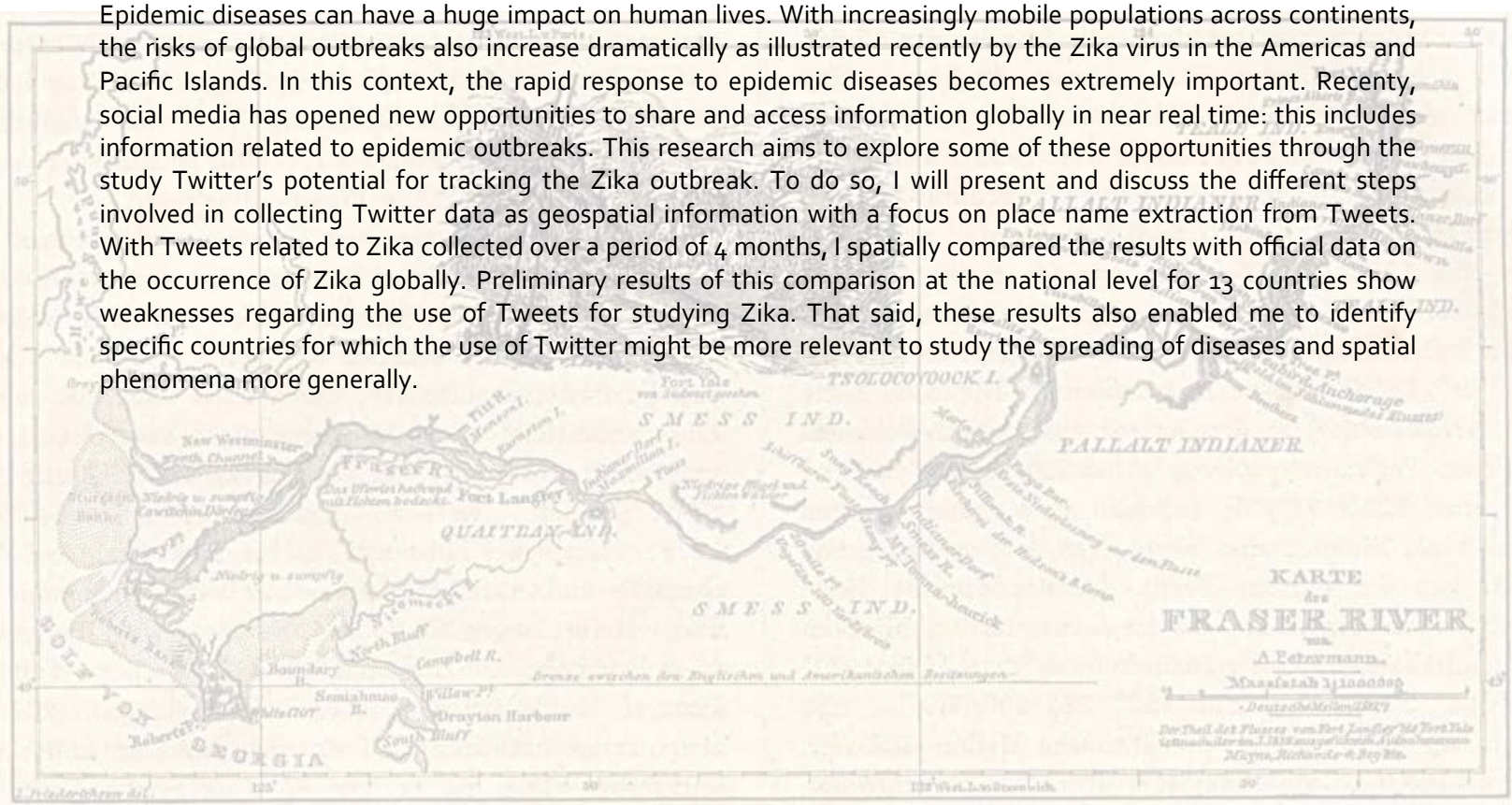
Presentation Session: The Future of Cartography 3

Mapping as an Interface for Places and Stories - Examples from the Geomedia Lab
Sébastien Caquard, Associate Professor, Department of Geography, Planning and Environment, Concordia University, Montréal

The Geomedia Laboratory at Concordia University (Montreal) was established in 2011 within the Department of Geography, Planning and Environment. This lab was born out of the convergence of two growing domains: (1) geospatial technologies with the development of the geoweb; and (2) emerging mapping practices in domains such as literary studies, film studies, oral history, and in the humanities and social sciences in general. In this presentation I will review some of the key research projects that have been developed within this lab in recent years with a focus on two interrelated ones: (i) the design of an online cartographic application dedicated to the representation of stories and (ii) its use for the mapping of life stories of refugees. I will draw from these examples to discuss the potential and limits of these types of applications to map stories. I will conclude by arguing for a broadening of our cartographic skills, tools, approaches and methods, both for pedagogical and research purposes, to address the very exciting challenges that we are now facing as cartographers, teachers and researchers interested in mapping narratives. Addressing such challenges in the design of spatial representations can help us to better mobilize the power of stories as unique sources of geographic knowledge for studying places in depth.

Mapping Zika with Twitter – Process, Results, Lessons
Mo Wang, MSc candidate - Department of Geography, Planning and Environmental Studies, Concordia University

Epidemic diseases can have a huge impact on human lives. With increasingly mobile populations across continents, the risks of global outbreaks also increase dramatically as illustrated recently by the Zika virus in the Americas and Pacific Islands. In this context, the rapid response to epidemic diseases becomes extremely important. Recenty, social media has opened new opportunities to share and access information globally in near real time: this includes information related to epidemic outbreaks. This research aims to explore some of these opportunities through the study Twitter's potential for tracking the Zika outbreak. To do so, I will present and discuss the different steps involved in collecting Twitter data as geospatial information with a focus on place name extraction from Tweets. With Tweets related to Zika collected over a period of 4 months, I spatially compared the results with official data on the occurrence of Zika globally. Preliminary results of this comparison at the national level for 13 countries show weaknesses regarding the use of Tweets for studying Zika. That said, these results also enabled me to identify specific countries for which the use of Twitter might be more relevant to study the spreading of diseases and spatial phenomena more generally.



Conference Abstracts

Session 3. The Future

Chair: Emmanuel Stefanakis

Presentation Session: The Future of Cartography 3 (cont.)

Tweeting an Urban Plaza: An Experiment in Geographic Information Retrieval
Emory Shaw, MSc candidate at Concordia University, Montreal, Canada

We increasingly witness and engage in geographies mediated by social media, which is changing how we experience and produce place. This raises questions about the positionality of place in complex and networked spaces, but also the politics underlying its representations. To explore these, I present a case study of Place Émilie-Gamelin in Montreal, Canada. Located atop the city's busiest transport hub and bordering downtown, the public space is flanked by a burgeoning arts district and a wavering Gay Village. Despite its centrality, it is a liminal space appropriated by marginalized groups and increasingly by contentious political movements (e.g. Maple Spring of 2012). Since 2015, it has been subject to a city-led revitalization program with intentions of attracting party-goers and tourists. Online, this place has evolved in scope, name and meaning, reflecting its mediation of flows and uses. Yet not all of these are captured by such virtual representations. This project explores these representations by articulating how their aggregation by theme and communicative function can inform us about complex places. In doing this, I aim to firstly untangle the relationships between virtual representation and physical witness by showing how they anticipate and follow key events and arise from distinct mobilities and geographies. Secondly, I explain how expanding on some of the presented findings could provide more nuanced cartographic representations of places.

The State of Online Indigenous Mapping in the Canadian Context
Thomas McGurk, MSc Candidate, Concordia University, Montreal

Mapping and cartography has felt the impact by web technologies in profound ways. Maps, movement, spatial data, communications, and social media have become part of everyday life for millions of people. A reoccurring narrative in this fusion of spatial and communications technology is its possible democratizing possibilities, especially for habitually marginalized groups and actors. The work examines how Canadian Indigenous peoples and their allies are creating on-line maps by producing an audit of existing websites. Drawing from the work of Smith (1999) a content analysis related to aspects of de-colonialized methodologies is performed for mapping sites run uniquely by Indigenous actors, sites run by Indigenous actors and NGOs, and sites run by Indigenous actors and research organizations. Additionally, a qualitative aspect of the work relying on interviews with Indigenous mappers, scholars, and technicians attempts to provide additional depth to the content analysis. Addressing the question of the web's democratizing aspects the work explores the ontological and epistemological frames of both Indigenous and colonial cultures related to maps, mapping, and cartography. Asking if increasing access to the internet and World Wide Web coupled with the ease of use, accessibly, and multimedia capabilities of on-line mapping platforms are promoting a de-colonialized discourse. Additionally, drawing on ideas related to third space(Lefebvre, 1991; Sparke,2011; Bhabha,2012) and deep maps (Bodenhamer, 2015)the work explores if on-line mapping has the potentially creates a space of de-colonialized discourse that expands the ontological and epistemological frames of Indigenous and settler societies.

Technical Session

Web Mercator Projection and Raster Tile Maps: Two Cornerstones of Online Map Service Providers
Emmanuel Stefanakis, Dept. of Geodesy & Geomatics Engineering, University of New Brunswick

Duration: 40min

Format: Oral Presentation with visuals in electronic format (PowerPoint slides)

Intended Audience: Professionals and students who make use of maps (not only for finding their way to the nearest gas station!) and want to have a better understanding on the properties of maps acquired by online map service providers, such as Google Maps and OpenStreetMap.

Description:
The popularity of online map service providers, such as Google Maps, Bing Maps, ArcGIS Online, and OpenStreetMap, has grown rapidly in recent years. It is hard for younger people to imagine and for older to remember a world without web maps (in the same way it is a world without mobile phones), a world that was the reality less than a dozen of years ago. Throughout these years, the developers of online map service providers had to address numerous technological challenges. They were called to provide efficient solutions and increase the popularity of the services by delivering voluminous map data to an ever increasing number of web users; and all that over a web infrastructure with severe limitations (low speed, compatibility issues, etc.). Apparently, they had to take important decisions that have eventually affected the technological developments and have imposed de facto standardizations on the online mapping domain.

Inevitably, some of these decisions have also had an impact on well-established rules for visualization and delivery of digital maps over the web. This tutorial focuses onto two cornerstones of modern online map services: Web Mercator Projection and Raster Tile Maps.

Four hundred and fifty years after the Flemish geographer and cartographer Gerardus Mercator published the most popular map projection ever, Google introduced the Web Mercator variant, which despite its initial rejection by cartographic committees as "an inappropriate geodesy and cartography", it rapidly became a de facto standard and was adopted by most online map service providers. The pros and cons of the new variant will be clearly explained in the tutorial.

The tiling of large maps is an old practice. Large paper maps have always been divided into a series of map sheets at various scales. With the increasing popularity of web mapping applications and the rapid growth of map data availability, the pre-computation and caching of map image tiles has become a common practice in online map services as they use far fewer server resources than maps rendered on demand. The creation of map tiles depends on a series of properties (shape and size of tiles, numbering of zoom levels, subdivision scheme of a tile, etc.). Combining tiles from various servers, including online map providers, might involve some simple or complex transformations. Over the last decade, the values for the above properties have been standardized. The tiling scheme adopted by modern online map providers will be clearly explained in the tutorial.

References:
Stefanakis, E., 2015. Web Mercator: the de facto standard, the controversy, and the opportunity. *GoGeomatics.* Magazine of GoGeomatics Canada. October 2015.
Stefanakis, E., 2015. Map Tiles and Cached Map Services. *GoGeomatics*. Magazine of GoGeomatics Canada. December 2015.

Poster /Concurrent Audio-Visual Presentations

Poster Session

Implementation Optimization for Improved Algorithm to Calculate Raster Perimeters
Steve Prashker, Carleton University
Poster will contain the original proposal to improve raster shape perimeter calculations, then suggest an optimization to speed up the process significantly.

Carleton Through the Years – Campus Maps Poster
Steve Prashker, Carleton University
A history of Carleton University through changing campus maps.

Flood Risk Mapping: a Case Study of Fredericton, New Brunswick
H. McGrath, Department of Geodesy and Geomatics Engineering, University of New Brunswick; E. Stefanakis, Department of Geodesy and Geomatics Engineering, University of New Brunswick; and M. Nastev, Natural Resources Canada, Geological Survey of Canada, Québec ,Canada

Concurrent Audio-Visual Presentations

Ian Crain
Early NFB film on the CGIS from 1967 (incudes Roger Tomlinson). Also a later film from Environment Canada - around 1980. Both have major comic elements - for fashion and gender bias, as well as for promising a lot! Continuous screening of these - for both information and amusement. (Total time of about 40 minutes).

Mark Gallant
EntertainMaps. Exhibition Format: Large screen monitor with EntertainMaps.com site loaded for users to interact with, ask questions, view demos, etc.

Mark Richardson, Green Hat Designs
Imaginary Cartography, Building Unreal Worlds for Analogue Games. At the heart of every great game is the place where it is played, both real and imagined. Examine how modern GIS tools are being used to work with writers and artists in the creation of maps to explain their vision of their worlds to their readers. With a focus on providing high quality Cartography for analogue Role Playing Games and Board Games explore the worlds of Cyberpunk Dystopias, Alternate Earths, Ancient Empires, and Fantasy Kingdoms. Featuring a detailed look at the Cartography for the incredibly popular Seventh Sea RPG which raised over $1.3 Million on Kickstarter.

Special Exhibitions

Canada's Submission to the 2017 International Cartographic Exhibition

This display showcases the majority of maps that will be exhibited in Washington, DC, from July 2nd – 7th, in conjunction with the 28th Conference of the International Cartographic Association. The impressive collection includes maps published in the past two years by Canadian government agencies, universities, private mapping organizations, and individuals. Canada is mapped coast to coast with both urban and wilderness landscapes represented. Mountain cartography is a popular theme with several large maps featuring the rugged terrain of our western provinces. Indigenous cultures of Canada's more northern regions are also featured in the collection. For more information on the International Map Exhibition, see http://icc2017.org/.

Northern Circumpolar Map Updated!

The Atlas of Canada North Circumpolar Map is a bilingual map using a unique projection which shows the geography of the northern circumpolar region, north of approximately 55 degrees, at a scale of 1:9, 000,000. This high quality cartographic product provides a uniquely Canadian perspective of the North. The map includes all international boundaries, as well as the Canadian provincial and territorial boundaries and Canada's 200 nautical mile offshore exclusive economic zone. It displays a number of significant northern features, including the median sea ice extent for September 1981 to 2010, the tree line, undersea relief, land relief, the Magnetic North Pole, glaciers, ice fields and coastal ice shelves. Natural Resources Canada has updated it from the 2008 version in honour of Canada's 150th . Come learn more while at the CCA Conference.

Looking to Stay on after the Conference?

That's a great idea. There is a lot to see and do in our Nation's Capital, especially this year as we celebrate our country's 150 anniversary.

Tourist Sites for General Information on Events

Are you looking for additional information on what is taking place in Ottawa during your visit? Access these sites.

- Doors Open Ottawa events http://ottawa.ca/en/residents/arts-heritage-and-culture/museums-and-historic-sites/doors-open-ottawa
- Ottawa 2017 Events http://www.ottawa2017.ca/events/
- Byward Market in Downtown Ottawa http://byward-market.com/en/home/
- Smartphone app for activities: http://ottawacitizen.com/news/local-news/city-unveils-phone-app-to-join-in-ottawa-2017-activities

Places to Visit

- If you haven't seen some of our sights, this is year to do so. Check out visiting hours and special events here.
- Parliament Hill http://www.lop.parl.gc.ca/Visitors/index-e.html
- The Mint http://www.mint.ca/store/mint/visit-the-mint/visit-the-mint-1200026
- The National Gallery http://www.gallery.ca/en/
- The Fairmont Chateau Laurier http://www.fairmont.com/laurier-ottawa/
- Museum of Nature http://nature.ca/
- Museum of History (previously known as Museum of Civilization) http://www.historymuseum.ca/
- Canadian War Museum http://www.warmuseum.ca/
- National Art Gallery http://www.gallery.ca/en/
- Notre Dame Church http://www.notredameottawa.com/the-cathedral

BUT don't forget a visit to

Rideau Hall http://www.gg.ca/ the Governor General's residence have options for visitors, on beautiful grounds, off of Sussex Avenue - it would be a nice visit bundled with the Gallery and the Notre Dame Cathedral - all in the same area (vehicles would be needed though - or bus to drive people from A to B to C etc.)

and

The Byward Market http://byward-market.com/en/home/

Looking to Stay on after the Conference?

OR for the more adventuresome visitor ready to go just a little further

Travel up into the Gatineau Hills to the MacKenzie King Estate (http://outaouais.quebecheritageweb.com/organization/mackenzie-king-estate-gatineau-park) and the picturesque village of Wakefield, Qc http://wakefieldquebec.com/

and

Upper Canada Village, a short drive down along the St. Lawrence River http://www.uppercanadavillage.com/

Other things to do while in town

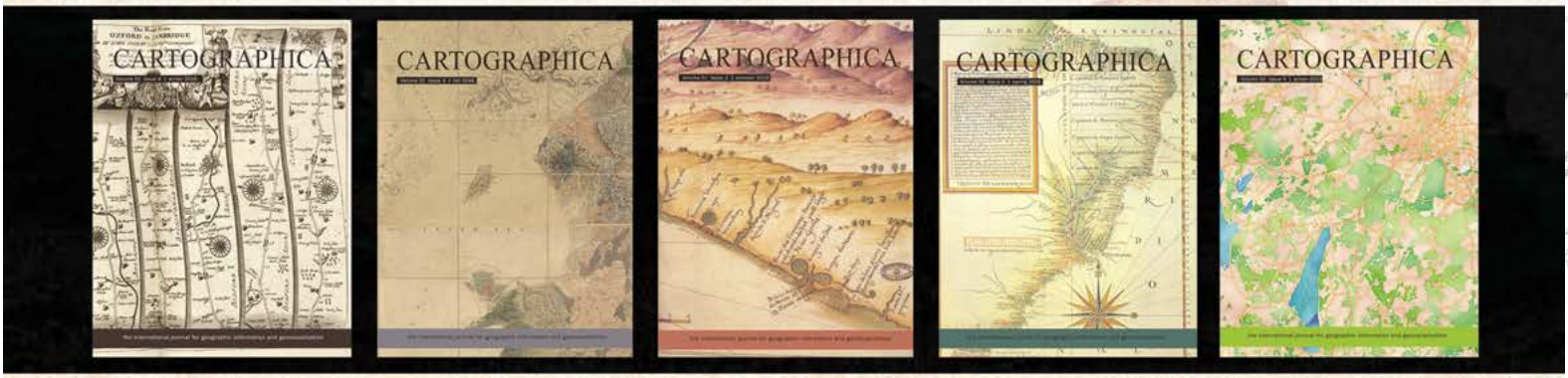
Perhaps a boat ride up the Rideau Canal or up the Ottawa River? There are various tour companies that offer those tours. http://www.pc.gc.ca/en/lhn-nhs/on/rideau

How about a microbrewery tour? Two scheduled by Brewdonkey on June 2 and 3 take you to the city's most famous micro-breweries https://www.brewdonkey.ca/collections/ottawa-brewery-tour

And finally, for the athletic

Bike Tour to Gatineau Park (contact roger.wheate@unbc.ca for details)

CARTOGRAPHICA



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Cartographica welcomes manuscript submissions of original perspectives and innovative findings in the production, design, use, cognitive understanding, and novel applications of maps in arts, computer science, economy, engineering, geography, history, medicine, health, and surveying. Submissions are accepted on a rolling basis.

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