

sources

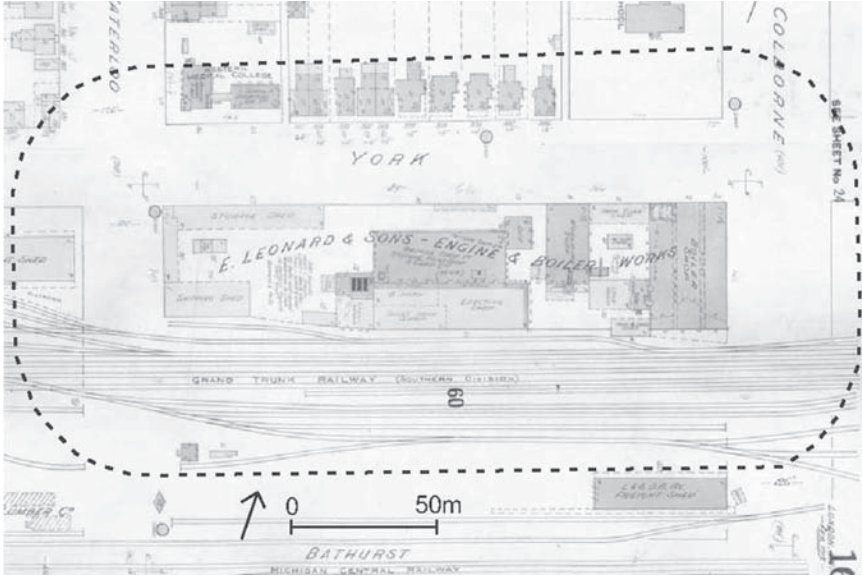
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ON POSITIONING THE PAST WITH THE PRESENT: THE USE OF FIRE
INSURANCE PLANS AND GIS FOR URBAN ENVIRONMENTAL HISTORY

FIRE INSURANCE PLANS have long been available to historians as a reliable source of evidence on natural and built environments of the past. Often housed in the collections of research libraries and regional archives, they are accessible for many cities and towns across North America and the United Kingdom.¹ This paper suggests new ways that environmental historians may apply these plans for research, by discussing both the wealth of historical information they offer and their practical use as the basis of a Historical Geographic Information System (HGIS). Examples are drawn from our own environmental history project on a mid-sized Canadian city: London, Ontario (1855-2005).²

The earliest examples of fire insurance plans date back to the mid-nineteenth century and were created as a result of the rationalization of the insurance industry at that time.³ The insurance underwriters demanded very accurate maps for setting their policies, and as such, these plans are comprehensive, high-precision data sources that present a large-scale picture of urban landscapes. Successive updates, typically after local building booms, provide historians the means to track changes in the urban environment. Several studies already have exploited fire insurance plans for their wealth of data, but few have taken the steps to incorporate them into a HGIS, which would convert them into an innovative research tool.⁴

Fire insurance plans offer an incredibly rich picture of historical urban environments; information on type of building materials (brick versus wood framing, for example) demonstrates fireproof versus flammable structures or solid versus flimsy construction. The footprints and heights of the buildings inform the environmental historian about density of development, and allow for the reconstruction of three-dimensional representations of lost urban landscapes. With such a model, one can explore critical issues of open space and breathing

Figure 1. A Buffer Surrounding an Industrial Site.



Charles E. Goad, *Insurance Plan of the City of London, Ontario* (Montreal: C.E. Goad Co, 1915).

Potential environmental hazards are recorded on fire insurance plans and are examined here using a “buffering” technique in GIS. This example of a fifty-meter buffer surrounding the E. Leonard & Sons Engine and Boiler Works suggests that the houses along the north side of York Street likely were affected by the activities of their industrial neighbor.

room in the rapidly industrializing city. Land use data provide insight into environmental hazards and can be used to explore potential neighborhood effects upon vulnerable populations. Additionally, information on natural features, such as rivers, parks, and open spaces that are found in the plans also can be examined to see how they have been transformed over the evolutionary course of an area (see Figure 1).

The power of Geographic Information Systems (GIS), once the domain of geographers and other earth scientists, recently has been recognized by scholars in other disciplines, such as history.⁵ GIS facilitates both spatial and temporal analysis, with the ability to conveniently gather and organize vast quantities of historical data, and the adaptability for including additional layers of data to continually explore new research hypotheses.

A HGIS typically comprises a dated series of cartographic sources, to which other spatially referenced data can be linked (for example, directories, censuses, building permits, municipal registers, and personal diaries). Fire insurance plans are one kind of comprehensive cartographic source. To use in a GIS, they must be scanned into digital format, a process which has the added benefit of preserving these often rare and fragile sources for future researchers. Georectification is the process whereby the digital images are stretched or “warped” in the GIS software to conform to their proper spatial coordinates. Once the maps are georectified, one can digitally superpose two or more maps on top of each other, much like the layering of map transparencies performed by historical geographers

Figure 2. Changing River and Urban Morphologies in London, Ontario.



Charles E. Goad, *Insurance Plan of the City of London, Ontario* (Montreal: C.E. Goad Co, 1915); City of London, *Mapping Data Distribution* (London, Ontario: Corporation of the City of London, Geomatics Division, 2005).

Superpositioning current environmental data on the 1915 fire insurance plan reveals a dramatic shift in the path of the Thames River and considerable change in the built environment along the floodplain. Comparing footprints of current structures (black outlines) with those on the 1915 plan reveals that many of the original buildings were destroyed or moved to higher ground as a result of the “great flood” of April 1937.

a generation ago. This allows the researcher to simultaneously compare multiple plans and locate changes among them.

Another useful step in creating a HGIS is the digitization of relevant environmental features of the plans. Areas such as a floodplain or a building footprint typically are digitized as polygons, whereas linear features such as a river or a street would be represented as polygons or simple lines, depending on the level of detail required for a particular analysis. When finished, this process allows the researcher to perform a multitude of automated calculations, to carry out complex spatial analyses using tools incorporated in standard GIS software, and, most importantly for historians, to compare change over time (see Figure 2).

The level of commitment in time, labor, and finances required to create a HGIS can be immense and should be carefully considered before initiating a project; however, this investment can pay large dividends to any environmental historian

who has an eye to building a long-term research program rather than a quick one-off project. HGIS is a powerful tool for gathering, storing, organizing, visualizing, and analyzing the large amounts of data that often are essential to environmental history research. Integrating fire insurance plans into HGIS allows for innovative explorations of information on the past, to provide new answers to old research questions and to raise entirely new questions. The inherent adaptability and expandability of HGIS means that a host of other historical sources can all be linked to, and build upon, existing databases as new research needs arise.

A quick glance at a fire insurance plan for any city can generate a host of important research questions for the environmental historian. Where are/were the industries that have potentially expelled pollutants into the river? What populations were historically most affected by natural and technological hazards such as flooding, fire or industry? How are historical land use and development practices associated with health and social problems in cities today? Such questions concerning the legacy of environmental justice are vitally important in North American cities today, and can all be dealt with in a multi-layered HGIS based on the high-quality cartographic record of the fire insurance plan.

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NOTES

1. Lorraine Dubreuil and Cheryl A. Woods, "Catalogue of Canadian Fire Insurance Plans, 1875-1975," *Association of Canadian Map Libraries and Archives Occasional Paper* 6 (2002).
2. For more on the London HGIS project see www.imagininglondon.ca.
3. Mark Tebeau, "Re-imagining the Urban Landscape: Fire Risk and Insurance in Nineteenth-Century St. Louis," in *Common Fields: An Environmental History of St. Louis*, ed. Andrew Hurley (St. Louis: Missouri Historical Society Press, 1997), 143.
4. For examples of research using fire insurance plans see Deryck Holdsworth, "Morphological Change in Lower Manhattan, New York, 1893-1920," in *Urban Landscapes: International Perspectives*, ed. J. W. R. Whitehand and P. J. Larkham (London: Routledge, 1992), 114-29; Richard Harris, "Reading Sanborns for the Spoor of the Owner-Builder, 1890s-1950s," in *Exploring Everyday Landscapes: Perspectives in Vernacular Architecture VII*, ed. Annemarie Adams and Sally McMurry (Knoxville: University of Tennessee Press, 1997), 251-67; Jason Gilliland, "The Creative Destruction of Montreal: Street Widenings and Urban (Re)development in the Nineteenth Century," *Urban History Review* 31 (2002): 37-51. HGIS is being used by the MAP project in Montreal: See Robert C. H. Sweeny and Sherry Olson, "MAP: Montréal l'Avenir du Passé, Sharing Geodatabases Yesterday, Today and Tomorrow," *Geomatica* 5(2002): 145-54.
5. For an overview of GIS and its application in history see Anne Kelly Knowles, ed., *Past Time, Past Place: GIS for History*, (Redlands, Calif.: ESRI Press, 2002).