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CARTOUCHE

THIS ISSUE

PARTICIPATORY MAPPING: Truth and Reconciliation Commission Map serves as a catalyst for sharing experiences >> Read more on page 2

Quarterly Newsletter of the
Canadian Cartographic Association/Association canadienne de cartographie
www.cca-acc.org

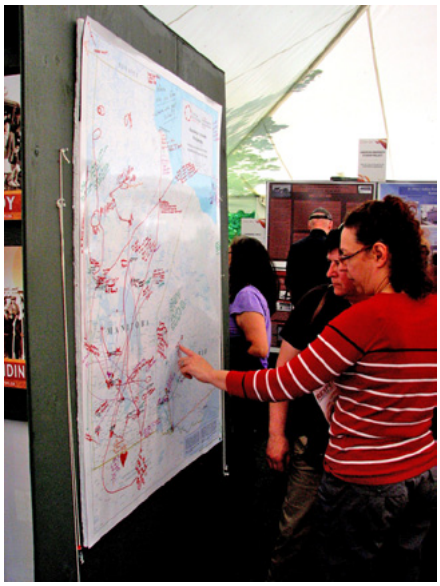
>> Cover Story Continued . . .

The first national event for the Residential Schools Truth and Reconciliation Commission (TRC) was held in Winnipeg (June 2010). A large-format paper wall map of Manitoba and Northern Ontario was provided to the Commission by Natural Resources Canada. This map was laminated and displayed in the 'Learning Tent' by the Commission's Research Group.

Former residential school students and their families were encouraged to use the map to assist in explaining their stories. Several people took the opportunity to add coloured arrows showing their routes from home to the residential schools, as well as adding some touching notes about their experiences. The result was a fascinating example of volunteered geographic information.

This map document will form part of the record of the Commission, to be made available at the conclusion of the hearings (2015) in a National Research Centre. In total, seven national events will be conducted; the next to take place in Inuvik, NWT (June 2011). It is expected that maps will continue to play a role in assisting former residential school students and their families to relate their experiences. Find more information at: *http://www.trc-cvr.ca/*

Submitted by Peter Paul, Natural Resources Canada.



Cover and above photos courtesy of Helen Harrison, Truth and Reconciliation Commission of Canada.

A Word from the New Editorial Team

First of all, we'd like to express a 1000 thanks to Patricia for her wonderful job creating many great issues of Cartouche and for keeping us well informed and in touch with our Association. The innovation of publishing Cartouche in PDF format has been key to the economic health of our Association and bringing us into the 21st Century. It will be so difficult to fill Patricia's shoes for the next few issues, therefore not only one person will play the editor role but a whole team! We hope to be able to keep the same high standards established by Patricia and publish content that will be of interest to you!

This issue is the first produced by the new editorial team: Donna Williams, Anna Jasiak, Ivy Rose, Diane Lacasse and Eric Kramers. We are all from the Atlas of Canada. Together, we will work hard to bring you enjoyable and informative issues. The table of contents for this issue presents engaging articles from the chairs of the interest groups "History of Cartography" and "Map use and Design". Our President brings the challenge of integrating the concept of cartography and "eye candy"; and in the cover story you will find an interesting and unusual use of maps. We hope that you will enjoy them.

We would greatly appreciate your feedback, future articles as well as news items and announcements from your organization. Please do not hesitate to contact us with your questions, concerns, suggestions or comments. Enjoy!

THE PRESIDENT and
HER MOST SERENE EXCELLENCY

The Challenge of Integrating the Concepts of Cartography and "Eye Candy"

August 19, 2010 at the Cottage
Here I sit on the porch at the cottage. My dog is asleep on a chair and my cat sits on the mat. Right now a thunderstorm is blowing in and at 3 pm I have had to turn the porch light on. So it seemed like a great time to try to put together my piece for Cartouche. I gave myself a challenge this time. I brought 4 articles with me to the cottage. Two I have had for a couple of years meaning to read them and a cartographer I work with and respect greatly, Andy Murray, recently sent the other two to me. The older ones look at cartography in the United States and online and the recent ones are written by designers arguing for the need for aesthetics to count. How can I bring these together to talk about a subject that might be interesting to cartographers and friends of cartographers?

Place of Cartography
The first two articles are linked to cartography directly. The first is written by Brandon Plewe entitled, "Web cartography in the United States" in Cartography and Geographic Information Science (2007). Plewe discusses the ways in which the Internet has changed cartography. He asks us to consider redefining maps and cartography for that matter. Many important concepts are reviewed such as how the internet has changed cartography – cheap map distribution, easier retrieval of maps, increased public demand for maps and geospatial information and the ability to create new kinds of maps. Plewe goes on to describe consumer oriented mapping (such as Google Earth), citizen oriented (such as municipal land parcel sites) and enterprise applications for collaborative work. He sees the major developments as being more dynamic interactive maps and the ability of users to enter their own map data. Once all these concepts are introduced the article moves into looking for the place of the cartographer in this environment. He asks,

"Are cartographers in danger of being squeezed out of existence from both ends, the programmer-mapmaker with technical but not design skills and the consumer-mapmaker with neither set of skills?"

The cartographer has two potential roles. One is as the "cartographer-developer" (my own terminology although derived from this article). This is a role where the cartographer can enter into dialogue with developers and effect development in the software realm his or herself. The challenge is to ensure that

cartographic skills are kept up to date while following trends and keeping up to date with the ever-evolving world of the Web. The other role is as a cartographer who uses existing services and applications to design well thought out maps. Cartographers can contribute at the consumer end by building quality content on top of open services.

Plewe, citing Wood in a 2003 publication, states that mapmaking had conquered cartography, that those who know and care about quality design have been marginalized in the new age of mediocre web maps and GIS. Wood did not believe that this was necessarily a bad thing. Plewe agrees that this is not far from the truth, but argues that as mapping moves into more mainstream society good map design is needed more than ever. He writes, "Design is more than aesthetics; quality yields accuracy, clarity and persuasion."

Jessica Clark in her article entitled, "The New Cartographers, What does it mean to map everything all the time?" February 28, 2008, (http://www.inthesetimes.com/article/3524/the_new_cartographers/), writes much about the new cartography that is found on the Web. Her thesis is that maps are everywhere and that it is becoming a new vibrant language. She goes on to describe much of what we find being mapped these days from OpenStreetMap to Worldmapper. This is creating a world of people placing themselves in space and using a new language to do it. The most intriguing statement comes very near the end of this short article.

"We no longer go to maps to find out where we are. Instead we tell maps where we are and they form around us on the fly, a sensation that can be comforting or stifling. After all, while finding the right map can orient you, having dozens can threaten to tip the signal-to-noise ratio towards cacophony."

To me, this screams out for the cartographer. Someone who understands these maps and can create them so that the signal-to-noise ratio is bearable. Cartographers can provide the filter that allows everyone to place him or herself in space without becoming lost.

"In Defense of Eye Candy"

After digesting these two articles, I am feeling quite convinced that there is a place for cartography in this complex, neo-geographer world. (Note: The dog is still curled up on a chair and the rain has stopped for a moment. Just an aside, did you know that the little, tiny hummingbird will still come to a feed in the downpour of a thunderstorm? I don't know why the raindrops don't tumble him from the sky!)

However, how do I incorporate the two articles related purely to the world of design into what I've just read? Andy supplied these articles to the design team after some serious discussions on the new direction for the Atlas of Canada so he obviously saw a link. After reading them in this relaxing and therefore creative moment, I see the link as well – the design discourse does present direction for cartography.

Stephen P. Anderson provides segue with his question in "In Defense of Eye Candy" when he asks, *"How do aesthetic design choices influence the understanding and emotions, and how do understanding and emotions influence behavior?"*

Anderson talks of designers believing that applications are made enjoyable because they are made easy to use and are efficient. He says it's close to the truth to say that things that are enjoyable will be easy to use and efficient. He argues rather convincingly that visual design is the most important factor in evaluating a Web sites' credibility.

Both articles (Anderson's, 2009 and "Emotion and Design: Attractive things work better", by D.A. Norman, 2002) focus on the concept of affect. These authors argue that affect is about feelings and emotions. Not in the obvious way that we might say that "I feel positively about your brand" but in a much less obvious way that feelings and emotions influence perceived and actual usability. These are basic and immediate responses that come before any conscious thought and are related to evolution and survival. Simply, when we are relaxed, our brains are more likely to find workarounds to difficult problems. When we are relaxed we are more creative. When we are tense, our brains get tunnel vision where we only see the problem.

To make this a little clearer, think of how quickly we respond to someone simply based on how they are dressed. Anderson points out to us that the car industry has known this for some time. Why do we think the Mini Cooper is "zippy and fun" or the Dodge Ram seems "durable"? For me it is that my Toyota is reliable. The Internet has been slow in picking up the research and responding to the positive impact that this kind of product design can have.

Norman asks us to consider the time when all computer screens were black and white. He says that when colour screens were first introduced he didn't understand their popularity because colour had no functional use. In those days, colour was used mainly for highlighting or adding superfluous screen decoration. Colour screens became popular anyways and Norman decided to try one. He still found it had no functional use compared to his black and white screen but he wouldn't give his back. Logically he understood that colour had no purpose but emotionally he didn't agree.

Norman challenges us with the statement, "Wash and polish your car: doesn't it drive better?" This statement makes me smile because I agree. I feel so much better about my car when it's shiny and vacuumed! Norman sites research that the chemicals released when we initially respond to "something" regulates how we solve problems and perform tasks. In the end, positive responses to something that is "appealing" lead us to try harder to make it work. We are more willing to work at making it work. It is important to achieve a balance between function and beauty, but we cannot underestimate the role of beauty. It's about balance. As Norman says in the last line of his article, "After all, attractive things work better."

Cartography and Eye Candy

There is a relationship here. It's not as evident as my dog still sleeping on a chair near me but there is a way to bring all of this together. Let's consider that the first article on cartography suggests that there are two places for cartographers in Web mapping. Cartographic expertise is needed in the service/application development area. These would be people who have skills in cartography and in programming and application utilization. This brings to mind a young man and a couple of young women who work with me now. They have programming skills together with a strong understanding of geographic information and cartography. Cartographers also contribute at the consumer end, designing communicating maps that are well designed in various application end environments such as Adobe and Google Earth. Again, there are geographer/cartographers who work with me who fit in at this end of the process of mapping too.

>> Continued on page 21

Nigel Waters Appointed as New Editor of Cartographica

I am happy to announce that after an extensive search, a committee of the CCA (Roger Wheate, Janet Mersey, Julia Siemer, Donna Williams, and myself) has chosen Dr. Nigel Waters to succeed Dr. Jeremy Crampton as editor of Cartographica at the start of 2011. We are all happy with Nigel as our choice and he seems eager to tackle the work involved. He plans to bring on board two assistants or co-editors: Dr. Germana Manca and Dr. Andrew Crooks.

For background, Nigel obtained a First Class, Honours BA from Cambridge University in 1972 and his MA and PhD from the University of Western Ontario in 1973 and 1977, respectively. He joined the Geography Department at the University of Calgary in 1975 and was promoted to Full Professor in 1990. He was nominated twice for the Master and Superior Teaching Awards, and has conducted numerous studies in GIS, modelling, spatial analysis and transportation geography. He is a former President of the Western Canadian Association of Geographers, and an associate editor of GeoWorld where he is also a regular contributor of the Edge Nodes column. At the University of Calgary he was the Founding Director of the Masters in GIS Program and of the Transportation Theme School and Transportation Studies Major. Prior to leaving the University of Calgary (where he is now Professor Emeritus of Geography) he was participating in two GEOIDE research projects, leading a SSHRC Project and was working with the Nobel Peace Prize winning Carter Center in Atlanta as the Technical Director of the Mapping the Media in the Americas Project (www.mediamap.info). In June 2007 he was appointed Professor of Geography and Director of the Center of Excellence for Geographic Information Science at George Mason University in Fairfax, Virginia.

Please join me in thanking Jeremy for his excellent service as editor, as well as welcoming Nigel to his position as the future editor of Cartographica.

Author Daniel G. Cole is Past President of the Association. He is the GIS Coordinator, Smithsonian Institution, Washington, DC.

AWARD OF DISTINCTION:
General Call for Nominations

The CCA Awards of Distinction were initiated in 1994 to recognize individuals or groups who have made exceptional contributions in the field of cartography. The list of recipients to date is provided at: *www.cca-acc.org/awards-past.asp*

The deadline for receipt of nominations will be January 31, 2011.

Nominations are sought in three categories:

I. Individuals who have or are making exceptional professional contributions to the practice of Cartography;

II. Individuals who have or are making exceptional scholarly contributions to Cartography; and

III. Individuals who have or are making exceptional contributions to the CCA.

The Committee will confer to select the award recipient from among the nominations received and determine the selection by February 28, 2011. Up to a maximum of two individuals in each of the three categories identified above may be granted awards per year. The awards may be granted posthumously. The Committee shall recommend their selection to the Executive for approval.

The Committee Chairperson will inform the award recipients shortly thereafter and will invite them or representatives to receive the award at the following Annual General Meeting (AGM) or the associated banquet. In any event, the names of the award winners will be announced at the AGM. The CCA is not able to reimburse the award winners or their representatives for their expenses in travelling to the AGM to receive the awards unless they qualify for reimbursement under the regulations of the CCA Travel Policy. The names of the award recipients and the award citations will be published in the first issue of Cartouche published after the AG

Jens Munk's New Denmark on Hudson Bay

(so much for Hans Island!)

It is ironic that Prime Minister Harper chose to start his 2010 summer sovereignty tour of the Arctic in Churchill, Manitoba. It was here that the Kingdom of Denmark, or at least Jens Munk (1579-1628) working for the Danish crown, claimed Nova Dania (New Denmark) in the winter of 1619. The name appeared on a map and in European atlases for many years. Today, only Hans Island between Ellesmere Island and Greenland is disputed territory between Canada and Denmark.

Munk's voyage is a little-known episode in Canadian history. On May 9, 1619, under the direction of the Danish King Christian IV, Munk set out with 65 men in two ships, the Enhiørningen (Unicorn) and Lamprenen (Lamprey) to search for the Northwest Passage to the Orient. He explored Davis Strait as far as 69°N, discovered Frobisher Bay, and then spent almost a month pushing his way through Hudson Strait. In September 1619 he finally entered Hudson Bay. After exploring the western shore, the season was late so he spent the winter near the mouth of the Churchill River, a place he called Munk's Winter-haven.

Cold, famine, and scurvy killed his crew except for only two men besides himself. Amazingly, with these men, Munk sailed the Lamprey home, reaching Bergen, Norway, on 20 September 1620 after a voyage of two months.

Munk planned another journey to take possession of Nova Dania for the Danish crown but his health was weak. After serving as a captain during the Thirty Years War, Munk died in 1628, probably as a result of being wounded in the battles at Kiel. However, according to the French intellectual Isaac de la Peyrère, who served as a legate at the French embassy in Copenhagen, Munk died as a result of a dispute with Christian IV, in which the king beat Munk with a cane. Peyrère's history of Greenland, Relation du Groenland (1647), includes an account of Jens Munk. An earlier account of Munk's voyage to Hudson Bay was published in Copenhagen in 1624 as Navigatio Septentrionalis.

Jens Munk Island, a barren and uninhabited landscape, 920 km2 in area, in the Qikiqtaaluk Region, Nunavut, at 69° 40' 0" N, 79° 40' 0" W, was named by Knud Rasmussen's Danish Fifth Thule Expedition (1921-24). The name Jens Munk Archipelago is proposed for a cluster of small monadnocks that rise 45 m above present sea level on the shores of Hudson Bay in the Churchill area. According to geologists Samuel Johnson and Markes Nelson in The Journal of Geology (2002). The University of Chicago Press. Many Canadian gardeners will know the name of a rose also named in his honour.

The sailors of the Enhiørningen and the Lamprenen prepare for winter harbouring at Jens Munk's Bay (mouth of Churchill River) on the western coast of the Hudson Bay. Munk's account from this expedition, and the 1619-1620 winter stay, are recorded in his Navigatio Septentrionalis (Courtesy University Library of Tromsø, Norway).

For a map of Hudson Strait and Hudson Bay also showing Munk's winter harbour map go to:
http://www.flickr.com/photos/manitobamaps/1128394683/

For a photo of Jens Munk Island go to:
http://commondatastorage.googleapis.com/static.panoramio.com/photos/original/5490950.jpg

Ken Favrholdt is the new History of Cartography Interest Group Chair.

A Plea for Attractive and Correct Maps

Recently, the map library at the University of Regina received a donation of a collection of books and atlases from a retired professor. Going through the atlases of the collection, most of them from the 1955s to the earlier 1970s, I was amazed to see how beautiful many of the maps in these atlases were. Even very simple, presumably inexpensive atlases included very attractive maps. Compared to these maps today's maps often look overly simplistic and visually unattractive. One factor of this development might be the availability of modern technology allowing everybody to quickly produce maps. On the one hand, this is a very positive development as it makes mapping a ubiquitous technique in many peoples' lives (e.g., Google Maps, the use of car navigation systems, etc.). On the other hand, this development puts very powerful tools in the hands of laypersons who don't necessarily know how to use these tools effectively.

The availability of better, more advanced technology appears to have led to more maps being produced and used but not necessarily better quality maps. In the early years of digital cartography, cartographers focused on raising concerns over limiting technical factors such as low resolution, quality of raster versus vector files, poor printing quality, etc. (Spiess 1996). In the meantime, many of these issues have been resolved; nowadays, cartographers need to be more concerned with cartographic design and content issues.Increasingly, maps are produced and published by GIS experts rather than cartographers. As a result, we see a large number of maps being produced with GIS software where the authors relied on default settings visualizing their analysis results. Even more critical than default colour settings, symbols and map lettering options is the frequent application of correct mapping techniques.

As cartographers, we should ask ourselves if we contribute to this development of declining cartographic quality. Are we also tempted to hastily produce maps without proper consideration of cartographic design principles and map content? I would like to think it's only the others, but I have to admit, many of the poor quality maps are produced by cartographers. We should remind ourselves of the importance of the correct use of cartographic methods and techniques to ensure the best possible cartographic outcome.

Why is it so important to create attractive maps?
Communication by means of maps is more than simply showing where things are, or what kind or how many features can be found at a particular location. A map at its best should help reveal new spatial pattern and relationships between features, etc. Not all maps are originally designed for such an ambitious goal, though. Nevertheless, it is important to create maps that are easily read and visually appealing to the user. Only a system of meaningful symbols, colours, legible lettering, etc. leads to an attractive map and allows for easy and correct interpretation of the map.

What constitutes an attractive map?
Of course, there are many different personal views of what is an attractive or unattractive map. But most of the better quality maps share certain characteristics that make them attractive to the map user. The British

Cartographic Society (2008) has published a neat little booklet that aims primarily at novices in the field of cartography but it also is a useful resource for the more experienced cartographer. According to this guide, consideration of the following key issues of map design help in creating appealing and useful maps:

- Clarity and legibility – can your map easily be read without any difficulty or confusion? Make sure all map symbols are large enough to be seen easily. This involves considering your target audience and the final medium of your map.
- Hierarchy and structure – separate your map elements into groups; the intellectual hierarchy of your map elements should be reflected in the map's visual hierarchy; map elements should vary in size, colour, and visual weight to reflect the importance of the elements.
- Colour and pattern – use conventional colours (e.g., green for vegetation) or associative colours (e.g., blue for cold, red for warm).
- Visual contrast – use graphic variables such as size, shape, colour, and orientation to create an interesting and meaningful contrast to enhance the map attractiveness.
- Figure-ground – figures (the elements the map readers' eyes settle on) are separated from the (back) ground by using finer structures, lighter colours or fewer elements to improve readability.
- Balance – balance your map body and remaining elements to create an attractive page layout.
- Typography – choose the right font size for your map body and additional map text. Use characteristics such as typeface, style, size, weight, colour, and spacing in a meaningful way. Edit automatic type placement to improve legibility.

In addition to these basic cartographic design aspects, it is important for the mapmaker to understand the phenomenon or topic of interest and the nature of available data to visualize it in map form. This is particularly important for the design of thematic maps. Too often, phenomena are displayed employing a thematic mapping technique that is not suitable for the available data. Cartographic textbooks typically include a section on the relationship of the characteristics of a phenomenon, the nature of available data and appropriate thematic mapping technique(s) (cf., MacEachren, A. M. 1994, Slocum et al. 2008). Although most cartographers should be aware of this relationship, it seems to me it is ignored almost more often than considered. A classic example for an often incorrectly employed technique is the commonly used choropleth map. All too often, this technique is used to visualize phenomena that are smooth and discrete in nature, where spatial reference units are very different in size, and the spatial distribution is rather uneven. All four aspects should be taken into consideration when designing a choropleth map. Ignoring these aspects can result in an incorrect, misleading map.

Cartographers should insist on the correct use of cartographic techniques and design and not let others produce maps that are unattractive, illegible, and often plain wrong. The unawareness and lack of cartographic knowledge are important factors to fight in an increasingly visual society where cartographic products are more available than ever.

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Author Julia Siemer is Chair of this Interest Group. Julia is an Assistant Professor of Geography (Cartography and GIS) at the University of Regina.

Mapping The North Circumpolar Region

Introduction

The Northern Circumpolar Region is a spectacular environment, rich in Inuit culture, wildlife and diverse ecosystems. D'Arcy McGee, a great supporter of Canada's Confederation in 1867, spoke of Canada as a Northern nation, bounded by the blue rim of the ocean. Canadians view the North as a vital part of our nation and identity. The North fills us with a sense of awe, as a place of expansive and mighty landscapes, history and limitless potential.

Figure 1: Gerard Mercator's Septentrionalium Terrarum descriptio from 1595 and Willem Barentsz's Deliniatio cartæ trium navigationum published by Cornelis Claeszoon in 1599.

The first detailed maps of the circumpolar north (Figure 1) were produced by Gerard Mercator in 1595 and Willem Barentsz in 1599. Both reflected very different understandings of the north at that time. Mercator's was mostly pure fantasy with rivers, between four fictitious large islands, flowing north from the southern oceans and ultimately into the earth at the North Pole (Ginsberg, 2006). It was representative of myths and lore of an arctic paradise described by the ancient Greeks and maintained to the 20th Century (McGee, 2004). The map by Barentsz took an opposite approach by leaving the unknown regions empty with the exception of some whales. Both maps are artistically beautiful, showing great cartographic skill and design. Four centuries later, the Atlas of Canada's newly revised map (Figure 4) shows the positional reality of all physical and toponymic features. Fictitious islands have been replaced by scientifically accurate and detailed undersea relief and empty spaces filled with physical and cultural features. The descriptive notes of the former have been replaced by a detailed legend in the latter. The artistic dimension of new maps has moved away from older embellished cartouches and motifs, hand colouring and engraved type and line work. The goal, however, of both maps remained the same: to show the reality of the times in which they were made using the most accurate available data and visualized using the best cartographic practices.

The International Polar Year(IPY), 2007-2008, has brought considerable scientific and societal focus on the polar regions of our planet. The result has been and continues to be a vast amount of new research, increasing the body of knowledge about these regions. In response to the International Polar Year various

new northern mapping initiatives have been undertaken around the world. This paper focuses on the revision and cartography of the Atlas of Canada's 2008 North Circumpolar Region Reference Map. The primary objectives of the map revision project were as follows:

- Produce an authoritative geo-political wall map of the north circumpolar region, with an anticipated 3 to 4 year lifespan, to replace the existing version of the map
- Emphasize Canada as a northern country
- Create a base map to be the source of three products with multiple delivery formats: printed and online viewable and downloadable vector and raster versions.
  1. Revised North Circumpolar Region map
  2. Promotional map/brochure for the Atlas of Canada containing the circumpolar map North of 55° and an equivalent circumpolar MODIS satellite image
  3. North of 55° round wall or floor map graphic file scalable to 6 metres in diameter
- Support Government of Canada activities for International Polar Year

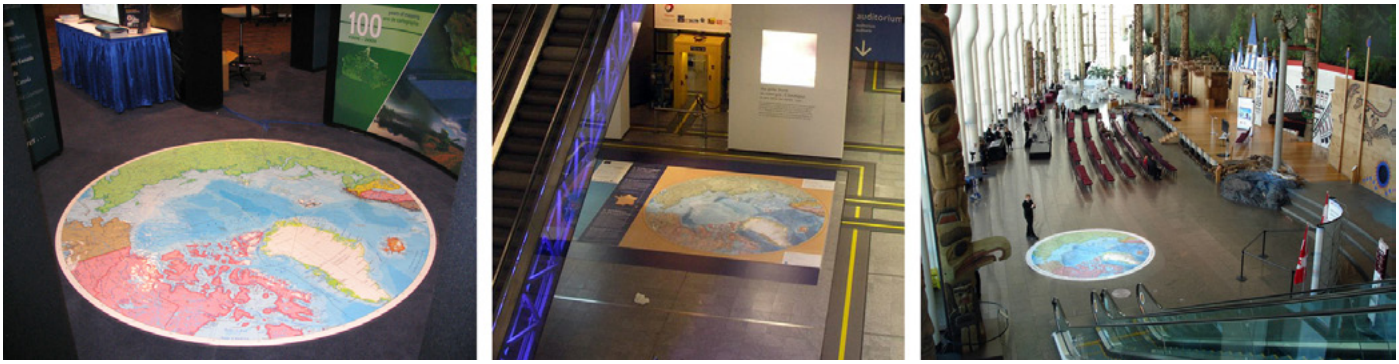

Figure 2: Round north of 60° circumpolar maps at the Atlas of Canada's 100th Anniversary (2006), IPY exhibit in Paris (2007), and IPY launch event in Ottawa (2007).

In 2006, a round 2.5 metre floor version of the Atlas' North Circumpolar Region map was created for an exhibit celebrating the Atlas of Canada's 100th Anniversary (Siemonsen, 2006). This was so popular and well received that in 2007, the newly scanned hillshade was incorporated into a larger round 6 metre "floor map" for the Government of Canada's International Polar Year (IPY) launch event in Ottawa. A few months later it was featured in the IPY exhibit at the Cité des Sciences et de l'Industrie in Paris along side a map of the Antarctic. The effect of the hillshading in a large map was dramatic and very well received (Figure 2). When it was decided to update the Atlas' North Circumpolar Region map there was no question that hillshading should be included and that a round and scalable version should be made.

Map Design – Defining the Map

The Atlas' original North Circumpolar Region map (Figure 3) was designed, produced and published in 1990 with revised versions in 1996, 1997 and 2004. Revisions of this map in the past were mostly limited to changes in colour, updates to toponyms and political boundaries, and other changes to text and the legend. The one exception was that the first edition in 1990 contained terrestrial and undersea hillshading that was removed at the time of second edition in 1996. The primary base components of hydrography, bathymetry, road and rail network, toponymy, glaciers and ice fields had remained much the same since these early editions. It was also discovered that there was little corporate knowledge and few written records about the map so the provenance of the features and data were not accurately known. Therefore, a full revision

and verification of all features became part of the project scope and the map was subject to new design ideas.

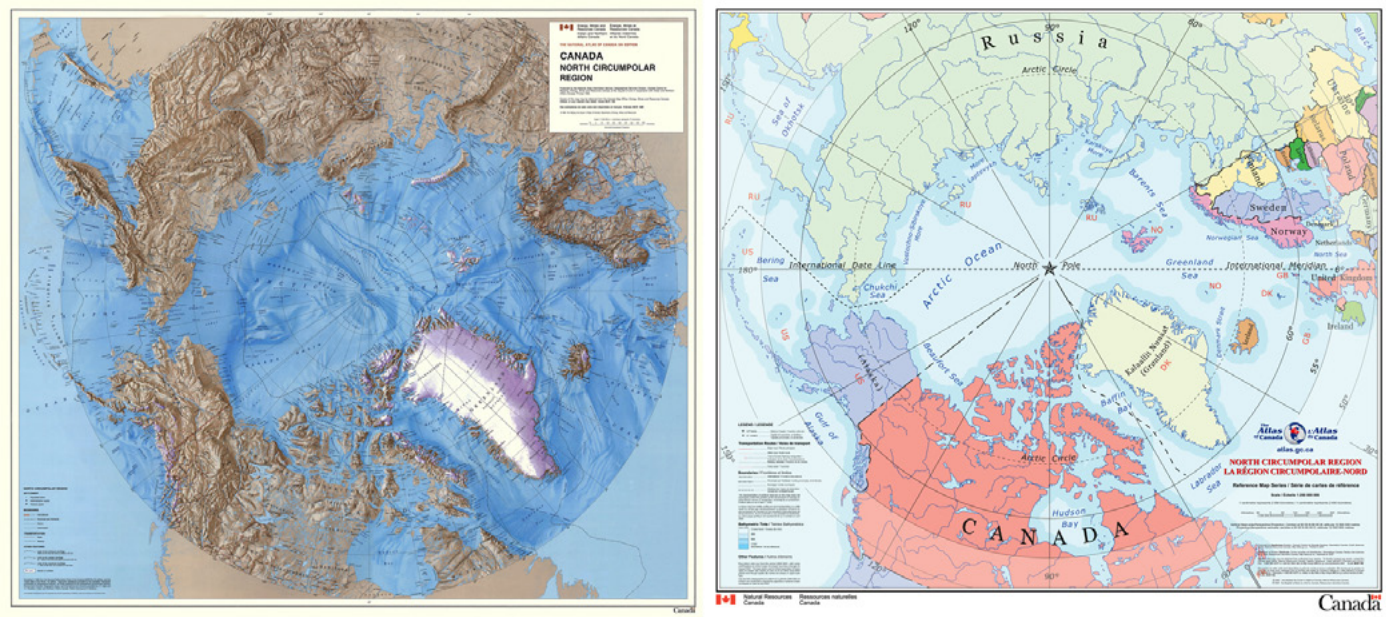

Figure 3: The original North Circumpolar Region map from 1990 (left) and conceptual draft of the revised 2008 map.

The design team discussed how the north could be defined and whether the existing extents of the map required changes (Figure 3) to reflect these definitions. The term "north", when referring to arctic latitudes, is subjective and open to numerous scientific and individual definitions. Most Canadian provinces consider their northern portions to be part of the "north". Canada has several indigenous Inuit populations whose traditional territories extend south into areas that are not considered to be arctic. When reviewing and considering a new extent for the revised map, that would satisfy both the scientific and general purpose uses, many views of the north and related factors were taken into consideration, including:

Indigenous populations

- Inuit of Nunavut, including their Islands of southern Nunavut in Hudson Bay and James Bay
- Inuit of Nunavik, Quebec
- Inuit of Nunatsiavut, Labrador
- Dene, Cree and other northern aboriginal groups

Other demarcations

- Physical: polar, arctic, subarctic by latitude
- Treeline
- Permafrost
- Heating degree days
- Vegetation zones
- Northern Canada income tax zone
- Political boundaries: territories / provinces
- Nordicity indicies by Hamelin: extreme, far, middle & near north
- Delineations based on indicators: Burns & Richardson 1975, Statistics Canada

- Arctic Circle
- Pop-culture terminology such as “North of 60” and “The Great White North”

While the earlier editions of the map mostly focused on the extent north of 55° latitude, the new map would extend further south in Canada and Europe. In Canada, the increased coverage would show all of Hudson Bay and James Bay (including the islands belonging to the Territory of Nunavut), more of northern Ontario, the Inuit land areas of Nunavik in Northern Quebec and Nunatsiavut in Labrador, and a greater number of southern communities. In Europe, it would include more seaports – potential gateways for Arctic shipping. In short, the new extents would offer map users a greater number of visible connections with the North.

Feedback from map distributors and retailers confirmed that a slightly larger map would be preferred. To accommodate this and the plan for increased map detail, it was decided to increase the physical dimensions of the map from 31.5 by 36 inches to 36 by 43 inches. The change resulted in an overall scale change from 1:10 000 000 to 1:9 000 000. This would still fit smaller 36 inch plotters used for printing the digital versions of the map to be made available on the Atlas of Canada website. Other design details included:

- Using a strong colour palette north of 55° and a subdued colour palette south of 55°
- A decreased level of detail south of 55°, except in Canada
- Updating bathymetric contours and polar sea ice extents
- Adding more polar undersea feature names
- Including terrestrial and undersea hillshading (also known as shaded relief)
- Adding the tree line to help define the north/south boundary
- Adding the North Magnetic Pole and its historical track of survey positions

Finally, this map is one of several in the Atlas of Canada’s Reference Map Series; therefore the overall design would need to respect the “look and feel” established for the other maps in the series.

Map Design – Colour

Colour was a major aspect of the design of this map, and the challenges were different for the terrestrial and marine areas. The design required that all countries be distinct from their immediate neighbours, and that no country be unduly dominant. At the same time this is a Canadian publication, so Canada should be “front and centre”. There were other factors to consider:

- A relatively light background was required for the large volume of symbology and toponymy.
- Tonal differences of the hillshading would darken country colours so the “base” hues needed to be light.
- Hillshading works best with colours/inks that can support a wide range of opacity. Black, magenta and cyan inks, being relatively opaque, do this fairly well by varying the amount of ink: less for highlights, more for shading. But yellow requires the addition of black ink to show shading, which tends to change the hue to brown or green. (Theoretical reflectance values for 100% ink coverage on white paper: black 10%, magenta 33%, cyan 38%, yellow 90%.) (Robinson and others, 1995).
- The convention of using blues for water features is so strong and obvious that it is difficult to use them for anything else.
- Larger areas of colour appear darker: “Warmer” colours (red, orange, yellow, and brown) appear to advance towards the viewer, while “cooler” colours (blue, green, perhaps violet) appear to recede.

These considerations influenced the assignment of colours. Russia, occupying a large area of the map, required a light, cool colour to prevent it from overwhelming the other countries. To place Canada in the foreground required a bright but not dominant warmer colour. Smaller countries needed to have greater-than-average contrast with their neighbours; similarly, countries with many small islands needed strong contrast against the ocean colour. Only countries with low relief could be shown in yellow.

Choice of colours for the marine areas was also a challenge. A light blue would be used in the ocean around the perimeter of the map south of 55°, and five more shades were required for the five ranges of depth. The darkest shade needed to be light enough that other, even darker blue symbols and text labels would still stand out well against it. Further, the tonal variations in the hillshading would create variations within each depth class colour which could potentially create confusion – ideally a shaded slope in one class still needs to be lighter than an illuminated slope in the next, darker class.

With the background colour in the deepest ocean depths being quite dark, the colour for water feature type was composed of 100% cyan ink and 75% magenta. While ocean type must be perceived as sitting on the water's surface, type for the undersea features had to be associated with the ocean floor, and so needed to appear "earthier" and "lower" than ocean labels. This was achieved with 100% cyan ink and 60% black.

Evaluating the Existing Version of the Map and Quality Control

The revision of the circumpolar map followed a standard Atlas of Canada revision process with some exceptions. Normally, between map revisions, ongoing records are kept with information about changes and their related data. At the time of the revision, these are used to expedite the process. For the circumpolar map these were not sufficient due to the number of unknowns about the existing data. This, combined with the desire to make other content additions such as the undersea and land relief, required additional steps and more time. The specific attention to the international toponymic and undersea feature names verification added steps along with the external reviews with subject matter experts. The overall revision process followed this outline:

1. Review of the existing circumpolar map features that should continue to be shown, added, and updated
2. Determine new sources of data and information
3. Find subject matter experts to validate and later review the feature(s) on a proof of the map
4. Production of the revised map
5. Translation requirements determined
6. Textual review, English and French
7. Undersea feature toponymic review
8. Detailed cartographic quality control
9. Cartographic amendments
10. External map review with subject matter experts
    a. International depiction
    b. Arctic research organizations
    c. Undersea features
    d. Toponymy
    e. Ice limits
    f. Ice shelves

g. Magnetic North Pole

11. Final cartographic quality check
12. Final cartographic amendments
13. Final Review

Conclusion

The Atlas of Canada's revised North Circumpolar Region map was more than a simple revision. This new map (Figure 4) offers Canadians and those interested in the north a detailed and complete view of this region. Canada is a northern land and this map along with its two derivative maps (Figure 5) will be useful to many different types of map users in the years ahead.

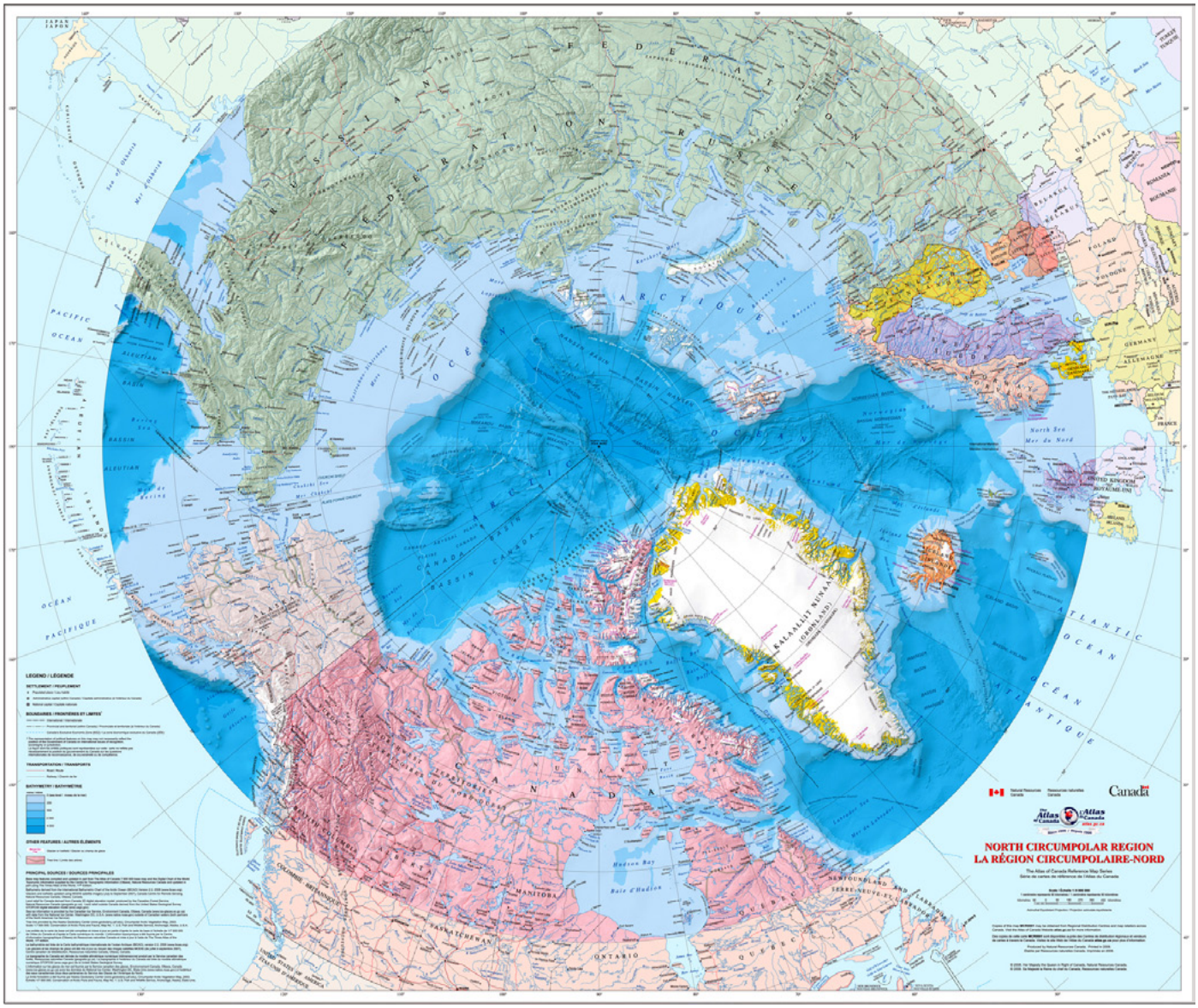

Figure 4: The Atlas of Canada's new North Circumpolar Region map, 2008.

To find out more about the technical challenges and production of this map, find a copy of the Fall 2010 edition of *Cartographica*. An article describing many of these things begins on page 201. The Atlas of Canada's new North Circumpolar Region map can be viewed and downloaded on the Atlas Website: *http://atlas.nrcan.gc.ca*

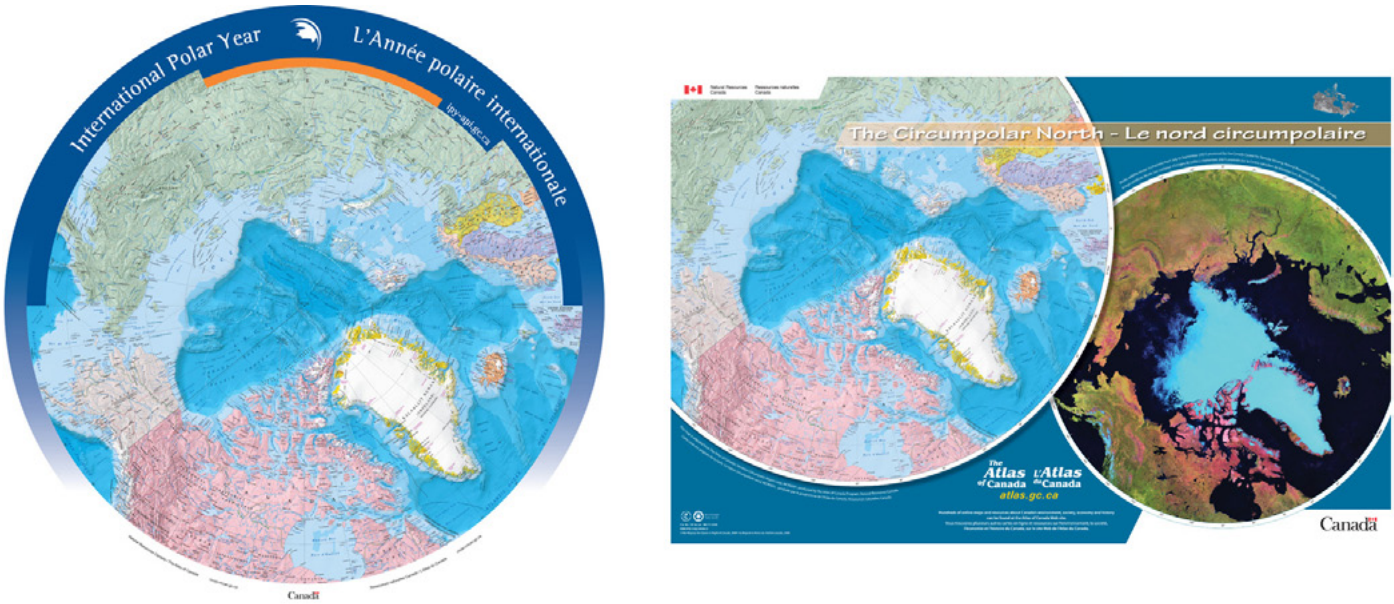

Figure 5: The Atlas of Canada's map brochure and scalable round wall and floor version.

As an end note, the round version of the North Circumpolar Region map (Figure 5) won 1st prize in the Thematic Maps category at the ICC2009 Cartographic Conference in Santiago, Chile. The International Cartographic Association's (ICA) recognition of this can be found on the ICA Website: *http://icaci.org/Map-of-the-Month-112010*

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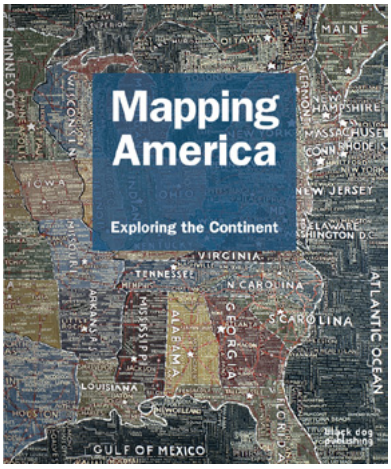
Authors: Eric Kramers and Andrew Murray are cartographers with the Atlas of Canada.

NEW PUBLICATIONS

***Mapping America: Exploring the Continent* by Fritz Kessler and Frank Jacobs.**
September 2010, hardback, 240 pages, $45.00 U.S. ISBN: 978 1 907317 08 8



Mapping America: Exploring the Continent is an illustrated survey of America's cartographic landscape, featuring an array of maps that document its development, from early engravings, to the latest satellite technology.

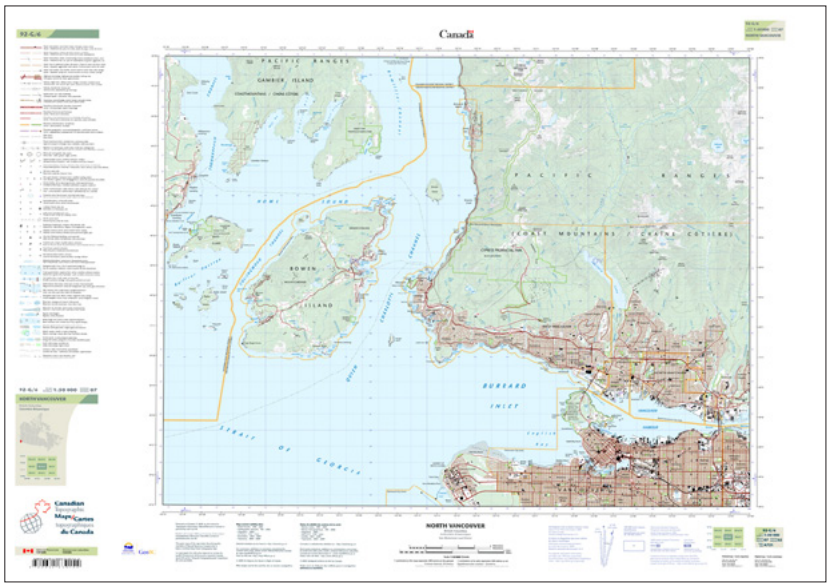
Following on from Mapping New York, Mapping England and Mapping London, Mapping America takes a similar approach in its presentation, thematically arranging a vivid collection of historic, demographic, cultural and artistic maps to aid the reader on their journey. Featuring four centuries of maps that depict the changing landscape of North America, Mapping America charts the continent through numerous landmark events and uprisings, including land cessations, border disputes, the Civil War and more recent concerns, such as the environment and terrorism.

Not just for cartography enthusiasts but anyone who enjoys the inherent adventure of maps, Mapping America will appeal to the general reader, as well as specialists in the area.

To celebrate the book's release, Black Dog Publishing is offering CCA members a 40% discount on all orders. To order at the discounted price, CCA members simply need to email Jessica Atkins at jess@blackdogonline.com with a mailing address and she will place the order.

New and Updated 1:50 000 Canadian Topographic Maps Released

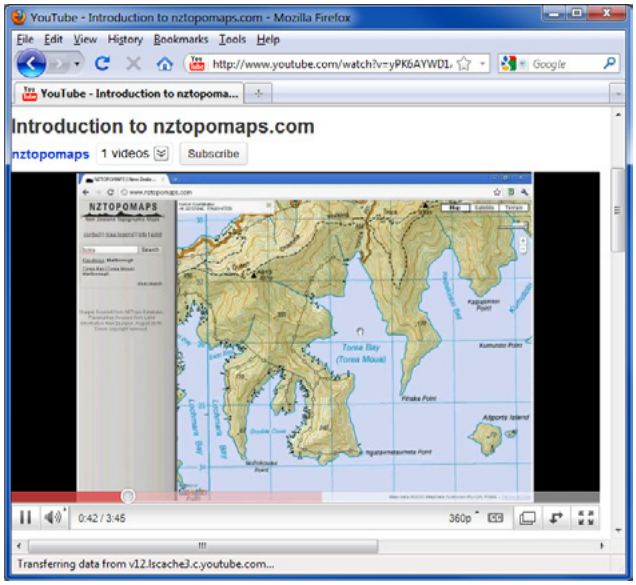
Natural Resources Canada announces the release of 237 new, updated or re-released Canadian Topographic Maps accessible via GeoGratis: *http://geogratis.gc.ca/*



This release includes new maps covering regions of Canada's North previously unmapped at the 1:50 000 scale, as well as updated maps for areas in Ontario, Manitoba, and the Atlantic Provinces.

With this release, the number of Canadian Topographic Maps released as part of the CanTopo collection stands at 1139 since June 2009.

Official New Zealand Topographic Maps are available for free online through the new website: *http://www.nztopomaps.com* This online service allows users to quickly find, view and print topographic maps for planning recreational, business and research activities, and includes a place name search function. Fast and simple access through nztopomaps.com is provided to the 'NZTopo' Topographic Map Series, a series which has been traditionally distributed as printed paper maps for a fee.



The 'NZTopo' Topographic Map Series is produced by Land Information New Zealand (LINZ). A detailed introduction to nztopomaps.com is available for viewing on YouTube at:
http://www.youtube.com/v/yPK6AYWD1Ao?hl=en&fs=1

Something Interesting for Those Who Like Historical Maps

Last fall, a collection of some of the earliest maps and drawings of Western New York were being donated to the University of Rochester. These maps feature the rare prints and are shown in a free exhibition in Rush Rhees Library of the University of Rochester. The exhibit opened November 11, 2010 and will be open through April 30, 2011. The collection includes the first map printed in the colony of New York, dated 1723, as well as the earliest known drawing of the region, a circa 1768 etching of the Upper Falls of the Genesee River. If you don't have the chance to visit Rochester, N.Y. before the exhibit ends, you can look at some of these maps and find out more about this series at the URL:
http://www.rochester.edu/news/show.php?id=3715

From the Collection of Drs. Ruth W. and Seymour I. Schwartz. Department of Rare Books and Special Collections, University of Rochester Libraries.

>> **Cartography and "eye candy" continued from page 5**

We need to go a little further than this though. Cartographers need to have mixes of various skills from the programming end to high-level understandings of application software to design theory. Adding in the literature on design underlines the need for more than just cartography and Web-related utilization and programming skills. Cartography needs to be informed by the dialogue going on in the design field. Recognition of the advances that have been made in the understanding of the role of aesthetics is but one area where the design literature can inform the cartographic design field.

The second article on The New Cartographers focuses on the idea that the field of mapping can easily be overwhelming for individuals who are trying to make spatial sense of their world. Cartographers have an opportunity to bring order and beauty to the world of information that the "New Cartographers" are trying to understand. The multi-skilled cartographer therefore needs the design literature to be built into the development of maps to ensure that the value of this expertise is understood.

Perhaps it is cartographers' role to bring the vocabulary on design, the impacts of affect of emotional response as well as a solid understanding of functional design to the table to help the Web designers making mapping services and applications. Cartographers well understand the visual communications that the map represents but this is not necessarily the case with Web designers or non-cartographer map makers. More people are involved in making maps but do they give the correct message, can others understand the message? A poorly designed map message or web mapping service, like a dirty car, will not seem to run well, and may frustrate, mislead and cause users to abandon or avoid them. For me, this combination of connecting the design discourse and the impacts of affect of emotional responses to functional map design presents an opportunity and an advance in thinking of the role of cartographers in today's Web cartography world. There is more discussion and thought needed though.

In the meantime, my dog is actually off the chair and the cat is meowing to get out. The rain has stopped and the endless beauty of the forest just after it rains is calling me to put away the computer and enjoy the visual stimulation of something that no cartographer has had a hand in!!

Author Donna Williams is President of the Canadian Cartographic Association. Donna is the Manager / Gestionnaire at the Atlas of Canada / Atlas du Canada, Mapping Information Branch / Direction de l'information cartographique, Natural Resources Canada/Ressources naturelles Canada, Government of Canada / Gouvernement du Canada.

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CCA Executive / Exécutif de l'ACC

President / Présidente
Donna Williams
Natural Resources Canada,
Atlas of Canada, 615 Booth St.
Ottawa, Ontario K1A 0E9
E-mail: president@cca-acc.org

Vice President / Vice-président
Gerald Stark
Alberta Agric. and Rural Development
#206, 7000 113 Street,
Edmonton, Alberta T6H 5T6
E-mail: gerald.stark@gov.ab.ca
vicepresident@cca-acc.org

Past President / Président-sortant
Daniel G. Cole
Smithsonian Institution
IT Office, MRC 136
P.O. Box 37012
Washington, D.C., USA 20013
E-mail: pastpresident@cca-acc.org

Secretary / Secrétaire
Elise Pietroniro
30 Shaughnessy Crescent,
Ottawa, Ontario K2K 2P2
E-mail: secretary@cca-acc.org

Treasurer / Trésorier
Paul Heersink,
39 Wakes Avenue
Markham, Ontario L3P 2C4
E-mail:treasurer@cca-acc.org

Interest Group Chairs / Présidents des groups d'Intérêt

GIS and Geovisualization / SIG et géovisualisation
Fiona Ryle
AbitibiBowater, Fort Frances Division
145 Third St. W., Fort Frances, Ontario P9A 3N2
E-mail: fiona.ryle@abitibibowater.com

Cartographic Education / Éducation cartographique
Dawn Mooney
UBC Center for Health Sciences and Policy Research
#201-2206 East Mall
Vancouver, British Columbia V8V 3R4
E-mail: dmooney@chspr.ubc.ca

Map Use and Design / Conception et utilisation des cartes
Julia Siemer
Assistant Professor of Geography,
Cartography and GIS
Department of Geography, University of Regina
3737 Wascana Parkway
Regina, Saskatchewan S4S 0A2
E-mail: Julia.Siemer@uregina.ca

Mapping Technologies and Spatial Data / Technologie cartographique et données spatiales
Paul Wozniak
Geospatial Data Specialist
Geological Survey of Canada
3303 - 33 Street N.W.
Calgary, Alberta T2L 2A7
E-mail: pwozniak@NRCan.gc.ca

History of Cartography / Histoire de la cartographie
Ken Favrholdt
Department of Geography, AE 186
Thompson Rivers University
900 McGill Road, P.O. Box 3010
Kamloops, British Columbia V2C 5N3
E-mail: kfavrholdt@tru.ca

Appointees /Personnes nommées

Cartographica (submissions / proposition d'articles)
Jeremy W. Crampton
Department of Geosciences
PO Box 4105
Georgia State University
Atlanta, Ga. USA 30302-4105
Email: jcrampton@gsu.edu

CNC Chair/Présidente CNC
Janet Mersey
University of Guelph
Department of Geography
Guelph, Ontario N1G 2W1
E-mail: jmersey@uoguelph.ca

CCA Representative on the CNC/ Délégué de l'ACC au Comité national canadien
Roger Wheate
Faculty of Natural Resources
University of Northern British Columbia
Prince George, British Columbia V2N 4Z9
E-mail: wheate@unbc.ca

Membership Coordinator / Coordonnateur des adhésions
Penny Hutton
1303 Emo Road
Fort Frances, Ontario P9A 2V6
E-mail: membershipcoord@cca-acc.org

Cartouche Editorial Team / Équipe éditoriale de Cartouche
Diane Lacasse
Natural Resources Canada
Ottawa, Ontario K1A 0E9
E-mail: cartouche@cca-acc.org

Co-ordinator, National Map Exhibit / Coordonnateur de l'exposition cartographique nationale
Dan Duda
Queen Elizabeth II Library
Memorial University of Newfoundland
St. John's, Newfoundland and Labrador A1B 3Y1
E-mail: dduda@mun.ca

Barbara Petchenik International Children's Map Competition / Compétition internationale Barbara Petchenik de cartes dessinées par des enfants
Karen VanKerkoerle
Cartographic Section
Geography Dept., SSC, Western
London, Ontario N6A 5C2
E-mail: kvankerk@uwo.ca

Student Representative / Représentante des étudiants
Christine Homuth
2-178 Holmwood Ave.
Ottawa, Ontario K1S 2P4
E-mail: studentrep@cca-acc.org

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