Mapping from Above/ Mapping from the Ground: Mapping Environmental Issues in the City

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Introduction

Expectations and conventions around "mapping" differ tremendously across different domains of knowledge and practice. While in cartography, mapping refers to specific techniques and concepts for representing information related to places, in the arts and humanities this terms is used more broadly and includes a diversity of practices and expectations. More than just data, artists and other creative practitioners express understandings, fears, hopes, emotions and perceptions about places and people through mapping, and these dimensions are essential for fully understanding our relation to places.

Contemporary artists have developed their own mapping practices as illustrated by recent publications such as *An Atlas of Radical Cartography* (Mogel & Bhagat 2008), *The Map as Art: Contemporary Artists Explore Cartography* (Harmon 2009), *Emotional Cartography Technologies of the Self* (Nold 2009), and *Journeys Beyond The Neatline – Expanding The Boundaries of Cartography* (Rangel et al. 2010). These artistic practices characterize a broad interest in the humanities for exploring the relationships between maps and artistic forms of expression such as painting (Orueta 2010), literature (Moretti 2007; Westphal 2007; Piatti et al. 2009) and cinema (Conley 2007; Castro 2009). The study of the relationships between arts and maps has also gained some interest within the discipline of cartography (Wood & Krygier 2006; Monmonier 2007; Cartwright 2010; Wood 2010).

The Art and Cartography working-group of the International Cartographic Association (ICA) was created in 2007 to stimulate the interaction between arts and cartography. Since then, this working group has organized its first symposium in 2008 in Vienna on "Cartography and Art - Art and Cartography", published an edited book (Cartwright et al. 2009), a special issue of *The Cartographic Journal* (Caquard et al. 2009) and organized a workshop entitled *"Mapping" Environmental Issues in the City: Arts and Cartographic Cross Perspectives,* in Montréal, Canada in September 2010. This workshop was designed to encourage and explore the interactions between cartographers, artists, designers and any other area of 'arts' who work in the various aspects of spatial representation, through the development of original mapping projects inspired by a common ground: a geographic database compiled to study environmental issues in the city of Montréal. This book formalizes the results of this workshop.

Contextualization

Database development is the first step of any map production (November et al. 2010). In the digital context, the role of databases in mapping processes is now paramount. According to new media theorist Lev Manovich (2000), the world, as an endless collection of images and files, needs to be approach as a database. This 'databasification' of the world reflects how computer structure defines the way the world must be categorized and analyzed (Leszczynski 2009). The production of the database creates a new world (Bowker 2000), and mapping the database becomes a way of making this world tangible. Although the map still serves to visualize "datascapes" as illustrated by Nadia Amoroso (2010), the relationship between maps and databases is changing dramatically.

As emphasized by Jeremy Crampton (2010a, p.4), in the discipline of cartography there is an "increasing emphasis on databases, rather than visual representation." The database is now what defines the world, while the map is more and more often envisioned as the interface to navigate through the growing wealth of data; it becomes what Valérie November and colleagues (2010, 583) call a "navigational platform." According to these authors, this "navigational platform" metaphor reflects the main function of the map in the growing volume of data. This idea is supported by the exponential use of maps by companies like Google to provide access to the wealth of data and information available online (Thielmann 2010). More and more often, Google returns maps as the result of searches done through its search engine.

Although there is an exponential development of user generated content in the context of Web 2.0 (Goodchild 2007; Crampton 2010b), compiling relevant

and reliable databases remains a major challenge for environmental projects. As emphasized by Denis Wood (2010, p.164) in his critic of Participatory GIS projects, "the cost of collecting and organizing data about the environment is insane", which explains why institutions and governments remain the main sources of environmental data. Individuals, communities and organizations have often no other choice than to rely (at least partially) on these institutional data and on the way they frame environmental issues. What is changing is more the way maps are used to navigate through these data (as discussed previously), as well as to make environmental issues public and sometimes more tangible.

In a recent U.S. Senate Committee Hearing entitled, "Oversight Hearing on Disease Clusters and Environmental Health" (March 29, 2011), one of the testimonies was given by U.S. environmental and health advocate Erin Brockovich. She used a U.S. map locating all persons who contacted her to report health issues that might be related to pollution in their neighborhoods[1]. In her testimony the map becomes the tangible proof of the pervasive existence of health issues clusters related to the environment all over the U.S. This map serves both, as way to demonstrate the existence of clusters in terms of environmentally related health problems, and as a mean of communicating the existence of such issues. On this map, environmentally related health problems appear both clustered (locally) and spread (globally).

This map also provides a conventional view of phenomenon that are taking place on the ground. It synthesizes data while at the same time distancing itself from the individual dramas associated with each of these mapped cases. This is the way maps work according to cartographic principles. They provide an overview, by synthesizing information and erasing any associated emotions. They dissociate themselves from their object of study.

However, 'mapping' is quite different in the arts and humanities where it is often envisioned as a means of interacting with places in different ways. This dichotomy between the cartographic perspective on places from above, and the artistic perspective from the ground was apparent during the workshop. This dual perspective has provided the overall structure for this book. The first section presents the cartographic projects offering a perspective on environmental issues from above, while in the second section, the artistic projects map environmental issues from the ground.

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[1] The full hearings and the map can be accessed on the U.S. senate web site: http://epw.senate.gov/public/index.cfm?FuseAction=Hearings. Hearing&Hearing_id=df802290-802a-23ad-480f-eba51b046c02

Mapping From Above: The Cartographic Perspectives

The goal of the workshop entitled *Mapping" Environmental Issues in the City: Arts and Cartographic Cross Perspectives* (Montréal, September 2010) was to provide the vehicle for bridging between internationally based artists, cartographers and individuals from the humanities interested in maps and mapping processes. About fifteen students, artists, cartographers, designers, and media practitioners (from Canada, USA, Europe, Australia, and New Zealand) were invited to attend the workshop, which was held over three days. The aim was to develop a project inspired by a given database. This database included data relative to health issues, socio-demographic profiles, air quality and industrial release in the city of Montréal. This database was compiled during the of winter 2010 by students undertaking the Master in Environmental Assessment (Department of Geography, Planning & Environment) at Concordia University (Montreal)[2]. The data collection and data analysis was part of a course entitled Geographic Information Systems for Environmental Impact Assessment (ENVS663). The goal of this course was to explore issues related to environmental injustices on the island of Montreal.

Undiné Thompson and Sébastien Caquard introduce and contextualize this database in chapter 2. This chapter emphasizes the pedagogical dimension of database production, as well as the limits inherent to the use of a geographic database (no matter how comprehensive) for addressing such a complex issue as environmental injustice. This contextualization chapter is followed by two chapters that explore the potential of some GIS tools and techniques for addressing specific environmental issues in Montréal. In chapter 3, Hiên Pham and colleagues use satellite imagery and statistical analysis to study the relationships between density of vegetation and sociodemographic profiles. Through this analysis they emphasize some relationships between low-income neighborhoods and limited access to vegetated areas, demonstrating the presence of few high inequity areas. In chapter 4, Tom Weatherburn and Daniel Naud analyze in depth the socio-demographic structure of Montréal through a geodemographic segmentation approach. This type of statistical analysis helps to refine the sociodemographic profiles of populations at risk of being subjects to environmental injustice. Throughout these three first chapters, it appears that the main sociodemographic divide in Montréal is more linguistic in nature than racial. The historical Francophone / Anglophone divide remains a major criteria for studying the geography of environmental issues in Montréal.

Chapter 5, 6 and 7 are developed by cartographers and illustrate the diversity of contemporary cartographic practices to represent environmental data. In chapter 5, Sven Fuhrmann proposes to rematerialize the health map by replacing conventional

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[2] The database is available online (http://mappingworkshop.wordpress.com/database/) in different formats (e.g. excel spreadsheets, ArcGIS shapefiles, KMZ files and JPEG images).

proportional symbols with real prescription bottles of different sizes and colors. Fuhrmann argues that the use of tangible objects, such as prescription bottles, to map health issues could help improving public health communication and awarness. In chapter 6, Glenn Brauen focuses on the use of audio-visual mapping to represent air quality and, more specifically, BTEX concentration. The online interactive audiovisual map developed by Brauen is one of the very few cartographic examples using sound not as a redundant or mimetic variable but as a way to make the otherwise invisible 'visible' as audible outputs. Air pollution is invisible, whilst being pervasive and fluctuating. This map conveys in a very subtle way these different dimensions and stimuates the development of audiovisual mapping into new directions. In the last chapter of this first section, William Cartwright proposes to repurpose the MetroMap concept in the context of Web 2.0. In this chapter, Cartwright presents an online MetroMap prototype that uses real-time geo-located feeds to annotate a map of Montréal. Information mapped concerns four domains: environment, social & cultural, economic, and governance. This application cut the city in different slices: thematic slices, spatial slices and temporal slices. The idea of the city being represented as an assemblage of slices resonates with the concept of *assemblage* discussed by Kathy Waghorn in the second section of the book.

Mapping From The Ground: The Artistic/Humanistic Perspectives

In the second section of the book, artists and individuals from the humanities propose different ways of mapping environmental issues in the city from the ground. The database provided served mainly as a guide to orient the exploration of environmental issues in the city. It provides a point of departure for various modes of drifting and interacting with the city.

In the first chapter of this second section (Chapter 8), Laurene Vaughan provides a personal perspective on what a database might be. Through her *Roaming Montréal* project, Vaughan challenges the notion of abstract/objective databases, as well as the cartographic saying that maps are the best way to represent complex data and to communicate information associated to places. She then provides a more fluid personal, emotional and experiential sense to what a database could be through a walking activity. What a database actually is is definitely not something about which we all agree.

In chapter 9, Sarah Kanouse revisits the figure of the naturalist through the presentation of a "post-naturalist field-kit" developed to study "post-natural urban landscapes." This beautifully designed kit contains different tools and items to assist field studies. This project is deeply rooted in historical naturalistic approaches

and design practices, as well as in social ecology and community-based activity. By making simple tools available to community members in order for them to collect and produce their own pieces of evidence of the environmental situation in their neighborhoods, Kanouse's approach definitely resonates with the geographical expeditions led by Bill Bunge in Detroit in the 1970s[3], and supports the idea and the importance of user-generated environmental data.

The importance of combining both the objective cartographic approach, with the more personal artistic perspective to address complex spatial phenomena is developed by Annalise Rees in chapter 10. Through the description of her drawing practices, Rees reflects on the importance of presence and perception in our relationships with places, and in mapping activities. In chapter 11, Kathy Waghorn envisions the city through Manuel De Landa's assemblage theory, which allows one to avoid "the reductive 'master narrative', so often activated as the 'master plan' in urban design terms." Building on the work of architect James Corner she envisions mapping as a "creative activity" determined more by its process than by its outcome. This perspective is materialized throughout her Montreal Garden Mapping project in which she proposes an assemblage illustrating the complexity and the diversities at stake in urban gardening. From this perspective, mapping provides the means to reveal complexity, instead of a way of simplifying it.

In chapter 12, John Calvelli proposes the application of his new photographic practice called "correlative ontography' – for mapping selected neighborhoods, based on environmental criteria provided via the database. The pictures taken during this process are then associated with different data characterizing the areas photographed. Through this process, Calvelli emphasizes the opposition between the pictures and the data, the personal and the measured, the visual discourse and the scientific.

Chapter 13 and 14 provide two different perspectives on sounds in the city. In chapter 13, Maryclare Foa proposes to improve our understanding of place through raising our awareness of ambient sound in the city. This is done through collaborative Driftsong performances, leading participants to react to ambient sounds, either through displacement or through the production of 'reacting' sounds. Foa considers this method - inspired from other drifting practices (such as the situationnist's *dérive*) – as being "the most democratic method of mapping place" because of its inherent lack of precision. Here again, artistic mapping practices serve to challenge conventional cartographic perspectives. In chapter 14, Jordan Lacey and Lawrence Harvey build on previous 'soundscape' work, proposing relevant locations for sites-of-respite in downtown Melbourne, Australia. These sites are envisioned both as places where one might take sound breaks from the noisy city, as well as indicating potential "performance locations for 'soundscape composition'.

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[3] See Wood (2010) for a recent review of Bunge's work.

Conclusion

Although the main goal of the workshop was to support interaction between cartographers and artists, a major dichotomy became quickly apparent in the way cartographers and artists approached the idea of mapping a common database as discussed in the conclusive chapter of this volume. While the former see the database as a source of *information* that can be mapped from above, the latter envisioned it as a source of *inspiration* to orient their research efforts from the ground. The map can serve as a way to navigate through the database, and to visualize its structure, just as the database can serve as a way to navigate through the world. This dichotomy emphasizes the complementary elements that exist between cartographic and artistic practices in their effort of portraying the world through mapping (in its widest context). From an artistic perspective mapping is personal, subjective, associated to ground exploration and dedicated to conveying the complexity of the phenomena being studied. From a cartographic perspective, mapping is data dependant, as objective as possible, provides a view from above distanced form the phenomena mapped, and largely dedicated to simplify the complexity of the phenomena represented as much as possible. Both of these approaches, and many others, are required for tracing environmental issues; as a way of leaving traces of their existence on maps, as well as tracing back their underlying causes and eventual consequences.

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