

**Towards Transdisciplinary Archival Strategies: Canadian Cartographic
Materials in a Digital Context**

By

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Territorial Acknowledgement

As a student in the Archival Studies program at the University of Manitoba, I spent nine months on Treaty One Territory, the original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene Peoples, and the homeland of the Métis Nation. I was privileged to experience Winnipeg as a centre of Indigenous scholarship, research, art, and history. As I researched and wrote this thesis I have been living and working on the unceded Indigenous lands where Tiohtiá:ke (Montreal) is currently located; the Kanien'kehá:ka Nation is regarded as the custodians of these lands and waters, though this is a historically significant location for many other Indigenous people and Nations who continue to live in this region. Before starting my post-secondary education, I was born and raised on the west coast of Turtle Island, on the unceded territories of the Matsqui, Kwantlen, Katzie, and Semiahmoo First Nations. I continue to learn what it means to be a respectful guest on these lands.

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This thesis has taken shape over the last three years, although I like to think the seeds were there for a lot longer. It combines two things that I love, archives and maps, but I have been lucky enough to take this time to get to know them better. They have challenged me, but I still love them both.

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Abstract

Through an examination of the complex history of cartographic records in their archival contexts, this thesis explores the inherent subjectivity of maps, the archives that acquire them, and the digital technologies routinely used to create these materials. I discuss parallels between archival and cartographic theory from the nineteenth century to the present and demonstrate that recent developments in the two fields are mutually reinforcing, as they emphasize the subjectivity of professional cartographers and archivists while rejecting simplistic assumptions about the objectivity and purportedly technical nature of mapmaking and archiving. Focusing on theoretical and practical developments in archives and cartography, this thesis supports self-reflexive and transdisciplinary approaches to cartographic materials in Canadian archives.

The first chapter delves into the theoretical foundations and more recent developments in the two fields. This exploration continues in the subsequent chapters, where the two case studies explore the creation of cartographic materials and their processing by archives (i.e. their appraisal, arrangement and description, preservation and being made available to archival researchers). The first case study illustrates the rift between theory and practice, focusing on Canada Land Inventory (CLI) materials held by Library and Archives Canada. An analysis of the creation and ongoing management of these materials reveals the role of cartography and archives in the formation of Canada as a modern colonial state, and in the ongoing dispossession of Indigenous Peoples. The second case study is situated within the broader history of digital technologies, focusing on the digital cartographic tools deployed through Cybercartography while exploring how these might be employed in support of decolonization and reconciliation processes. This case study illustrates the benefits of crossing these two fields, articulating a new, transdisciplinary approach to cartographic materials in archives.

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Introduction:

A Self-Reflexive Approach to Archival Analysis

As long as I can remember, I have been fascinated by archives. Not as they are, but rather as a kind of fantastic landscape of hidden places and lost narratives. Adhering closely to this notion of a secret topography of papers, boxes, small objects, and books, is the belief in the existence of a fabulous map that will illuminate these spaces and stories. Delightful. In 2015, I read about archival processes for the first time in Kirsten Weld's *Paper Cadavers: The Archives of Dictatorship in Guatemala*.¹ It was a necessary clarification. Weld describes a repository of police records that was neglected for years, its existence denied by the state, and the painstaking and sometimes hazardous work that preceded public access. The files held there could become key pieces of evidence revealing the human rights abuses that took place during Guatemala's civil war (1960-1996) if handled carefully and approached systematically. These archives represented a powerful tool of oppression and control for the police force, and this dynamic is inverted when the contents are reclaimed by the people targeted by the same police force. The materials are meaningless without careful documentation of the administrative systems that created them. There is nothing about this process that is mysterious or whimsical.

Similarly, in October of 2017, I was given a copy of Terry Cook's 1984 article, "A Reconstruction of the World: George R. Parkin's British Empire Map of 1893."² In it, Cook explains that a map is a manipulation of facts, communicating a political message rather than an objective representation of geographical information. A map cannot be a neutral representation as it is an authored text, produced with an intended message, and therefore intentionally lies, if only by omission.³ Maps, as many scholars now argue, should not be conceptualized as a faithful representation of geography, but instead viewed as a window onto principles of access, use, and ownership that vary widely depending on the context of its creation. As Cook notes, it had been broadly accepted that maps are more objective than other types of archival media, placing them

¹This was a book assigned in a history seminar on the global Cold War at Concordia University. Kirsten Weld, *Paper Cadavers: The Archives of Dictatorship in Guatemala*, (Durham and London: Duke University Press, 2014).

² Tom Nesmith gave me his copy to borrow as part of an assignment in his Archival Studies seminar at the University of Manitoba during the Fall semester of 2017. Terry Cook, "A Reconstruction of the World: George R. Parkin's British Empire Map of 1893," *Cartographica* 21, 4 (1984), 53-65.

³ Mark S. Monmonier, *How to Lie with Maps* 2nd ed., (Chicago: University of Chicago Press, 1996), 2.

firmly in an area of specialized knowledge and interest. A broader classification of maps as cultural artefacts rather than technical documents would create the space for multiple perspectives.⁴ This interpretation challenged me to think more critically about these materials, and appreciate the multi-layered messages and meanings they hold. Weld and Cook revealed my understanding of both archives and maps to be built on anecdotal evidence and shallow assumptions, and I was not alone in this limited scope.

The following thesis is an attempt to take a close look at archival processes through the lens of cartographic materials, in the context of Canadian archival traditions. In an effort to take a holistic approach to this process and as a reminder (to myself and the reader) of the subjectivity of archival and cartographic work, I will include aspects of my own academic and professional experience as an entry point to this discussion, situating myself within my research as an active and subjective interpreter of my findings. Representing the writer as an active part of the research process is a direct response to the obfuscation of the authored nature of the processes that define both archival work and cartography. Focusing on digital materials is connected to the critique of the “blank” surface, or “empty” landscape, two important themes which I will revisit in the following chapters.⁵

I completed my first undergraduate degree, a BFA in art history, at Concordia University in Montreal. Moving to this city was an exciting change from the Vancouver suburb where I was born and raised. A wide range of non-textual materials form the foundation of the field of art history; studying visual art cultivated an affinity for graphic communication systems in my understanding of records in general, while studying the theory behind it pushed me towards a second undergraduate degree in history. As a Canadian woman of Anglo-European settler ancestry, it is my responsibility to recognize and explore the direct connection between Canada’s settler-colonial history and a narrowed approach toward the history of art, and by extension, toward archival materials. Extending this theme, mapping and record keeping practices at the government level can also limit the ways in which we view our collective past and current reality. Archival literature published over the past few decades reveals that engaging in the difficult process of reconciliation between Indigenous Peoples and settler/immigrant communities is regarded as a crucial part of preserving and maintaining appropriate access to the

⁴ Cook, “A Reconstruction of the World,” 53.

⁵ Catherine Delano-Smith and Roger J.P. Kain, *English Maps: A History* (London: British Library, 1999), 6.

documentary records created by all areas of government, academic institutions, corporations, and communities. As a student at a Canadian university, it is important that I continue to learn about and participate in this ongoing process.

In the autumn of 2017, I began my first year of coursework at the University of Manitoba. Relocating from Montreal to Winnipeg played a significant role in the trajectory of my academic research as Winnipeg is an important location for dialogue between Indigenous and settler/immigrant communities. As a part of the Archival Studies program, Tom Nesmith and my supervisor Greg Bak suggested a focus on cartographic materials in archives for my thesis.⁶ After nine months of study in Winnipeg, I completed my course work requirements in Montreal, enrolling in a seminar on Geomatics and the Geoweb through Concordia University's Geography department.

My initial thesis proposal included sections that would address elements of geographic representation and GIS in the National Centre for Truth and Reconciliation (NCTR)'s Missing Children Project, as well as cartographic materials at Library and Archives Canada (LAC). As I began to research archives and cartographic materials I also began to learn more about decolonizing methodologies and reconciliation frameworks. This also led to constructive feedback from professional archivists at various organizations and institutions. I found I could not jump in wherever and whenever I felt would work for my research interests while also respecting these approaches. A meaningful connection did not exist between my work and these projects and materials, and inserting myself without having fully examined my intentions and potential contributions meant that as time passed it became clear that I would need to refocus my research. My resolve to move in this direction was also motivated by Margaret Kovach's *Indigenous Methodologies: Characteristics, Conversations, and Contexts*. Kovach's study succinctly combines academic research (using a methodology developed from a tribal-based approach) and personal experience.⁷ This is a compelling framework for a student of archival

⁶ I had included a mapping theme in my application to the program. Initially, I was interested in the ways in which geography has impacted in the lives of women in the northern regions of Canada. It was a personal interest as my grandmother was born at a Hudson's Bay Company factory. After learning more about archival research frameworks, focusing on the systems and approaches that address contextual relationships between records rather than their content, I began to understand that my initial proposal was grounded in a history research perspective rather than archival studies.

⁷ Margaret Kovach, *Indigenous Methodologies: Characteristics, Conversations, and Contexts*, (Toronto, Buffalo, and London: University of Toronto Press, 2009), 9.

studies as this profession looks towards meaningful reconciliation and decolonization practices.⁸ I have struggled to balance this with a creeping sense of immobility as I often think myself into the corner bounded by indecision and a lack of both professional and personal experience in the field. However, this has also been a useful process as I have learned valuable lessons from my mistakes. As a result, I have refocused my research on areas to which I have more direct connections. This led me to consider materials from the Canada Land Inventory (CLI), which surveyed regions where I have lived and worked. In addition to these materials I have also incorporated my experience as a research assistant on the preparation of map modules for a cybercartographic atlas project.

With a foundation in archival theory, and newly acquired insight on the impact of mapping technologies in contemporary society, I began to put my research together. The following chapters reflect the trajectory of this research, moving within the archives, then extending outward. Following this introduction, chapter one includes my analysis of theoretical frameworks which is the foundation of my research. The first section addresses broader transformations in archival and cartographic theory. I will demonstrate that the developments in critical theory, total archives, macroappraisal, and archival postmodernism in the Canadian context are mirrored in the field of cartography. I will also outline the more eclectic theoretical frameworks that have influenced me over the past three years. Some elements, such as the overarching emphasis on interdisciplinarity and critical theory are already commonly found in archival theory. An emphasis on shifting narratives and process-over-product is drawn from fields that intersect with archival studies in a ‘cartographic’ context, and more broadly in relation to the development of archival approaches to reconciliation and decolonization processes. Kirsten Weld tells us that the transformation of archives from sites of oppression and control to sites of empowerment and reconciliation is a firmly rooted dynamic among archival scholars and activists. However, the processes that support such significant change “and the shifting, volatile

⁸ In addition to Kovach’s exploration of an Indigenous research framework, Linda Tuhiwai Smith makes reference to the cultural archive that encompasses “Western knowledges, philosophies, and definitions of human nature,” defined by Foucault, which “reveals ‘rules of practice’ which the West itself cannot necessarily describe because it operates within the rules and they are taken for granted.” This understanding reveals the necessity for a plurality of worldviews in the Canadian archival context. In order to maintain a total archives approach, the shortcomings of dominant frameworks and systems need to be acknowledged and space created for multiple perspectives. Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples* 2nd ed. (London: Zed Books, 2012), 46.

synthesis resulting from that transformation” have been largely neglected.⁹ Weld’s observations on archival thinking motivated me to explore a self-reflexive approach to archival work with emphasis on transdisciplinary frameworks as a constructive place to begin thinking about the future of archives.

The second chapter of my thesis outlines the history of maps and their associated materials in Canadian archives. This history demonstrates the subjectivity of human intervention regarding collecting practices, while my first case study, focused on the Canada Land Inventory (CLI), and the Canada Geographic Information System (CGIS), reinforces the existence of a gap between theoretical and practical developments in the archives. This incongruity is evident in the treatment of cartographic materials as neutral technical documents by the archivists (and other professionals) who handle these materials even as initiatives to better reflect and incorporate a plurality of voices and perspectives have been pursued in relation to collections of textual and non-textual archival materials. Maps have historically received less scrutiny than written or photographic materials as expressions of colonial control and oppression. However, as this chapter will show, this is starting to change. Archivists would do well to embrace this development by addressing their own professional processes.

The third chapter looks beyond the archives. At the Geomatics and Cartographic Research Centre (GCRC) at Carleton University in Ottawa, Ontario, post-doctoral fellow and cybercartographic researcher Stephanie Pyne has been working on the collaborative Residential Schools Land Memory Mapping Project (RSLMMP) since 2014.¹⁰ I joined this project as a research assistant in the spring of 2018. Through this experience and additional research, I have been introduced to frameworks and tools that intersect with archival studies, with links to the larger processes of reconciliation, decolonization, and social justice. The first part of this chapter includes some of the history of digital mapping, demonstrating the extensive and ongoing integration of art and science which sustains this practice. The combination clearly supports mapping processes, yet the shift to rigid professional standards obscures that creative elements of cartography are still present, even in a digital context. I will also introduce some of the mapping practices that have been incorporated into the administrative processes of various archives.

⁹ Weld, *Paper Cadavers*, 237-238.

¹⁰ Geomatics and Cartographic Research Centre, “Residential Schools Land Memory Mapping Project,” *Indigenous Knowledge* (accessed February 15, 2020), https://gcrs.carleton.ca/index.html?module=module.gcrsatlas_indigenousknowledge

Atlas-style administration tools are not new, however the Cybercartographic framework offers a different perspective that could be constructive in the Canadian context. Considering how numerous ontologies and epistemologies can coexist, and how they might impact the development of such an approach is part of this exercise. My analysis involves reflecting on the potential uses for cartographic tools and frameworks in an archival context, which can be extended beyond cartographic materials. The cybercartographic atlas framework illustrates this potential.

The conclusion of this thesis will revisit some of the key similarities between archival studies and cartography. This comparison aims to identify how professionals in these two fields could build on these themes, both in their respective fields and on inter or transdisciplinary projects and frameworks. An analysis of mutually reinforcing professional histories serve to highlight approaches that strengthen each field while also providing a space for critical reflection on the approaches that limit the capacity for development and change. This conclusion is grounded in the notion of transdisciplinary approaches as a crucial foundation for future developments in archival theory and practice in the context of reconciliation and decolonization processes.

Chapter 1:

Archives and Cartography: Theoretical and Practical Parallels

As a student of archival studies, one of the most challenging aspects has been adapting my perspective to navigate this field. Shifting a primary research focus from the *content* to *context* of the record takes a concerted effort even when using primary source documents (usually archival records) is a familiar process. Mapping analogies are commonly found in archival literature, and this has led me to look more closely at the parallels between archival studies and cartography. Kit Hughes, likening the appraisal process to cartography, states that “archivists become cartographers when they try to discern and systematically order the environmental context of records creation.”¹ Jacques Derrida emphasizes the forward-facing aspects of archival work, noting that the enduring question of the archive as a concept is not of the past but “the question of the future itself, the question of a response, of a promise and of a responsibility for tomorrow.”² Archival scholars and educators place significance on the network of complex relationships between records, their “archival-ness” resting on the ability to clearly define the role of records in relation to a larger system. Cartographic materials have recently benefited from the shift from content to context-driven approaches, within and outside of the archives. This combination of archives and cartography creates an environment that doubly prioritizes context.

Beginning with some background on archival theory, I will address the development of critical theory, total archives, macroappraisal, and archival postmodernism as major shifts in the Canadian archival profession. I will then address parallels in the transformations of the field of cartography, examining theory that has impacted the way maps are approached by academics, professionals, and the general public. In addition to this analysis, I will also outline the frameworks I have found most applicable during my research on these two fields. Examining the broader changes to archival and cartographic work, and incorporating the more eclectic combination of approaches I have found useful in my research process forms the foundation to

¹ Kit Hughes, “Appraisal as Cartography: Cultural Studies in the Archives,” *The American Archivist* 77, 1 (Spring/Summer 2014), 281.

² Jacques Derrida, *Archive Fever: A Freudian Impression*, trans. Eric Prenowitz (Chicago and London: The University of Chicago Press, 1996), 36.

the further examination of cartographic materials, tools and technologies that are addressed in the second and third chapters of this thesis.

The two dominant conceptions of the Anglo-American archivist have been shaped by archival professionals during the modern era. First, the passive or neutral “keeper” archivist, followed by a more recent “active” archivist.³ The nineteenth- and twentieth-century transformations of the cartographer mirror this trajectory. A commonly held belief in the ability to produce objective representations of reality and effectively communicate specific narratives characterized early scholarly contributions in both fields. However, this belief has been challenged over the past sixty years by transformations to both theoretical and practical approaches. Like cartographic processes, archival functions such as appraisal, arrangement and description, preservation, and access do not exist without human intervention and mediation; there is no part that can be accurately described as “organic.” It has also been noted that neither the passive nor active interpretations of archival interventions fully reveal the more basic functions that archivists perform, an assertion that can also be extended to cartographers and cartographic interventions.⁴ However, elements of critical cartography do have the potential to constructively contribute to archival theory and practice, relating specifically to the ways in which cartographic materials are handled by archivists, or more broadly to the culture within archives as a whole. Likewise, archival insight is a necessary part of cartography, largely in terms of the continued preservation of and access to materials. Geography professor Jeremy W. Crampton, pointed to collaborative work between cartographers and map artists, geographers, historians, philosophers, and political activists, and wrote that “cartography is strongest ... when it reaches out and joins with these other forms of questioning.”⁵ This statement is equally applicable to archival work, especially in relation to the perpetual pursuit of *theory*.

³ Terry Cook discusses the impact of the “archival revolution” over the 1950s and 1960s in a Canadian context. Influenced by W. Kaye Lamb, Dominion Archivist at the Public Archives of Canada (PAC, now Library and Archives Canada), these changes were characterized by a shift from passive keeper to professional archivists as active-co-creators practicing finely-honed skills in Terry Cook, “An Archival Revolution: W. Kaye Lamb and the Transformation of the Archival Profession,” *Archivaria* 60 (2006): 185-234.

⁴ This interpretation comes from Francis X. Blouin Jr. and William G. Rosenberg’s chapter on the “archivist as activist” which I have extended in this instance to include cartography as a potential site for activism. See Francis X. Blouin Jr. and William G. Rosenberg, *Processing the Past: Contesting Authority in History and the Archives*, (Oxford and New York: Oxford University Press, 2011), 141-142.

⁵ Jeremy W. Crampton, “Foreword,” in *Classics in Cartography: Reflections on Influential Articles from Cartographica*, ed. Martin Dodge (Chichester and Hoboken: Wiley-Blackwell, 2011), xviii.

In a 1987 issue of *The American Archivist*, John W. Roberts attempted to demonstrate that archival theory was deterring the productivity of archival practice. Roberts stated that a focus on theory was fueled by an “emotional” need rather than any “objective” requirement: an attempt to cultivate wider professional acceptance of the field.⁶ He then divided archival theory into two groups: the practical, concerned with the technical aspects and efficiency of archival work, and the theoretical. This second group was framed as historiography, therefore outside of the scope of the archivist-as-archivist.⁷ In response to this rejection of theory on “practical” grounds, Terry Eastwood wondered how feasible it would be for archivists to make any changes or advances in their field if they neglected theoretical exploration. He stated:

From the archivist’s perspective and need, archives are not historical source material. The first objective of archival theory is the nature of archival documents or records. The archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have. Thus, the large theoretical question is what are those properties that need to be protected and why.⁸

Roberts then clarified his position in the pages of *Archivaria*, stating that rather than enhancing the work of the archivist, theory could only be expanded to a limited degree before causing unnecessary complications in practical applications.⁹ As this debate continued, Terry Cook and Tom Nesmith joined in. While their arguments may have been at odds with Eastwood’s specific articulation of archival theory, all three could agree that far from inhibiting archivists’ work, theory informs practice in crucial ways. The two exist in a reciprocal relationship.¹⁰ Adopting a critical approach to theory is a necessary exercise; disregarding theory all together is risky at best. As recent scholarship reveals, user needs and expectations do not inevitably line up with current archival methods, especially in the context of reconciliation and decolonization processes.¹¹ These findings support the need for ongoing theoretical development as archivists

⁶ John W. Roberts, “Archival Theory: Much Ado About Shelving,” *The American Archivist* 50, 1 (Winter 1987), 67.

⁷ Roberts, “Archival Theory,” 67.

⁸ Terry Eastwood, “What is Archival Theory and Why is it Important?” *Archivaria* 37 (Spring 1994), 125.

⁹ Roberts illustrates this idea with a scenario where an airline cockpit crew becomes fixated on finding the cause for a malfunctioning warning light and failed to stay on course, causing a fatal crash. John W. Roberts, “What is Archival Theory and Why is it Important? Response to Terry Eastwood’s Paper,” *Archivaria* 37 (Spring 1994), 132.

¹⁰ Thanks to Greg Bak for this insight. Personal correspondence with the author, May 6, 2020.

¹¹ For example, Christine Bone and Brett Loughheed address this challenge in their paper, while Jesse Boiteau presents the National Centre for Truth and Reconciliation (NCTR) as a case study on the processes of archival decolonization in his MA thesis. Christine Bone and Brett Loughheed, “Library of Congress subject headings related to indigenous peoples: changing LCSH for use in a Canadian archival context,” *Cataloging & Classification*

and other records management professionals address the dynamic needs and expectations of records creators, potential users, and contributors. Without engaging meaningfully, when appropriate, with the theory that grounds archival practice, this process cannot happen. The development of the principles of Ownership, Control, Access and Possession (OCAP), the federal government's decision to support the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and the Truth and Reconciliation Commission (TRC)'s Calls to Action, demonstrate that continued theoretical development in archives in a Canadian context is more important than ever.¹²

Since the creation of a national archives in 1872, a distinct archival tradition has been developed by archivists working in what is now Canada. Influenced by European and American methods, Canadian archivists notably diverged from their international colleagues in the twentieth century, incorporating the "Total Archives" approach and the "macroappraisal" appraisal strategy.¹³ Adopting a total archives mandate meant that publicly funded archives "would acquire, preserve, and make available for public use both government and private sector records in all media, including paper documents and visual and cartographic images, sound recordings, and in more recent years, magnetic and digital media."¹⁴ Early stages of this approach began with W. Kaye Lamb, Dominion Archivist from 1948 to 1968, as he addressed the eclectic acquisition patterns of his predecessors, and the nature of Canada's documentary history.¹⁵ Terry Cook expressed concern that acquiring all types of media under the umbrella of 'total archives' would erode provenance at the federal level based on media segregation, a practice that would allow proper physical preservation, but might compromise the intellectual

Quarterly 56,1 (2018): 83-95; Jessie Boiteau, "The National Centre for Truth and Reconciliation and the Pursuit of Archival Decolonization," (MA Thesis, University of Manitoba, 2017).

¹² See: First Nations Information Governance Centre, "The First Nations Principles of OCAP," OCAP Home. (accessed October 19, 2019), <https://fnigc.ca/ocap>; United Nations General Assembly, *United Nations Declaration on the Rights of Indigenous Peoples : resolution / adopted by the General Assembly*, 2 October 2007, A/RES/61/295, https://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf; Truth and Reconciliation Commission of Canada, *Truth and Reconciliation Commission of Canada: Calls to Action*, (Winnipeg: Truth and Reconciliation Commission of Canada, 2015).

¹³ American archivist T.R. Schellenberg notes that in 1893, when the American Historical Association formed a committee in support of the establishment of a national archives, a few members felt that the institution should handle both public and private records. This was not a popular position and the majority of the committee was unconvinced, which Schellenberg found to be an unfortunate outcome. T.R. Schellenberg, *The Management of Archives*, (Washington D.C.: National Archives and Records Administration, 1965), 22-23.

¹⁴ The term 'total archives' was in use in Anglophone archives by the 1970s. Laura Millar, "Discharging Our Debt: The Evolution of the Total Archives Concept in English Canada," *Archivaria* 46 (Fall 1998), 104.

¹⁵ Cook, "An Archival Revolution," 197.

connections between various records.¹⁶ He categorized this “media-focused McLuhanism” as one of a number of broader trends impacting twentieth-century archival theory.¹⁷ However, as Laura Millar notes, by the 1990s total archives referred not only to a responsibility to acquire all types of records, but to also maintain close connections with records creators on both an intellectual and physical level where possible.¹⁸ During the first decades of the twenty-first century, demonstrated by Cook’s 2015 definition of total archives, this approach was further impacted by the digital context where

the custodial and curatorial model of institution-based total archives will need to be further transformed into a virtual total archive system of shared functions, skills, resources, networks, and standards, community-centered and collaborative. In such a framework, archivists will focus more on archiving as a participatory “total” process in society, rather than necessarily acquiring the “total” archives in their institutions.¹⁹

Developed from the earliest years of archiving in Canada, the total archives approach represents shifting archival theory on a conceptual level. Macroappraisal, folded into the total archives approach much later, represents a shift in archival theory in a specific type of practical application.

Macroappraisal was adopted when Canadian archivists began to recognize that their existing appraisal strategies were unsustainable. One of these earlier strategies was the life-cycle approach. Characterized by the assumption that all records pass through specific, well-defined phases, the life cycle-approach became well-established during the twentieth century, promoted by influential American archivist T. R. Schellenberg.²⁰ In large part due to growing bodies of records produced at the federal level, including electronic and digital formats, this loss of

¹⁶ Cook described “total” archives as an approach that incorporates active acquisition policies reflecting the whole of society, incorporating archival control at all record creation and recordkeeping stages, without excluding any type of material, which then operates within a network of federal, provincial, and municipal level archives and private institutions. Terry Cook, “Tyranny of the Medium: A Comment on Total Archives,” *Archivaria* 9 (Winter 1979-1980), 141-142.

¹⁷ Terry Cook, “What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift,” *Archivaria* 43 (Spring 1997), 46.

¹⁸ This indicates some appreciation for the location of records and the need to maintain ties to the place and space of their creation, a factor that will be explored in greater detail in the second chapter of this thesis. Millar, “Discharging Our Debt,” 104.

¹⁹ Terry Cook, “Total Archives,” in *Encyclopedia of Archival Science*, eds. Luciana Duranti and Patricia C. Franks (Lanham, Boulder, New York, and London: Rowman and LittleField, 2015), 399.

²⁰ See Terry Cook, “Macroappraisal in Theory and Practice: Origins, Characteristics, and Implementation in Canada, 1950-2000,” *Archival Science* 5 (2005), 107-112; Zawiyah M. Yusof and Robert W. Chell, “The Records Life Cycle: An Inadequate Concept for Technology-generated Records,” *Information Development* 16, 3 (September 2000): 135.

confidence was augmented by emerging feminist and postmodernist theory.²¹ Instead of relying on archivists to appraise records by anticipating scholarly interest, macroappraisal emphasises a relationship with and knowledge of the context of records *creation*.²² This is a process- rather than product-centred approach to appraisal, tied to the principle of provenance and what archival educator Tom Nesmith describes as the “history of the record.”²³ Terry Cook, credited with the development of macroappraisal, understood provenance as the central “principle or mechanism for determining what becomes archival record,” thus requiring significant research and analysis by archivists before any appraisal decisions are made.²⁴ However, as Catherine Bailey noted in the late 1990s, an emphasis on textual records meant that archivists had not demonstrated macroappraisal as a successful strategy for “non-textual records such as audio-visual, photographic, or cartographic records which have generally been preserved outside the control of the traditional record systems on which the model was based.”²⁵ This statement highlights a need for a better understanding of non-textual records as important components of communication systems rather than lower-level entries in a logocentric records hierarchy, and is supported by Cook’s assertion that cartographic materials should be appreciated as cultural artefacts. Although neither transformation dealt directly with cartographic materials, the development of the macroappraisal strategy, along with the total archives approach, characterize important shifts, impacting the way archivists approached their key functions. A “thickening” of contextual information through the application of concepts such as societal provenance and other kinds of multiple provenance is particularly important when addressing cartographic materials, which combine textual and graphic representation on a wide variety of media over the course of production.

²¹ Cook states that his exposure to Feminist and Postmodernist theorists allowed him to understand “that records classification systems were far from being dispassionate entities, but rather reflections of institutional power by controlling information and its subjects (in both senses), all rooted in contextual social theory and work-place realities.” Cook, “Macroappraisal,” 122.

²² Cook, “Tyranny of the Medium,” 123.

²³ Provenance is generally understood as the context of a record’s creation, which has too often been confined to “surface level” information “such as the title of the creator(s), mandated functions, and organizational structures and links.” Cook, “Tyranny of the Medium,” 124; Tom Nesmith, “The Concept of Societal Provenance and Records of Nineteenth-century Aboriginal-European Relations in Western Canada: Implications for Archival Theory and Practice,” *Archival Science* 6 (2006), 352.

²⁴ Catherine Bailey, “From the Top Down: The Practice of Macroappraisal,” *Archivaria* 43 (Spring 1997), 94.

²⁵ Bailey, “From the Top Down,” 123.

Postmodernism has also impacted archival theory in significant ways. Though this influence came at a later date than many other fields, it has taken on a specifically archival application; archival postmodernism reveals the hand of the archivist.²⁶ This could be interpreted in two ways. If the power of the archivist is the element rendered visible then the postmodernist concept of communication, when filtered through archival theory, highlights the role of the archival process in relation to the prioritization of certain kinds of materials. This reading situated the archivist in an active role, as opposed to the more traditional passive or neutral keeper of records.²⁷ Tom Nesmith has noted that the ability to intervene in the meaning-making process of any given body of records may even allow the archivist to exert more influence over the record than the creator over time.²⁸ He writes:

The postmodern view of communication helps us to see archiving anew and, perhaps for many, to see it for the first time, since it is an activity that has typically gone on almost invisibly, even to those who often use archives. The postmodern outlook suggests an important new intellectual place for archives in the formation of knowledge, culture and societies. It helps us to see that contrary to the conventional idea that archivists simply receive and house vast quantities of records, which merely reflect society, they actually co-create and shape the knowledge in records, and thus help form society's memory. This implies that studying the archiving process itself (and not just using archives in the familiar way to study other things) is a vital aspect of the pursuit of human understanding. The study of archives is no longer just the seemingly esoteric interest of a few archivists who believe it makes them more effective on the job, or provides an underpinning for professional culture, valuable as these internal pursuits may be.²⁹

²⁶ An early example of the impact postmodernist thinking on archival studies is Brien Brothman's 1991 article where the author concludes "that archives should be regarded as a proper object of historical and cultural analysis," recognizing the role of the archivist as an active participant in the history of the record. Ten years later, Terry Cook noted that although "postmodernism is difficult to define and fraught with controversy, it would be irresponsible not to engage with ideas that are fundamentally affecting society, and society's perception and use of the archives," especially those that might bring useful insight to the field. Brien Brothman, "Orders of Value: Probing the Theoretical Terms of Archival Practice," *Archivaria* 32 (Summer 1991), 91; Terry Cook, "Fashionable Nonsense or Professional Rebirth: Postmodernism and the Practice of Archives," *Archivaria* 51 (2001), 15. For additional examples of the trajectory of Cook's as well as Joan M. Schwartz's thinking on postmodernism in the archives see: Terry Cook, "What is Past is Prologue: A History of Archival Ideas Since 1898, and the Future Paradigm Shift" *Archivaria* 43, (Spring 1997): 17-63; Joan M. Schwartz and Terry Cook, "Archives Records, and Power: The Making of Modern Memory," *Archival Science* 2, 1-2 (March, 2002): 1-19; Terry Cook and Joan M. Schwartz, "Archives, Records, and Power: From (Postmodern) Theory to (Archival) Performance," *Archival Science* 2, 3-4 (September, 2002), 171-185.

²⁷ These transformations are outlined in: Tom Nesmith, "Seeing Archives: Postmodernism and the Changing Intellectual Place of Archives," *The American Archivist* 65, 1 (Spring-Summer 2002), 26.

²⁸ Nesmith, "Seeing Archives," 35.

²⁹ Nesmith, "Seeing Archives," 26-27

In addition to redefining the role of the archivists in society, archival postmodernism affects the conceptualization of provenance and its representation through processes like description.

The second interpretation is about the archivist's work. The postmodern approach encourages the expansion of provenance beyond the basic creator (such as the individual or office) to include the societal and intellectual contexts that shape records adding levels of detail that might have previously been untapped as a resource.³⁰ Chris Hurley suggested that provenance would be further clarified if archivists attributed records to more than one creator, due to the higher level of detail which would be retained.³¹ He later cited instances of classificatory distinctions that divide the documents generated, in his example, by an English estate into separate fonds for the estate and for the family that lived on the estate. Rather than aiding description, this created two separate narratives that obscured the equal importance of each one. The records in each category are contextually important to one another, and the provenance statement is enriched when more than one creative process is acknowledged with the application of principles of simultaneous multiple provenance.³²

Tom Nesmith places importance on the ongoing assessment archival theory as a crucial area for discussion and growth, pulling influences from other fields to deepen and broaden our understanding of records. He points to developments in scientific approaches to both research and knowledge production that encourage ambiguity, rather than precision, to better serve further developments in archival theory. These developments highlight the nuanced, or “fuzzy, but more accurate” characteristics of important questions and concepts.³³ The challenge for working archivists to more accurately include the complexity of multiple provenance, while addressed theoretically, is often difficult to negotiate on a practical level, especially as digital formats have become the norm for most records creators. Archival practice may appear to be a fundamentally reactive exercise, however ongoing theoretical development is indispensable and does not belong to a separate field of historical research, as Roberts suggested in 1987. The following section

³⁰ Nesmith, “Seeing Archives,” 35.

³¹ Chris Hurley, “Problems with Provenance,” *Archives & Manuscripts* 23, 2 (November 1995), 235-236.

³² Chris Hurley, “In Pursuit of Provenance: When Societal met Parallel with a View to Relationships,” (paper given at the Society of Archivists, Adelaide, 21 June and Sydney, 17 July, 2013).

<https://www.descriptionguy.com/images/WEBSITE/What-is-PP.pdf>

³³ Tom Nesmith, “Still Fuzzy, But More Accurate: Some Thoughts on the “Ghosts” of Archival Theory,” *Archivaria* 47 (Spring, 1999), 137.

aims to demonstrate that the recent emphasis on theoretical development is also shared by many of the academics and professionals creating, using, and studying cartographic materials.

During the nineteenth century, the subjectivity of mapmaking was downplayed throughout a period of professionalization. Formally reconstituted as cartography, the practice was converted from a creative exercise to a specialized academic pursuit.³⁴ German geographer Max Eckert was a noted contributor during this transitional period. Eckert situated the practice within “a self-consciously hegemonic vision of timeless principles,” which Arthur Robinson and Randall Sale would later define as ‘The Essential Cartographic Process’ in their 1953 book *Elements of Cartography*.³⁵ Although cartography was initially viewed as “an active combination of art and science through whose interaction the profession had developed and would continue to develop into the future,” the more creative elements were not acknowledged as part of professional cartography by the latter half of the twentieth century.³⁶

The active distancing within the field from what are perceived as subjective qualities has been remarked upon in light of recent theoretical shifts. Cartographer, geographer, and map historian John B. Harley cautioned that an assumption of cartography defined as progressive science is a myth that should be challenged by historians and cartographers.³⁷ Adapting McLuhan’s “logic of print” to a “logic of the map,” Harley remarked that we should consider

[t]he effects of abstraction, uniformity, repeatability, and viscosity in shaping mental structures and in imparting a sense of the places of the world. It is the disjunction between those senses of place and many alternative visions of what the world is, or what it might be, that has raised questions about the effect of cartography on society... maps, by articulating the world in mass-produced and stereo-typed images, express an embedded social vision.³⁸

The proliferation and accessibility of tools and technologies during the final decades of the twentieth century, combined with increased access to reliable internet connections, led to an unprecedented growth in amateur, community, and counter-mapping initiatives.³⁹ These projects

³⁴ Denis Wood, John Fels, and John Krygier, *Rethinking the Power of Maps* (New York: Guilford Press, 2010), 121.

³⁵ *Elements of Cartography* was first published in 1953 and currently in its sixth edition. Wood, Fels, and Krygier, *Rethinking the Power of Maps*, 121; Matt Knutzen, “Elements of Cartography,” New York Public Library (blog), January 6, 2011. <https://www.nypl.org/blog/2011/01/06/elements-cartography>

³⁶ Matthew H. Edney, “Academic Cartography, Internal Map History, and the Critical Study of Mapping Processes,” *Imago Mundi* 66, suppl (2014), 86.

³⁷ John B. Harley, *The New Nature of Maps: Essays in the History of Cartography*, ed. Paul Laxton (Baltimore and London: The Johns Hopkins University Press, 2001), 151.

³⁸ Harley, *The New Nature of Maps*, 167.

³⁹ These factors also shaped who could initiate these projects, and why they would do so. Tim Berners Lee has called for more even broadband connectivity, noting that limitations on internet access “fall along the familiar lines

often question the legitimacy or appropriateness of the well-established approaches to geographic information.⁴⁰ In *Rethinking the Power of Maps*, artist and cartographer Denis Wood explains that maps are communication systems better understood as narratives than a scientific representation of data. “Mapmaking,” he states, “is a lot more like talking, like writing. You want to direct protesters to a protest, you draw a map. You want to draw people’s attention to where white commuters kill black kids, you make a map. You want to help people navigate the Underground, you draw a map.”⁴¹ The development of critical cartography and the influence of postmodernism, which questions the positivistic readings of the past, also support broader initiatives of decolonization and reconciliation through a wide range of cartographic projects.

The field has been expanded by the presence of these map-producing and map-circulating communities, creating space for projects that question legitimacy and appropriateness of traditional cartography in various contexts, even as the practice of mapmaking has become more rigidly structured and controlled through the widespread use of proprietary software and digital mapping applications. This recent proliferation of multiple perspectives reveals mapping as a fundamentally political practice that fits well with themes of and discussions held in our core archival studies seminars at the University of Manitoba.⁴² While technological developments transformed the practical aspects of cartography into a professional position requiring specific

of wealth, race and rural v urban divides.” Changing this reality today involves government investment in network infrastructure while services providers must ensure that these networks are performing at a high level. Tim Berbers-Lee, “Covid-19 makes it clearer than ever: access to the internet should be a universal right,” *The Guardian*, June 4, 2020, <https://www.theguardian.com/commentisfree/2020/jun/04/covid-19-internet-universal-right-lockdown-online>

⁴⁰ OpenStreetMap (OSM) developed in response to the prohibitive cost and limited availability of updated and accurate geographical information in Europe, while initiatives in the United States have been propelled to use maps to illustrate the dark side of gentrification in urban areas. Countermapping projects like the defense of the Miskito Reefs by the Miskito community provide maps that can challenge the versions created by occupiers. See: Mordechai Haklay and Patrick Weber, “OpenStreetMap: User-Generated Street Maps,” *IEEE Pervasive Computing* 7, 4 (October-December, 2008): 12-18; Manissa M. Maharawal and Erin McElroy, “The Anti-Eviction Mapping Project: Counter-Mapping and Oral History toward Bay Area Housing Justice,” *Annals of the American Association of Geographers* 108, 2 (2018): 380-389; Bernard Nietschmann, “Defending the Miskito Reefs with Maps and GPS,” *Cultural Survival Quarterly* 18, no. 4 (December, 1994), n.p.

⁴¹ Here the authors reference a number of high-profile mapping projects in the USA and UK. Wood, Fels, and Krygier, *Rethinking the Power of Maps*, 120-121.

⁴² While not applicable in all contexts, archivists have written about the importance of the archivist-as-activist, revealing the value and significance archival knowledge and records in law courts and seats of government. Anne Lindsay refers to archivists as “silent partners in the pursuit of social justice” in the opening sentence of her 2011 article. See: Kirsten Weld, *Paper Cadavers: The Archives of Dictatorship in Guatemala*, (Durham and London: Duke University Press, 2014); Verne Harris, “Jacques Derrida meets Nelson Mandela: Archival Ethics at the Endgame,” *Archival Science* 11 (2011): 113-124; Raymond Frogner, ““Innocent Legal Fictions”: Archival Convention and the *North Saanich Treaty* of 1852,” *Archivaria* 70 (Fall 2010): 45-94; Anne Lindsay, “Archives and Justice: Willard Ireland’s Contribution to the Changing Legal Framework of Aboriginal Rights in Canada, 1963-1973,” *Archivaria* 71 (Spring 2011): 35-62.

technical training, theorists, historians, and professionals have also been influenced by postmodernist, feminist, and other emerging theoretical frameworks. The incorporation of critical theory in the field of cartography has continued to transform the way maps are produced, disseminated, and preserved beyond the parameters of methodological change.

Postmodernism has had a significant influence on cartographic theory. Geographer John Pickles describes the early years of the twenty-first century as an era of “new cartography” which is

the term coined by Gilles Deleuze to describe the important shift in thinking taking place in twentieth century thought and, in this case, marked by the writings of Michael Foucault. Foucault was the “new cartographer,” whose works signaled a new mode of investigation and writing that sought not to trace out the representations of the real, but to show how mappings always produce the world by combining and recombining relations and ideas; to show how knowledge and social interests always work in conjunction; how maps are always technologies that depend for their effectiveness on specific institutions, discourses, and practices; and that these specific conditions are important in constructing what we understand to be the world around us, the real.⁴³

Jeremy W. Crampton, professor of Geography at the University of Kentucky, describes the rise of critical cartography in his book, *Mapping: A Critical Introduction to Cartography and GIS*, as part of a wider trend characterized by Foucault’s writings. Crampton writes that this approach draws on Foucault’s definition of “critique” which explores accepted practices by examining and being cognizant of the assumptions on which they are built, rather than rejecting them altogether.⁴⁴ In this way, categories made invisible though their ubiquity become highly visible and other possibilities become more apparent.⁴⁵ Harley combines theory from both Foucault and Derrida, suggesting that maps should be read as cultural texts, and actively deconstructed in order to uncover the “the silences and contradictions that challenge the apparent honesty of the image.”⁴⁶ Through this postmodernist exercise, a more complex and nuanced understanding of maps and cartography emerge, which can also enhance archival approaches to cartographic materials.

⁴³ John Pickles, “Foreword,” in *The Natures of Maps: Cartographic Constructions of the Natural World*, Denis Wood and John Fels (Chicago: University of Chicago Press, 2008), ix.

⁴⁴ Jeremy W. Crampton, *Mapping: A Critical Approach to Cartography and GIS* (Oxford: Wiley-Blackwell, 2010), 13.

⁴⁵ Crampton, *Mapping*, 14.

⁴⁶ Harley, *The New Nature of Maps*, 152-153.

The role of the cartographer, like the archivist, has remained almost invisible to those who do not actively identify their hand in cartographic interventions. Only recently have these occupations been formally identified as positions of power rather than neutrality; a theoretical connection that has been derived in part by acknowledging the historic and current impact of these interventions. Maps have often been used to remove both inhabitants and histories from the landscape. Linda Tuhiwai Smith asserts that large-scale projects including draining marshland, infilling shorelines, and diverting waterways could physically transform a landscape. However, “renaming the land was probably as powerful as changing the land,” as this is an act that willfully obfuscates land use and occupation by Indigenous peoples, and specifically targets children through state-run education initiatives.⁴⁷ American geographer Bernard Nietschmann stated that “[m]ore indigenous territory has been claimed by maps than by guns. This assertion has its corollary: more indigenous territory can be defended and reclaimed by maps than by guns.”⁴⁸ In many instances, cartographic materials and technologies have been repurposed in support of regaining rights to land, for the purpose of documenting place names, and the geo-transcription of oral histories. Examples of these kind of initiatives will be discussed in more detail in chapter three of this thesis, however it is worthwhile for archivists to consider how their own work with cartographic materials could support these activities and initiatives.

Regardless of the varied outcomes mapped data might support, the documents themselves cannot be produced without a significant amount of manipulation (of data, of the condensed or simplified representation of landscapes, and so on), which should not be overlooked. Geographer Mark Monmonier states that to make an effective map the creator *must* lie. Map users should expect map creators to “experiment freely with features, measurements, area of coverage, and symbols and can pick the map that best presents their case or supports their unconscious bias.”⁴⁹ The prevalent view of Western cartography for the past five hundred years was of a “technological discipline set on a progressive trajectory,” which claims to represent land accurately and without subjectivity, using tools and methods grounded in geometry.⁵⁰ Critical theory concludes that the same trajectory has also produced a standard that has affected the

⁴⁷ Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples* 2nd Ed., (London: Zed Books, 2012), 53-54.

⁴⁸ Nietschmann, “Defending the Miskito Reefs with Maps and GPS,” 37.

⁴⁹ Mark S. Monmonier, *How to Lie with Maps* 2nd ed., (Chicago: University of Chicago Press, 1996), 2.

⁵⁰ Harley is quoted in Denis Wood and John Fels, *The Natures of Maps: Cartographic Constructions of the Natural World*, Chicago: University of Chicago Press, 2008), 6.

ability of historians to accurately assess the value of materials produced outside of this tradition. Writing on the question of ethics in cartography, Harley states that both the aesthetic and empirical content of a map are value-laden and have considerable power over the interpretation of maps. He cites examples that criticize the use of blue for water and brown for terrain as ways in which cartographers misinform their audience or perpetuate Eurocentric design conventions.⁵¹ Another important aspect of critical cartography is challenging the positivistic readings of maps while supporting the incorporation of mapping practices into decolonization and reconciliation initiatives. This process involves a more reflexive approach from within the field.⁵² Scholars have also begun to appreciate that neglecting collaborative practices, where multiple types of expertise and viewpoints intersect, can result in the loss of crucial data over time.⁵³

Rather than conceptualizing the map as a single, finished document, the expansion of cartographic theory encourages a much more nuanced reading, potentially impacting the way archivists handle the materials produced by map creators. Geographer Matthew Edney asserts that the best way to study maps is not through the maps themselves (the product) but by analysing how they came to be, using a processual approach.⁵⁴ This approach, which mirrors elements of macroappraisal in a number of ways, functions on a methodological and philosophical level. According to Edney, this approach encourages scholars to take a reflective position in their work by considering production, consumption, and circulation equally, as a whole, and without exception.⁵⁵ “It is not that there is one phenomenon (map) which comes in many variants,” he explains, “but many different phenomena that can be arranged along a continuum only on the basis of a superficial characteristic. The proper subject of analysis is therefore not maps, but the mapping processes that gave rise to them.”⁵⁶ The processual approach

⁵¹ Harley, *The New Nature of Maps*, 202.

⁵² Stephanie Pyne, D. R. Fraser Taylor, and Trina Cooper-Bolam, “Introduction” in *Cybercartography in a Reconciliation Community: Engaging Intersecting Perspectives*, eds. Stephanie Pyne and D. R. Fraser Taylor (Amsterdam: Elsevier, 2019), 18.

⁵³ For example, it has been shown that scientific data alone is insufficient for preservation, rather metadata is needed to both make decisions about uses of data, as well as demonstrate quality. In order to properly archive scientific data, archivists and scientists should work towards this goal together. Tracey P. Lauriault, Barbara L. Craig, D.R. Fraser Taylor, and Peter L. Pulsifer, “Today’s Data are Part of Tomorrow’s Research: Archival Issues in the Sciences,” *Archivaria* 64 (Fall 2007), 165.

⁵⁴ Earlier in this chapter I noted that cartographic theory and practice benefits from archival insights; promoting a processual approach to the study of cartography is also connected to the availability of cartographic materials over time and the assumption that these materials remain accessible in the future.

⁵⁵ Matthew Edney, “What Is a Processual Approach to Mapping?” *Mapping As Process* (blog), January 11 2018, <https://www.mappingasprocess.net/blog/2018/1/11/what-is-a-processual-approach-to-mapping>

⁵⁶ Edney, “What Is a Processual Approach,” n.p.

to cartography, then, follows a similar trajectory as archival theorists such as Bearman, Cook and Schwartz traced in the 1980s and 1990s when they sought to shift the focus of working archivists from the content of records to the context of record creation. Cartographer Margaret Wickens Pearce explains that academics have also begun to assess Indigenous cartographic materials on their own terms rather than continually comparing materials that document disparate worldviews using a single Euro-centric standard. She explains that this distinction highlights, for example, the inscriptive nature of non-Indigenous cultures which store information for later use in contrast to the incorporative nature of indigenous culture which focuses on communicating knowledge directly.⁵⁷ The development of a processual approach to cartographic materials represents a framework that can extend beyond the postmodern perspective, which has limitations in the context of settler-colonial states.⁵⁸

Archivists have been incorporating interdisciplinarity into their work for decades, and as a researcher I value the dynamism of this approach.⁵⁹ However, over the course of my research on cartographic materials, I came across the argument for a transdisciplinary approach in the context of developing better digital preservation strategies. Reflecting on the International Research on Permanent Authentic Records in Electronic Systems (InterPARES) 2 Project, Luciana Duranti explained that a purely disciplinary approach could not provide researchers with solutions to digital preservation challenges. While interdisciplinary or multidisciplinary approaches both offer pathways to solutions *within* disciplines, researchers on the InterPARES 2 project found that a transdisciplinary approach was the most creative and useful to meaningfully address digital preservation challenges.⁶⁰ In addition to the multi-referential and multi-dimensional aspects of transdisciplinarity, which “involves thinking at the same time within, across, and outside of each discipline,” Duranti explains

Rigor, openness, and tolerance are the fundamental characteristics of the transdisciplinary attitude and vision. *Rigor* in argument, taking into account all existing data, is the best defence against possible distortions. *Openness* involves an

⁵⁷ Margaret Wickens Pearce, “Indigenous Cartographies,” in *Encyclopedia of Geography*, ed. Barney Warf (Thousand Oaks: SAGE Publications, 2010), 1562.

⁵⁸ Similarly, Linda Tuhiwai Smith is critical of an approach that would assume that “colonialism” is somehow finished when the repercussions of both are currently being felt and confronted. This will also be discussed in the third chapter of this thesis in relation to cartographic materials. Wickens Pearce, “Indigenous Cartographies,” 1562; Tuhiwai Smith, *Decolonizing Methodologies*, 101.

⁵⁹ See: Taylor, Hugh A., “Information Retrieval and the Training of the Archivist,” *The Canadian Archivist* 2, 3 (1972): 30-35.

⁶⁰ Luciana Duranti, “Reflections on InterPARES: The InterPARES 2 Project (2002-2007): An Overview,” *Archivaria* 64 (Fall 2007), 115-116.

acceptance of the unknown, the unexpected and the unforeseeable. *Tolerance* implies acknowledging the right to ideas and truths opposed to our own.⁶¹

This statement aligns well with the current state of the archival field, which faces calls for significant change on multiple levels.⁶² In an effort to incorporate this transdisciplinary outlook to my own research and writing process, I will also highlight additional important themes that have surfaced in multiple locations, and the impact of certain frameworks on the parameters of this thesis project. In addition to the broader theoretical and practical transformations discussed in this chapter, I have amalgamated an eclectic theoretical framework as I prepared for and conducted my research. Drawing on several fields, including scholarship focused on archival ethics, Indigenous research methodologies, borderlands studies and a rejection of notions of objectivity and neutrality in academic and professional fields, I have attempted to incorporate a holistic approach to my research.

In addition to Duranti's description of transdisciplinarity, I would like to include an adaptation of Verne Harris's ethics of hospitality as a fundamental part of my own approach.⁶³ In a Canadian context this approach must go through a transformation; it is not appropriate to conceptualize it as the archivists' prerogative to welcome 'outsiders' to access archived materials. Colonialism imposes a perverse version of hospitality on communities that have been excluded from the hegemonic ideal.⁶⁴ It is therefore more effective to approach an ethics of hospitality in Canadian archives as a reconceptualization of *the archivist as the guest*. A large part of this reconceptualization is also contingent on the incorporation of a self-reflexive understanding of how and where accepted theory and practice influence these processes. An

⁶¹ Duranti, "Reflections on InterPARES," 116.

⁶² For example, the Truth and Reconciliation Commission of Canada: Calls to Action number 69.i., 69.ii., and 69.iii., which call upon LAC to fully adopt and implement the *United Nations Declaration on the Rights of Indigenous Peoples* and the *United Nations Joint-Orientlicher Principles* to support "Aboriginal peoples' inalienable right to know the truth about what happened and why, with regard to human rights violations committed against them in residential schools." LAC must ensure the records they hold related to residential schools are accessible, while also committing more resources to educate the public on residential schools. Truth and Reconciliation Commission of Canada, *TRC: Calls to Action*, 8.

⁶³ See Verne Harris, "Jacques Derrida meets Nelson Mandela: Archival Ethics at the Endgame," *Archival Science* 11 (2011): 113-124.

⁶⁴ This conceptualization originates with a discussion with my supervisor Greg Bak in the context of my thesis research, and he continues to develop this approach in his own research on processes of archival decolonization. Personal correspondence with the author, May, 2020. Greg Bak, "Counterweight: Helen Samuels and Archival Decolonization," (unpublished manuscript, 23 July 2020), typescript.

approach rooted in effective communication strategies and respect for incommensurability is necessary as well. Discussed by Eve Tuck and K. Wayne Yang, ethics of incommensurability prioritizes a recognition of boundaries as a significant component of reconciliation, stating, “opportunities for solidarity lie in what is incommensurable rather than what is common across these efforts.”⁶⁵ Writing on the process of building the *Lake Huron Treaty Atlas*, cybercartographic researcher Stephanie Pyne notes that mapping tools might serve as constructive sites for incommensurable knowledges to exist side by side due to the atlas contributors’ ability to layer information and narratives in the same digital space.⁶⁶

Margaret Kovach’s *Indigenous Methodologies: Characteristics, Conversations, and Contexts* succinctly combines academic research (incorporating methodology developed from a tribal-based approach) and personal experience.⁶⁷ This is a compelling framework for a student of archival studies as this profession looks towards meaningful reconciliation and decolonization practices, which are grounded in the acceptance of Indigenous approaches and frameworks in institutions which have been hostile or dismissive to alternative ways of seeing.⁶⁸ For example, she describes the Nêhiyaw (Plains Cree) epistemology, specifically the linguistic paradigms she learned in a language course. Kovach was informed that “fluent Cree speakers most often speak in the subjunctive or ‘ing,’ mode. The subjunctive is the opposite of declarative and suggests a world view that honours the present, what we know now. It also suggests a world view that focuses as much, if not more, attention on process rather than on product or outcome.”⁶⁹ While Tuck and Yang, and Pyne draw attention to incommensurability, Kovach clearly demonstrates that there is a need for Canadian scholars educated in the Western academic tradition to become acquainted with Indigenous methodologies. This acceptance provides space for the appropriate

⁶⁵ Eve Tuck and K. Wayne Yang, “Decolonization is Not a Metaphor,” *Decolonization: Indigeneity, Education & Society* 1, 1 (2012), 28.

⁶⁶ Stephanie Pyne, “The Role of Experience in the Iterative Development of the *Lake Huron Treaty Atlas*,” in *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping*, eds. D. R. Fraser Taylor and Tracey Lauriault (Oxford: Elsevier Science & Technology, 2013), 259.

⁶⁷ Margaret Kovach, *Indigenous Methodologies: Characteristics, Conversations, and Contexts*, (Toronto: University of Toronto Press, 2009), 9.

⁶⁸ One of the most impactful statements I have heard, in terms of developing my own research and approach to archives, relates to cultivating the ability to listen, value patience, and build respectful, professional networks. Linda Tuhiwai Smith, “A Conversation on Governance and Indigenous Research with Dr. Linda Tuhiwai Smith and Bonnie Healy,” (lecture, University of Winnipeg, Winnipeg, Manitoba, April 11, 2018).

⁶⁹ Kovach, *Indigenous Methodologies*, 65-66.

frameworks for Indigenous scholars to conduct research, situating Indigenous knowledges *within* the academy, or in this context, within the archives.⁷⁰

Drawing on themes from Borderlands Studies, two elements stand out in this field of research as constructive in an archival context. Historians Pekka Hämäläinen and John R. Wunder caution against a conceptualization of history that “revolves around time and several geopolitical words and their definitions: ‘empire,’ ‘frontier,’ ‘borderlands,’ and ‘bordered lands,’” deliberately overlooking the unbroken and continuous histories of indigenous peoples in favour of a simplified narrative that fits a specific reading of the present (such as a European monopoly over empire-building and the inevitability that these empires result in nation-states).⁷¹ In a later article co-authored with Samuel Truett, Hämäläinen suggests that the entanglements, the middle ground that constitutes a borderland, is the space in which master narratives (or meta narratives) can be destabilized and a true shift to new centres can be supported.⁷² This approach acknowledges that incommensurable world views and vastly different experiences sit alongside one another, with a wide range of possible outcomes. The framework is built on the notions that deliberate shifts from the established centres, and a fuzziness that recalls Nesmith’s definition of provenance, promotes a discourse that better reflects the messiness of human interactions.

The false sense of a scientific world view producing universal, or even *neutral* representations of data pertaining to a geographical area is embedded in our understanding of maps, largely due to the standardizations introduced through the proliferation of tools and platforms.⁷³ Historical geographers Catherine Delano-Smith and Roger J.P. Kain write that

⁷⁰ Kovach contends that the incorporation of the most appropriate methodology depends on the researcher, their goals, and the field in which they are working, and that while Indigenous researchers may choose to incorporate Indigenous frameworks, they are in no way expected to do so. The over-arching goal is to demonstrate that Indigenous methodologies are necessary, legitimate, and available when and where appropriate. Kovach, *Indigenous Methodologies*, 158, 175.

⁷¹ John R. Wunder and Pekka Hämäläinen, “Of Lethal Places and Lethal Essays,” *American Historical Review* 104, 4 (October 1999), 1229. It should also be noted that Truett and Hämäläinen state that despite the transformations in borderlands studies, older trends have continued to dominate narratives in the field. For example, the notion of borderlands history as an approach to untangling complex interactions that inevitably lead *somewhere* plays into the restraints of a teleological reading of history. Pekka Hämäläinen and Samuel Truett, “On Borderlands,” *The Journal of American History* 98, 2 (September 2011), 361.

⁷² This aligns with Tom Nesmith’s assertion that a “fuzzy” approach to archival theory can result in a more accurate interpretation of archival processes. Truett and Hämäläinen, “On Borderlands,” 361; Nesmith, “Still Fuzzy,” 140-141.

⁷³ John B. Harley discussed this development in the early 1990s, noting that cartographers had often characterized their work as a correct, accurate, and objective scientific practice, which is “a key ethical issue and, indeed it is this positivism, fueled by recent technological developments, that is beckoning cartographers away from the very ethical issues now espoused by other professions.” Harley, *The New Nature of Maps*, 203.

“maps are drawn on a blank surface, not with a blank mind.”⁷⁴ This suggests the need to consider the subjectivities of the cartographer, but also reflects a truncated understanding of mapping processes that has too easily transferred to the assessment of digital representations. The suggestion that there could be such a thing as a “blank” surface in the digital age is not well-aligned to archival processes. A “blank” page with “nothing” on it still contains a record of its provenance through its form and substance.⁷⁵ It is important to acknowledge that “we make our tools and our tools make us” when we engage with cartographic and archival materials, in a theoretical and practical sense.⁷⁶

In my analysis of archival theory, I have been influenced by a number of archivists whose research reveal the complex relationship between the medium and the message in an archival context. Ciaran B. Trace, addressing organizational records, describes these materials as the products of a social process, which, until the development of a post-Positivist paradigm, had gone largely unrecognized and unexplored by archivists. Trace explains,

It is perhaps the record’s very embeddedness in what appear to be routine processes and mundane practices that creates this difficulty. The record has become naturalized and thus invisible, an assumed backdrop rather than active agent. In general, creators themselves seem to reflect little on their own practices of records creation and maintenance. This being so, obtaining information about records creation solely from interviews with creators seems, at best, to generate less than comprehensive answers to the fundamental questions that we seek to answer. Archivists must learn from, and utilize methods capable of, studying the perceived minutiae of human social action to begin to answer our questions.⁷⁷

In addition to this archival scholarship, historians have also been discussing the similar themes with regard to cartography.

⁷⁴ Catherine Delano-Smith and Roger J.P. Kain, *English Maps: A History* (London: British Library, 1999), 6.

⁷⁵ For a more detailed discussion on materiality and archival records see: Ala Rekrut, “Matters of Substance: Materiality and Meaning in Historical Records and Their Digital Images,” *Archives and Manuscripts* 42, 3 (2014): 238-247. Tom Nesmith also discusses societal provenance in relation to the materiality of records in: Nesmith, “The Concept of Societal Provenance, 351-360.

⁷⁶ This “McLuhanite” conceptualization is an important part of Canadian archival development, demonstrated by Schwartz, who was in turn influenced by Taylor’s early support for the incorporation of Marshal McLuhan’s theories on the significance on the various forms of communication systems. Taylor notes that an understanding of textual records as the most reliable scholarly sources emphasises content rather than modes of communication. Archivists also understood these records as “neutral ‘carriers’ of messages or pieces of information, despite the fact that the nature of each medium does shape administrative systems.” Hugh A. Taylor, “The Media of Record: Archives in the Wake of McLuhan,” *Georgia Archive* 6 (Spring 1978), 1; Joan M. Schwartz, “We Make Our Tools and Our Tools Make Us: Lessons from Photographs for the Practice, Politics, and Poetics of Diplomats,” *Archivaria* 40 (Fall 1995), 43.

⁷⁷ Ciaran B. Trace, “What is Recorded in Never Simply ‘What Happened’: Record Keeping in Modern Organizational Culture,” *Archival Science* 2 (2002), 159.

William Rankin, who teaches the history of science at Yale University, has promoted a departure from the common perception that more accurate mapping leads to better maps (and more power over the landscape). He refers to his approach as an exploration of the way geographical knowledge is produced, why it takes certain forms, and how it is known and used. He uses the term *geo-epistemology* to describe the framework of knowledge production, noting that while it is about the way users know and understand their surroundings, it is also about perceptions of trustworthiness and “[a]bove all it is about the importance - and the unavoidability – of tools; the goggles of geo-epistemology come in many styles, but they can never be removed.”⁷⁸ The geo-epistemology that forms the foundation of any group of cartographic records is an important aspect of the history of those records. As with the history of computing, archival records are not universally understood as the sum of their parts, which means that the human behind the creation of something like a cartographic record often is not considered or even recognized by those who routinely interact with these materials.⁷⁹

Now that I have introduced some of the major transformations in the fields of archives and cartography and the eclectic theoretical frameworks that influence my research, it is evident that there are a number of common elements that appear as professionalization took hold in each field. The development of total archives, macroappraisal, shifts to process- over product-centred approaches, a growing emphasis on research and analysis, and a crucial appreciation for the reciprocal nature of theory and practice have allowed both archivists and cartographers to deepen their understanding of the materials they produce. However, unlike the archival channels, which largely address textual materials, the value to be gained from the theoretical developments in cartography relates to the “in-betweenness” of the cartographic record, which is a combination of both text and image, analogue and digital. In the next chapter I will address cartographic materials in an archival context. In doing so, I will attempt to ground my examination in this framework that aims to prioritize transdisciplinarity. As Harley states, “if we are truly concerned with the social consequences of what happens when we make a map, we might also decide that

⁷⁸ William Rankin, *After the Map: Cartography, Navigation, and the Transformation of Territory in the Twentieth Century* (Chicago: University of Chicago Press, 2016), 2.

⁷⁹ Michael S. Mahoney suggests that in order to fully grasp the implications of “computing(s)” or digital technologies for society, we must first decentre the machine itself, reinserting the human agency that creates and manipulates it as the means to a specific end. Michael S. Mahoney, “The Histories of Computing(s),” *Interdisciplinary Science Reviews* 30, 2 (June 2005), 121; Mark Monmonier asserts that the viewer should consider the bias that must feature in maps, whether intentionally or unintentionally in order to fulfill a specific purpose. Monmonier, *How to Lie with Maps*, 2.

cartography is too important to be left entirely to cartographers.”⁸⁰ Once again, this statement easily translates to the archives. In the spirit of this encouraging (if cautionary) statement, I will proceed to my case studies.

⁸⁰ Harley, *The New Nature of Maps*, 203.

Chapter 2:

The Canada Land Inventory (CLI), and the Canada Geographic Information System (CGIS): New Materials in an Old System

The previous chapter dealt with relevant archival and cartographic theory that informs my understanding of cartographic materials in the archives. Chapter one also demonstrated that increasing numbers of scholars and professionals have adopted a critical approach in their respective fields, situating the value of cartographic materials in the process of creation rather than in a final product. What is now known as Canada is “the second largest country in the world covers almost 10 million km² with over 243 thousand kilometres of coastline, so you can only imagine the amount of *Canadian geographic information* that exists.”¹ Harley suggests that maps should be read as cultural texts, actively deconstructed in order to uncover the “the silences and contradictions that challenge the apparent honesty of the image.”² While archivists are concerned less with the content and more with the context of the records they address, it is worthwhile for archivists to consider how their own work with cartographic materials could support this deconstructive approach to research.

This chapter will address a collection of cartographic materials at Library and Archives Canada (LAC), providing some historical background and further addressing the impact of theoretical developments discussed in the previous chapter. With attention to the implications of the concept of total archives, and the strategy of macroappraisal, I will explore the gap, identified by Catherine Bailey, between these important developments in archival practice, and the management of non-textual materials.³ Specifically, I will focus on the Canada Land Inventory (CLI) and the Canada Geographic Information System (CGIS). This project played a crucial role in the development of digital cartographies in North America and established impactful concepts of land use and development promoted first by the settler colonial state but also repurposed to

¹Canadian GIS, “Canadian GIS and Geospatial Resources,” CanadianGIS.com (accessed March 6, 2020), <https://canadiangis.com/>

² John B. Harley, *The New Nature of Maps: Essays in the History of Cartography*, Paul Laxton, ed. (Baltimore and London: The Johns Hopkins University Press), 152-153.

³ Catherine Bailey, “From the Top Down: The Practice of Macroappraisal,” *Archivaria* 43 (Spring 1997), 123.

support Indigenous land claims.⁴ As noted in chapter one, identifying all of the processes that intersect during the creation of cartographic materials can be challenging for archivists.⁵

My argument in this chapter will demonstrate that an archival shift in the conceptualizations of cartographic materials is necessary to more accurately reflect the impact of cartography and cartographic materials. The lack of critical attention to the subjectivity of maps, archives, and digital technologies in general keeps descriptive standards in the archives narrow and content-driven.⁶ This in turn constricts the scope of perceived uses for cartographic materials as primary source documents in various fields, while also shoring up the power of the settler colonial state in subtle, yet persistent ways. In order to expand this scope, archivists might incorporate a processual approach to cartographic records, and include geo-epistemologies in the process of description. As a means of exploring what this might look like, I will address the materials of the CLI through published materials, including two articles that look at very different aspects of their history.

When I first began researching cartographic materials in archives, the most basic information that I came across related to arrangement, which is grounded in best practices for preservation. As oversized, fragile, or otherwise unwieldy items, maps are commonly separated from intellectually linked materials and stored alongside similarly over-sized items such as architectural plans.⁷ What at first seemed to me like a minor failure of archival management (putting representations of geographic data together with the plans for structures based on human aesthetics and/or functional requirements) began to seem acceptable on a practical *and* theoretical level. In terms of cost-efficiency this strategy remains effective, as certain types of

⁴ Peter Schut, who was part of the team that worked to save the CLI data and the CGIS system from obsolescence in the 1990s, characterizes the CGIS quite vividly as a “truly revolutionary idea, and from its ambitious beginnings, CGIS ultimately grew to contain the equivalent of thousands of maps. It also spawned an industry that today is worth billions of dollars. CGIS was a homegrown software. Bill Gates was in public school when Environment Canada’s programmers were busy developing software and functionality that was decades ahead of its time.” This assessment celebrates the recovery of imperiled data but does not consider other ways in which this data was used. Peter Schut, “Back from the Brink,” *Geospatial World*, November 20, 2010, <https://www.geospatialworld.net/article/back-from-the-brink/>

⁵ Ciaran B. Trace, “What is Recorded is Never Simply ‘What Happened,’: Record Keeping in Modern Organizational Culture,” *Archival Science* 2 (2002), 159.

⁶ See Terry Cook, “The Concept of the Archival Fonds in the Post-Custodial Era: Theory, Problems and Solutions,” *Archivaria* 35 (1992): 24-37; Dancy, “RAD Past, Present, and Future,” 7-41.

⁷ This kind of best practice also relates to the physical copies of cartographic materials, which are often also part of collections that are largely digital, or have been digitized.

shelving can hold a wide variety of materials.⁸ As I learned more about cartography itself, the highly structured format and intention that infuses all elements of cartographic materials, the similarities between maps and building plans became much clearer.⁹ In order to illustrate the meaning of this statement, I will first discuss this more personal experience before addressing the CLI and CGIS. I hope by the end of the chapter to have demonstrated that these concepts are connected to this case study in ways that are often overlooked.

As I have noted above, architectural materials and cartographic materials are routinely stored together, which reflects the similarities in format. However, I posit that there is another connection between these two types of documents and their physical proximity reveals this common conceptual thread. Plans and drawings contain intentions that are not necessarily expressed in the final construction, or fail to reflect changes that have been incorporated over time. Mapping tends to “differ from some other forms of presentational symbolism in that it often depicts a view that has not actually been seen,” and may in fact never be seen by the majority (if any) of its users.¹⁰ This highlights the narrative and interpretive qualities of the map, as well as the assumption of a specific kind of cartographic literacy, a factor that I have tried to keep in my mind through this process. Whether driven purely by practical storage options or a deeper psychological motivation, the map and the plan do share a certain kind of aspirational quality that does not always reflect outcomes *on the ground*. Putting them together in the archives makes theoretical sense. Beyond this realisation, brought about through experiencing the proximity of certain types of records, how do archival processes reflect the narrative and interpretive qualities of cartographic materials?

In order to discuss materials that map aspects of the “Canadian” landscape it is crucial to address these documents as tools of *ongoing* processes of colonization. This connection between

⁸ Betty Kidd discusses the storage solutions that Canadian archivists at the Public Archives of Canada (now Library and Archives Canada) have used for cartographic materials ranging from horizontal shelving and vertical cabinets, to specially constructed covers and boxes. Kidd, “Preventative Conservation for Map Collections,” *Special Libraries* 71, no. 12 (December 1980), 532-533.

⁹ Terry Cook discusses Dominion Archivist W. Kaye Lamb’s use of the word *fingerspitzengefühl*, in relation to appraisal decisions, which reflected the practice at the time. What interests me about this is that Cook and other Canadian archivists who followed Lamb were correct to questions this practice, but perhaps it should be better understood. For example, maps and architectural plans are not particularly different in aim/intent/outcome – perhaps they do belong together beyond considerations for their oversized format. Emotional responses to materials should not be overlooked. Terry Cook, “Macroappraisal in Theory and Practice: Origins, Characteristics, and Implementation in Canada, 1950-2000,” *Archival Science* 5 (2005), 111.

¹⁰ Arthur H. Robinson and Barbara Bartz Petchenik, *The Nature of Maps: Essays Toward Understanding Maps and Mapping* (Chicago and London: The University of Chicago Press, 1976), 53.

the treatment of cartographic materials in archives could be addressed through Glen Coulthard and Leanne Betasamosake Simpson's "grounded normativity" frameworks. They define settler colonialism as "a structure of domination that is partly predicated on the ongoing dispossession of Indigenous peoples' lands and the forms of political authority and jurisdiction that govern our relationship to these lands."¹¹ In response to the ongoing disruptions between Indigenous peoples and connection to land and resources, Coulthard and Betasamosake Simpson propose a place-based solidarity through the ethical frameworks they term "grounded normativity."¹² Kovach similarly notes, drawing on existing Indigenous scholarship, that place is the differentiating factor between Indigenous Peoples and also a difference between Indigenous and settler societies.¹³ One of the areas I have been struggling with is the notion that records created within the physical space that is now known as Canada would be untethered to the conditions of their creation, namely dispossession of Indigenous lands over the course of a few generations.¹⁴ The separation of what are understood as Indigenous records (either created by or about Indigenous Peoples) from other archival records surely enables settlers and their descendants to maintain their sense of colonialism as a process that *already happened* when it comes to cartographic records and the significance of their creation, use, and reuse. This failure to take responsibility or make a personal connection to decolonization and reconciliation processes can also be connected to the "post-" designation. Linda Tuhiwai Smith explains, "naming the world as 'post-colonial' is, from indigenous perspectives, to name colonialism as finished business," which is not a reality in a place where settler society remains the dominate force of government, education, and culture.¹⁵ In addition, the notion of a 'postmodern' society is also critiqued by Tuhiwai Smith, as Indigenous resistance to colonization and pursuit of justice has continued regardless of these

¹¹ Glen Coulthard and Leanne Betasamosake Simpson, "Grounded Normativity/ Place-Based Solidarity," *American Quarterly* 68, 2 (June 2016), 251.

¹² They refer to "grounded normativity" as "the ethical frameworks provided by these Indigenous place-based practices and associated forms of knowledge" comprised of the "generative relationships and practices that create and maintain Indigenous nationhoods, political practices, sovereignties, and solidarities." Coulthard and Betasamosake Simpson, "Grounded Normativity," 254.

¹³ Kovach, *Indigenous Methodologies*, 61.

¹⁴ Banting Postdoctoral fellow Ranjan Datta (University of Regina) stated that Indigenous Elders, knowledge holders, scholars, educators, youth and TRC perspectives regard the recognition of Indigenous land rights as a prerequisite for reconciliation. Ranjan Datta, "Indigenous Reconciliation: Why, What, and How," *International Journal of Critical Indigenous Studies* 12, 2 (2019), 49, 59.

¹⁵ Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples* 2nd Ed., (London: Zed Books, 2012), 101.

designations.¹⁶ *Coming to know the past*, a part of the critical pedagogy of decolonization, is a process of reclaiming Indigenous histories colonized by dominant Western narratives and worldview.¹⁷ Taiaiake Alfred states that for Indigenous Peoples, “colonization is disconnection from the land.”¹⁸ A reassessment of cartographic materials that incorporates a transdisciplinary approach can aid in the development of archival processes which might better identify the map as a form of colonization rather than an impartial collection of data. As I have researched and written this thesis, I have come to the conclusion that while there are infinite varieties of map, there are two broad categories for mapping. The first is the forward-looking map, which endeavors to chart possible outcomes with certainty; the second looks to the past, documenting what has happened but with the intention of unlimited interpretations. The most meaningful iteration includes both concepts simultaneously; to map where you’re going, you must know where you’ve been. As Kit Hughes notes, archivists become cartographers when they interact with records, attempting to order the landscape they encounter.¹⁹ While I am not suggesting that the specialized expertise and specific skillsets of archiving and mapmaking are interchangeable, there are similar challenges facing the two fields. Acknowledging the power of cartographic materials as a tool of *ongoing* colonization is a constructive contribution to the processes of reconciliation and decolonization in Canadian context.

Cartographic records cannot be treated as purely text-based records, however the nature of cartographic materials as text *and* image is part of a wider discussion on non-textual records in archives. Terry Cook suggests a better understanding of maps as “cultural artefacts,” while Betty Kidd notes that even in the 1980s, historians often left maps out of their pool of primary sources.²⁰ While Cook seems to have placed the onus on the archivist to change this situation, Kidd notes that at both secondary and post-secondary levels, maps are infrequently used by educators, leaving their students with little appreciation for these materials as they begin to engage in their

¹⁶ Tuhiwai Smith, *Decolonizing Methodologies*, 35-36.

¹⁷ Tuhiwai Smith, *Decolonizing Methodologies*, 36.

¹⁸ Taiaiake Alfred, “Don’t Just Resist. Return to Who You Are: Let’s Re-experience Our Homelands the Way Our Ancestors Did and Regenerate That Culture,” YES (Spring 2018), n.p.

¹⁹ Kit Hughes, “Appraisal as Cartography: Cultural Studies in the Archives,” *The American Archivist* 77, 1 (Spring/Summer 2014), 281.

²⁰ Terry Cook, “A Reconstruction of the World: George R. Parkin’s British Empire Map of 1893,” *Cartographica* 21, 4 (1984), 53; Betty Kidd, “Maps as Sources of Historical Evidence,” in *Explorations in the History of Canadian Mapping: A Collection of Essays*, eds. Barbara Farrell and Aileen Desbarats (Ottawa: The Association of Canadian Map Libraries and Archives, 1988), 33.

own academic pursuits.²¹ Whether or not the responsibility of introduction lies with archives or with academic institutions, the responsibility for archivists to maintain a level of understanding of cartographic materials in their care remains significant; if these materials can be properly described by archivists, researchers will be able to locate them through a wider range of subjects. Maintaining a level of cartographic literacy and contextual knowledge is especially relevant in the LAC's Maps, Charts and Architectural Plans Collection. Before I turn to the CLI and CGIS, I will first turn to the history of the collection (known previously as the National Map Collection) by going over its institutional history, and more generally, the history of archival management of cartographic materials.

Betty Kidd began working as an archivist at the Public Archives of Canada (now LAC) in the 1960s and she provides a great deal of insight through her writing during her tenure. She was the director of the National Map Collection when she wrote about its history in the Winter 1981-82 issue of *Archivaria*.²² Kidd placed a great significance on the active collecting of maps, describing the collection as “a microcosm of the history of archives in Canada,” characterized by “false starts and unfulfilled plans,” balanced by “progressive developments and advances.”²³ While she focused half of her article on the early years of the Map Division, here I will simply note that while the collection of maps has been undertaken in an official capacity since 1907, expansion of the collection only began to accelerate after the Second World War; by the 1970s,

²¹ Kidd, “Maps as Sources of Historical Evidence,” 35. Another example of these varied types of research value, Jim Burant discussed the work of British military artists (including engineers, surveyors, and officers) and the creation of documentary art in what are now in eastern, western, and northern regions of Canada. He notes that the majority of archivists are not trained as specialists in art holdings, leading to an underdeveloped appreciation of the context and use of these materials within archives. By developing a better understanding of documentary art, including more research on creators and provenance, the potential of types of records be appreciated by both archivists and researchers is better supported. Jim Burant, “The Military Artist and the Documentary Art Record,” *Archivaria* 26 (Summer 1988), 48.

²² This was a special issue on cartographic archives. While there are a number of sources that discuss the history of mapping in Canada, a similar wealth of sources does not exist for archiving maps in Canada, thus her writing has been a valuable window into the National Map Collection, and I am relying on her observations to form my own understanding of the theory and practice that she utilized during her tenure there. Betty Kidd, “A Brief History of the National Map Collection at the Public Archives of Canada,” *Archivaria* 13 (Winter 1981-82): 3-22.

²³ Kidd includes an excerpt from a document by Holmden in which he characterized the acquisition of an important collection of maps and drawings that had been “bandied from pillar to post until at last they had been absolutely lost sight of, and no one could or would admit any responsibility.” Kidd, “A Brief History,” 5, 21. This characterization was contradicted by Robert J. Hayward, who criticized Holmden’s ignorance regarding the collection’s provenance and custodial history, while also levelling criticism at Kidd for her lack of detail on certain aspects of the Map division. Robert J. Hayward, “‘The Real Nucleus of the Map Collection’: Charting Its Provenance,” *Archivaria* 14 (Summer 1982): 174-180.

the Map Division held around 500,000 items.²⁴ Although a mandate to include both Canadian and international maps contributed to this growth, after 1949 common practice was to collect current maps, as they were produced, and “by the mid-1960s, a systematic acquisition programme for series and separately published maps was instituted, and a very high percentage of the current Canadian map production was being collected by the Public Archives.”²⁵ Key changes to this production included the use of aerial photography, followed by satellite imaging, and the development of digital cartographic tools that standardized representations of geography, while also creating new types of supporting documentation in the form of born-digital media.²⁶ Kidd concluded her history stating that keeping pace with the volume of acquisitions led to a number of different classification systems, as archivists introduced new methodologies and relied on standardization in specific areas.²⁷ Handling the increased volume of cartographic records in machine-readable form was in its early stages in 1982. Kidd indicates the importance of developing preservation strategies and adequately allocate limited resources by “careful rationalization to establish methods of sharing the burden and yet ensuring the task is accomplished.”²⁸

The preservation of cartographic materials relies on the skills of professionals who are willing to augment their knowledge and acquire necessary skills over time. Writing on conservation in map collections, Kidd states “map curators can provide such care by using a combination of common sense and knowledge, both practical and technical, most of which is not taught in any course. Practicing map curators learn through experience, reading in related literature, and discussion with their professional colleagues.”²⁹ A large map collection will have anywhere from several hundred to millions of items in its holdings, and the primary purpose of the collection will impact all aspects of administration and methods of control.³⁰ In their 2015

²⁴ 1946-1973. Kidd, “A Brief History,” 11.

²⁵ Kidd, “A Brief History,” 11.

²⁶ Ralph Ehrenberg lists aerial photography (especially during World War I and World War II) as the most impactful advancement on modern mapmaking, followed by echo-sounding devices, seismic monitoring stations, the 1984 launch of NASA’s mapping satellites, geographic information systems (GIS), and global positioning systems (GPS). Ralph Ehrenberg, “Making of the Modern Map: Advances in Technology Continue to Transform the Ancient Art and Science of Mapmaking,” *Library of Congress Magazine* 5, 5 (September/October 2016), 16-17.

²⁷ Kidd, “A Brief History,” 17.

²⁸ The theme of rationalization will surface later in this chapter in connection to the CLI program and while perhaps I am inferring a deeper meaning than Kidd intended here, in the context of twentieth-century concepts of modernity it is certainly relevant to my own research questions. Kidd, “A Brief History,” 20.

²⁹ Betty Kidd, “Preventative Conservation for Map Collections,” *Special Libraries* 71, 12 (December 1980), 529.

³⁰ Betty Kid, “The Administration of a Large Map Collection,” *Library Trends* (Winter 1981), 475.

“Digital Strategy,” LAC noted that there were “3 million maps, plans and architectural drawings,” in its holdings.³¹ The description of the training detailed by Kidd reveals a certain amount of subjectivity to any and all decisions made about cartographic materials which is relevant to the broader discussion surrounding the assessment of non-textual materials. Ultimately it points to a certain devaluing of materials that fall outside of a text- or even an image-based category. These records are expected to “speak for themselves,” however this is an unsuitable way to approach authored materials.³²

Archival scholars have indicated that until quite recently, a limited amount of archival theory directly addressed cartographic records. This inattention pushed maps to a peripheral position in archives and research on these materials lacked the interdisciplinary scope afforded to other materials.³³ Archivist Andrew Janes suggested that archivists might “draw cartographic records away from the “margins of archivry” and closer to the heart of reflective professional practice.”³⁴ This shift could be supported through an assessment of maps as cultural artefacts with broad significance, as Terry Cook had hoped. In addition to this shift from maps as objective, ‘scientific’ documents to more nuanced source material, development in both cartographic and archival studies reinterpret the map as a recordkeeping technology rather than a discrete item. Janes shows this assessment to be relevant by demonstrating that even a printed map could be updated or changed over time. A map can also be reused regardless of whether any alterations have taken place. He suggests that a more appropriate concept is a mapmaking continuum, with multiple stages of creation.³⁵

Tom Nesmith defines societal provenance as more than an additional layer of information. In his estimation, societal provenance functions as a “societal dimension” that

³¹ Library and Archives Canada, “Digital Strategy 2015 and Beyond,” (Ottawa: Library and Archives Canada, Systemscope, 2015), 2.

³² This notion of a “voice” is supported by the representation of the Canada Geographic Information System (CGIS) as a problem-solving system rather than the actual function of the CGIS, the quick collation of geographic information for fast access. Classifying information as knowledge both removes and devalues the human intentions and actions that produce these materials. The CGIS will be further addressed later in this chapter. Shannon Stunden Bower, “Tools for Rational Development: The Canada Land Inventory and the Canadian Geographic Information System in Mid-twentieth Century Canada,” *Scientia Canadensis* 40, 1 (2018), 63. See also: Terry Cook, “From Information to Knowledge: An Intellectual Paradigm for Archives,” *Archivaria* 19 (Winter 1984-85): 28-49.

³³ Kara A. Quann, “Remapping Archives: Cartographic Archives in Theory and Practice at the Provincial Archives of Manitoba,” (MA diss., University of Manitoba, 2001), 26.

³⁴ Andrew Janes, “Of Maps and Meta-Records: Eighty-Five Years of Map Cataloguing at The National Archives of the United Kingdom,” *Archivaria* 74 (Fall 2012), 120; Cook, “A Reconstruction of the World,” 53.

³⁵ Andrew Janes, “Maps as a Recordkeeping Technology,” *Journal of the Society of Archivists* 32, 1 (April 2011), 119, 122.

permeates all other provenance-related information.³⁶ Like the processual approach to maps, societal provenance is a part of a more fluid understanding of records. However, it is not a simple change to make on a practical level, as Nesmith notes. In other works, Nesmith considers the impact of an expanded understanding of contextuality in terms of defining the concept and incorporating it into the regular work of archives.³⁷ For example, in formal systems of descriptive standards, there is little evidence of the documentation of “much of the subsequent custodial history of the records prior to archiving, the interventions of the archivists, and the uses and impact of the records across time.”³⁸ The issues with multiple provenance in relation to cartographic materials lie largely in the development of archival standards for cartographic materials.

Cartographic records have traditionally been incorporated into archives with methods borrowed from library cataloguing practices. Maps were treated as individual items rather than parts of larger bodies of interrelated, recorded evidence, and provenance received little consideration beyond the most basic attributions.³⁹ However, Hugo L. P. Stibbe discussed the relationship between cataloguing cartographic materials in libraries and archival description in 1999. Noting the “thickness” of archival description as opposed to library catalogue entries he writes, “when the map is individually catalogued without its contextual information and links, it has interest only as a geographical depiction of a site...[n]ot very impressive, in comparison with its archival-record presence!”⁴⁰ Well before this statement was made, archivists’ appreciation for cartographic records as a separate and distinct type of archival material led to initiatives that demonstrated a shift to a specifically archival approach, even if some elements were borrowed from libraries.⁴¹ The 1898 *Manual for the Arrangement and Description of Archives* (known informally as the *Dutch Manual*), describes the arrangement of maps as contingent on form; “[h]ence, volumes should be placed together, loose documents should be assembled in portfolios,

³⁶ Tom Nesmith, “The Concept of Societal Provenance and Records of Nineteenth-century Aboriginal-European Relations in Western Canada: Implications for Archival Theory and Practice,” *Archival Science* 6 (2006), 352.

³⁷ Tom Nesmith, “Reopening Archives: Bringing New Contextualities into Archival Theory and Practice,” *Archivaria* 60 (Fall 2005), 260.

³⁸ Nesmith, “Reopening Archives,” 270.

³⁹ Quann, “Remapping Archives,” 9.

⁴⁰ Hugo L.P. Stibbe, “Cataloguing Cartographic Materials in Archives,” *Cataloguing & Classification Quarterly* 27 3/4 (1999), 457-459.

⁴¹ Dorothy Ahlgren and John McDonald, “The Archival Management of a Geographic Information System,” *Archivaria* 13 (Winter 1981-1982), 59-65; T.R. Schellenberg, *The Management of Archives*, (Washington D.C.: National Archives and Records Administration, 1965), 303.

and maps and charters should be stored separately, because they should be kept in a different manner from other archival documents.”⁴² While this statement reflects best practice for preservation, this physical separation is connected to the separation of media, and may also be necessitated by a lack of specialized training for archivists who deal with these materials.⁴³ There is no indication that the map was approached as an information system, though the intellectual links between the materials should have been maintained in finding aids and catalogues.

The *Rules of Archival Description (RAD)* are an integral part of the Canadian archival process. These rules also demonstrate that the archival treatment of cartographic materials is filtered through frameworks that prioritize a scientific objectivity rather than the subjectivity of the map as a cultural artifact. The proliferation of a content-driven understanding of cartographic materials is rooted in the definitions provided by the field of cartography rather than archival equivalents.⁴⁴ The *RAD* definition reads, “cartographic materials are any documents that represent the whole or part of the earth or any celestial body, normally to scale. Included are two- and three-dimensional maps and plans; aeronautical, navigational, and celestial charts; globes; block diagrams; sections; remote sensing images (e.g. aerial photographs with a cartographic purpose); atlases; and map views.”⁴⁵ This definition places primary importance on the content of these materials, rather than attributing value directly to, for example, the impact of the use of mapping materials. In Canada, a modern nation state built on the foundations of European imperial projects and the expansion of settler-colonist populations, maps are also evidence of ongoing colonial encounters, used to shape the spaces they depict, and not the other way around.⁴⁶ Positioning maps as both tools and narratives rather than science-based facts

⁴² S. Muller, J.A. Feith, R. Fruin, *Manual for the Arrangement and Description of Archives*, trans. A.H. Leavitt (New York: Wilson, 1968), 157.

⁴³ This point is made by Skelton in 1970 and is echoed by archivist Ron Grim in 2016. Skelton, *Maps*, 103; Paige G. Andrew and Katherine Hart Weimer, “Looking Back Moving Forward: An Interview with Ron Grimm, Map Curator and Archivist,” *Journal of Map & Geography Libraries* 12, 3 (2016), 356.

⁴⁴ Harley, *The New Nature of Maps*, 151.

⁴⁵ Canadian Committee on Archival Description. *Rules for Archival Description*, Rev. Ed. (Ottawa: Bureau of Canadian Archivists, 2008), Section 5:4.

⁴⁶ Matthew Sparke, “Between Demythologizing and Deconstructing the Map: Shawnadithit’s New-Found-Land and the Alienation of Canada,” *Cartographica* 32, 1 (Spring 1995), 1. In the following examples, scholars have addressed the impact of mapping out arbitrary political boundaries in North America. See Michael Hogue, *Metis and the Medicine Line: Creating a Border and Dividing a People* (Regina: University of Regina Press, 2015); Lissa K. Wadewitz, *The Nature of Borders: Salmon, Boundaries, and Bandits on the Salish Sea* (Seattle: Centre for the Study of the Pacific Northwest in association with University of Washington Press, 2012); Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (New York and Oxford: Oxford University Press, 1999).

should be an important part of archival description in a reconciliation and decolonization context. However, there are some physical characteristics of cartographic records, including their status somewhere between graphic and textual material, that have allowed archivists to focus on the activities related to preservation challenges, while keeping descriptions minimal.

Herman R. Friis describes maps and their “accessorial data” as “accumulating often as heterogeneous masses of records of numerous different sizes and shapes, they have long taxed the patience of archivists and frequently have become fugitive records.”⁴⁷ Archivists routinely place maps, along with architectural plans and drawings, in designated storage locations due to their fragile and often oversized formats. Writing on National Archives map-handling practices, Friis notes that “[g]raphic mediums, such as the index maps so often used for published maps issued in series, are particularly helpful finding aids.”⁴⁸ However Schellenberg notes that a wide variety of maps could only be “indexed with great difficulty.”⁴⁹

The author-title entry for books is a useful approach for cataloguers and acquisitions personnel but not for map reference use, so alternate rules of entry must be provided for control over map reference collections. A map lies in character between a book and a picture and combines some features of both. The main entry for cataloguing maps should begin with geographical area, followed by subject, date, size or scale, publisher or authority. And notes on edition, series, number of sheets and classification number. The main entry heading is one that is useful in the information it provides.⁵⁰

Aside from the challenges presented by varied physical characteristics and the notable hurdle for Canadian archivists using the *RAD*, as Schellenberg noted, maps are often printed, with an author, date, and publisher included. This gives the impression that such records might be best approached like a published book. However, he cautioned against this understanding since it fails to address the “aerial character [of the map] and ignores the methods of map compilation and the differences between the development of map printing and book printing. The visual character of

⁴⁷ Friis worked at the National Archives and Records Service in the USA, and conducted research on cartographic materials in archives and institutions in both the United States and Canada among other places. It should also be noted that in this article Friis confirms that the practice of addressing content first was encouraged for archivists working with cartographic materials, largely in order to dispel any misgivings harboured about the wide range of materials and formats these records are found in. Herman R. Friis, “Cartographic and Related Records: What Are They, How Have They Been Produced and What Are Problems of Their Administration,” *The American Archivist* 13, 2 (April 1950), 138.

⁴⁸ Quoted in Schellenberg, *The Management of Archives*, 315.

⁴⁹ Schellenberg, *The Management of Archives*, 315.

⁵⁰ Schellenberg quotes then chief of the Map Division of the Library of Congress Archivist C. Gerlach in reference to a debate over whether or not cataloguing maps as books is appropriate. Schellenberg, *The Management of Archives*, 317.

a map can be grasped by considering the amount of text required to explain the spatial relations on even a simple map. Difficulties begin shortly after the title is read.”⁵¹ Placing significance on the theme of inadequacies of the bibliographical approach in archives brings me to Richard Dancy’s reflective article on *RAD*. The implementation of the descriptive standard was successful in Canada, providing archivists and educators with useful tools developed collectively by the Canadian archival community. However, according to Dancy, *RAD* is

burdened by an archaic structure inherited from bibliographic models of the library world that have been abandoned by archivists elsewhere and are no longer current among librarians. This structure makes for a cumbersome and repetitive document, unnecessarily difficult to access, learn, and teach; prone to inconsistencies; resource-intensive to maintain; not easily adjusted to incorporate new descriptive elements of practices; organized into media chapters rooted in an analogue world; and ill equipped to meet the descriptive challenges of digital objects.⁵²

Other descriptive standards such as the *General International Standard Archival Description ISAD(G)* developed in response to the nature of archival materials rather than by adapting an existing standard taken from another field.⁵³ The use of various standards for description, especially in the context of digital materials, further complicates this process. However, it is clear that there are limitations to any approach that does not address the unique qualities of cartographic materials which, as Schellenberg wrote, layer the concepts of text and image.

How can this challenge be addressed? Since the position of the archivist is not one of interpretation but rather to provide necessary contextual information this process relies on a number of factors, including access to resources and the availability of source material. Nesmith states that, “the archival history essay could offer a broad outline of the main types of contextual information relevant to the archives’ holdings,” and that a conceptual approach, developed from a more agile and dynamic descriptive standard reflected in theory developed by Wendy Duff and Verne Harris, “relates both to what may not yet be known about records in actual custody and what may be known about records not in custody.”⁵⁴ Nesmith noted that an effective approach would “base archival work on as much knowledge of the multiple provenances, many contexts of

⁵¹ Schellenberg, *The Management of Archives*, 303.

⁵² Richard Dancy, “*RAD* Past, Present, and Future,” *Archivaria* 74 (2012), 8.

⁵³ This is evident in the table comparing the two descriptive standards where Dancy points out a number of common elements, but also demonstrates the inefficiency of including elements that are seldom needed in archival contexts (*Edition*, *Publisher’s series*, and *Standard number*), or push a substantial amount of descriptive information into one place (such as the *Note Area* which can have up to thirty separate elements within it), Dancy, *RAD*, 15-17.

⁵⁴ Nesmith, “Reopening Archives,” 272.

creation, or the overall history of the records as can be obtained – and then use the power of this provenance information to locate, appraise, describe, make available, interpret, preserve, and protect the integrity of the records.”⁵⁵ This type of approach to cartographic materials could be a useful step in establishing more nuanced interpretations and additional uses for materials viewed as “technical” or “scientific.” The narrative quality of the map and the privileging of specific themes and societal values should be highlighted as part of the potential uses and reuses of these kinds of materials beyond recycling collected geographic data.

One of the most prominent challenges in the shift from technical document to cultural artefact is the way we have treated maps (and by extension, their supporting materials) in circulation. R.A. Skelton’s list of map adversaries is indicative of the uncertain trajectory from active use to archival holdings. In *Maps: A Historical Survey of Their Study and Collecting*, Skelton lists *purpose* as the primary hurdle; a map fulfilled a specific need, such as a boundary dispute, and was no longer of use when this need was met. This is followed by the appearance of *updated versions*; “out of date charts were not only useless, they were also dangerous,” he noted, especially when intended for navigating bodies of water.⁵⁶ Lastly, *format*; as typically oversized documents often lacking protective coverings, maps are exposed to changing conditions of light, temperature and humidity, and natural disaster, further narrowing the margin for acquisition and preservation.⁵⁷ These format-related challenges have influenced archivists’ focus on the physical characteristics of maps. In response to the growth of digital mapping technologies over the past few decades attention to format has remained essential, prompting collaborative work between archivists and scholars and specialists in other fields.⁵⁸

Terry Cook argues for a focus on provenance-based information retrieval, aided by authority records created through archival knowledge of records creation. Instead of discarding

⁵⁵Tom Nesmith, “What’s History Got to Do With It?: Reconsidering the Place of Historical Knowledge in Archival Work,” *Archivaria* 57 (Spring 2004), 27.

⁵⁶R. A. Skelton, *Maps: A Historical Survey of Their Study and Collection* (Chicago and London: The University of Chicago Press: 1972), 31.

⁵⁷Skelton, *Maps*, 28-32.

⁵⁸In the context of this thesis, the International research on Permanent Authentic Records in Electronic Systems (InterPARES) 2 is a relevant example of collaborative work forming the foundation for further research into the challenges of preserving digital cartographic materials. The project summary notes that the in order to meet the goals to “develop and articulate the concepts, principles, criteria and methods that can ensure the creation and maintenance of accurate and reliable records and the long-term preservation of authentic records in the context of artistic, scientific and government activities,” input from members of each of these fields and archivists was included in the project. InterPARES 2 Project, “Project Summary,” InterPARES 2 Project (accessed February 15, 2020), http://www.interpares.org/ip2/ip2_index.cfm

existing methodology and theory, he suggests that archivists would better adapt to change and address challenges by reinforcing it. Instead of assessing value by examining records themselves, “the secret to appraising records is to put a bag over them, and focus on the context of their creation,” including use, asserting the conceptual over the physical character of the records.⁵⁹ Rather than viewing cartographic materials by location, proponents of the processual approach prioritize map creation over content, which supports this macroappraisal strategy. Kara A. Quann argues for a postmodern approach to cartographic materials in her 2001 Masters’ thesis. She notes that one challenge for archivists handling cartographic records is to go beyond the common understanding of mapped representations as factual information compiled with neutral tools. Archivists should instead embrace the more critical assessment of these records as “value-laden products of human activity.”⁶⁰ This involves, as with a text-based record, the archivist’s understanding of both technological attributes and the context of the record’s creation. She suggests that a postmodern approach would include additional context and content which would reveal the intended (primary) and corollary (secondary) map audiences to the archivist or researcher.⁶¹ Moving away from a conception of maps as a “discreet, published item” Quann argues for an increased level of value placed on the process of map creation, which reflects elements of the processual approach to cartography, and expanded definitions of provenance in archival practice.

Joan M. Schwartz has made a similar observation in her work on photographs and other images. She notes that “the impact of the “iconic revolution” of the nineteenth century has received only scant attention from archivists, while the “information revolution of the late twentieth century has sent ripples of panic throughout the profession,” causing “hand-me-down textual approaches” to be routinely employed when more rigorous visual approaches should be

⁵⁹ David Bearman gave Cook this appraisal advice in 1986 after the Deschênes Commission. The Commission had held inquiries “into records scheduling generally, records disposition specifically, and archival appraisal methodologies,” when a Royal Commission of Inquiry uncovered the destruction of records that might have enabled the federal government to locate and deport possible Nazi war criminals. The glaring issues with a life cycle approach to archival records were exposed to the Canadian public and archivists. Cook, “Macroappraisal in Theory and Practice,” 116-117, 123.

⁶⁰ In this assessment Quann points to similar conclusions shared by Matthew Edney. Quann, “Remapping Archives,” 36; Matthew Edney, “What Is a Processual Approach to Mapping?” *Mapping As Process: A Blog on the Study of Mapping Processes: Production, Circulation, and Consumption* (blog), January 11, 2018, <https://www.mappingasprocess.net/blog/2018/1/11/what-is-a-processual-approach-to-mapping>

⁶¹ Quann, “Remapping Archives,” 54.

developed to meet the requirements of graphic materials.⁶² Lori Podolsky Nordland observes that archivist Hugh Taylor and geographer John B. Harley both entreated their colleagues to redefine their approach to documents, in particular to read them “against the grain” and “redefine the map as a representation of power as much as it is a representation of geography.”⁶³ During the early 2000s, further development of the World Wide Web and digital mapping tools transformed way the general public accessed and interacted with cartographic materials.⁶⁴ Archival postmodernism reframes cartographic records as interstitial types of records, firmly attaching archives to the history of technology, social justice movements, and other areas (rather than simply historic cartography). This approach also creates space for collaborative research, but as I have noted earlier in this chapter, does not apply to all of the challenges represented by these materials.

Schwartz’s argument for enhanced contextual knowledge of non-textual records is also relevant to cartographic materials in an archival context. Her conclusions on the viability of traditional archival practices like diplomatics, a highly structured and detail-oriented discipline developed centuries ago to assess the authenticity of official documents, demonstrate that a content-driven approach is unsuitable for non-textual materials.⁶⁵ The core argument Schwartz advances reflects similarities between cartographic materials and photographs; both are “documents, created by a will, for a purpose, to convey a message to an audience.”⁶⁶ Like many archival documents, photographs cannot be understood by content alone and rely on the

⁶² Joan M. Schwartz, “Negotiating the Visual Turn: New Perspectives on Images and Archives,” *The American Archivist* 67 (Spring/Summer 2004), 108-109.

⁶³ Podolsky Nordland presents the maps created by Hudson’s Bay Company employee Peter Fidler as evidence of the crucial role local Indigenous knowledge – in this case from Siksika (Blackfoot) chief Ac ko mok ki. The knowledge he shared with Fidler concerning geographic, topographic, and demographic characteristics of the area around a newly built HBC fort was otherwise unobtainable for a stranger to the region. Lori Podolsky Nordland, “The Concept of “Secondary Provenance”: Re-interpreting Ac ko mok ki’s Map as Evolving Text,” *Archivaria* 58 (Fall 2004): 147-159, 147.

⁶⁴ In response to increased lobbying from a variety of business interests (such as GPS and the automobile industry), the United States Government turned off their Selective Availability (SA) programme in 2000. Previously, SA had maintained a degraded signal for any non-government actor from a few hundred metres to the ground, rendering that information useless to the general public. See Jerry Brotton, *A History of the World in Twelve Maps* (New York: Penguin, 2012), 420; National Coordination Office for Space-Based Positioning, Navigation, and Timing, “GPS.gov: Selective Availability,” GPS.gov (accessed January 11, 2020) <https://www.gps.gov/systems/gps/modernization/sa/>

⁶⁵ This short definition of diplomatics is taken from Schwartz’s article; however, diplomatics is discussed at length by Luciana Duranti in her series of six articles in *Archivaria* 28, 29, 30, 31, 32 and 33. Joan M. Schwartz, “We Make Our Tools and Our Tools Make Us: Lessons from Photographs for the Practice, Politics, and Poetics of Diplomats,” *Archivaria* 40 (Fall 1995), 43-44.

⁶⁶ Schwartz, “We Make Our Tools,” 42.

availability of contextual information to provide a framework of actions and transactions within which to situate creation, use and retention within a matrix of functions. Schwartz emphasizes *functional context* as a means “to shed new light on both informational *and* evidential value and thus increase visual literacy.” She concludes that,

procedures designed two centuries ago to ensure the maintenance of hegemonic power do not determine what does and does not belong in archives, particularly Canadian archives. Our inability to apply a rigid concept of diplomatics to photographs in Canadian archives suggests three areas for further study, each with broad implications for archival institutions, theory, and practice. The first is the evolution of communication technology and its impact on records and record-keeping, the second concerns changing concepts of the nature and uses of memory, and the third involves shifting notions of authority, reality, and truth.⁶⁷

In addition to the traditional archival focus on the content of visual representations over their context, Schwartz also suggests that the logocentric bias within archival education programs and institutions has obscured text as a visual communication tool by separating it from other visual documents in the history of non-textual archival materials.

Cook states that “documentary traces” become obscured by separation of the records based on media, impeding our ability to identify and understand meaningful interrelationships. He uses an example of a map to demonstrate this phenomenon. Rather than acquiring cartographic materials for their content (ostensibly containing previously unknown information), an institution might pursue maps for the technical achievement they demonstrate, or even as examples of the work of specific cartographers.⁶⁸ Cook believed that separation based on media generates a specialized interest that narrows from the general to the specific too quickly and absolutely; archivists prioritize these traces of the medium, increasing the potential for poorly documented intellectual links between physically separated records.⁶⁹ Resulting inconsistencies, compounded by a lack of regular communication between the media divisions in the Public Archives of Canada (now LAC), created the potential to weaken acquisition, custody, and public service activities.⁷⁰ Cook posed two solutions. First, he suggested “the maintenance of the present organization by medium with improved inter-media acquisition coordination and especially the development of common, compatible, cross-media reference aids.”⁷¹ He followed

⁶⁷ Schwartz, “We Make Our Tools,” 63-64.

⁶⁸ Terry Cook, “Tyranny of the Medium: A Comment on Total Archives,” *Archivaria* 9 (Winter 1979-1980), 143.

⁶⁹ Cook, “Tyranny of the Medium,” 144.

⁷⁰ Cook, “Tyranny of the Medium,” 145.

⁷¹ Cook, “Tyranny of the Medium,” 147-148.

this with the more extreme “restructuring of our archives in a manner consistent with the principles of provenance,” giving each archivist the responsibility for all records regardless of medium, which would be divided into either institutional records or private collections.⁷²

In the late 1970’s, the Society of American Archivists (SAA) published five volumes of their *Basic Manual Series* dealing with archival functions. The reception within the archival community was positive and a second series was added, including *Archives & Manuscripts: Maps and Architectural Drawings*, by Ralph E. Ehrenberg, in 1982.⁷³ Ehrenberg recommends that an archivist be familiar with cartographic records, but also “survey all of the related records that are produced in conjunction with maps” in order to form as complete an understanding as possible of the records during appraisal, acquisition, arrangement and description processes.⁷⁴ A map is a recordkeeping system; often a deceptively simplistic means of expressing theoretical concepts and images in a graphic format.⁷⁵ Until the last decades of the twentieth century there was limited research on the use of maps as a part of a larger network of materials. The bulk of cartographic scholarship focused on the how cartographic works were made rather than the effectiveness or impact of these materials from the perspective of users.⁷⁶ Ascertaining which types of materials are necessary for the preservation of cartographic records has received relatively limited attention from professionals. In a 2008, Tracey P. Lauriault, D. R. Fraser Taylor, and Peter L. Pulsifer examined the viability of digital maps over time, citing the incorporation of archival preservation strategies at “the point of creation not after the fact” as a key component of long-term accessibility.⁷⁷

⁷² Cook, “Tyranny of the Medium,” 148.

⁷³ Edward Weldon, “Foreword,” in *Archives & Manuscripts: Maps and Architectural Drawings*, The Society of American Archivists Basic Manual Series (Chicago: The Society of American Archivists, 1982), 3. Ehrenberg’s manual was also well received, although some criticisms were levied towards the section on reference and access, his focus on cartographic archives over smaller map collections, and associated costs. See: J.B. Post, “Reviewed Work,” review of *Archives & Manuscripts: Maps and Architectural Drawings* by Ralph E. Ehrenberg, *The American Archivist* 46, 1 (Winter 1983), 76-77; Doris C. Sturzenberger, “Reviewed Work,” review of *Archives & Manuscripts: Maps and Architectural Drawings* by Ralph E. Ehrenberg, *The Midwestern Archivist* 8, 1 (1983), 44-45; Edward C. Papenfuss, “Reviewed Work,” review of *Archives & Manuscripts: Maps and Architectural Drawings* by Ralph E. Ehrenberg, *The Public Historian* 6, 4 (Autumn 1984), 163-164.

⁷⁴ Ralph E. Ehrenberg, *Archives & Manuscripts: Maps and Architectural Drawings*, The Society of American Archivists Basic Manual Series (Chicago: The Society of American Archivists, 1982), 11.

⁷⁵ Robinson and Bartz Petchenik, *The Nature of Maps*, 1.

⁷⁶ Robinson and Bartz Petchenik, *The Nature of Maps*, 23-24.

⁷⁷ Their research documents an atlas project from the Geomatics and Cartographic Research Centre (GCRC) at Carleton University, and the need for collaborative, interdisciplinary projects such the 2002-2007 International Research on Permanent Authentic Records in Electronic Systems (InterPARES 2) Project. Tracey P. Lauriault, D. R. Fraser Taylor, and Peter L. Pulsifer, “Will Today’s Internet Maps be Available Tomorrow? The Preservation and Archiving of the Cybercartographic Atlas of Antarctica Through Action Research,” in

Like photographs, maps are produced with tools that impact the document at the time of creation; each subsequent interaction between these materials and an archivist, researcher, or other user will add layers of meaning and metadata. I have found this concept to be useful, especially from an archival perspective. Addressing the information and themes represented by the visual data of a map, without looking further seems like the most straightforward way to deal with cartographic materials. After all, as T.R. Schellenberg stated, cartographic and pictorial records have traditionally been characterized as “mainly important from the point of view of their subject matter, not from the point of view of their provenance and functional origins.”⁷⁸ However, the archival task of establishing the relevant relationships between records indicates that the value of cartographic records should more logically be predicated on the availability of contextual metadata and supporting documentation *in addition* to knowledge of the content of a published map. Supporting materials provide the researcher or archivist with important resources and perspectives as they represent the processes that culminate in a single map. The map, much like Foucault’s definition of the ‘statement,’ “circulates, is used, disappears, allows or prevents the realization of a desire, serves or resists various interests, participates in challenge and struggle, and becomes the theme of appropriation or rivalry.”⁷⁹ Cartographic materials should not be approached through a framework that prioritizes the content of a map as it represents only one presentation of collected data.⁸⁰ I am particularly interested in the ways in which traditional and contemporary methodologies intersect through collaborative approaches to cartographic challenges. Thus far in my research (which is by no means *finished* or contained by a rigid boundary) the most compelling definition of the map, which is generally seen as an intersection between science and art, and a cultural artefact, might be Foucault’s definition of the statement,

International Perspectives on Maps and the Internet. Lecture Notes in Geoinformation and Cartography, M.P. Peterson, ed., (Berlin: Springer, 2008), 418; InterPARES 2 Project, “Project Summary,” InterPARES 2 Project (accessed July 4, 2020), http://www.interpares.org/ip2/ip2_index.cfm

⁷⁸ Schellenberg, *The Management of Archives*, 325.

⁷⁹ Michel Foucault, *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith (London and New York: Routledge, 2002), 118.

⁸⁰ This argument does not intend to devalue the varied types of uses to which these records can be put, regardless of the functional context of their creation. The preservation of contextual information is crucial for my argument here, and is supported in Anastasia Rodgers’ article which encourages the user to look beyond the City of Toronto’s motivation for documenting the construction of the Bloor Viaduct. Jill Delaney takes this argument to the next level by examining the relationship between photography, geography, and the supporting documents created around the process of land surveys in Canada. Anastasia Rodgers, “Constructing Beauty: The Photographs Documenting the Construction of the Bloor Viaduct,” *Archivaria* 54 (Fall 2002): 72-91; Jill Delaney, “An Inconvenient Truth? Scientific Photography and Archival Ambivalence,” *Archivaria* 65 (2008): 75-95.

as the quoted passage above can attest. In this sense, a postmodernist approach does in fact form a solid framework from which to address cartographic materials. But does this apply to the archival context as easily? While I was initially inclined to believe that it does, this approach is complicated not only through an archival relocation, but also by the settler-colonial context of Canadian institutions.

In the context of this processual approach the materials collected for the Canada Land Inventory (CLI) represent a complex set of cartographic and archival processes for both archivists and researchers. My focus on the CLI and CGIS was a deliberate choice. I was interested in materials in a federal archive that could emphasize the wide variety of outcomes and impacts that these kinds of materials have had and continue to have in Canada. Although it was a federal initiative, and a highly centralized endeavor, the activities involved in creating and preserving these materials have taken place largely on the peripheries and in the interstitial spaces of Canadian geography. Prioritizing these peripheral connections within the archives is evident in the changing approaches to cartographic materials at LAC. A particularly interesting example of non-textual and multi-media records are those produced through the use of Geographic Information Systems (GIS). In order to address the various aspects of the CLI and associated CGIS in an archival context, I will first discuss the history of this system, followed by a closer look at the trajectory of these materials *after* creation.

The CLI, which can currently be accessed online through Agriculture and Agri-Food Canada (AAFC) and the Canadian Soil Information Service (CanSIS) is described by the government of Canada as:

a comprehensive multi-disciplinary land inventory of rural Canada, covering over 2.5 million square kilometers of land and water. Land capability for agriculture, forestry, wildlife, recreation, wildlife (ungulates and waterfowl) was mapped. Over 1000 mapsheets at the 1:250,000 scale were created during the 1960's, 70s, and early 80's. Although the information is old, and better information is available for some areas as part of more recent soil surveys, the interpretations are still largely valid, and many jurisdictions still use them for land use planning purposes. There are seven classes used to rate agricultural land capability. Class 1 lands have the highest and Class 7 lands have the lowest capability to support agricultural land use activities. Subclasses are used to identify specific limiting factors for each class.⁸¹

⁸¹Government of Canada, "Canada Land Inventory (CLI), National Soil DataBase (accessed May 22 2020), <http://sis.agr.gc.ca/cansis/nsdb/cli/index.html>

Scans of the printed maps published under the Agricultural Rehabilitation and Development Administration (ARDA) in the 1960s and 1970s are available to view and download along with GIS datasets and the CLI Agriculture and CLI themes. The data is free to use with acknowledgment of the AAFC's authorship.⁸² At LAC, an archives search shows that materials from the CLI can be found in the Department of Environment Fonds, in the Canada Land Inventory, Lands Directorate series, as a sub-series of the Environmental Conservation Service (ECS) series. Some materials are in a separate accession gifted to the Canada Land Inventory map collection.⁸³ The custodial history for the materials states that the CLI program was proposed by the Senate of Canada's Special Committee on Land Use in 1958, further developed during the 1961 Resources for Tomorrow Conference in Montreal. In 1963 the federal government established the CLI program with an Order-in-Council authorizing \$25,000,000 over ten years to fund CLI development and the creation of the computerized mapping system to support access to the collected data. The federal government would coordinate with the provinces through the Department of Regional and Economic Expansion until 1971, when this role was transferred to the Lands Directorate, Department of Environment.⁸⁴

English geographer Roger Tomlinson is credited with the development of the Canada Geographic Information System (CGIS), the first operational GIS in the world, with a computer system developed by IBM to accommodate the Canada Land Inventory (CLI).⁸⁵ Tomlinson characterized geographic information systems, which were being developed by various sectors to meet specific requirements, as

a digital system for the analysis and manipulation of a full range of geographical data, with associated systems for inputting such data and for displaying the output

⁸² Government of Canada, "Canada Land Inventory (CLI), National Soil DataBase (accessed May 22 2020), <http://sis.agr.gc.ca/cansis/nsdb/cli/index.html>

⁸³ Rather than transferred from other parts of the government, 1100 CLI maps were gifted to the CLI Map Collection by Michel A. Comeau in Ottawa, Ontario. This accession is linked to the ECS series in the Related Materials field of the LAC description. Library and Archives Canada, "Canada Land Inventory Maps," Archives Search, (Library and Archives Canada: Ottawa, n.d.), http://collectionscanada.gc.ca/ourl/res.php?url_ver=Z39.88-2004&url_tim=2020-05-

[23T19%3A53%3A55Z&url_ctx_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Actx&rft_dat=3691606&rft_id=info%3Aid%2Fcollectionscanada.gc.ca%3Aapam&lang=eng](http://collectionscanada.gc.ca/ourl/res.php?url_ver=Z39.88-2004&url_tim=2020-05-23T19%3A53%3A55Z&url_ctx_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Actx&rft_dat=3691606&rft_id=info%3Aid%2Fcollectionscanada.gc.ca%3Aapam&lang=eng)

⁸⁴ Library and Archives Canada, Custodial History, Canada Land Inventory (CLI) [cartographic material (electronic)], Environmental Conservation Service [textual record, cartographic material] R653-261-3-E. http://collectionscanada.gc.ca/ourl/res.php?url_ver=Z39.88-2004&url_tim=2020-05-23T21%3A11%3A19Z&url_ctx_fmt=info%3Aofi%2Ffmt%3Akev%3Amtx%3Actx&rft_dat=212636&rft_id=info%3Aid%2Fcollectionscanada.gc.ca%3Aapam&lang=eng

⁸⁵ Karen K. Kemp, "Canada Geographic Information System (CGIS)," *Encyclopedia of Geographic Information Science* (Los Angeles: SAGE Publications, 2008), 18.

of any analyses and manipulations. In geographical information systems the emphasis is clearly on these latter functions, which provide the main motivation for using digital methods.⁸⁶

In 1967, while working as a data processing coordinator for the Agricultural and Rural Development Administration (ARDA) on the CLI, Tomlinson wrote an introductory text on the CGIS.⁸⁷ He explained that the Canadian government, coming to terms with the difficulties of developing natural resources on such a large scale, established ARDA to address how best to collect and utilize data on “land, water, and human resources.”⁸⁸ The CLI was compiled in an effort to collect this data, while the CGIS allowed access to this extensive data in a manageable format. Supported by the CGIS, the CLI functioned as an automated resource for mapping and analysing “land capabilities for agriculture, forestry, recreation, and wildlife for the purposes of regional planning.”⁸⁹ Historian Shannon Stunden Bower cites a 1954 article by geographer F. Kenneth Hare as the first call for a “national inventory of land and resources.”⁹⁰ This suggestion was then firmly tied to the notion of “future prosperity” by the federal and provincial governments that later supported the CLI.⁹¹ I would like to emphasize the link between mapping initiatives and the notion of “rational” development of natural resources as a relevant contextual element of cartographic materials for archivists. Stunden Bower states that development, as both an ideology and practice, is visible in the federal government’s ARDA legislation:

Development involved deliberate, government-led efforts to change human behavior, and especially behavior related to natural-resources use, thought by proponents to lead to improved outcomes in line with urban-industrial modernity. Importantly, this conception of modernity, development’s implied endpoint, was narrow. The development imperative animating mid-twentieth century federal-government policy was fueled by the presumption that the lifestyles believed to characterize prosperous urbanized and industrialized areas were good for

⁸⁶ In his article, Tomlinson focused on forestry, property and land parcel data, utilities, transport, facility and distribution planning, civil engineering, and agriculture and environment. R. F. Tomlinson, “Current and Potential Uses of Geographic Information Systems: The North American Experience,” *International Journal of Geographical Information Systems*, 1, 3 (1987), 204.

⁸⁷ R. F. Tomlinson, *An Introduction to the Geo-Information System of the Canada Land Inventory* (Ottawa: Agriculture and Rural Development Administration, 1967).

⁸⁸ Tomlinson, *An Introduction*, 1.

⁸⁹ Heather McAdam-Ferrarotto and Susan Mowers “Putting Canada Back on the Map: The Need for Updated Maps of Canada,” ACMLA/ACACC Policy Brief (February, 2007), 2. https://acmla-acacc.ca/docs/ACMLA_Policy_Brief_Feb_2007.pdf

⁹⁰ Quoted in: Stunden Bower, “Tools for Rational Development,” 44.

⁹¹ Stunden Bower, “Tools for Rational Development,” 45.

everyone and desired by most, and that those who did not seek them needed assistance in adjusting their aspirations.⁹²

The use of the CGIS to accommodate the data collected in the CLI was presented as a practical solution to the abundance of map sheets generated by a nation-wide resource mapping project (figure 1). The CGIS consisted of two parts, what Tomlinson described as the “data bank” and the “information system.” The data bank held the collected data, while the information system consisted of the “set of procedures and methods for moving the data into the bank, and for carrying out the manipulations, measurements, and comparisons.”⁹³ Tomlinson explained that that subsequent policy and planning summaries would generate an estimated 30,000 map sheets of varying scales, creating a situation “where the amount of data precludes their use.”⁹⁴ Human interventions could not produce meaningful and timely analysis for administrative purposes, therefore a “system whereby the map and related data could be stored in a form suitable for processing by a computer, which is also a computer-oriented system capable of rapid measurement and comparison of the data,” was designed and developed in 1963, with routine use scheduled for September of 1967, the same year of Tomlinson published his *Introduction*.⁹⁵

⁹² Stunden Bower, “Tools for Rational Development,” 46.

⁹³ Tomlinson, *An Introduction*, 3.

⁹⁴ Tomlinson, *An Introduction*, 2.

⁹⁵ Tomlinson, *An Introduction*, 2.

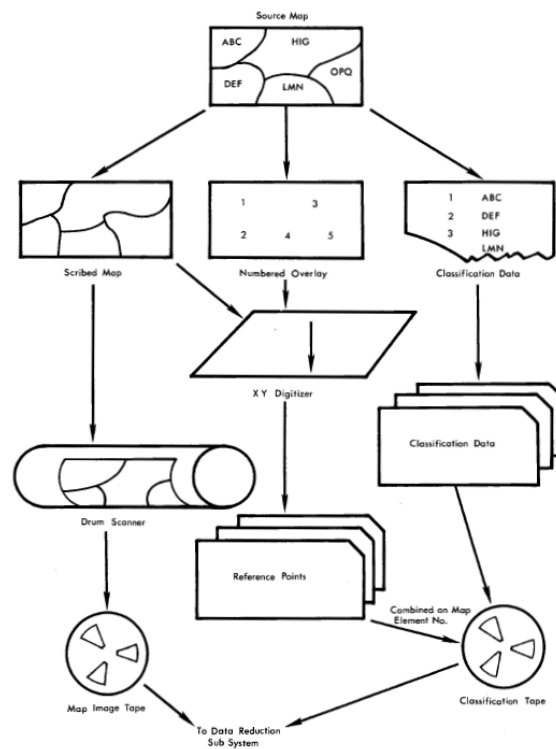


Figure 1. Diagram Showing Flow of Data Preparation Procedures.⁹⁶

⁹⁶ R. F. Tomlinson, *An Introduction to the Geo-Information System of the Canada Land Inventory* (Ottawa: Agriculture and Rural Development Administration, 1967), 9.

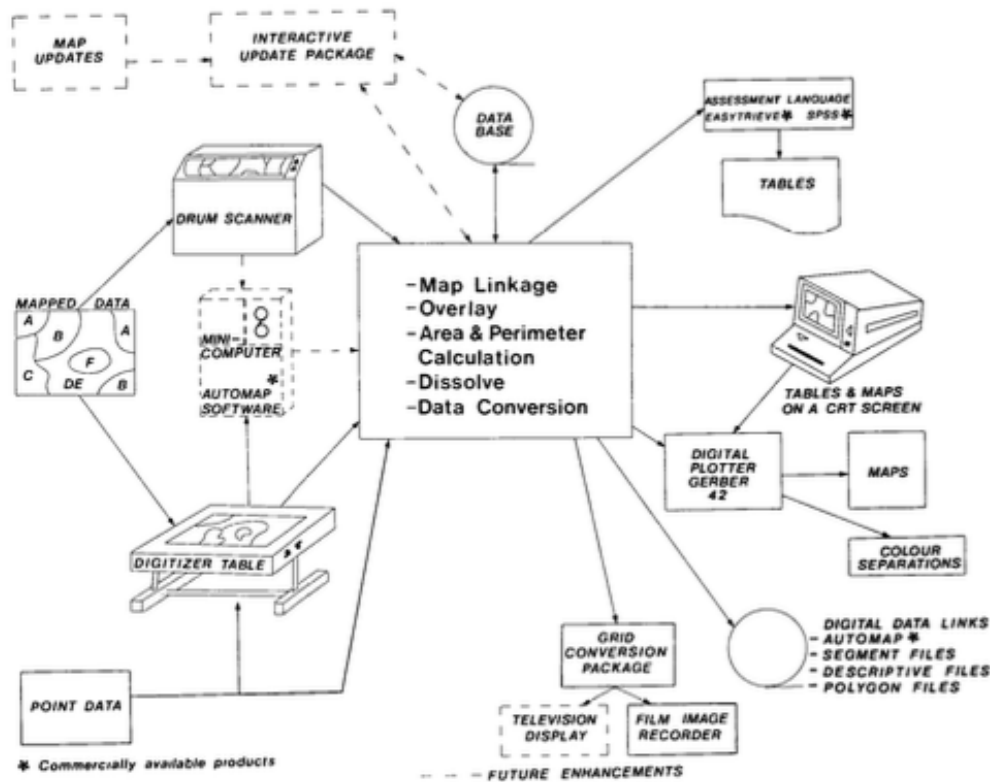


Figure 2. Illustration of the CGIS scanning and digitizing processes.⁹⁷

As both figures 1 and 2 demonstrate, data input involves multiple steps, machines, and time to ensure the materials are accessible through the system's data base.⁹⁸ The drum scanner provided "rapidity, accuracy, low cost, and the handling of a large number of maps. Line following digitizing, using a digitizing table, [was] also available for both polygon and point

⁹⁷ Terry Fisher and Connie MacDonald, "An Overview of the Canada Geographic Information System (CGIS)," *AutoCarto 4* (1979), 611.

⁹⁸ Tomlinson states that a full-sized map (48" x 48") would take 15 minutes to scan, including mounting and dismounting the map, using the drum scanner. Smaller sheets would take less time, but this would vary according to size. Tomlinson, *An Introduction*, 8. David Millar's 1968 documentary film also demonstrates the process – the National Film Board of Canada's description notes that the short "examines the workings of this new and mysterious machine," the Canada Land Inventory Geo-information System. It is interesting to note that over fifty years later, the characterization of the system as mysterious still encourages the viewer to overlook the human intervention that creates both the system and the data it holds. National Film Board of Canada, "Data for Decision," Ottawa: NFB, 1968. (accessed May 22 2020), https://www.nfb.ca/film/data_for_decision/

data, All images and descriptive data [were] carefully edited to ensure an error free data base.”⁹⁹ This description of the scanning process demonstrates the significant human intervention that took place between the compiling and scanning or digitization of the maps created for the CLI. A processual approach to the study of maps promotes analysis that considers production, consumption, and circulation equally, emphasising a deliberate separation from “the well-established teleologies of cartographic progress.”¹⁰⁰ Similarly, it could be productive to disentangle similar categories in an archival context, elaborating on the distribution and subsequent uses of mapped data in addition to production indicated by the inclusion of the creator in the archival description.

The CLI program spanned the 1960s and 70s, and I initially imagined that this could offer some insight into the transformation of technologies and approaches over time. Since the CGIS materials were produced with retention intended from the start, they should reveal in some ways a “best case scenario” for the preservation of cartographic materials. This was in fact the opposite of what happened to these materials. Peter Schut, who began working at AAFC in 1992, recounts the decline of the CGIS and the near complete loss of the CLI data in a 2010 article. In this piece he makes a number of observations that highlight the ambiguous role of technology in records creation and the importance of deliberate and early preservation strategies for digital materials. By the late 1980s, he explains, the CGIS was no longer in use, and, when he began to search for the CLI data that might support his own work, only one person had kept the “boxes and boxes of tapes, and racks of documentation that was useless without a computer to run it on.”¹⁰¹ Despite the cost and time that had gone into the CLI program, no one was actually officially responsible for the materials. It would seem that the adversary of the map, digital or paper, remains obsolescence. Whether that means, as Skelton stated, the purpose of the map has been met, the information has been updated, or the form has deteriorated, this is not an unknown (or even new) aspect of mapping. In 1998 the group of “empowered employees and one private citizen determined to see it through” successfully recovered the CGIS database, along with CLI

⁹⁹ Terry Fisher and Connie MacDonald, “An Overview of the Canada Geographic Information System (CGIS),” *AutoCarto 4* (1979), 612.

¹⁰⁰ Matthew Edney, “What Is a Processual Approach to Mapping?” *Mapping As Process: A Blog on the Study of Mapping Processes: Production, Circulation, and Consumption* (blog), January 11, 2018, <https://www.mappingasprocess.net/blog/2018/1/11/what-is-a-processual-approach-to-mapping>

¹⁰¹ Schut credits Vee Neimanis, the last person responsible for the decommissioned CGIS, with the foresight to keep the data in case it could be recovered for future use. Schut “Back from the Brink,” n.p.

themes, after years of uncertainty. The themes are now in the public domain. “The CLI is safe,” wrote Schut, “for now.”¹⁰² What is unclear is the amount of contextual information that is accessible to potential users; the motivations behind the CLI program impacted what kinds of data were collected as the primary function of the program was to further resource development, a designation that carries a specific meaning embedded in the social and economic frameworks of a modern, post-war Canada.

Tomlinson indicates that during the early years of development and use GIS, documentation of the creation and implementation processes was not centralized in a meaningful way. He expressed concern in the late 1980s that government at the federal level had neglected to conduct comprehensive appraisals of the uses of GIS or captured the practical experiences of working with the technology.¹⁰³ Addressing this gap, Tomlinson discussed GIS in relation to five sectors: (1) forestry, (2) property and land parcel data, (3) utilities, transport, facility and distribution planning, (4) civil engineering, and (5) agriculture and environment. He lists the crucial ways each sector impacted the technology, and the challenges faced by both developers and users. Tomlinson explains that “the human problem” was the most significant hurdle for a more widespread use of GIS. Peter Schut’s experience with the CLI confirms that the concerns Tomlinson expressed for general neglect and lack of documentation were replicated in other areas as well. This perceived shortcoming is connected to the introduction of new technology, “which requires not only a new way of doing things, but also has as its main purpose permitting the agency to do many things which it has not done before and often does not understand.”¹⁰⁴ This description of the challenges involved in the use of GIS is particularly relevant when considering the challenges faced by the archivists who would then take on the materials created

¹⁰² Schut “Back from the Brink,” n.p.

¹⁰³ R. F. Tomlinson, “Current and Potential Uses,” 203-204.

¹⁰⁴ R. F. Tomlinson, “Current and Potential Uses,” 211. In this climate of new experiences and unknown outcomes, a critical perspective towards GIS began to take shape. By the early 1990s scholars in the field such as Jeremy Crampton, Trevor Harris, John Pickles, and Nicholas Chrisman supported an expanded conceptualization of GIS; beyond the technical exercise, users and developers were encouraged to consider GIS as “situated within cultural, social, economic and ethical contexts.” L. Jesse Rouse, Susan J. Bergeron, and Trevor M. Harris, “Participating in the Geospatial Web: Collaborative Mapping, Social Networks and Participatory GIS,” in *The Geospatial Web: How Geobrowsers, Social Software and the Web 2.0 are Shaping the Network Society*, eds. Arno Scharl and Klaus Tochtermann (London: Springer-Verlag London Ltd., 2007), 154. By 2005, some geographers were pondering whether critical theory could maintain a place in GIS. They note that despite a wider acceptance and interest in critique within their field, “critical GIS” [remained] an oxymoron for many GIS users and critical social theorists.” GIS has also been described as one of the most common, but also misunderstood, technologies in contemporary society. Francis Harvey, Mei-Po Kwan, and Marianna Pavlovskaya, “Introduction: Critical GIS,” *Cartographica* 40, 4 (Winter 2005), 1.

through fast-paced technological change.¹⁰⁵ This theme extends to thinking about meaningful ways to address and incorporate decolonization and reconciliation approaches in archival processes. However, while there were challenges involved in ensuring access and preserving data collected for the CLI, I will turn to the GIS as a model for archival processes. The shortcomings that Tomlinson later identified in the field did not preclude a positive assessment of the geographic information system as a model for archivists to study.

In response to Cook's article on the threat of a "tyranny of the medium," Dorothy Ahlgren and John McDonald presented GIS as starting point to achieve a version Cook's first proposed solution to this challenge (i.e. virtual unification across media through description) in 1981.¹⁰⁶ GIS processes, as shown in figures 1 and 2 above, represent an example of upholding provenance despite media segregation. Ahlgren and McDonald caution against rejecting media specialization. Although the risk of compromising contextual information in favour of a fixation on the medium was a real concern, specialization also challenged archivists to broaden their understanding of the record beyond traditional text-based documents.¹⁰⁷ Information systems, like the CGIS could only be adequately managed by exploiting the positive side of media specialization. An archivist responsible for an entire system would need to consider the impact of fragmentation on the integrity of archival materials even when the structure of the system is relatively simple. The authors explain that in order to appropriately acquire a multi-media system like the CGIS in the late 1970s, "policy documents, maps, magnetic tapes, reports, and aerial photographs would have to be preserved," with four or more divisions of the Public Archives of Canada responsible for preservation of these materials.¹⁰⁸ However, the organic whole of the information system is the most important part of the implementation of control functions. Rather than focusing on the physical separation necessitated by preservation strategies, the archivist

¹⁰⁵ Archival scholars are interested in interdisciplinary approaches in the context of methodologies, and aid in the application of concepts like multiple provenance, as demonstrated by Cook, Eastwood, and Nesmith's articles. Cook, "What is Past is Prologue," 20; Tom Nesmith, "Still Fuzzy, But More Accurate: Some Thoughts on the 'Ghosts' of Archival Theory," *Archivaria* 47 (Spring, 1999), 140. However, there is an important distinction between drawing on external theory and methodologies to support archival functions. Terry Eastwood notes that the "archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have. Thus, the large theoretical question is what are those properties that need to be protected and why." To achieve this, archivists need not look to other fields for their theory, but can build it from the inside out. Eastwood, "What is Archival Theory" 124-125.

¹⁰⁶ Ahlgren and McDonald, "Archival Management," 59.

¹⁰⁷ Ahlgren and McDonald, "Archival Management," 60.

¹⁰⁸ Ahlgren and McDonald, "Archival Management," 63.

should be compelled to maintain the intellectual unity of the system by relying on established archival approaches: acquiring both the form and the substance.¹⁰⁹

While corresponding with archivists at LAC during my research for this thesis, I was informed that the scope and size of the cartographic materials archivists assess, and the heterogeneity of types of data and the media on which it was recorded, impact their ability to provide access to some of these materials. There are large or unwieldy formats, which slows efforts to digitize materials, limiting accessibility. The division of materials by media creates additional complexities for the processing archivists as the various components must be located and amassed, while any sort of revisions to the series and item identification must be approached carefully in order to preserve the integrity of the original processing, which represents a significant part of the history of these records. Map data, due to the large quantity and varied formats of supporting materials was described by one of the archivists as “ungainly and awkward.”¹¹⁰ Figures 1 and 2 demonstrate how data was processed using the CGIS, relying on various media and tools to complete this process. It would be challenging for experienced archivists to parse through these materials, let alone someone like myself, a student researching their MA thesis.

Using Canadian government records, including cartographic materials, court and other legal documents, Haudenosaunee historian Susan M. Hill was able to trace the persistence of traditional Haudenosaunee values operating within the colonial system in her book *The Clay We Are Made Of: Haudenosaunee Tenure on the Grand River*. Traditional practices of property dispersal, concepts of land ownership and community resources, and intergenerational roles and responsibilities are visible if these documents are read by a person with access to specific types of knowledge and experience.¹¹¹ However, established archival practices can separate the

¹⁰⁹ Ahlgren and McDonald, “Archival Management,” 64. This example also demonstrates that while the challenges of preserving cartographic materials, as part of a system and for the long term, has only recently become an area of importance for cartographers, archivists have been thinking about these challenges for decades. See: Lauriault, Fraser Taylor, and Pulsifer, “Will Today’s Internet Maps be Available Tomorrow?”; InterPARES 2 Project, Tracey P. Lauriault and Yvette Hackett, “Case Study 06 Final Report Cybercartographic Atlas of Antarctica,” *InterPARES 2 Project* 2007 (accessed April 4, 2018), http://inter pares.org/ip2/ip2_case_studies.cfm?study=5.

¹¹⁰ LAC archivist Sarah Hurford and communications advisor (Public Affairs) Joanne Guillemette in conversation with the author, November 26, 2019.

¹¹¹ Susan M. Hill, “The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River” (Lecture, 2018 James A. Jackson Memorial Lecture, University of Manitoba, Winnipeg, March 1, 2018). See also: Susan M. Hill, *The Clay We Are Made Of: Haudenosaunee Land Tenure on the Grand River* (Winnipeg: University of Manitoba Press, 2017).

materials from the contributors that made their creation possible. As Greg Bak notes, archives are not simply passively accumulated, but actively created. The use of terminology that indicates passive or organic processes “mask social and professional/cultural forces that define theory and practice of archives, including what counts as an archival record, the pathways by which records may arrive at archives, and the role of the archivist in creating the archives.”¹¹² Jennifer Douglas recognized that the conventions of archival theory discourage archivists from preparing descriptions that deviate from the “traditional notions of archives as impartial and natural and of archivists as objective and neutral.”¹¹³ Her assessment was in the context of writer’s archives, focusing on three different ways in which these fonds can be manipulated; first through the creator of the archives, followed by the archivist, and finally by other interested parties.¹¹⁴ In the context of cartographic materials this observation is also relevant, as the history of the CLI and CGIS demonstrates, the active parties behind the creation of these materials were using technologies designed to meet the parameters of what government perceived as modernization, development, and future prosperity. The land was shaped by the data collection, which focused on a fixed set of possible uses and manipulating possible outcomes. Not only are these materials and datasets still in use (through CanSIS) the content can be accessed without the context which positions the federal government as an active creator, rather than a neutral collector of this index of natural resources.¹¹⁵ While there is a marked difference between the experience of reading through the online LAC descriptions of the CLI data and downloading the CLI themes from the CanSIS website, the perception of a map as a data repository rather than as a “value-laden [product] of human activity” is the primary outcome.¹¹⁶ If these human activities are well-documented in archival descriptions, the nature of the materials becomes more transparent.

The concept of archivists as cartographers is, as noted above, not necessarily shared by cartographers or geographers. The near total loss of the CLI materials demonstrates that the development of professional partnerships and collaboration (like those that produced the CLI in

¹¹² Greg Bak, “Not Meta Just Data: Redefining Content and Metadata in Archival Theory and Practice,” *Journal of Archival Organization* 13, 1-2 (2016), 2.

¹¹³ Jennifer Douglas, “Toward More Honest Description,” *The American Archivist* 79, 1 (Spring/Summer 2016), 50.

¹¹⁴ Douglas, “Toward More Honest Description,” 27.

¹¹⁵ As Terry Cook and others noted the medium itself is part of the message; context (such as physical characteristics) is not a “luxurious frill but essential knowledge to permit the location and appraisal of records, their arrangement and description, and their intelligent use by all manner of researchers.” Terry Cook, “Legacy in Limbo: An Introduction to the Records of the Department of the Interior,” *Archivaria* 25 (Winter 1987-1988), 82.

¹¹⁶ Quann, “Remapping Archives,” 36.

the first place) should also include efforts by archivists to clarify and share their knowledge of what archival processes include. The documentary heritage of these lands takes as many forms as there are methods of communication. A processual approach, which is an expansion of the postmodern reading of maps and their associated materials, and addresses this specific type of record and the way it is *actually* used. This is perhaps an uneasy position for an archivist as the interpretation of records is not generally perceived as a part of the job description. However, in understanding the history of the record it is possible to include multiple layers of provenance as well as multiple layers of impact. Shifts from the central to the peripheral could provide a pathways toward a better understanding of the impact of these documents and their continued use; a process- rather than product-centred approach. This calls for a transdisciplinary approach to these records. The intention here is to draw attention to the record as more than cartographic, though certainly, this classification is still useful to certain types of research. The overarching goal is to include information that firmly defines the authored nature of the materials where possible, or pointing to the gaps where they exist. For example, the Government of Canada notes the information in the CLI printed maps and datasets “is old, and better information is available for some areas as part of more recent soils survey, the interpretations are still largely valid, and many jurisdictions still use them for land use planning purposes.”¹¹⁷ However the influence of quantitative geography was at work in the original development, which prioritizes what has been termed a “god’s-eye view.” In Stunden Bower’s estimation, this approach “failed not only to encompass the historical processes that created patterns of inequality, but also to accommodate the perspectives of those with a different ambitions for the future.”¹¹⁸ This connects to the conceptualization of the map as a form of “presentational symbolism” and depicts a view that has never actually been experienced by those involved, whether map creators or map users.¹¹⁹ In archival contexts there is an opportunity to acknowledge this disparity, perhaps most noticeably (to archival researchers) in additional description, but also in more subtle ways that could affect processes of arrangement or terms of access.

This case study illustrates the rift that still persists between theoretical developments and archival practice, while also revealing the role of both cartography and archives in

¹¹⁷ Government of Canada, “Canada Land Inventory (CLI),” National Soil DataBase (NSDB), (accessed June 11, 2020), <http://sis.agr.gc.ca/cansis/nsdb/cli/index.html>

¹¹⁸ Stunden Bower, “Tools for Rational Development,” 64.

¹¹⁹ Robinson and Bartz Petchenik, *The Nature of Maps*, 53.

the formation of Canada as a modern colonial state and in the ongoing dispossession of Indigenous Peoples. Arguing that an archival shift in the conceptualizations of cartographic materials is necessary to more accurately reflect the impact of cartography and cartographic materials, I have explored the management of materials from CLI in response to Eastwood's assertion that "the archival discipline consists in building knowledge about archival documents and acting upon them in methodical ways to protect the properties that they have."¹²⁰ Cartographic materials, like other non-textual materials, should be understood and contextualized with attention to positioning within a record-keeping system, and as cultural artefacts rather than technical documents. Critical attention to the subjectivity of maps, archives, and digital technologies has the potential to enhance and expand descriptive standards in the archives while also contributing to more diverse and creative uses for these materials that transcend the creators' original use or intention. Incorporating a transdisciplinary approach to these materials, I suggest archival adaptations of a processual approach to cartographic records, and the inclusion of geo-epistemologies in the process of description. These are only two possibilities, however the concept of using cartographic tools in archival work is not new (as the next chapter will demonstrate). By incorporating a processual approach and geo-epistemologies in this case study, I have attempted to position these developments in cartographic theory as viable archival approaches meriting consideration in support of cartographic materials.

¹²⁰ Terry Eastwood, "What is Archival Theory and Why is it Important?" *Archivaria* 37 (Spring 1994), 125.

Chapter 3:

A Cybercartographic Approach: Putting Cartographic Tools to Work in the Archives

In this chapter, my focus shifts from cartographic materials in the archives to cartographic tools and technologies that can be utilized in an “archival” way. I will turn to the processes of production that support the map as a performative, reflexive form of information organization, rather than the “inventory of the land” compiled by and for the state. As I have noted in an earlier chapter, elements of critical cartography have the potential to constructively contribute to archival theory and practice, relating specifically to the ways in which cartographic materials are handled by archivists, or more broadly to the professional archives culture as a whole.

The following discussion addresses the “unscientific” origins of the digital map and establishes that mapping is already used in an administrative capacity in archives. I will also address the second case study, which contemplates the development of a cybercartographic approach as a model for archival approaches. I will look specifically at the creation of the Residential Schools Land Memory Atlas, and the modules connected to my role as a research assistant on this project. The Atlas represents a creative approach to mapping using a critical framework that promotes participatory research projects and education as components of reconciliation processes. As Cook noted, the custodial and curatorial definition of “total” archives needs to be transformed in a way that better reflects “a virtual total archives system,” and recasts archiving as a “participatory “total” process in society.”¹ Inspired by Cook, I make an argument for a cybercartographic approach in an archival context that could provide archivists with tools to support decolonization and reconciliation processes. Exploring the subjectivity inherent in archival processes and the incorporation of community voices and priorities are only two possible outcomes supported by a cybercartographic approach.

Scholars like Andrea Laue and Michael S. Mahoney encourage us to view the computer, and the history of technology, as a history of the society that has produced it. From this perspective, the functions of the computer are understood as trajectories of specific human

¹ Terry Cook, “Total Archives,” in *Encyclopedia of Archival Science*, eds. Luciana Duranti and Patricia C. Franks (Lanham, Boulder, New York, and London: Rowman and LittleField, 2015), 399.

intentions.² Mahoney notes that it is irresponsible to neglect the impact we have on how we develop, distribute, and access certain types of technology. “The devices and systems of technology are not natural phenomena but the products of human design, that is, they are the result of matching available means to desired ends at acceptable cost.”³ This conceptualization of computer-based technology aligns well with the processual approach to cartography as well as the functional approach and macro-appraisal strategy in archives. Drawing from my experience as a research assistant on a cybercartographic atlas module, this chapter charts some of the history of digital maps, highlights instances of the map as an administrative tool in the archives before turning to the atlas modules themselves. In addition to assessing digital tools and technologies as human-made and purpose-built, I want to propose an extension of the notion of the media silo, and the “tyranny of the medium” concept to the classification of records as “Indigenous” in settler-colonial institutions.

This history-of-technology-as-history-of-society perspective is also useful when looking at digital mapping. As this chapter aims to illustrate, there is a consensus among scholars that digital mapping technologies are greatly influenced by developments outside the fields of geography and cartography. In addition, technological developments have enabled the integration of maps into quotidian human activities at a level unprecedented in recent history. It is central to my thesis to acknowledge that while the nuance and complexity of the map has become clearer over time, our understanding of the processes of mapping has not crystalized in the same way. There is a similarity to this nebulous understanding of mapping and the ways in which the concept of “archive” has been incorporated into theoretical explorations, like Jacques Derrida’s assertion in *Archive Fever* that “[n]othing is less reliable, nothing is less clear today than the word ‘archive.’”⁴ Combined with an already woefully stereotyped dusty old archives, this representation from outside the archival community created a new and potentially confusing view of the process of archiving. For mapping, this ambiguity is in part related to the relatively

² See Andrea Laue, “How the Computer Works,” in *A Companion to Digital Humanities*, Susan Schreibman, Ray Siemens, John Unsworth, eds. 145-160 (Oxford: Blackwell, 2004); Mahoney, “The Histories of Computing(s),” 119-135.

³ Mahoney also reminds scholars in the humanities that creating tools specifically designed to support their research should be a part of their use of digital technologies, rather than fitting their research into pre-existing software. Mahoney, “The Histories of Computing(s),” 122, 133.

⁴ He writes of being *en mal d’archive*, in need of archives, which relates to a much more idiosyncratic notion of archives that has less to do with the actual functions of an archivist than to the way in which society values their individual and collective memory and identity. Jacques Derrida, *Archive Fever: A Freudian Impression*, trans. Eric Prenowitz (Chicago and London: The University of Chicago Press, 1996), 90.

fast-paced developments of global positioning systems (GPS), geographic information systems (GIS), as well as advances in computer-assisted design. The monetization of data generated by the continual use of GPS and GIS has also greatly impacted the production of and access to applications and tools that make use of these mapping technologies.⁵ In this respect, their development shares common characteristics with the trajectory of other digital technologies.⁶ However, some scholars see advantages to using mapping applications, where expert-driven systems enable local knowledge to expand the Geospatial Web, while also acknowledging GIS as more than a technical exercise, and situate it within cultural, social, economic and ethical contexts.⁷

In 1965, Marshal McLuhan described prints, including maps, as “pictorial statements.” He stated that the ability to make this type of document “in a precise and repeatable form is one that we have long taken for granted in the West. But it is usually forgotten that without prints and blueprints, without maps and geography, the world of modern sciences and technologies would hardly exist.”⁸ McLuhan noted that the basic function of media is to store information, thus expediting that information.⁹ The main message of the medium of print and of typography in general, is one of repeatability. In a simplified form, he describes media as “cool” when they

⁵ For example, Sarah Holder recounts an anecdote noting that “when commercial companies like Google decide to map the not-yet-mapped, they use “The Starbucks Test,” as OMSers like to call it. If you’re within a certain radius of a chain coffee shop, Google will invest in maps to make it easy to find. Everywhere else, especially in the developing world, other virtual cartographers have to fill in the gaps.” Sarah Holder, “Who Maps the World?” *CityLab* (blog), March 14, 2018, <https://www.citylab.com/equity/2018/03/who-maps-the-world/555272/>

⁶ Organizations and individuals are often quick to use them for many different purposes without much consideration to the long-term implications of conditions of access to proprietary software and ownership of collected data. Coupled with data collection, mapping applications are part of the geospatial web, which trade their services for access to data harvested from the mapping applications on smart phones or GPS in vehicles. Geosurveillance is “characterized by a continual thrust and counterthrust pattern of development, necessitating iterative explorations of the subject to reveal opportunities for resistance.” Not only do voluntarily participate in geosurveillance, failure to do so can lead to both social and economic disadvantages, which is particularly troubling. David Swanlund and Nadine Schuurman, “Mechanism Matters: Data Production for Geosurveillance,” *Annals of the American Association of Geographers* 106, 5 (2016), 1064, 1067, 1073.

⁷ The critical perspective regarding GIS and its uses lead to the development of Participatory GIS (PGIS), which works towards “the empowerment of communities through the facilitation of greater community input and access to geospatial data and technologies, community mapping and spatial analysis in support of project decision making.” L. Jesse Rouse, Susan J. Bergeron, and Trevor M. Harris, “Participating in the Geospatial Web: Collaborative Mapping, Social Networks and Participatory GIS,” in *The Geospatial Web: How Geobrowsers, Social Software and the Web 2.0 Are Shaping the Network Society*, eds. Arno Scharl and Klaus Tochtermann (London: Springer Verlag London Limited, 2007), 153-154.

⁸ Marshall McLuhan, *Understanding Media: The Extensions of Man*, Critical Edition, ed. W. Terrence Gordon (Corte Madera, CA: Ginko Press, 2003), 215.

⁹ Here he was referring to the alphabet. He wrote that it was unsurprising that in societies which have “reduced even spoken language to a visual mode,” scientific research as well as popular culture would inevitably be impacted by this transformation. McLuhan, *Understanding Media*, 216.

require the user (consciously or unconsciously) to complete the picture – such as comic books (printed as discrete dots that the viewer’s mind joins up to make pictures) and the low-fidelity television broadcasts of the 1950s and ‘60s. “Hot” media are those over which the publisher or broadcaster had more control, such as textual publications in print.¹⁰ Although he uses the early woodcut and the comic strip to illustrate “cool” media, he also included an excerpt from Prince Modupe’s autobiography.¹¹ Modupe recounts a conversation with his father on the European-style maps he had learned to read at school. His father was emphatic in his distrust of a document that could so inadequately represent the experience of the space it was supposed to depict. “The truth of a place,” he told his son, “is in the joy and hurt that come from it.”¹² Maps, then, can be seen as either hot or cool, depending on whether, as in Cook’s analysis of Parkin’s British Empire Map of 1893, they are intended to control viewers’ perceptions or, as in Prince Modupe’s father’s interpretation, they are seen as radically incomplete representations that the viewer, if possible, must fill in by drawing on personal memory, knowledge, and experiences. The development of digital technologies for creating and circulating maps make it possible for creators to include a more comprehensive amount of contextual information.¹³

One of the constraints of using GIS and the representational models embedded in this methodology is closely linked to the challenges of adequate descriptions for archival records.

¹⁰ In this case, although the printed word might be designated “hot” as it requires only one of the senses to fully comprehend these types of media, the additional inference required when using simplified images or symbols (such as those employed by cartographers), create a more complex “cool” document which assumes a certain level of understanding on the part of the viewer.

¹¹ Prince Modupe was raised in West Africa in what is now Guinea. He worked in American theatre during 1930s. A composer, choreographer, theatrical producer, music consultant for film, and a lecturer and educator, Modupe also worked on Hollywood film productions as an actor and consultant. Karin Patterson, “Prince Modupe: An African in Early Hollywood,” *Black Music Research Journal* 31, 1 (Spring 2011), 29, 31, 38.

¹² McLuhan, *Understanding Media*, 216;

¹³ McLuhan devotes a chapter “Media Hot and Cold” to this theory of high definition (filled with data, or hot) and low definition (lacking data, or cool) forms of media. McLuhan published *The Mechanical Bride: Folklore of Industrial Man* in 1951, followed by *The Gutenberg Galaxy: The Making of Typographic Man* in 1962, *Understanding Media: The Extensions of Man* in 1964, and *The Medium is the Massage: An Inventory of Effects* in 1967. McLuhan, *Understanding Media*, 39; McLuhan is discussed in connection to photographic materials in archives by Nicole Courier in her MA thesis: Nicole Courier, “Picturing archives: The National Photography Collection, Public Archives of Canada, 1975-1986,” (MA Thesis University of Manitoba, 2017), 20. The history and definition of the total archives concept is discussed in Laura Millar’s two articles, Millar, “Discharging Our Debt,” 103-146, and Laura Millar, “The Spirit of Total Archives: Seeking a Sustainable Archival System,” *Archivaria* 47 (Spring 1999): 46-65. Greg Bak discusses McLuhan’s creeping influence on archival theory in the Canadian context citing Hugh Taylor and Joan Schwartz as clear examples of the sustained impact his works have had in the archival community. Greg Bak, “Media and the Messengers: Writings on Digital Archiving in Canada from the 1960s to the 1980s,” *Archivaria* 82 (Fall 2016), 67-69. The connection between “total archives” in practice and the theoretical meaning of specific types of media is also highlighted by Terry Cook. Cook, “Total Archives,” 398.

Anne Kelly Knowles, Levi Westerveld, and Laura Strom state that “the processes involved in bringing qualitative source material into alignment with these representational models almost always involve acts of translation, which can result in the loss of meaning or the invention of meaning.”¹⁴ In addition to an awareness of the human author/agent, some archivists have noted the benefits of a “material literacy” that extends beyond preservation, enriching their understanding of the materials in their care, and enhancing their knowledge of research opportunities for potential users.¹⁵ In this context, I will turn to the history of digital maps, which impacts the way these resources are both used and understood.

Historically, maps have been incorporated by authors and artists, providing spatial constructs for unfamiliar narratives, or providing a ready-made narrative that might be underscored or deconstructed.¹⁶ Like maps produced for more utilitarian purposes, the viewer, reader, or researcher interacts with and is influenced by these documents, however in the context of art production, the viewer is generally more prepared for manipulation and fabrication as a part of the experience.¹⁷ Understanding map making as a creative process, regardless of the intended use of a map, reveals the subjectivity of the tools and technologies used to create these records.¹⁸ Author Thomas King remarks that the camera allows the photographer “to invent, to create. That’s really what photographs are. Not records of moments, but rather imaginative acts.”¹⁹ J. B. Harley also asserts that making a concerted effort to view maps and other visual materials as “authored,” would allow for a better understanding of these materials within the

¹⁴ Anne Kelly Knowles, Levi Westerveld, and Laura Strom, “Inductive Visualization: A Humanistic Alternative to GIS,” *GeoHumanities* 1, 3 (2015), 4.

¹⁵ Material literacy is limited to analogue records in this article, however there is no reason to assume a digital materials literacy would not also lead to a more nuanced appreciation for something like digital maps and mapping applications. Rekrut, “Matters of Substance,” 238.

¹⁶ A well-known example in English literature is J. R. R. Tolkien’s maps of Middle Earth. A significant French language example is the *Carte du Pays de Tendre*, (Map of the Land of Tendre) in Madeleine de Scudéry’s seventeenth century novel *Clélie*. Both maps depict imaginary landscapes that have proved impactful to readers. The development of mass media and social and political upheaval of the First World War, artists would begin to use maps regularly in a wide range of genres and mediums. Wood, Fels, and Krygier, *Rethinking the Power of Maps*, 190-197.

¹⁷ Tania Rossetto suggests that map researchers and literary scholars might collaborate to “explore the ways in which literary texts both encapsulate emergent cartographies and work as sources for the epistemological interrogation of maps.” Tania Rossetto, “Theorizing Maps with Literature,” *Progress in Human Geography* 38, 4 (2014), 526.

¹⁸ John B. Harley, *The New Nature of Maps: Essays in the History of Cartography*, Paul Laxton, ed. (Baltimore and London: The Johns Hopkins University Press), 153.

¹⁹ King underscores the use of photographs as a tool for perpetuating the myth that indigenous populations in the United States were both locked in the past and dying out. Thomas King, *The Truth About Stories: A Native Narrative* (Toronto: House of Anansi Press Inc., 2003), 43.

contexts of their creation.²⁰ Emphasising the “authored” nature of archival processes like arrangement and description, or even acts of digitization, acknowledges archivists as co-creators of the record, which is in turn a “product of archival politics, [and] of purposive archival intervention.”²¹ Arno Scharl notes that “for true media innovation to have a human impact, however, it must affect the imagination – creating an associated magic ‘behind the eyeballs’ that changes people’s behaviour in their commercial, academic and personal environments.”²² In the context of the map, any “magic” that might be conjured must exist on the foundational “stage” represented by the map. Both are created by human agents before the user engages their imagination, which continues to be uninfluenced by the creators behind it. Whether or not some focus is maintained on whoever is “behind the curtain” creating this magic, rests with the user, and with the archivist.²³

Engineers developing early digital mapping applications were impacted by iconic manipulations of geographic information and spatial data, while potential users based their expectations of the form and functions of these technologies through exposure to the same representations. This impact should not be under-valued; it is important to discuss these technological developments as fuelled in large part by the fantastic and the imaginary.²⁴ Ray and Charles Eames’ short film *Powers of 10* (1977) and the *Surrealist Map of the World* (1929), are two relevant examples of the representation of geographic information.²⁵ Neither one was produced by cartographers, yet both examples have impacted subsequent development of cartographic tools and cartographic theory. In the *Powers of 10*, the narrator tells us that the

²⁰ As Joan M. Schwartz points out in her review. Joan M. Schwartz, “Negotiating the Visual Turn: New Perspectives on Images and Archives,” *The American Archivist* 67 (Spring/Summer 2004), 119.

²¹ Robert McIntosh, “The Great War, Archives and Modern Memory,” *Archivaria* 46 (1998), 2.

²² Arno Scharl, “Towards the Geospatial Web: Media Platforms for Managing Geotagged Knowledge Repositories,” in *The Geospatial Web: How Geobrowsers, Social Software and Web 2.0 are Shaping the Network Society*, eds. Arno Scharl and Klaus Tochtermann (London: Springer-Verlag, 2007), 3.

²³ In reference to the MGM’s 1939 film, *The Wizard of Oz*. For an archival perspective on technology see Ciaran B. Trace, “Beyond the Magic to the Mechanism: Computers, Materiality, and What It Means for Records to Be “Born Digital,”” *Archivaria* 72 (2011): 5-27.

²⁴ I was introduced to both of the following examples through a geography course “Geomedia and the Geoweb” at Concordia University in the Fall semester of the 2018-2019 academic year. The course was taught by Dr. Sebastien Caquard (associate professor and graduate program director in the department of Geography, Planning and Environment, director at the Geomedia Lab and founding member of the MappingBack Collective. Concordia University, in addition to work with the Geomatics and Cartographic Research Centre (GCRC) at Carleton University. Concordia University, “Sebastien Caquard,” Concordia University Faculty (accessed August 30, 2019). <https://www.concordia.ca/faculty/sebastien-caquard.html>

²⁵ Jerry Brotton, *A History of the World in Twelve Maps* (New York: Penguin, 2012), 416; Jeremy W. Crampton, *Mapping: A Critical Approach to Cartography and GIS* (Oxford: Wiley-Blackwell, 2010), 21-22.

camera is one metre above two picnickers in a Chicago park.²⁶ The camera begins zooming out by a factor of ten while the narrator situates viewers with information relative to time, distance, and scale; “this square is a kilometre wide” he says, “one thousand metres. The distance a racing car can travel in ten seconds.” The live action footage gives way subtly to animation over lake Michigan, and continues to the power of 10^{+25} , a billion light years away. The camera quickly zooms back to earth, down to the picnic-ers (and shifting back to animated images), “to our next goal, a proton in the nucleus of a carbon atom, beneath the skin of the sleeping man at the picnic,” or 10^{-16} . In the credits they thank the Chicago Aerial Survey and NASA along with Graphic Films and Modern Film Effects, which indicates a clear, and perhaps, standard blurring between scientific data and creative representation.

Historian Jerry Brotton wrote about the connection between this film and ultimately, the development and launch of Google Earth, “the world’s most detailed globe.”²⁷ He notes that the management at Silicon Graphics (SGI), a California-based computer hardware and software manufacturer, soon picked up on the “principle of interconnectedness” represented by the film. They began to focus on producing applications that would “unify satellite imagery and computerized graphics to zoom seamlessly between the earth and space very quickly – without being locked into the power of ten (or any other particular multiplier).”²⁸ Critically, they wanted to “mask the obvious intervention of technology in an attempt to simulate perfectly the experience of flight above the earth and deep into the cosmos.”²⁹ SGI was aware, in part due to the cult status of the Eames’ film, that combining geographic visualization with this new technology would impact their potential consumers in a significant way.³⁰ During the 1980s and

²⁶ The first version of the film was released in 1968, but the final version was released in 1977. There is similar 1968 animated film available through the National Film Board of Canada called *Cosmic Zoom*. Directed by Eva Szasz, this short film features a score by Pierre F. Brault, but unlike the Eames brothers’ film, has no voice-over narrative. Charles and Ray Eames, *Powers of 10*, 1977, Eames Office LCC

<https://www.youtube.com/watch?v=0fKBhvDjuy0>; National Film Board of Canada, “Cosmic Zoom,” nfb.ca (accessed June 15, 2020), https://www.nfb.ca/film/cosmic_zoom/

²⁷ As described by the programs website which also suggests users start with their own home, take guided tours “around the globe with some of the world’s leading storytellers, scientists, and non-profits,” use their tools to plan travel and measure distance, and access the program across multiple devices. Google, “Google Earth,” Google.com (accessed September 9, 2019), <https://www.google.com/earth/>

²⁸ SGI specialized in 3D graphics display systems and was founded in 1981. Brotton, *A History of the World in Twelve Maps*, 416.

²⁹ Brotton, *A History of the World in Twelve Maps*, 416.

³⁰ Brotton, *A History of the World in Twelve Maps*, 416. A study completed in 2006 found that the students surveyed on how watching the *Powers of 10* impacted their understanding of scale were better able to conceptualize large scale rather than small. M. Gail Jones, et al. “Understanding Scale: Powers of Ten,” *Journal of Science Education and Technology* 16, 2 (April 2007), 192.

1990s, SGI continued to develop related technologies, acquiring key companies to further this goal. These acquisitions included Intrinsic Graphics, which developed applications that could render graphics at a much higher speed and resolution than had previously been available. Not long after this, a breakthrough in clip-mapping (an economical way to render images on-screen) precipitated a group of SGI's engineers leaving to found Keyhole, Inc., which specialized in developing geospatial data visualization applications. This software development company would subsequently be acquired by Google in 2004. A few months later, rebranded as Google Earth, the program was free to download by online users.³¹ This form of information visualization and distribution reveals two important themes which I will discuss in relation to the cybercartographic atlas format. The first is the relentless and hegemonic reproduction of a western scientific world view, while the second is the acceptance and promotion of non-linear and intuitive forms of information organization.

In a theoretical context, artistic appropriations have generated critical mapping practices during the twentieth century. In the *Surrealist Map of the World*, generally attributed to Surrealist Paul Eluard, the work demonstrates the inherently political nature of the map, subverting traditional cartography as an act of resistance and a form of critique.³² With its distortions (Africa and Europe are relatively similar in size) and omissions (Canada is labelled "Labrador" and shares its border with Mexico), it might seem irrelevant to compare it to the standardized world maps that appear in classrooms or on news programs. However, my earliest exposure to maps as archival documents was through Terry Cook's analysis of George R. Parkin's 1893 *British Empire Map of the World on Mercator's Projection*. Cook demonstrates that this map, though it may appear innocuous to many viewers, is similarly manipulated and heavily coded, and to my mind, much more like the *Surrealist Map of the World* than it might seem.³³ Parkin's choice of projection, use of colour, and focus on industry were fuelled by his objective to support his own views on empire and communicate them in a simple way.³⁴ Cook is quick to point out that when classified as a scientific or technical document in the archives and beyond, a map is not given the same level of scrutiny when it comes to propagandistic or political purposes as

³¹ Brotton, *A History of the World in Twelve Maps*, 424.

³² Crampton, *Mapping*, 21-22.

³³ Terry Cook, "A Reconstruction of the World: George R. Parkin's British Empire Map of 1893," *Cartographica* 21, 4 (1984), 56.

³⁴ Cook, "A Reconstruction of the World," 56.

materials like novels, pamphlets, posters, and even photographs.³⁵ The *Surrealist Map* can easily be discounted as a unusual representation of geography as a geopolitical fabrication, however it relies on the same types of visual literacy employed by Parkin in his *British Empire Map*. Intellectual descendants of the Surrealists' map include map hacking, mashups, and the geospatial web. Each of these represent the growth of a critical practice that plays an important role in the development of digital mapping applications. These examples also reflect the growth of an 'amateur' mapping community with participants who view digital maps as powerful communication tools, and the wider impact of postmodern understandings of maps as cultural artefacts.³⁶

While maps and mapping applications are primarily created and accessed for practical purposes such as navigation, situating news coverage, or communicating meteorological activity, they remain tools of power. Addressing the permeable boundary between producers and users, scholars and professionals have developed concepts and terms such as produsers, neogeography, and Volunteered Geographic Information (VGI) to define the recent proliferation of widely accessible tools, non-expert contributors, and user-generated content.³⁷ It has been argued that access to maps and mapping technologies can "greatly increase the power of people living in a mapped area to control representations of themselves and their claims of resources."³⁸ This strategy of resistance is referred to by Nancy L. Peluso as "counter-mapping," whereby local populations either create their own maps or other documents or designate a trusted representative to conduct the research and produce a body of records including maps.³⁹ As Terry Cook

³⁵ Cook, "A Reconstruction of the World," 55.

³⁶ For example, the Anti-Eviction Mapping Project aims to document the issues that arise when urban areas are gentrified. Their "narrative oral history and video work centers on the displacement of people and complex social worlds, but also modes of resistance. Maintaining antiracist and feminist analyses as well as decolonial methodology, the project creates tools and disseminates data contributing to collective resistance and movement building." Anti-Eviction Mapping Project, "About," Anti-Eviction Mapping Project, (accessed February 14, 2020), <https://www.antievictionmap.com/about>; Manissa M. Maharawal and Erin McElroy, "The Anti-Eviction Mapping Project: Counter-Mapping and Oral History toward Bay Area Housing Justice," *Annals of the American Association of Geographers* 108, 2 (2018), 380.

³⁷ These three terms are some of the options, however definitions often overlap and intersect even when they do not have the same definitions. See Axel Burns, *Blogs, Wikipedia, Second Life, and Beyond: From Production to Produsage* (New York: Peter Lang, 2008); Sanjay Rana and Thierry Joliveau, "NeoGeography: An Extension of Mainstream Geography for Everyone Made by Everyone?" *Journal of Location Based Services* 3, 2 (June 2009): 75-81; Michael F. Goodchild, "Citizens as Voluntary Sensors: Spatial Data Infrastructure on the World of Web 2.0," *International Journal of Spatial Data Infrastructures Research* 2, (2007): 24-32.

³⁸ Nancy Lee Peluso, "Whose Woods Are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia," *Antipode* 27, 4 (1995), 87.

³⁹ Peluso, "Whose Woods Are These," 87.

explains, “European imperial powers more generally used records, from maps to censuses to royal commission reports, to legitimize and reinforce their own power by controlling the definition, naming, and categorizing of their subjects into marginal subaltern spaces.”⁴⁰

Similarly, in his *Imagined Communities*, Benedict Anderson frames maps (along with the census and the museum) as “institutions of power which, although invented before the mid-nineteenth century, changed their form and function as the colonized zones entered the age of mechanical production.”⁴¹ Though Anderson focuses specifically on Southeast Asia, acknowledging the significant impact of the three in conjunction extends to the Canadian context. For example, even areas that were not actually under colonial occupation could find their borders “colonially determined,” which brings to mind Canada’s northern and arctic regions.⁴² In addition, Anderson quotes Thai historian Thongchai Winichakul articulating a well-known concept by which maps define, rather than faithfully record, a spatial reality, creating a foundation upon which to build the mechanism of future military and administrative activities.⁴³ This process has been countered in more recent cases using the same types of records. In the context of Inuit experience, Inuk activist, writer, and consultant Zebedee Nungak states:

In the constitutional process we had to break the sort of superficial picture that the country had of us. We had to make people take notice that we were sitting on the top third of the landmass of Canada. We may have a numerically small population, but we are extremely important in having the country achieve its full governing picture, let’s put it that way!⁴⁴

One of the ways that this was accomplished was through the production of maps detailing Inuit land use and occupancy. Like the Southeast Asian nationalists of the 1960s, Inuit activists used

⁴⁰ Terry Cook, “The Archive(s) is a Foreign Country: Historians, Archivists, and the Changing Archival Landscape,” *The Canadian Historical Review* 90, 3 (September 2009), 521.

⁴¹ It could certainly be argued that the archives should be included as a fourth institution of power. Benedict Anderson, *Imagined Communities*, Revised edition (London and New York: Verso, 2006), 163.

⁴² Anderson, *Imagined Communities*, 171.

⁴³ Anderson also notes that there is a “crucial intersection” between the census and the map which together allow colonial administrations to fill in the built territorial framework with a political landscape as well. I will not be addressing the use of the census in this thesis, but these types of records are also a rich source of information in the Canadian context. Anderson, *Imagined Communities*, 173-174. Brian Edward Hubner described the use of the census in a Canadian colonial context, as a part of assimilation policies towards Indigenous peoples and also includes instances of Indigenous resistance. Various forms of non-cooperation have challenged the government’s collection of information for over 150 years. Brian Edward Hubner, ““This is the Whiteman’s Law”: Aboriginal resistance, bureaucratic change and the Census of Canada, 1830–2006,” *Archival Science* 7, 3 (2007): 195-206.

⁴⁴ Quoted during an interview in: John Amagoalik and Louis McComber, *Changing the Face of Canada: The Life Story of John Amagoalik* (Iqaluit: Nunavut Arctic College, 2007), 148.

maps to represent themselves a unified group, which in turn counters the colonial legacy of mapping in *Inuit Nunangat*.⁴⁵ Digital cartographic tools, unlike earlier paper-based mapping tools provide map makers with the ability to enhance contextual knowledge attached to specific points or areas while also breaking away from strict hierarchical structures of representation. For example, the digital map biography is considered to be a much-improved version of the earlier paper-based map biography as it can show both quantitative *and* qualitative data in one place at one time.⁴⁶ The transformation of the map from a tool for shoring up the power of colonial and settler institutions to one of resistance and land rights is directly tied to the proliferation of digital technologies and tools for creating and managing these materials.

The use of certain types of maps as a practical administrative tool surfaces periodically in archival literature. In his 1960s manual, T.R. Schellenberg describes index maps as a potential key control, functioning like a “metamap” for cartographic materials. He includes an 1895 description of ‘key charts’ from Francis H. Parsons writing for *Library Journal*:

which on a single map of large scale, show at once all a library possesses relative to any given locality. And the fact that it has nothing can be ascertained with a much smaller expenditure of time and patience than is required to read many cards about which a seeker cares nothing. By introducing schemes of color and similar devices in the limits of maps, as shown upon the “key,” a great deal of information may be graphically imparted, as, for example, nationality of authorities, where maps of exploration are concerned; or the approximate date of maps around cities, where resurveys are frequent; or any other class of information especially needed by the librarian. In this one respect maps hold an advantage over and above all other treasures of the library.⁴⁷

In the 1980s, Terry Cook outlined another such system, previously adopted by the Canadian government’s Department of the Interior. In this case, the organization of records by geographic location was extended beyond cartographic materials to text-based materials:

By the 1930s when the Department was abolished, some 5.6 million files had been:

⁴⁵ The Inuit Land Use and Occupancy Project of the 1970s was initiated by Inuit Tapirisat of Canada (now Inuit Tapiriit Kanatami) and the report would be used during the negotiations for two land claim agreements: the 1984 *Inuvialuit Final Agreement*, the 1993 *Nunavut Land Claim Agreement*. Milton M. R. Freeman, “Looking Back – and Looking Ahead – 35 Years After the Inuit Land Use and Occupancy Project,” *The Canadian Geographer* 55, 1 (2011), 27. *Inuit Nunangat* refers to all Inuit regions of Canada. Inuit Tapiriit Kanatami, “Maps of Inuit Nunangat, *About Inuit* (accessed January 25, 2020), <https://www.itk.ca/maps-of-inuit-nunangat/>

⁴⁶ Olson, Rachel, Jeffrey Hackett, and Steven DeRoy, “Mapping the Digital Terrain: Towards Indigenous Geographic Information and Spatial Data Quality Indicators for Indigenous Knowledge and Traditional Land-Use Data Collection,” *The Cartographic Journal* 53, no. 4 (November 2016), 350.

⁴⁷ T.R. Schellenberg, *The Management of Archives*, (Washington D.C.: National Archives and Records Administration, 1965), 314-315.

created by the Dominion Lands Branch alone. In addition, almost five hundred volumes of correspondence registers and indexes provided more detailed access to the individual letters on the files. And a quite separate series of township registers with township maps were used to represent the file information on a graphic geographic basis, with patentees or lessees' names and file or grant cross-reference numbers being encoded directly on very detailed maps. To support this complicated system, Interior devoted many of its resources to correspondence registration and indexing, bookkeeping, and maintaining survey records, maps, and land patenting documentation.⁴⁸

In addition to the historical incorporation of maps in archival management, there are more recent examples that reveal successful applications of the same approach. The National Centre for Truth and Reconciliation (NCTR) at the University of Manitoba has incorporated an interactive map as one of their online search tools.⁴⁹ Using this place-based starting point, the user can search for the archival records related to specific residential schools, events, and hearings. In addition to place, a timeline feature enables these locations to be displayed during the time when they were active.

Stanley H. Griffin also makes a compelling case for mapping tools in the archives. His blog post from September of 2018 introduced the “University of the West Indies Archives Data Map of Archival Repositories,” illustrating the “record-relationship of all 4 campuses of the University and its administrative hub, the Vice Chancellery,” each differentiated by colour.⁵⁰ The map is intended to aid researchers navigating the confusing institutional records at a university, and also support the archives staff: “this Data Map then will enable easier ‘cataloguing’ as well as promote better or deeper research, as themes and connections are visually illustrated and the foundation for fully described and accessible archival collections are clear.”⁵¹ In my experience as a researcher and student intern, the extensive first-hand knowledge long-time archives staff functions like a living finding aid. While it is not feasible to capture all of this experiential knowledge, a digital education hub could be a practical place to store some of this information, providing a tool for archivists to “archive” themselves. This might take place, as Nesmith and

⁴⁸ Terry Cook, “Paper Trails: A Study in Northern Records and Northern Administration, 1898-1958,” in *For Purposes of Dominion: Essays in Honour of Morris Zaslow*, William R. Morrison and Kenneth S. Coats eds.: 269-296 (North York, On: Captus University Publications, 1989), 272.

⁴⁹ National Centre for Truth and Reconciliation, “Interactive Map,” NCTR (accessed June 15, 2020), <https://nctr.ca/map.php>

⁵⁰ Stanley H. Griffin, “An Archival Treasure Map: A Guide to the Riches of the UWI Archives,” Blog Post, 6 September, 2018. n.p. <https://uwiarchives.wordpress.com/category/archives-records-management/>

⁵¹ Griffin, “And Archival Treasure Map,” n.p.

Hurley have suggested, within the parameters of archival description. Such activities, while connected to the community paradigm described by Cook, rests largely within the parameters of his third paradigm, where archivists, as professionals within their field, construct a common identity.⁵²

These instances of mapping archival records demonstrate that graphic representation and geography as access points for information has been adopted as a practical tool by archivists in both analogue and digital contexts. This characterization led me to view a tool like a cybercartographic atlas as a good fit for further study. However, as Cook's Department of the Interior description shows, geo-referencing materials produces a complex system; navigability depends on updating materials and maintaining a level of familiarity with the system by those that work with these materials. In addition to this administrative challenge, the use of maps as access points and organizational tools further entrenches the notion of the maps as a mere data repository, rather than the "thing" itself.⁵³ David Weinberger proposed that we encounter three categories of ordered information: physical (first), catalogue or metadata (second) and digital (third).⁵⁴ Victoria L. Lemieux, discussing her research on the potential for third-order archival interfaces, defined a "third order" archival interface as "a system in which users can easily arrange archival resources in as many different aggregation and sequences as desired according to their needs."⁵⁵ One of the challenges that Lemieux highlights is the tensions between abstraction and representation, and between parsimoniousness and expressiveness. The uses of cybercartographic atlases prompted me to draw a parallel between these materials and Tom Nesmith's suggestion that an "archival history essay" or context-based set of supporting documents would enhance standardized archival description and lend insight to archivists and researchers. For example, William E. Rees observed that "many southern readers may be

⁵² Terry Cook, "Evidence, Memory, Identity, and Community: Four Shifting Archival Paradigms," *Archival Science* 13 (2013), 112.

⁵³ Matthew Edney points out a number of ways that this disregard for the map as a materials object manifests libraries, published works, and, of course, archives in his blog post. Matthew Edney, "The Map's the Thing," *Mapping As Process: A Blog on the Study of Mapping Processes: Production, Circulation, and Consumption* (blog), May 9, 2020, <https://www.mappingasprocess.net/blog/2020/5/9/the-maps-the-thing>

⁵⁴ He describes these as an ordering of "things themselves" in the first, followed by information on these things in the second and finally the digital space of the third order, which eliminates much of the constraints of the first two, but introduces a number of new challenges to the ordering of information. David Weinberger, *Everything Is Miscellaneous: The Power of the New Digital Disorder* 1st ed. (New York: Times Books, 2007), 17-18, 20-21.

⁵⁵ Victoria L. Lemieux, "Toward a "Third Order" Archival Interface: Research Notes on Some Theoretical and Practical Implications of Visual Explorations in the Canadian Context of Financial Electronic Records," *Archivaria* 78 (2014), 54.

surprised that a commonplace, often overly bureaucratic process like land-use planning could generate much emotion and heated debate, especially in what is often perceived as the vast emptiness of the North.”⁵⁶ This statement belies the federal government’s development ideology discussed in the previous chapter, which frames land and resource-use in ways that support the modernity of the urban-industrial with little room for multiple interpretations of this process. Essays, deliberately included to add context to the maps in an atlas, for example, function like Nesmith’s archival essays. As the cybercartographic atlas modules will demonstrate, attempts to broaden descriptions of archival materials is also closely tied to how users then connect to these materials.

The following section introduces Cybercartography and the cybercartographic atlas modules to which I have contributed as a research assistant. This section also returns to the two themes referred to earlier in this chapter. Cybercartography provides an entry point to discuss disruptions in the reproduction of a western scientific world view and evidence of the acceptance and promotion of non-linear and intuitive forms of information organization. To this end, I suggest that the process of creating a specific cybercartographic atlas as well as the application of a mapping process in archives provide useful tools in relation to reconciliation and decolonization in the archives. This involves a recognition of transdisciplinary partnerships and collaborative work as essential in archival as well as cartographic contexts, which is a central focus in this chapter.

Representing a synthesis of geographer D. R. Fraser Taylor’s ideas and experiences, Cybercartography was drawn from a number of published articles and research models that Fraser Taylor had been developing during the course of his research projects.⁵⁷ He defined the paradigm, a necessary update to the cartographic field in the information era, as the

⁵⁶ Terry Fenge and William E. Rees, eds. *Hinterland or Homeland?: Land-use Planning in Northern Canada* (Ottawa: M.O.M. Printing, 1987), 3.

⁵⁷ William Cartwright discusses D. R. Fraser Taylor’s proposed model to more accurately describe contemporary mapping in 1991, which he then developed into “New Map,” taken further in 1994 with addition of elements of communication, interaction, and dynamics, as well as then-new cartographic tools and resources. Fraser Taylor introduced Cybercartography during his keynote address at the 18th International Cartographic Conference in 1997. Fraser Taylor is a cartographer, the director on the Geomatics and Cartographic Research Centre and Chancellor’s Distinguished Research Professor of International Affairs and Geography and Environmental Studies at Carleton University in Ottawa, Canada. William Cartwright, “Linking Geographical Facts with Cartographic Artifacts,” in *Cybercartography: Theory and Practice*, 1st ed. Modern Cartography; vol. 4, ed. D. R. Fraser Taylor (Amsterdam; Boston: Elsevier, 2005), 335; D. R. Fraser Taylor, “The Theory and Practice of Cybercartography: An Introduction,” in *Cybercartography: Theory and Practice*, 1st ed. Modern Cartography; vol. 4, ed. D. R. Fraser Taylor (Amsterdam; Boston: Elsevier, 2005), 1.

“organization, presentation, analysis and communication of spatially referenced information on a wide variety of topics of interest to society in an interactive, dynamic, multisensory format with the use of multimedia and multimodal interfaces.”⁵⁸ Not unlike the introduction of postmodernist approaches to archives, Fraser Taylor and his colleagues intended to demonstrate that, while a distinctly new concept, Cybercartography was not unknown territory. Rather, it would function as “an evolutionary and integrative process which incorporates important elements from the past, redefines others,” and maintains an openness to new theory and practice.⁵⁹ Although the term ‘Cybercartography,’ strongly emphasises the scientific elements of the paradigm, it is also intended to express hybridity, bridging the sciences and the humanities.⁶⁰ Since 2005, the development of Cybercartography has led to a number of projects that utilize a cybercartographic atlas to engage with traditional knowledge and Indigenous languages.⁶¹ Fraser Taylor described the conceptual framework defining Cybercartography as iterative, and this is reflected in the process of building and adapting the atlas modules in response to changing project requirements.⁶² In the most recent iteration, Cybercartography is

defined as a complex, holistic, user-centred process which applies location-based technologies to the analysis of topics of interest to society, and the presentation of the results in innovative ways through cybercartographic atlases. A cybercartographic atlas is a metaphor for all kinds of qualitative and quantitative information linked by location and

⁵⁸ Fraser Taylor, “The Theory and Practice of Cybercartography,” 2.

⁵⁹ Fraser Taylor, “The Theory and Practice of Cybercartography,” 2.

⁶⁰ Fraser Taylor, “The Theory and Practice of Cybercartography,” 4. These projects rely on the Nunaliit Cybercartographic Atlas Framework, developed over the past 15 years in response to user needs. The framework is described by its creators as a ‘bottom up’ free and open source software suite driven by user needs and characterized by collaborative and iterative development process: “an interactive data management platform for collecting, relating, presenting, and preserving information and its context, with a particular focus on using maps as a unifying framework.” In addition to bottom-up development strategies, the framework relies on data-driven interactive elements, open source (OS) technologies, platform neutral data storage, and supports open standards for both data use and sharing. H Amos Hayes, Peter L. Pulsifer, J.P. Fiset, “The Nunaliit Cybercartographic Atlas Framework,” in *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping*, eds. D. R. Fraser Taylor and Tracey P. Lauriault (Oxford: Elsevier Science & Technology, 2014), 129-130.

⁶¹ This does not refer to the use of a digital platform as a solution to the erosion of languages and other types of site-specific knowledge since the systematic destruction of colonization began; the cybercartographic atlas is framed as a resource that supports the preservation of information in multiple formats. For example, when describing the Gwich’in Place Name Atlas, Claudio Aporta and fellow authors explicitly state that the cataloguing of place names lacks significant depth without those speaking the language as a recording (later attached to a specific location) can only capture part of this interaction. Claudio Aporta et al. “The Gwich’in Atlas: Place Names, Maps, and Narratives,” in *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping*. Modern Cartography: vol. 5, eds. Tracey P. Lauriault and D. R. Fraser Taylor (Oxford: Elsevier Science & Technology, 2014), 243.

⁶² D.R. Fraser Taylor, “Some Recent Developments on the Theory and Practice of Cybercartography: An Introduction,” in *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping*. Modern Cartography: vol. 5, eds. Tracey P. Lauriault and D. R. Fraser Taylor (Oxford: Elsevier Science & Technology, 2014), 7.

displayed in innovative, interactive, multimodal and multisensory formats. Cybercartographic atlases permit user communities to tell their own stories. Both mapping and storytelling are basic human instincts and are a central part of the holistic nature of Cybercartography. The process of creating these atlases is as equally important as the atlas as product.⁶³

This understanding complements observations made by Terry Cook, Terry Eastwood, and Tom Nesmith which draw attention to the maintenance of a robust relationship between theory and practice in archives.⁶⁴ In addition to illustrating this transdisciplinary overlap, these observations support what I find to be the most important element of the discussion: understanding that archives, in the theoretical and practical sense, represent fluid rather than fixed processes. Actively incorporating reflexivity and transparency can only enrich the profession as well as the records, yet there are also key responsibilities archivists take on as they do this.⁶⁵

Fraser Taylor describes the cybercartographic framework as an approach “with the potential to help us navigate and better understand the sea of information threatening to drown us all as computer-based information increases exponentially on almost a daily basis.”⁶⁶ This statement mirrors observations made by archival scholars and professionals. I intended to examine data visualization as a form of archival access, a shift towards a similar type of “information hub” as a tool for archival practice, however I have since shifted from that practical goal to a largely theoretical application.⁶⁷ Another element that connects to the characterization the Cybercartography as a holistic concept with a foundation built on an iterative relationship between theory and practice:

The map has always been more than a material artefact but the strong impact of technology in recent decades has tended to concentrate on this aspect and to give less attention to the important cognitive aspects of cartography as well as to the map as a social construct. Critical cartography has drawn attention to this latter aspect, but the theoretical aspects of the arguments made have not always been followed by concrete and useful applications.

⁶³ D.R. Fraser Taylor, “Cybercartography Revisited,” in *Further Developments in the Theory and Practice of Cybercartography: International Dimension and Language Mapping*: vol. 9, eds. D. R. Fraser Taylor, Erik Anonby and Kumiko Murasugi (Amsterdam, Oxford, and Cambridge Ma.: Elsevier, 2019), 20-21.

⁶⁴ Terry Eastwood, “What is Archival Theory and Why is it Important?” *Archivaria* 37 (Spring 1994), 122; Tom Nesmith, “Still Fuzzy, But More Accurate: Some Thoughts on the “Ghosts” of Archival Theory,” *Archivaria* 47 (Spring, 1999), 137.

⁶⁵ This is a position influenced by the incorporation of Postmodernist theory to archives that Terry Cook explores in his 2001 article: Terry Cook, “Fashionable Nonsense or Professional Rebirth: Postmodernism and the Practice of Archives,” *Archivaria* 51 (Spring 2001), 34.

⁶⁶ D. R. Fraser Taylor, “Preface,” in *Cybercartography: Theory and Practice*, 1st ed. Modern Cartography; vol. 4, ed. D. R. Fraser Taylor (Amsterdam; Boston: Elsevier, 2005), x.

⁶⁷ Hayes, Pulsifer, and Fiset, “The Nunaliit Cybercartographic Atlas Framework,” 129-130.

Cybercartography attempts to combine all three aspects of mapping and to present these in ways that give voice to people who are often ‘invisible’ in the technological maps of the twenty-first century.⁶⁸

In the recent past, archivists have attempted to engage with various communities in an effort to better describe materials in their holdings, such as LAC’s photography-focused Project Naming. However, seeking information can also create, rather than mitigate tensions between archivists and the communities with whom they want to engage.⁶⁹ The same neglect for relationship building shown in various archival contexts manifested in my own research process.⁷⁰

The Residential Schools Land Memory Mapping Project (RSLMMP) was initially proposed in 2014 to expand on existing projects by engaging in collaborative work aimed at addressing in the history and impact of Canada’s Residential Schools.⁷¹ Supported by a SSHRC Insight Grant (2015-2020), the project involved a collaborative and emergent approach to expanding the Residential Schools map component of the Lake Huron Treaty Atlas into the separate Residential Schools Land Memory Atlas. As a collaborative project, the atlas

⁶⁸ D. R. Fraser Taylor and Tracey Lauriault, “Conclusions and the Future of Cybercartography,” in *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping*, eds. D. R. Fraser Taylor and Tracey P. Lauriault (Oxford: Elsevier Science & Technology, 2014), 344.

⁶⁹ Carmen Miedema demonstrates this in her 2019 Masters thesis noting that efforts to “engage in knowledge transfer” should start first with relationship building, including appropriate forms of communication (face-to-face versus telephone or email), and refrain from approaching groups who have been displaced to urban areas by natural disasters or other serious circumstances in an effort to benefit from their proximity to archival holdings. In an effort to fill gaps in archival knowledge quickly, archivists often fail to effectively communicate with the very people they seek to include in these archival processes. Carmen Miedema, “Building Bridges: Dismantling Eurocentrism in Archives and Respecting Indigenous Ways of Doing It Right,” (MA thesis, University of Manitoba/University of Winnipeg, 2019), 30-32.

⁷⁰ In my own experience as I began my research for this thesis project I found myself mis-stepping early, much to my embarrassment. I failed to approach any other organization before contacting LAC with my research request. I found myself belatedly in conversation with the organization responsible for the creation of the collection and was unable to take my research any further. Had I started with the creating organization I would have been able to change my focus earlier in my research process, better understand the restrictions on these materials and, most importantly, I would have been conducting my research in a respectful manner. What seemed logical to me (simply consulting with the archives holding the records) turned out to be an inappropriate approach in relation to the administrative records I was hoping to consult. This experience, beyond hammering home my own naïveté and inexperience, revealed one of the ways in which the legacy of colonialism is embedded in all levels of education and research.

⁷¹ Existing projects included the Residential Schools and E.F. Wilson Maps of Lake Huron Treaty Atlas, the National Commemorative Marker Project in development by the Assembly of First Nations and the Aboriginal Healing Foundation, emerging work with the National Centre for Truth and Reconciliation, and the Embodying Empathy: Fostering Historical Knowledge and Caring Through a Virtual Indian Residential School project. Work with residential school Survivor and other community groups, religious institutions and among Residential schools and sites is part of the development of the atlas project. Stephanie Pyne, “Cybercartography, Emergence and Iterative Development: The Residential Schools Land Memory Project (RSLMMP),” in *Cybercartography In A Reconciliation Community: Engaging Intersecting Perspectives*, eds. Stephanie Pyne and D. R. Fraser Taylor (Oxford and Amsterdam: Elsevier, 2019), 46.

incorporates map modules “that reflect a broad view of Residential Schools and reconciliation. This includes mapping digital media, exhibitions, gatherings, sketch mapping of Survivor Stories, and news stories reflecting a diverse array of dimensions.”⁷² In addition to the content of the atlas itself, the project aimed to contribute to student training by providing an environment in which the postdoctoral fellow leading the research project (Pyne) could contribute to theoretical and conceptual approaches, while providing an opportunity for student research assistants (like myself and others) to gain technical knowledge and ability in relation to Cybercartography and other forms of geographic information processing and learn about the ethics and application of participatory research.⁷³

There is no question that the preservation of and access to geospatial data depends on proactive intervention and archiving strategies.⁷⁴ The CLI data discussed in the previous chapter is a significant example of the near total loss of the data collected over decades by numerous people and costing a considerable amount of money. These are also the main reasons listed by those who would support efforts to archive these records. However, in this context I will not be focusing on the areas that are already well documented by archivists, researchers, and other professionals. The intention here is to focus on the atlas modules as a snapshot of intersecting frameworks that are of interest in an archival context. Rather than attempt to provide concrete solutions to archival challenges, this section will include observations intended to generate additional questions which in turn could lead to more depth to archival theory and practice.

The Residential Schools Land Memory Atlas is presently comprised of 10 map modules, including the Residential Schools Interactive Map, the E.F. Biography Map, the map essay “I Have a Right To Be Heard,” In the News, Truth and Reconciliation Commemorative Projects

⁷² Geomatics and Cartographic Research Centre, “Welcome to the Residential Schools Land Memory Atlas,” Residential Schools Land Memory Atlas (accessed May 22, 2020), <https://residentialschoolsatlas.org/index.html>

⁷³ Pyne, “Cybercartography, Emergence and Iterative Development,” 47.

⁷⁴ Members of the GCRC participated in the InterPARES 2 project in the early 2000s, and have continued to address the challenges of archiving and preservation strategies at the research centre. See: Tracey P. Lauriault, Barbara L. Craig, D. R. Fraser Taylor, and Peter L. Pulsifer. “Today’s Data are Part of Tomorrow’s Research: Archival Issues in the Sciences,” *Archivaria* 64 (Fall 2007): 123-179; Tracy P. Lauriault, D. R. Fraser Taylor, Peter L. Pulsifer. “Will Today’s Internet Maps be Available Tomorrow? The Preservation and Archiving of the Cybercartographic Atlas of Antarctica Through Action Research,” in *International Perspectives on Maps and the Internet. Lecture Notes in Geoinformation and Cartography*, ed. Michael P. Peterson (Berlin: Springer, 2008); InterPARES 2 Project. “Project Summary.” InterPARES 2 Project. Accessed February 15, 2020. http://www.interpares.org/ip2/ip2_index.cfm; InterPARES 2 Project, Tracey P. Lauriault and Yvette Hackett, “Case Study 06 Final Report Cybercartographic Atlas of Antarctica,” *InterPARES 2 Project* 2007 (accessed April 4, 2018), http://interpares.org/ip2/ip2_case_studies.cfm?study=5

Map, Reclaiming Shingwauk Home, the Assiniboia Residential School Map, the Shingwauk Residential School Map and the Jeff Thomas and WATC Exhibitions module. These modules combine a variety of mapping tools and research frameworks, using place as the organizing factor for content, including audio, video, images, and text-based records collected for or generated through the project.⁷⁵ The “Jeff Thomas and WATC Exhibitions” module, like the others in the atlas, uses place as an organizing factor for the media associated with these events. The module maps the *Where Are the Children? Healing the Legacy of Residential Schools* exhibition, as well as additional solo and group exhibitions and Photo Journeys curated or created by Thomas, and other events and exhibitions related to reconciliation and Residential Schools.⁷⁶

The 2019 book chapter, “Talk, Templates and Developing a Geospatial Archives Tradition: Stories in the Making of the Residential Schools Land Memory Atlas,” explores the ways in which critical archival theory can support cybercartographic development.⁷⁷ The cybercartographic atlas as a geospatial archive is reversed here in some ways, echoed in others. Rather than thinking about what archival theory offers mapping practices, I am looking at how useful Cybercartography might be in an archival context. The introduction to the “Talk, Templates and Developing a Geospatial Archives Tradition” chapter emphasises both the value of process-oriented work and reflexive documentation as integral elements of the

⁷⁵ While the atlas is now launched and ready for further development, it was in development during the writing of this thesis. It is important to note that this discussion deals with the intention behind the map modules rather than the impact or outcomes that are yet to be identified. Pyne, along with collaborators, contributors, and GCRC team members discuss the RSLMMP and other aspects of Cybercartography in Stephanie Pyne and D. R. Fraser Taylor, eds. *Cybercartography In A Reconciliation Community: Engaging Intersecting Perspectives* (Oxford and Amsterdam: Elsevier, 2019); D. R. Fraser Taylor, and Tracey P. Lauriault, eds. *Developments in the Theory and Practice of Cybercartography: Applications and Indigenous Mapping* (Oxford: Elsevier Science & Technology, 2013).

⁷⁶ The biography section of his website describes Jeff Thomas as “an independent curator and photographer who deals, in examination of his own history and identity, with issues of aboriginality that have arisen at the intersections of Native and non-Native cultures in what is now Ontario and northern New York state. Nationally recognized for ground-breaking scholarship and innovative curatorial practice in this area, he has been involved in major projects at such prominent cultural institutions in Canada as the Canadian Museum of Civilization, the Woodlands Cultural Centre, the Art Gallery of Ontario, and Library and Archives Canada.” Lynda Jessup, “Bio” Jeff Thomas.ca (accessed May 22, 2020), <https://jeff-thomas.ca/bio/>

⁷⁷ My contribution as a research assistant to this chapter involved considering and discussing archival scholarship relevant to the cybercartographic atlas project. The chapter consists of a literature review and reflections on the atlas development research process. Stephanie Pyne, Melissa Castron, Kevin Palendat, “Talk, Templates and Developing a Geospatial Archives Tradition: Stories in the Making of the Residential Schools Land Memory Atlas,” in *Cybercartography in a Reconciliation Community: Engaging Intersecting Perspectives*, eds. Stephanie Pyne and D. R. Fraser Taylor (Amsterdam: Elsevier, 2019), 178-180.

cybercartographic approach taken to this atlas.⁷⁸ As Margaret Kovach's research on Indigenous methodologies indicates, the process-centred approach is part of Indigenous research frameworks, which are in turn founded on Indigenous epistemologies, thus resulting in processes that vary considerably depending on the individual or group proposing and completing the research.⁷⁹ The support for and incorporation of Indigenous methodologies allows for the expression of worldviews previously excluded from academic settings, even while institutions encouraged Indigenous student enrollment.⁸⁰ This is a de-centring process that reflects themes of shifting locations of power, complex and nuanced narratives and a dismantling of established hierarchies of knowledge and education.

The years of development that have resulted in the current iterations of the RSLMMP Atlas modules reflect process of relationship-building. For example, although the project manager maintains deadlines for the varied elements of an atlas, the modules themselves are not intended to remain fixed. Rather, the modules exist in a state of transformation, at least on a conceptual level, as the notion of "finishing" or "completing" a cybercartographic atlas – even imagining that the current iteration will not change in any number of ways – is not part of this approach. As Pyne notes, "one of the main issues in critical approaches to cartography and GIS is that geospatial technologies are not yet fully capable of accurately presenting multiple understandings of space, environment, and culture that are necessary in a reconciliation context."⁸¹ One outcome of a self-reflexive mapping process applied in an archival context could be that this understanding becomes rooted in archival practice and can contribute to further technological development.

Terry Cook's description of a community approach in archives dovetails with the holistic and transdisciplinary approach embodied by the cybercartographic atlas framework. According to Cook, the community approach should allow archivists to "document human and societal experience with a richness and relevance never before attainable, and with it the opportunity to

⁷⁸ Pyne, Castron, and Palendat, "Talk, Templates and Developing a Geospatial Archives Tradition," 167-168.

⁷⁹ Margaret Kovach, *Indigenous Methodologies: Characteristics, Conversations, and Contexts*, (Toronto, Buffalo, London: University of Toronto Press, 2009), 56.

⁸⁰ Kovach, *Indigenous Methodologies*, 163; Adam Gaudry and Danielle Lorenze, "Indigenization as Inclusion, Reconciliation, and Decolonization: Navigating the Different Visions for Indigenizing the Canadian Academy," *AlterNative* 14, 3 (2018), 218-219; Eve Tuck and K. Wayne Yang, "Decolonization is Not a Metaphor," *Decolonization: Indigeneity, Education & Society* 1, no. 1 (2012), 2.

⁸¹ Stephanie Pyne, "Sound of the Drum, Energy of the Dance: Making the Lake Huron Treaty Atlas the Anishinaabe Way," (PhD Diss., Carleton University, Ottawa, 2013), 2.

blend our past foci on evidence, memory, and identity into a more holistic and vibrant “total archive.”⁸² That is, if archivists can present their professional knowledge as an integral part of these collecting activities. The era of the community framework has also generated some concern among archivists and the communities they interact with, however these challenges can be ameliorated through adequate levels of communication. Archivists remain experts on archival practice, and the history of the record, as Tom Nesmith has stated. Archivists must take care to acknowledge where their expertise ends. Defining records, assigning value to records, or making decisions on where preservation can take place (in a community, or another location), are tasks best undertaken by records creators with the support of archivists. In addition to offering a supporting role, in instances where communities may lack the capacity to take on archival tasks, archivists should willingly take direction from the community in order to complete the appropriate tasks themselves.⁸³ However, while this community-focused archival paradigm is an important part of the current reality, Cook notes, “[n]ot only are the paradigms open-ended, overlapping, and constantly evolving, the community of archivists that has emerged through these different and overlapping paradigms is itself bound together as a community by the symbiotic interaction of continuity and disruption, continually constructing and deconstructing our mythologies.”⁸⁴ These interactions are recorded in broad strokes in the pages of academic journals and book chapters, however the smaller quotidian version of the same process is embedded in the personal experiences of archivists in the workplace, and may or may not be captured for posterity.

The extension of the notion of the media silo, and the “tyranny of the medium” concept to the classification of records as “Indigenous” in settler-colonial institutions picks up from research that cautions against promoting decolonization as a metaphorical concept.⁸⁵ A primary purpose for Pyne’s collaborative modules is the presentation of counter narratives to colonial history, revealing an inclusive medium, with the potential to represent multiple agendas

⁸² The community approach (or paradigm) is one of four Cook addresses. The other three (evidence, memory, and identity), are addressed in a chronological format for clarity, but Cook also notes that these frameworks continue to interact and overlap in archival theory and practice. Cook, “Evidence, Memory, Identity, and Community,” 113.

⁸³ Correspondence between the author and Greg Bak, September 2019.

⁸⁴ Cook, “Evidence, Memory, Identity, and Community,” 117.

⁸⁵ Tuck and Yang. “Decolonization is Not a Metaphor.”

simultaneously.⁸⁶ Through my work on the modules, I have been introduced to the iterative and performative approaches that characterize the development of the atlas, while further exploring aspects of critical cartography. This ongoing collaborative exercise continues to fuel my interest in approaches to information visualization and the preservation of institutional memory. In my initial assessment I determined that there were both theoretical and practical applications for cybercartographic theory in archives, however my work as a research assistant has impacted my preliminary position. Over the course of my thesis research, my interest in digital cartographic tools and technologies has broadened to include an awareness of the limitations and complications that arise with their use. The above discussion of the roots of digital mapping demonstrate the strong connections between art and cartography, despite the assumptions we might make about the neutrality of machine-made images. The applications that create these representations are made by and for human actors; they are not natural or organic. The archival collections and fonds have this in common with the digital map. The increased accuracy which cartographers and other professionals incorporate in their work obscures the fundamental purpose of the map which is, as ever, to tell a story. If this representativeness is visible, the potential to add diverse narratives is also revealed.

The guiding principle of the medium-as-message should be kept at the forefront of archival interactions with cartographic materials, in paper or digital formats. The assumption that “maps are drawn on a blank surface, not with a blank mind” is examined in the context of the digital mapping applications and atlas frameworks widely used today.⁸⁷ By refuting the suggestion that there could be such a thing as a “blank” surface, I aim to also draw attention to what Cybercartography as *a process* has to offer archival theory (which may then be extended to archival practice). This awareness of the authored text and the constructed nature of all aspects of a digital map can serve as an example that applies to archival processes more broadly, and specifically to non-textual materials which are often conceptualized simply as data repositories. This conceptualization is approached critically here by the looking at the creative history of these tools which were impacted by popular culture as much as technological changes. In addition, it is useful to examine the ways in which these tools are being used both inside and outside of the

⁸⁶ Stephanie Pyne, D. R. Fraser Taylor, and Trina Cooper-Bolam, “Introduction” in *Cybercartography in a Reconciliation Community: Engaging Intersecting Perspectives*, eds. Stephanie Pyne and D. R. Fraser Taylor: 1-30 (Amsterdam: Elsevier, 2019), 6.

⁸⁷ Catherine Delano-Smith and Roger J.P. Kain, *English Maps: A History* (London: British Library, 1999), 6.

archival repository. Cartographic literature does not seem to incorporate archival analogies to the process of mapping with the same frequency that archivists consider themselves to map records. Part of my exploration of Cybercartography expands on this notion of the map as not only a data repository, but as a narrative, in some ways filling the *conceptual* role of an archive, although not required to perform the processes of a true archival repository. This conceptual role is a productive area for archival consideration. While critical archival theory and practice can be useful in providing models for cybercartographic atlas projects with an interest tracking their collaborative design and development processes, there is also great potential for geo-visualization and critical cartography to transform archival theory and practice. If archivists and cartographers work towards acknowledging the subjectivity of both fields, this perspective can enhance decolonization and reconciliation processes in an archival context, ensuring meaningful and impactful action that is sustainable over time.

Conclusion:

The Benefits of A Transdisciplinary Approach

Archival educator Tom Nesmith asserts that archivists rely on their *own* knowledge, or “knowledge bathed in hypothesis” to make decisions about the origins of records. They include and exclude information depending on their priorities and their resources, becoming a co-creator of the records they process. This “speculative element,” wrote Nesmith, “remains strong, if often neither highly visible nor recognized; the meaning of what we have found is contingent on further awareness of a much wider array of unknowable, yet to be known, and neglected factors. If we look at things from this angle, it is obvious that our knowledge is in important ways bathed in hypothesis.”¹ The speculative element of knowledge should be a fundamental consideration students and professionals in the archival field. In the introductory chapter of this thesis, I noted that John B. Harley states, “if we are truly concerned with the social consequences of what happens when we make a map, we might also decide that cartography is too important to be left entirely to cartographers.”² In this conclusion I will revisit some of the key parallels between archival studies and cartography, while also reflecting on the future research trajectories involving cartographic materials and cartographic tools.

Betty Kidd’s observation on the map collection as a microcosm of the history of the larger national archives held my attention on this branch of archival materials. However, I would like to move beyond her observation on the collecting practices and goals of the individuals appointed to run these various branches of archives. Historically, the most common use of maps is as a demonstration ownership and authority over specific geographical areas, including the resources within these parameters. These documents are graphic representations of geographic information, but they are also products of social, cultural, and economic processes. As such these materials require cartographic literacy suited to the time and place of their production, circulation, and consumption. Neglecting these elements of the map limits the understanding of the relationships between the map creator, audience, and ultimately, the archivist in Canadian

¹ Tom Nesmith, “Still Fuzzy, But More Accurate: Some Thoughts on the “Ghosts” of Archival Theory,” *Archivaria* 47 (Spring, 1999), 141.

² Harley, *The New Nature of Maps*, 203.

archival practice. Instead, cartographic materials have largely been valued based on content, with limited attention given to contextual information beyond the immediate author or publisher. This narrowed approach prevents the development of deeper and more nuanced understanding of cartographic materials.

Re-valuing these materials as cultural artefacts, revealing them as evidence of how and why land is valued, is an important aspect of reconciliation that has been vastly underappreciated by non-indigenous Canadians. The changes in the field of cartography on a practical level have generated theoretical discussions that are useful in a broader archival context. For many scholars, recent critical discourse regarding archival practice focuses on records created by or about Indigenous Peoples. However, the broader understanding of land rights is the foundation for further reconciliation processes and connects any and all records created in relation to land use to the rights of Indigenous Peoples. The TRC's Calls to Action, UNDRIP, and the OCAP principles clearly demonstrate the need to minimize harm through better controls over and accessibility to records. Current technology allows any person with access to a device and an internet connection to utilize maps in ways that reinforce our relationships with our surroundings in certain ways, and also creates a level of abstraction to this understanding. This technology has only recently become ubiquitous to human strategies of navigation, and mapping, though access is not universal or guaranteed. The layered and complex realities of our interactions with maps as reflected in developments in archival practice over the past thirty-five years remains uneven. By the late 1970s and early 1980s, archivists were calling for significant changes in the theoretical and methodological approaches to archival functions such as appraisal and description, and they included cartographic materials in their assessment. As these archival institutions do not operate in a vacuum, the growing calls for more inclusive archiving strategies also emerged during the same period, and continue to challenge archivists and archives to be more transparent and open about efforts to support decolonizing practices and reconciliation processes between settler/immigrant communities and Indigenous Peoples.

My first case study explored the rift between theory and practice by looking at records and other materials generated through the Canada Land Inventory (CLI) and the Canada Geographic Information System (CGIS). The creation and ongoing management of these materials reveals the role of cartography and archives in the formation of Canada as a modern colonial state, and in the ongoing dispossession of Indigenous Peoples. My second case study,

situated within the broader history of digital technologies, and focused on the digital cartographic tools deployed through Cybercartography, explored how these tools might be employed in support of decolonization and reconciliation processes.

The benefits of crossing archival studies and cartographic studies, thereby articulating a new, transdisciplinary approach to cartographic materials in archives, builds upon and is supported by the parallel developments in archives and cartography that were discussed in the first chapter. My discussion of the cartographic and archival literature, and my case studies, show that archives and cartography have a parallel history of development. And while this parallel movement from the purportedly objective and neutral work of archivists and cartographers, towards current understandings of inevitable subjectivity and bias, has been recognized by scholars in both fields, I have not found any attempts to conduct transdisciplinary work based on this parallel history.

Archival studies and cartography share a foundation in their nineteenth century professionalization, twentieth century “modernization” and a more recent deconstruction through the development and application of critical theory and postmodern approaches. Perhaps the most necessary change in the Canadian context today is to incorporate a plurality of perspectives into both archiving and cartography, in response to urgent calls for a long-overdue decolonization of Canadian archives and maps. These processes are crucial to both fields. Sustainable change can be supported through the cultivation of transdisciplinary approaches to future projects and research. As this thesis has argued, one of the most important stages of this process is the acknowledgment and acceptance of the subjectivity of archival processes and cartographic materials. Numerous contributors to archival studies and cartographic studies have already acknowledged and accepted this inevitable subjectivity in their theoretical approach to these records. However, in an archival context the practical application this shift has not been fully embraced. By the same token, in the cartographic field, challenges in preservation and long-term access remain common. Both fields have a lot to offer one another.

As Canadian of settler/immigrant ancestry, and a student researcher, I have endeavored to situate myself within my research and writing as a beginner in these necessary conversations. I have been overly optimistic and naïve about my ability to take a critical position with regards to theory, practice, and institutions I was raised to accept without question. However, I also cannot accept the notion that I will slip back into complacency when this process has finished. In this

sense, I would like to consider this thesis as a part of a larger whole on the trajectory of education, in an academic sense but also as a member of a society built largely, but not entirely, on colonial foundations. Part of this foundation consists of the complex relationships that developed between the peoples that have come to consider this part of Turtle Island their home. Moving forward with inclusive approaches to archival materials is possible if there is broad participation in a transdisciplinary process. This exploration has been an attempt to develop my critical thinking by starting at a beginning. Not *the* beginning, but at one beginning; the one where a student of archival studies starts to look at the records her ancestors helped to create, seeing them as value-laden and nuanced, remaining focused on the *ongoing* process of that creation.

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