Indigenous Online Mapping in Canada - Decolonizing or Recolonizing Forms of Spatial Expressions?

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ABSTRACT

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Thomas J. McGurk, MSc

Digital cartography technologies have expanded the tool base for Indigenous communities in Canada as a means of representing their lands and the contestation of space. However, critiques of digital technologies question if these tools are a new system of technological colonialism. This study addresses the question of how this technology is being used today and what impact it is having on Indigenous mapping content. Additionally, I ask if the web as cyberspace can be conceptualized as "a third space," a decolonialized space of communication, recognition, and reconciliation (Soja, 1996; Bhabha, 2004). I theorize that Indigenous ways of knowing and constructions of space align with Lefebvre's idea of first space, while Western ways of knowing and mapping practices align more closely with his concept of second space. A mix of quantitative and qualitative methods is used to investigate this theory. The former involves content analysis of 26 Canadian Indigenous web mapping sites using a decolonialized methodologies perspective. The qualitative dimension consists of 10 semi-directed interviews with Indigenous and non-Indigenous cartographers, technicians, scholars, and the producers and consumers of online mapping websites. Triangulation of these data sets identified narrative as an emergent theme, including its strong links to Indigenous cultures and processes of decolonialization. I conclude that while online mapping is a potential medium of decolonization, it has not yet fulfilled this possibility. It currently offers a hybrid space for the examination and reclamation of knowledge production but falls short of being a primary location for discussion, communication, and nexus due to a lack of feedback mechanisms.

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CHAPTER 1. INTRODUCTION

Mapping as a practice is multi-faceted and culturally dependent. Mapping and its associated processes come with sets of conventions about how and what to map. The conventions and tools used to map are guided by the culture and society of a map's creator; a mapper's relationships with place, space, and identity matter. They impact how and what we map, and the means used to produce them. In other words, our worldview or cosmovision has impacts on the types of maps we make. Historically, the dominant paradigm of mapping in the Western world is one based on Eurocentric ideas and concepts related to the control and ownership of land and how it can be abstracted and represented graphically. Exploring how and what people map can help us to understand better the way we conceive, use, and create space and place as well as the underlying power relationships.

Indigenous peoples have been mapping for a long time (Cameron, 2011). This work begins with a focus on the cartographic experience of the first contact between the Indigenous peoples of Canada and European explorers. In the colonial context maps, mapping, and map making provided a tool of common understanding for settler and indigenous inhabitants (Eades, 2015). As the power and popularity of maps became entrenched in colonial culture maps and mapping drifted away from its use as a common language to become one of the tools used to dispossess and disenfranchise based on the concept of terra nullius (Reynolds, 2003; Banner, 2005, 2009; Cavanagh, 2014; Burrows, 2015; Bryan and Wood, 2015). This concept of terra nullius served to justify colonial perspectives on the use and acquisition of land for over 450 years. It managed to do so despite the existence of treaty relationships between the Native inhabitants of Canada and European colonizers (Dickson, 2011).

Eventually, in the 1970s and early 1980s after centuries of loss and devastation, the Indigenous peoples of Canada started to use mapping to reclaim their rights and property through the practice of counter-mapping and the use of Traditional Land Use and Occupancy Studies (TLU). As the 21st century dawned new technology and tools changed mapping for those who are connected to the internet. These tools made maps more accessible and easier to create for both professionals and non-professionals. The internet and the expanded spatialization of data and information have pushed maps and mapping into the day to day lives of millions of people. Mapping's embrace of the internet has opened the practice to new forms of expression made possible by the multi-media capabilities of the web and modern information technology.

In addition to changes in technology in the last quarter of the twentieth century, there also have been changes in the understanding of systems of knowledge and how research is conducted (Best and Holmes, 2010). Distinctions have been made between Indigenous knowledge and Western ways of knowing. More specifically, that Indigenous knowledge systems are more local, and experiential compared to Western systems based on the scientific method (Reynolds, 2010). Beyond this fundamental difference, Indigenous knowledge systems and Indigenous methodologies are characterized by diverse sets of practices and modalities (Drawson, 2017). Some argue that maps are a means of exploring the differences and similarities between these two systems. They maintain that maps can break down information silos and cross the borders between different systems of knowledge (Wood, 2010; Palmer, 2013).

This work examines people's concepts of space, place, and identity via the medium of mapping. It seeks to explore and understand to what extent maps, mapping, and cartography as web-based expressions and communications may expose differences and similarities between knowledge systems. It hypothesizes that the current era and its technology provide new and different opportunities of mapping for marginalized groups like Indigenous peoples. It is re-asking the question proposed by Agrawal (1995) if what is being produced online is something new and different or more of the same. In addition, it explores the idea that the internet and cyberspace are a potential location of nexus, communication, and reconciliation. To address the hypothesis this work's aim is to understand better the current state of Indigenous mapping online in Canada by producing an audit. The audit examines the contents found on the websites (See Appendix 8.2) from a decolonialized frame. It uses a set of meta-criteria and traits derived from the works of the Indigenous scholar Linda Tuhiwai Smith (2013). The analysis also categorizes the content within four broad frameworks; sources of the information portrayed on the maps, acts and processes documented, the results of the acts or processes, and finally the location. It uses data from the content analysis to help formulate questions for participant interviews. The interviews are with people practicing or doing research in the fields of cartography and or Indigenous studies. This mixed methods approach is an attempt to shed light on the question of how web-based mapping by Indigenous actors may represent the creation of a new space. This new space is a third space, a location of contestation, communication, and nexus where dialogue between Indigenous and non-Indigenous actors can take place.

CHAPTER 2. LITERATURE REVIEW

2.1 HISTORICAL CONTEXT

"Once a map has been published, it is pretty much taken for a description of the way things actually *are*." (Wood, 2010, p. 5)

Historical precedents support the argument that cartography and mapping in the mainstream have been and are dominated by Eurocentric views, values, and beliefs about space and place. This Eurocentric world-view or cosmovision is framed by a market-based model of understanding that focuses on issues of ownership, use, value, and commodification (Chapin et al. 2005; Wyatt, 2008; Hall, 2015; Pasternak, 2015). This model of mapping dominated well into the twentieth century until questions, and subsequent theories about maps and their links to power and control gained traction in scholarly debate and gave rise to the practice of critical cartography

Lewis (1998), describes the early dealings between Indigenous peoples and western mappers as cartographic encounters and argues that in the intervening years between initial contacts and today, that Indigenous cartographies and geographies have been negatively impacted and usurped by a Eurocentric worldview. Cameron (2011) argues that mapping by Indigenous people has been around for a long time. Explicitly noting tools such as carvings on trees or the use of narratives as means of wayfinding and spatial ordering that convey knowledge from person to person about territory. Pearce and Louis (2008), recounting the history of Indigenous mapping note that it comes in a variety of forms ranging from the more ephemeral formats such as verbal or gestural mapping to more enduring artifacts that are inscribed on natural (e.g., wood, stones, skins, and bodies) and human-made surfaces. Turnbull (2003) is an early supporter of the idea of processual mapping noting that processes and practices are linked to culture; therefore, each group may use different tools of expression for spatial representation. Building on Woodward and Lewis (1998), Caquard (2013) points out that Indigenous people and communities use means of spatial expression across a variety of mediums (e.g., song, dance, visual arts, mapping) and are part of processes of reclamation and agency. A common theme in the literature is the diversity in the means of expression found in Indigenous maps. In other

words, for many Indigenous people, the range of possibilities of what constitutes a map might be much broader than it is for those coming from a Eurocentric view of the world.

Rundstrom (1991) in his critique of postmodernism within the culture of mapping, argues that there are text-based peoples who place value on the product and non-text-based peoples who place value on the process. Specifically, he argues that Eurocentric ways are weighted more towards the physical artifact, and Indigenous ways are weighted towards processes. In addition, he argues the makers and providers of geographic technologies including GIS have not addressed these differences (Rundstrom, 1995). Because of this, the result has been the distortion, suppression, and assimilation of Indigenous culture into a Western cartographic paradigm. Sletto (2016) constructs an argument comparable to Rundstrom's and builds on the premise that memory and performance should be considered as factors in Indigenous mapping practices. Asserting that memories exist within landscapes and that narratives can shape past, present, and future understandings of place and space. Sletto argues for a post-representational construction of mapping that values process over product.

Eades (2015) expands specifically on the Canadian experience. He argues that within a framework of foreign investment by England and France, that maps and mapping were first used as a means of basic communication between two sets of peoples who lacked a common language. That Indigenous people and colonists used maps as a supplement to or a replacement for communication-based on mimicry or imitation of the other. Eades notes this was somewhat of a self-reinforcing situation. The need for communication forced early Europeans in the Americas to set up cartographic standards and become cartographers while simultaneously invoking a Eurocentric view of the physical world upon the Indigenous inhabitants. Despite the parallel development and use of maps as a means of communication, there existed a significant distinction between what the two groups were doing. Eades citing a concept of Wood's (1992) is suggesting Indigenous persons were mapping but not necessarily map making (see figure 2.11).

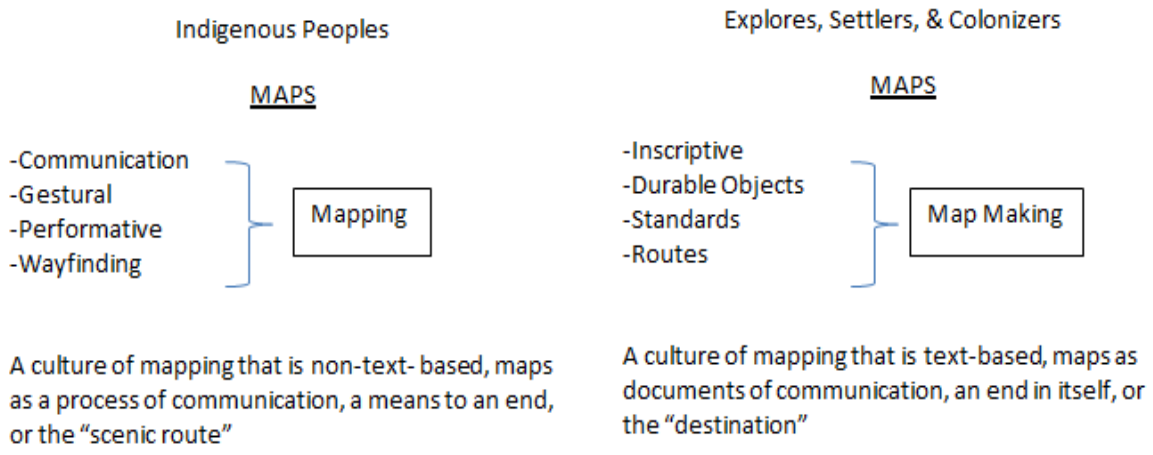


Figure 2.1.1 Eades distinction between mapping and making maps

Eades (2015) argues that maps were used as a tool of basic communication between the Indigenous peoples of Canada and Westerners. However, he draws a distinction between the concept of mapping and map making. He argues that mapping is a process-oriented activity and indicative of an Indigenous way of seeing while map making is object focused and reflects a Eurocentric world view.

Eades (2015) observation on the difference between mapping and map making draws support from Rundstrom's (1991) theories on text-based and non-text-based peoples and the values assigned to the product (map makers) versus values assigned to process (mappers). Eades argues this initially played out as a method of defining and formulating Indigenous identity by mapping Indigenous peoples into reserves and out of the landscape for the benefit of the state. He argues this was a de facto practice of the concept of terra nullius in the Canadian context or as Eades puts it, "Blank spaces on maps fulfill criteria for appropriation" (p.81) creating what he refers to as a meme of blank space. Bryan and Wood (2015) confirm the concept of mapping out and terra nullius as a means for colonialist exclusion of Indigenous peoples. Sparke (1998) in his critique notes that Indigenous people, their culture, and their mapping have been framed by some as pre-historic. This assertion invokes a sub-text that before the arrival of Europeans in North America history did not exist and allowed for the creation of blank spaces on the map. These blank spaces on the map without history, under a colonial worldview, defined North America as a terrain free and open for exploitation. This Western Eurocentric view of land and space perpetuated an idea of resources being wasted, seeing Indigenous spaces as unused capital, free and awaiting exploitation as justified by the state and its maps.

Returning to the Canadian context, Pratt (2004) notes that compared to other instances around the world the history of colonial/Indigenous relations in Canada is unique because of treaties. She also notes that while the existence of treaties in Canada had some favorable outcomes for Indigenous inhabitants, it does not mean that treaty relations were unflawed or immune to processes of colonialism. More specifically she argues that treaties were subject to an applied yet unrecognized application of the concept of terra nullius in Canada. Dickson (2016) acknowledges the existence of treaties between various Indigenous nations in the pre-contact era. Treaties in this period were used as a means of formalizing obligations between groups and stabilizing relationships among the compact's members. Treaties beyond formalizing spatial relationships for Indigenous peoples also addressed issues of kinship and reciprocity relating to territory and resources. The treaty processes for Indigenous peoples were iterative and based on ritual and rights that reinforced existing inter-group relationships as well as being adaptive and evolutionary. Miller (2009) notes that in the post-contact era treaties initially took the form of commercial agreements between Indigenous inhabitants and traders that facilitated commerce between the American and European markets. Treaties in this sense were still about use and reciprocity for those engaged in the compact. However, they were now being negotiated between two groups with dramatically different worldviews.

Cavanagh (2014) in his critique of the judicial history of terra nullius notes that issues of tenure and property relationships were not addressed in a meaningful way in Eastern Canada. Arguing that early French settlers, traders, merchants, and missionaries were more concerned with the day to day issues of survival and settlement than they were with issues of control and ownership in the new world. Cavanagh notes that the French crown before 1663 took little interest in matters and that colonial settlement in New France had effectively occurred without formal recognition of indigenous rights to the property. In effect, a view that land and resources acquired by the French happened via an informal version of adverse possession. Pulling from Reynolds (2003) and Banner (2005) (2009) he argues that in this context the concept of terra nullius should not be viewed as a legal doctrine to explain and justify dispossession but as a construct of settler colonialism. In other words, he argues that we need to acknowledge that there is a difference between actual practice and legal doctrine when addressing terra nullius in the Canadian context.

Burrows (2015) in his review of the rulings related to land claims in western Canada argue that the state's legal position about terra nullius is contradictory. To build his argument, he notes the case of Tsilhqot'in Nation vs. British Columbia (2014 SCC 44, [2014] 2 S.C.R. 256) as an example of this paradox. While that ruling states the doctrine of terra nullius was not applied in Canada it also says that at the point of European assertion the British crown acquired title to all land in the region. Burrows views this as a contradiction and citing Pasternak (2014) asks how the crown can claim sovereignty without some supposition of terra nullius. A ruling that he argues is a de facto reproduction of terra nullius in the Canadian context.

Returning to Eades (2015) distinction between mapping and map making, a case can be made that Eurocentric cartographic practices, in due course acted as an extension of state power in colonial North America. Specifically, Eades argues that state power was being expressed under the rubric of map making and cartography for expansion and extraction. The history of Indigenous people in the colonial period and mapping practices are inseparably intertwined with the issues of extraction and expansion (Bryan & Wood, 2015). Eades highlights that over the comparatively brief history of colonial occupation, opposed to thousands of years of Indigenous occupation, the issue of extraction and land claims has been pivotal for both colonist and colonized.

Eades (2015) argues the intersection of Western mapping practices and Indigenous peoples in Canada occurred along three distinct fronts. An Eastern front defined by contacts occurring in Atlantic Canada that includes the regions of Arcadia, Newfoundland, Upper Canada, and Lower Canada. An Arctic front, defined as including the regions of the Labrador coast, Hudson Straits and Bay, and the areas North of Baffin Island. Finally, a western front defined by activities and contacts initiating from colonial expansion from the Pacific coast eastward.

The Western front plays a pivotal role in the establishment of modern Indigenous mapping in Canada. Primarily this is because the history of Pacific-based contact and disputed claims are well documented within the colonial legal system. This in-depth documentation was a principal factor in the Calder case (Sparke, 1998; Eades, 2015). In Calder 1973, the Supreme Court of Canada established that Aboriginal land claims existed before colonization and were not subsequent to the colonial statutory law (Sparke, 1998). The final ruling on the case and the following actions taken by the Nisga'a Nation, as part of Calder set precedents and paved the

way for Indigenous mapping and counter-mapping practices across Canada. Specifically, the precedents it set were leveraged by the Dene in the West, the James Bay Cree in the East, and in the North by Inuit.

The Dene, Cree, and Inuit experiences according to Bryan and Wood (2015) serve as the wellsprings of contemporary Indigenous mapping practice in the Canadian context. Specifically, they note the development in the 1970s of Traditional Land Use and Occupancy Studies (TLU) that played a role for the Dene during Treaty 8 disputes. Also, they note the activities in Quebec related to the clash between the James Bay Cree and Quebec Hydro that eventually led to the James Bay Agreement. Finally, they note the Inuit's Land Use and Occupancy Project and the establishment of the Nunavut Territory as relevant case studies.

The Inuit Land Use and Occupancy Project is perhaps second only in importance to Calder when defining Canadian Indigenous mapping today. Specifically, as it relates to the pivotal role it played in the development of map biographies as part of the research process. Bryan and Wood (2015) highlight the breadth and depth of the Inuit Land Use and Occupancy Project. They note participation by 34 communities, involving 1600 participants, and a response rate of 80 to 95% that resulted in 209 maps, tables, and reports all of which were derived from primary data collection and without reference to outside source material.

Peter Usher (2003) one of the primary study partners of the Inuit Land Use and Occupancy Project, notes a vital aspect of the work setting it apart from previous ventures was that it was mapping not done by outsiders but that it was based on the experience and knowledge of the Indigenous population inhabiting the land. Other factors setting the work apart were that the mapped information was recollection based; it used historical narratives, traditional place names, and traditional Indigenous Knowledge in their construction. Initially, the data derived from the Inuit project met with skepticism. Indigenous knowledge for some only takes on legitimacy when it can be made to fit into the narratives of Western science (Ellis, 2005). Critics of the work focused on the concept of Indigenous Knowledge Systems versus established western paradigms about the validity of science and data collection. However, TLU and map biographies have come to be the accepted standard for Indigenous mapping projects in Canada.

2.2 CRITICAL CARTOGRAPHY

Palmer (2013) defines critical cartography as a social theoretical critique of maps and the power relationships between the producers of the maps and the content produced. In other words, the who, how, why, what, and the goals of a map need to be considered when evaluating what a map proclaims to represent. Palmer describes the modes of critiquing cartography as evolving over the last thirty years in three distinct stages. Early attention in critical cartography was paid to the relationships between knowledge and power and focused on the reading of maps as texts (Harley 1988). Palmer describes this as the first wave of critical cartography and notes that Harley and his contemporaries were influenced by scholars from outside the fields of geography and cartography like Foucault and Derrida. A fundamental point in Harley's work is that maps are not neutral documents. In other words, maps are not impartial inscriptions of spatial data that represent a given landscape. The concept of critical cartography as framed by Harley's work moves the discipline of mapping beyond the functional and technical boundaries of physical geography and into the terrain of the social sciences.

According to Palmer (2013), the second wave appears in the middle 1990's with the work of Pickles (1995). This round of critique is distinguished from the first by greater collaboration between the fields of human geography and geographic information systems to study the social implications of mapping technologies. It is in the second wave that issues of Indigenous ways of knowing became part of the debate with the dawn of counter-mapping practices by Indigenous actors, for example in the work of Nancy Peluso (1995). Palmer suggests that work done during the second wave of critical cartography begins to address epistemological issues and ways of knowing for Indigenous peoples and what is put on a map. In addition, drawing from the work of Pearce (2008) he notes that it is during the second wave there was a shift away from viewing maps as objects to one that sees them as processes. Specifically, Pearce's concept that when maps are seen as processes, it opens the doors to experimental forms of mapping that can exploit the strengths of oral, written, and performative formats as means of transmission of Indigenous knowledge. In effect, she is arguing that a processes-based view expands the range of mapping tools that can be used by Indigenous peoples in the expression of knowledge about place.

A third wave appears in the early part of the twenty-first century and expands the scope of critical cartography and counter-mapping by examining the social aspects of cartographic practice. Issues such as participatory mapping, volunteered geographic information, online

mapping, and cybercartographic methods are part of the third wave of critical cartography. It is in this third wave of critical cartography where this work is situated.

2.3 COUNTER-MAPPING – AN EXPRESSION OF CRITICAL CARTOGRAPHY

Foucault (1975) in his discussion of discipline notes that its power is built on the arrangement of individuals in space and the ability to surveil and control conduct. From this perspective, those who draw the lines and make the traces on the landscape inevitably are more powerful than those who do not. The term counter-mapping fundamentally refers to the use of cartographic tools and mapping by marginalized actors in the service of counter-hegemony and reclaiming space and power. The strength of counter-mapping is that it appropriates the conventions and ways of knowing that the state, its actors, and interested third parties use and understand as part of an Indigenous mapping process. Peluso (1995) coined the term counter-mapping while working with the Indigenous peoples in the forest territories in Kalimantan, Indonesia. From her perspective counter-mapping efforts "appropriate the state's techniques and manner of representation to bolster the legitimacy of 'customary' claims to resources." (p.384). In other words, counter-mapping enables Indigenous actors to document local knowledge in their own voices and from their own perspectives as they are the ones drawing the lines on the maps.

Since Peluso's (1995) work the concept of counter-mapping and its impact has been critiqued by various scholars. Herlihy (2003) argues that participatory counter-mapping can be used as a source of transformation in the politicization of Indigenous people's relationships with land and space. However, he notes that participatory counter-mapping projects vary in their degree of impact on given communities. Suggesting that beyond mapping, political engagement must be part of a set of integrated processes before substantive change can occur for disenfranchised groups. Harris and Hazen (2005) see counter-mapping as participatory and inclusive. They argue traits such as it being a bottom-up process; its contestability, its exposure of power differentials, and the ability to address situations of injustice as defining elements of the practice. Sletto (2009) describes Indigenous counter-mapping as a set of complex cultural constructions. These constructions informed by tension and contestation are related to placemaking from an Indigenous person's perspective. In addition, Sletto notes that Indigenous based mapping efforts are not merely straightforward depictions of space and territory because they arise from alternative and complex ideas about the production of space. For example,

concepts perpetuated and ingrained in Western cartographic culture related to the fixity of borders, access to the commons, ownership, and the resolution of local conflicts tied to a place are not necessarily shared by Indigenous peoples and communities around the world. Wood (2010) says that counter-mapping practices by Indigenous peoples are a form of boundary crossing between knowledge systems. Palmer (2013) notes that the exercise of counter-mapping helps to break down information silos that have historically segregated Indigenous knowledge systems from Western scientific ways of knowing.

Hunt and Stevenson (2016) argue there is no "pan-indigenous definition" (p.377) of what constitutes Indigenous counter-mapping. Building on the work of Cameron (2011) they reject the idea defining mapping and counter-mapping in a binary sense. They argue that maps for some Indigenous peoples and communities could be spatialized representations of traditional stories, practices, and performances. For some, it is the use of the tools and conventions of technocratic map making to depict spatial information in a new light while for others it is a hybridization of a variety of formats. They challenge the notion of counter-mapping altogether. Citing Cameron, they support a view that mapping by Indigenous people has been around for a long time. Explicitly noting tools such as carvings on trees or the use of narratives as means of wayfinding and spatial ordering that convey knowledge from person to person about territory and environment. In a sense arguing a position that Indigenous peoples historically and contemporaneously are just selecting the format of mapping that best suits their needs. In other words, they define Indigenous counter-mapping in a broad sense. They see it as the general processes where Indigenous peoples use maps and mapping as tools to re-focus and re-position the standard narratives about land and space as conventionally framed by colonial discourse. It is a means of establishing occupancy on ancestral territories and giving them the right to protect it from further infringement. Under this broad definition, Indigenous people have a significant degree of latitude of what to map and how to map on their terms. In short, the methods of Indigenous counter-mapping are diverse.

2.4 KNOWLEDGE SYSTEMS

Raymond et al. (2010) argue that there are distinctions between scientific knowledge and Indigenous knowledge systems. Notably, they say that Indigenous knowledge systems are local, experiential, divers, and multi-layered. They describe a structure having at least twelve different taxonomies related to local Indigenous knowledge (i.e., Indigenous, traditional ecological knowledge, local ecological, personal, lay, local or situated, tacit, implicit, informal, non-experts, novice experts, explicit, and formal). Cash Ahenakew (2016) an Indigenous scholar, working in the fields of Indigenous studies and education argues there are differences between Indigenous ways of knowing and understanding the world and Western or Eurocentric systems. Andreotti (2016), expanding on Ahenakew describes Western systems of knowledge and understanding as being grounded in logocentric, universalistic, anthropocentric, teleological, dialectic, allophonic and evolutionary ways of thinking that guide, reinforce, and self-perpetuate concepts about knowledge and its validity (See Table 2.4.1).

Logocentric	Reality can be described *i.e., "I say; therefore, it is"*
Universalism	Perceived objectivity and legitimacy *i.e., "I think; therefore, it is all there is"*
Anthropocentric Thinking	Reason as a means of separation from nature *i.e., "I think; therefore, the world is mine"*
Teleological Thinking	Linearity vs. Paradox & Complexity *i.e., "It is this; therefore, it cannot be that"*
Allochronic & Evolutionary Thinking	Judging the other within the linear context of time *i.e., I succeed because I am Intelligent and strong;* *therefore, you perish because you are stupid and weak*

Table 2.4.1 Andreotti's characteristics of Western knowledge systems

Andreotti (2016), coming from a political economy background builds on Ahenakew (2016), an Indigenous scholar working in the field of education to create a model to conceptualize and understand modern Western perspectives on research, understanding, and knowledge production. It views the Western scientific knowledge system as rigid, exacting, and based on Enlightenment thinking.

Best and Holmes (2010) argue that there has been an evolution in our thinking about types of knowledge systems. They propose that since the early 2000s there has been greater acceptance of theories supporting ideas that knowledge is informed by culture and reflects the priorities and concerns of various groups. Despite the growing recognition of these ideas Rathwell et al. (2015) note that systems based on experience or inferred knowledge often take a backseat to systems of scientific knowledge that still dominate official decision-making processes. Rathwell et al., also argues that the delineations between knowledge systems can sometimes be unclear and that it is perhaps an oversimplification to assign labels such as *scientific* or *indigenous* to knowledge. Instead, they suggest, noting Brody (2001) and Cruikshank (2012) that a better way to delineate the differences is by noting that the holders of different types of knowledge confirm and prioritize information based on their own worldview or cosmovision.

The tools and processes we use to understand the world are not just abstract concepts related only to our epistemological and ontological constructions of knowledge. They are also part of what shape our cultures and our unique worldviews. Dickason (2011) argues that in Canada despite a variety of Indigenous cultures and nations there are some underlying commonalities among the original inhabitants of North America. Specifically, she argues that the Indigenous peoples of Canada have a shared cosmovision based on an underlying premise of interconnection between all beings and the environment. She summarizes this shared world-view as being rooted first in a belief that all beings are people. Second, a sense that some beings are human while others are not and that humans are part of a larger interconnected system. Finally, a logic that argues because human beings have certain advantages they, therefore, have specific responsibilities related to the preservation of the system. She argues this stands in contrast with a shared Eurocentric cosmovision that separates humans from nature, views humans as having dominion over other beings, and conceptualizes nature as a resource in the services of humanity.

2.5 DECOLONIALIZED METHODS AND MAPS

As noted earlier there are differing perspectives on how people create knowledge and understand the world. These differences open the possibility of alternative ways of addressing the process of research. Drawson et al., (2017) asserts that Indigenous research methods are

diverse, and no single definition describes the depth of the practice. However, they do identify critical distinctions between Indigenous and Western techniques. For example, they note that Indigenous methods are done collaboratively with Indigenous peoples. Additionally, they argue they must move beyond knowledge creation to address issues of power imbalances, decolonialization, reconciliation, and healing. They also recognize that Indigenous methods re-prioritize ways of knowing, more explicitly highlighting Indigenous ways over Eurocentric scientific traditions.

Louis (2007) asserts there are four general and unwavering principles of Indigenous methodologies. First, Relational Accountability, which addresses the concepts and ideas we have about interdependence and relationships between everything and everyone in the environment. It implies that all aspects of the research process are related and interdependent and the researcher carries responsibility and accountability for all the relationships that are part of a research project. Second, Respectful Representation refers to a holistic approach towards being referential to the entire process of research. As Louis puts it moving beyond the "please" and the "thank you" to a method that is grounded in open-mindedness, humility, generosity, and forbearance in accommodating the decisions made by Indigenous peoples as it relates to the sharing of knowledge. Third, Reciprocal Appropriation is the concept that all research is appropriation. Therefore, it should have benefits for the researcher as well as the partner participants of the investigation. Fourth, Rights and Regulation that builds on Smith's (2013) concept that research should be motivated by Indigenous protocols and goals that ponder the possible impacts of the proposed research. Ultimately, this principle aims to address issues of intellectual property rights and ownership of information. Research should strive to be non-extractive, collaborative, and accessible across all aspects of the research process from initial investigation through publication.

2.6 EXAMPLES OF DECOLONIALIZED METHODS

Linda Tuhiwai Smith (2013) an Indigenous scholar, researcher, and leading theorist on decolonization gives another perspective related to types of knowledge and the methodologies used to study them. Smith, drawing from the culture of Pacific Islanders visualizes a model using the metaphor of the tidal pool to construct an Indigenous research agenda. The pool and its

overlapping and intermingling waves acting upon individuals in the environment is intended to help visualize various concepts that impact the creation of knowledge. (See figure 2.6.1).

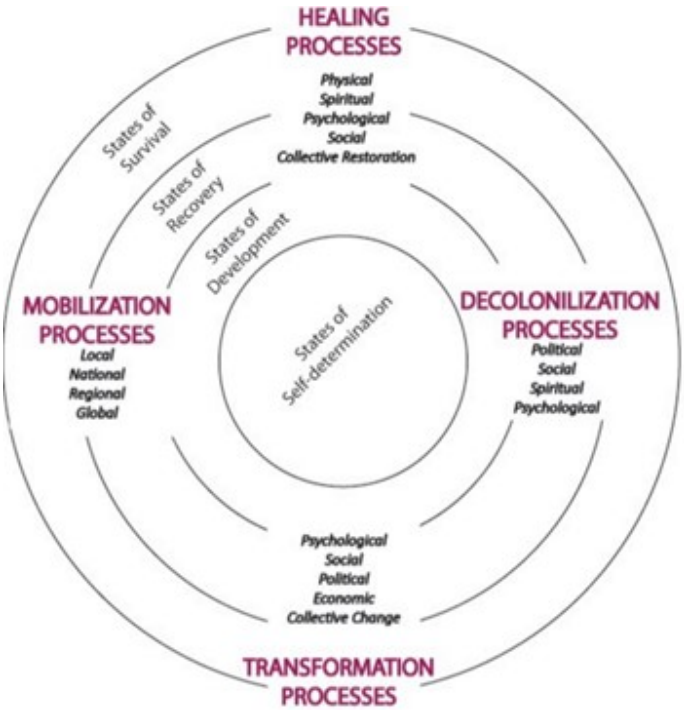


Figure 2.6.1 Smith's concept model of Indigenized research process

Her model of a decolonialized research agenda is defined by a mix of processes and conditions. The processes work across scales from the local to the global and facilitate real-world actions and practices that are multi-layered. The conditions refer to states of being through which peoples, groups, or communities are moving during the process of research.

The processes in the model are conceptualized as the waves spreading across a pool in four cardinal directions. The process waves work across scales from the local to the global, the individual to the collective, and the political to the spiritual and facilitate multi-layered actions and practices in the real world. The states refer to conditions of existence or being through which Indigenous peoples, groups, or communities are passing. Another way to think about the model might be to consider the states of being as the water, the processes as the waves, and the researchers and participants as the organisms existing in the pool. As such, researchers and participants alike depending on their position in the water (their state of being) are, subject to the forces of the waves (processes) when conducting research and creating knowledge.

Olson et al. (2016) argue for a more nuanced approach to Indigenous knowledge and methodologies and their relationships to mapping practices. They call for a re-examination of data collection methods, information sharing, and production processes as part of a new model for Indigenous mapping. They note that the standard in Canada today for most Indigenous mapping projects is rooted in the TLU method that grew out of the land claims processes of the early 1970's. Acknowledging the work of various early scholars such as Brody (1981), Tobias (2000), Usher (2003) and Natcher et al. (2009) they note TLU's iterative nature and its links to the principles as described by Louis (2007).

However, Olson et al., (2016) argue that technological changes in recent years have had an impact on the TLU process and they present new opportunities and challenges for mappers. In particular, they note concerns with the use of culturally sensitive means during the data collection phase of the work. They also suggest a need to be aware of linguistic, epistemological, and issues of scale when dealing with Indigenous Knowledge. To address these concerns, they argue for a method they call direct-to-digital mapping when working with Indigenous participants to create map biographies. The direct-to-digital process draws from the TLU model and builds on its strengths.

According to Tobias (2009), a critical methodological aspect of the TLU process is the use of a diamond model when gathering site-specific map biography information. In conventional TLU practices the central questions of when, who, what, and where activities occurred on the land are asked, and the responses are documented on the map. Advocates of the direct-to-digital method argue that advances in geospatial technology provide an opportunity to include substantially more participants and accommodate multiple narratives of place in a more efficient format. They create a set of four additional data points related to knowledge transfer, relationality, ecological systems, and kinship that can be overlaid on the traditional TLU diamond concept forming a double diamond model for data collection and validation when mapping (see figure 2.6.2). Olson et al., (2016) claim these four added data points bolster the

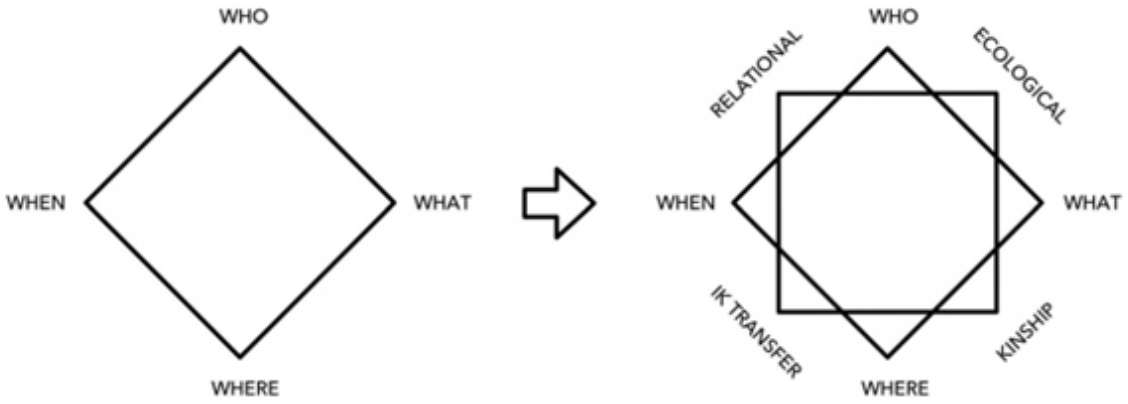


Figure 2.6.2 Olson et al., Direct to digital double diamond model of TLU

The direct to digital model of mapping builds on the TLU process. The original TLU diamond model focuses on the who, what, where, and when of Indigenous land use and occupancy activities. The direct to digital process includes four additional points related to knowledge transfer, relationality, ecological systems, and kinship to form a new double diamond model.

process because it can combine spatial data and narrative to expose and explore Indigenous people's relationships to space and place.

Olson et al., (2016) also argue that documenting narratives is the underpinning of a process that allows for the direct connection of story to the landscape. Narrative cartography, story maps, and geospatial storytelling are just some of the labels that have been applied to these types of mapping practices (Caquard, 2013). The oral transmission of knowledge is often an important aspect of the lives of Indigenous peoples. Drawson et al., (2017) noting the work of McIvor (2010) asserts that narrative and storytelling are significant aspects of many Indigenous cultures. Stories and narratives of place are likely linked to the concept of myth as defined by Campbell (2008). Arguing that myth is a socio-cultural tool that evolved to communicate information on how to survive and live in the world. One of the strengths of these narrative tools is their flexibility and adaptability. For example, Wright et al., (2012) argue that for many indigenous cultures storytelling allows for the blending of human and non-human elements (e.g., air, water, and animals) into the processes of data gathering and interpretation. In addition, Drawson et al., suggest that the adaptive and flexible nature of storytelling makes it a useful tool for the dissemination and translation of different kinds of knowledge.

Storytelling also can be a supportive tool of decolonialization as it has inherent relational aspects. According to Dyll-Myklebust (2014), this relational aspect is a factor that helps ensure

a sense of equity and respect among research participants. Willox et al., (2013) argues that digital tools, when used in storytelling, may reduce the risk of perpetuating colonial preconceptions as it ensures the participant information is presented from their perspective. Eglinton et al., (2017) in their work with Indigenous youth note that digital storytelling and internet technology offers participants the ability to share their stories across internal and external communications networks. They conceptualize digital narratives as a tool of participatory development suggesting it addresses uneven power relationships and opens spaces of expression for the marginalized. They contend that for marginalized groups the telling of stories in digital formats fosters empowerment, participation, and engagement by potentially giving voice to historically unheard groups. They compare the process of creating narratives and digital storytelling to the concept of radical democracy where individuals are actively defining and redefining themselves and their communities. In addition, Eglinton et al., notes that aspects of digital narrative allow for self-exploration in lived as well as in hybrid spaces where our lives are experienced, and identities are formed. The work of de Jager et al., (2017) argues that the telling of stories in online formats can move beyond being entertaining or educational to become counter-narratives and that the posting of alternative views of oneself and the world are powerful tools in countering existing dominant narrative frames.

2.7 PLACE, SPACE, AND THIRD SPACE AS CYBERSPACE

Place is a complex concept. Creswell (2009) conceives of place as a trinity consisting of location, locale, and sense of place. For others, a place is defined by our social interactions (Heidegger, 1971; de Certeau, 1984; Pred, 1984, Lefebvre, 1991; Krell, 1993; Massey, 1993). They argue that the discourse of daily life involves encounters between individuals within spaces and is marked by direct or indirect communication. For them, it is the discourse of daily life or the ongoing lived experiences of the inhabitants that build and encode places and give them meaning. Lynch (1960) and Ingold (2000) argue the practices of everyday life have an impact on our cognition and understanding of space and place, and that these practices also play a role in constructing our mental maps. Further, they argue that our mental maps can influence our expressions and spatial depictions when we are mapping in the physical world outside of our heads.

Lefebvre (1991) in a theoretical analysis of space, place, and time approaches the topic from a historical perspective. Arguing that in the pre-enlightenment era human perceptions of time and place were based on the bodily experience of individuals as they practiced social relationships in the physical world. Our world and sense of place were defined and governed not by the clock and the compass but by our capacity to live, move, and work within the limits of the body's abilities. This is a description of a literal experiential model of defining and understanding our environment and giving meaning to place via our social practice. This literal experience model was challenged by the scientific revolution that allowed us to explain space and place in abstracted terms. This ability to abstract allowed for new ways of codifying the world and then documenting, altering, and controlling spaces and places. This is an early manifestation of Cartesian logic and the introduction of technocratic ways of seeing the world. This philosophy propagated and insinuated itself into the practices of everyday life as it was quickly assumed and applicable to western capitalist ways of being.

To describe this process, Lefebvre constructs a tryptic view of space and spatial practices that humans use to define places. The world of spatial practice or first space is where and how we experience the world via our senses. It is the pre-enlightenment non-abstracted world in which we live out our social relationships that define our sense of place and time. Representation of space or second space is the abstracted experience of time, space, and place. It is the world of the cartographer, manager, government, institutions, and technocrats of all stripes. This is the space of the modern. It is perhaps best characterized by the industrial revolution and the impacts it had on human beings' experiences, understandings, and practices related to space and time. Finally, representations of space or third spaces are the worlds of the imaginary and contestation. Third space is a re-imagining and challenging of the abstractions that are used to conventionalize our practices. Its function is to question the world and its orthodoxy, rules, and representations of space or what Lefebvre calls second space.

Soja (1996) and Bhabha (2004), drawing on Lefebvre, expand upon the concept of third space in their works. Soja specifically argues that third space is the location of nexus where contradictions collide to create a unique spatial awareness grounded in that space, its history, and society. This spatial awareness allows us to understand, conceive, and modify that space. Soja views this space as otherworldly and growing, which is continually opening to new actors making it subject to contestation, compromise, concession, and negotiation. Bhabha explored

the concept of third space relative to relationships between colonizers and colonized. In his vision, third space is a location of uncertainty where the concepts of culture and community as being unifying forces are called into question. It is a broad open space of voice, agency, and practice by subalterns' questioning Western conceptions of its superiority, hierarchy, and its construction of space and meaning.

Lee (2016) describes Bhabha's concept of third space as a performance space marked by hybridity. It is a space where subalterns enact complementary discourse in opposition to the dominant culture. It is a space of recontextualization and translation where alternative narratives are created and expressed by native inhabitants. It moves beyond a space of re-enacting narratives to a location of resistance where it is possible to undermine colonial narratives via agency and mobilization. Lee also argues it is a space where a paradox of Indigenous cultural identity plays out, more specifically the dilemma of remaining authentic or being assimilated out of existence. As for the concept of hybridity, she argues third space is interstitial and exists on the boundaries between cultures where native actors can debate and reclaim the sites of knowledge production.

Sparke (1998) applies third space theory to maps and mapping, suggesting that certain mapping practices are examples of an entry space for discourse by minorities. He defines this as space where different narratives about a place and its history can play out in an antagonistic and contra-autocratic manner to challenge the dominant narratives. At the time Sparke was explicitly addressing the practice of paper-based counter-mapping or what he termed "contrapuntal cartography" (p.496), which is analogous to the concept of counter-mapping discussed earlier. Sparke argues that the concept of point and counterpoint can be applied to cartographic representations to subvert the idea that maps and atlases tell a single story. Specifically, he suggests that counter-mapping depictions are a manifestation of third space that opens new realms of discussion and contestation.

2.8 STATEMENT OF POSITIONALITY & LITERATURE REVIEW SUMMARY

As a non-Indigenous person and member of a non-visible minority, I am aware of my own experiences of colonialism. I am aware that my ethnicity and gender have immunized me from most if not all the consequences of discrimination, racism, and colonialism that have been inflicted upon visible minorities. However, as an openly gay man for the past thirty-five years, I

have experienced episodes of discrimination, and I have some personal insight on the pain and harm it can inflict. In addition to my personal life experiences, my work life experiences also have an impact on my view of the world. I have spent a large portion of my non-academic life working in the telecommunications and data technology sector. That experience has given me perspective on the power of communications technology and what it has done for the good and the bad. With this work, I wanted to explore and better understand how one minority, Indigenous peoples, might use maps and the tools of technology as a means of empowerment.

The rejection and devaluation of Indigenous ways of knowing under the conditions of colonialism is a critical tool in the arsenals of occupiers. According to Smith (2013), it is the principal means of universalizing Western ways of knowing. She argues the consistent certainty of the power of the universalization no matter what truths are being upheld or reinforced is in its ability to justify denial of rights, impose hardship, and rationalize annihilation for those considered incapable of understanding and accepting said truths. Another tool used in the universalization of Western ways of knowing and the separation of Indigenous peoples from their homelands was cartography (Chapin et al. 2005; Wyatt, 2008; Wood, 2010; Hall, 2015; Pasternak, 2015; Eades, 2015). Cameron (2011) notes that Indigenous people have been mapping for a long time. However, this history of mapping and their modes of spatial expression did not always fit Eurocentric understandings on the nature and functions of maps (Turnbull, 2003; Pearce and Louis, 2008; Caquard, 2013), a situation that severely disadvantaged Indigenous peoples for hundreds of years. Fortunately, as noted by Best and Holmes (2010) and Rathwell (2015) there has been an evolution in our thinking about different types of knowledge systems in the last forty years. Additionally, our ways of conducting research have also evolved in a manner that allows us to be aware of the colonialized aspects of information gathering processes (Smith, 2013; Louis, 2007, Olson et al., 2016)

One of the positions of this work is that aspects of spatial theory and our mental construction of space and place can be used to understand how people coming from different worldviews and knowledge systems might be able to understand each other's positions better. As it relates to this work, the idea of third space can be conceptualized in the following manner. Lefebvre's (1991) concept of third space is linked with Eades' (2015) and Wood's (1992) ideas on the differences between mapping and making maps. It places that model within the cultural context of two different groups of people holding contradictory cosmovisions (Dickson, 2011).

It also links their mental constructions of space and place, as described by Lynch (1960) and Ingold (2000), to the practice of everyday life (de Certeau, 1984; Lefebvre, 1991; Creswell, 2009). It conceptualizes these as drivers of their forms of spatial expression.

This construction is visualized as a parallel process of spatial documentation, where Indigenous ways of knowing and understanding are analogous to first space and the practice of mapping. Eurocentric ways of knowing coincide with second space and the practice of making maps or cartography. Under this model and considering the ability of digital technologies to possibly enable historically unheard voices (Krämer et al., 2017; Eglinton et al., 2017; Dyll-Myklebust, 2014; Willox et al., 2013) an argument of cyberspace as a third space is possible. It can be conceived of as the location where Indigenous actors embrace their agency and present Indigenous visions of place as a counterpoint to dominant Western views (de Jager et al., 2017; Kellerman, 2016; Ritzer and Jurgenson, 2010; Sparke,1998). Finally, it proposes that these alternative views of the world can be presented in a manner more equitable than cartography has historically enabled (See Figure 2.8.1). Under this model, this work asks if web-based mapping and digital communications represent a realm of expression for Indigenous people that is decolonialized? Also, it asks if the web and cyberspace can be conceptualized as a third space or hybrid space and the home to processes of recognition and reconciliation?

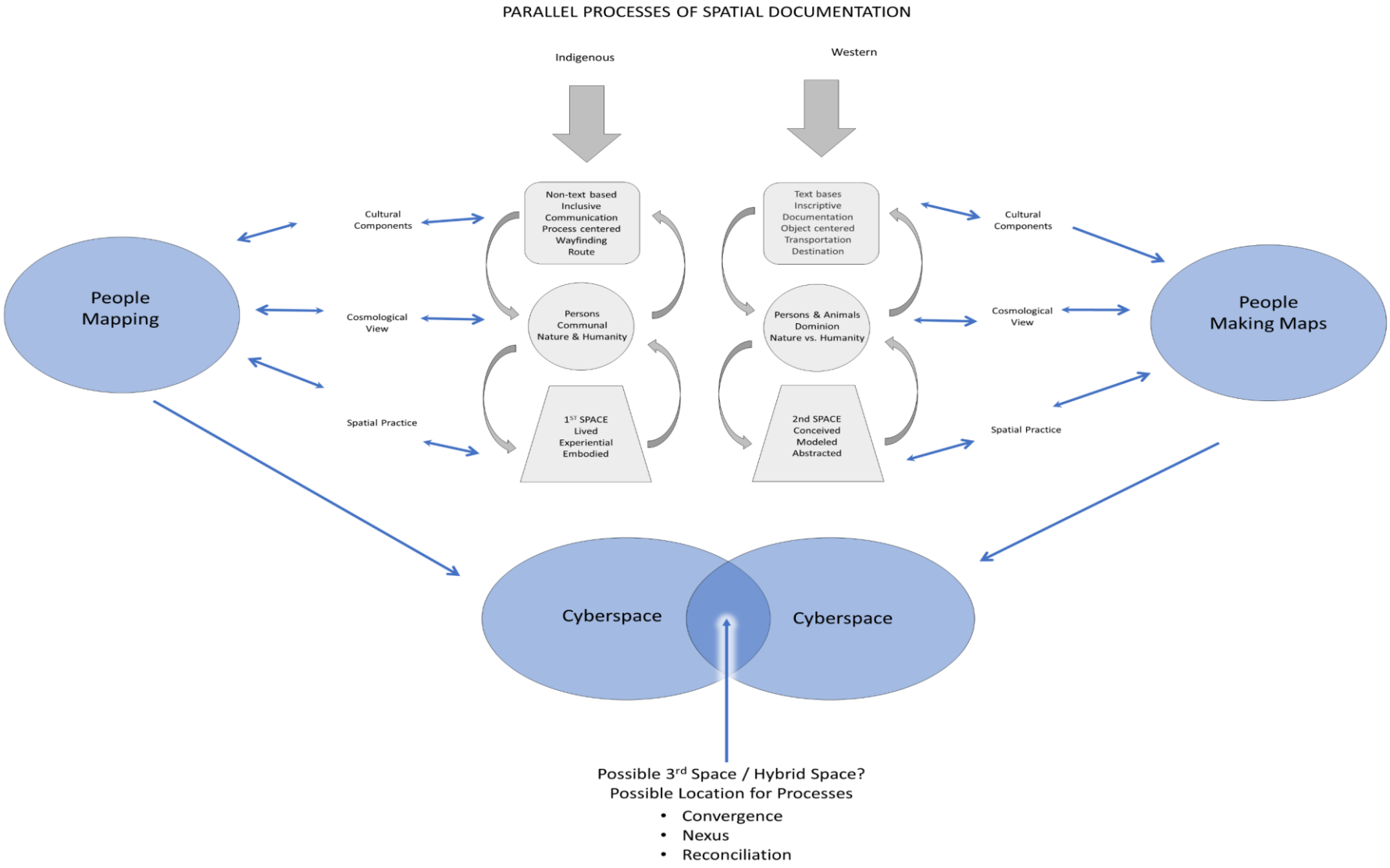


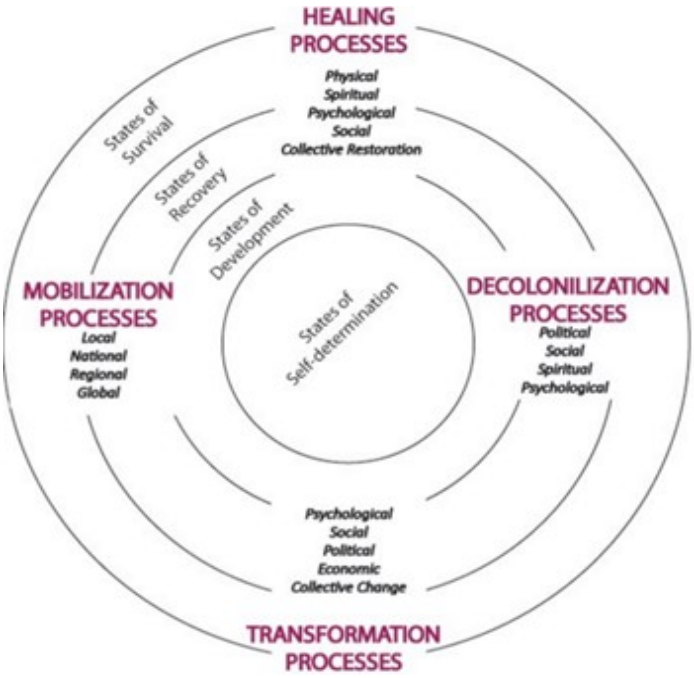
Figure 2.8.1 Parallel processes of spatial documentation and its relationship to third space.

The model builds on the work of Eades (2015) ideas on mapping and map making. It links them to Lefebvre (1991) and his thoughts about third space. The model visualizes the concept of mapping belonging to first space, and map making to the concept of second space. Finally, it envisions third space as the location of contestation, nexus, and reconciliation as existing in cyberspace.

CHAPTER 3. RESEARCH DESIGN

Data gathering for this project was a twofold process. The first phase of the work consists of a site audit and content analysis, while the second phase relies on interviews with map producers, consumers, and project participants. This method was selected to gather both qualitative and quantitative data. The audit of websites captures quantitative data to provide a baseline description of the type of mapping that is occurring online. Qualitative data derived from the interviews is intended as an aid in the analysis of how online mapping sites are being perceived and used by Indigenous communities, institutions, and researchers.

Methodologically the work draws upon Smith's (2013) framing of an Indigenous research agenda. Her model of a decolonialized research agenda is defined by a mix of processes and conditions. The processes operate across scales from the local to the global and facilitate real-world actions and practices that are multi-layered. The conditions refer to states of being through which peoples, groups, or communities are moving (See Figure 3.1).



Processes of Indigenous Research

- Decolonization
- Healing
- Transformation
- Mobilization

Peoples Conditions & States of Being

- Self-Determination
- Development
- Recovery
- Survival

Figure 3.1 Smith's tidal pool model visualizing an Indigenous research agenda

Her model of a decolonialized research agenda is defined by a mix of processes and conditions. The processes work across scales from the local to the global and facilitate real-world actions and practices that are multi-layered. The conditions refer to states of being through which peoples, groups, or communities are moving during the process of research.

3.1 CONTENT ANALYSIS

Smith (2013) identifies twenty-five examples of decolonialized project types. Using Smith's examples as a framework, a meta-criteria system was devised to organize traits distinguishing decolonized content under seven groupings or families. The families and characteristics are used to identify and quantify the types of material found on the websites. The meta-criteria families, traits, and descriptors are listed in table 3.1.1 below. Two different link scraping browser plugins, *Link Grabber* and *Link Klipper*, were used to collect links on each of the websites. The links were then manually reviewed for maps and mapping content. When mapping content was found on a webpage it was assigned to an appropriate family group and counted. A scoring system based on a Likert scale is used to rank the quantities of the traits by ranges (See Table 3.1.2). This counting system determined the density of content at the trait level for each of the websites. In addition, it allowed for the identification of possible trends appearing across all or portions of the sample. The content analysis also serves as the basis and background for the creation of interview questions for stakeholders that are outlined in section 3.3

Meta-Criteria Families

A. <u>Acquisition/Control/Ownership</u>

1. Claiming – Content documenting current occupied spaces
2. Naming - Content documenting traditional names (e.g., Points, Regions, Landmarks)
3. Returning –Content documenting contested space and place

B. <u>Ethnographic/Cultural</u>

1. Testimonial- Content documenting personal statements or individual's stories
2. Narratives – Contents are documenting:
   - Traditional Story Telling
   - Documenting History and Culture
   - Documenting Practices and Skills
3. Survival Documentation – Content documenting resistance to external forces (*e.g., overt, and covert counter-hegemonic contents*)

C. <u>Indigenized Processes</u>

1. Indigenous Voiced – Content that is self-generated (*e.g., locally produced & sourced* material)
2. Political –Content documenting bottom-up/grassroots action

D. Proactive/Change Oriented

1. Interventionist – Content related to meet "community" (across all scales) needs
2. Connective – Content documenting internal links (*e.g., individuals, groups, institutions*)
3. Network Building – Content documenting external links (*e.g., individuals, groups, institutions*)

E. Defensive Information Distribution

1. Inattentive Sharing – Content possibly disclosing sensitive insider information
2. Prudent Sharing – Content that informs without disclosing sensitive insider information (*e.g., Hunting /fishing are important parts of culture but not openly documenting the best areas of resource exploitation*.)

F. Critical

1. Reframing –Content that critiques or are anti-colonial
2. Counter Paternalistic – Content that is based on Indigenous Knowledge (IK) systems
3. Gendered – Content addressing issues of gender and power

G. Restorative

1. Envisioning – Content documenting to future possibilities and plans
2. Wellbeing –Content documenting and addressing human needs:
   - Spiritual
   - Emotional
   - Physical
   - Mental
3. Locally Innovating - Content documenting collective problem solving or management
   -Participatory Planning
   -Community-Based Resource Management
   -Crowdsourcing

Table 3.1.1 Meta-criteria families and traits based on Smith (2013)

Scale Rating:

0 = No Content
1 = Minimal Content (1 incident)
2 = Some Content (2-3 incidents)
3 = Moderate Content (4-5 incidents)
4 = Extensive Content (6 + incidents)

Table 3.1.2 Likert scale for ranking quantities of traits

3.2 SITE SELECTION AND IDENTIFICATION

An initial canvas was conducted to identify websites of interest. As the emphasis of this work is an examination of the Indigenous use of online cartography in Canada a wide net was cast for the first round of selection. Effectively, the primary means of finding subjects for the audit was to search the web for sites that met the following criteria:

1. Is the site based in Canada?
2. Is the site dealing with an Indigenous community in Canada?
3. Does the site contain some mapping content?

Based on these criteria the initial canvas was culled, and twenty-six study sites were identified that fell into three broad categories. First, some websites are associated with an NGO. The NGO affiliated websites are linked to Ecotrust Canada in Vancouver British Columbia. The second a set of websites are connected to research organizations operating out of a Canadian university. Websites that matched this criterion are affiliated with either the Geomatics or Cartographic Research Center (GCRC) at Carleton University in Ottawa, Ontario or with the Ethnographic Mapping Lab (EML) at the University of Victoria, British Columbia. Third, a group of websites that are non-affiliated and appear to be self-managed or stand-alone concerns was identified. A complete list of the sample websites appears in table 3.2.1.

Indigenous Group	Website URL	Affilation
Okanagan Nation Alliance, BC	http://voicesontheland.org/index.html	Ecotrust
Carrier Sekani Tribal Council, BC	http://livingatlas.org	Ecotrust
Blueberry River First Nation	http://ecotrust.ca/project/blueberry-river-first-nations-disturbance-atlas/	Ecotrust
Various First Nations, BC	http://ecotrust.ca/project/traditional-land-use-and-occupancy-studies-cumulative-effects-assessments/	Ecotrust
Heiltsuk Nation, BC	http://ecotrust.ca/project/historic-land-use-plan-protects-great-bear-rainforest/	Ecotrust
Carrier Sekani Tribal Council	http://data.ecotrust.ca/mapping/pipelines.html	Ecotrust
Nunavut Sivuniksavut Students	http://dltk.gcrc.carleton.ca/viewsfromthenorth/index.htm	GCRC - Carleton University
Nunavut and Nunavik communities	http://sikuatlas.ca/index.html	GCRC - Carleton University
Nunavut Youth Consulting, Inuit Heritage Trust, Nunavut Arctic College, & Arctic Bay Communities	http://arcticbayatlas.ca/index.html	GCRC - Carleton University
Kitikmeot Heritage Society	http://atlas.kitikmeotheritage.ca	GCRC - Carleton University
Aboriginal people in Ontario	http://atlas.gcrc.carleton.ca/glsl/Atlas_Intro/intro_page.xml.html	GCRC - Carleton University
Gwich'in Social and Cultural Institute (GSCI)	http://atlas.gwichin.ca/index.html	GCRC - Carleton University
Kitikmeot Heritage Society	https://thuleatlas.org/index.html	GCRC - Carleton University
Eastern and Central Canadian Arctic Inuit	http://paninuittrails.org/index.html	GCRC - Carleton University
Stz'uminus First Nation	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/stzuminus/index.php	EML University of Victoria
Coast Salish	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cartographic-legacies/index.php	EML University of Victoria
Coast Salish	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cultural-landscapes/index.php	EML University of Victoria
Hul'qumi'num	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/twohouses/index.php	EML University of Victoria
Kanien'kehà:ka - Oka	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/oka/index.php	EML University of Victoria
Hul'qumi'num Treaty Group	https://sites.google.com/view/htgcasestudy/	EML University of Victoria
Hupacasath First Nation	http://www.hupacasath.ca	No Affilation
Tsleil-Waututh Nation	http://www.twnation.ca	No Affilation
Lil'wat Nation	http://lilwat.ca	No Affilation
Gitxsan Nation	http://www.gitxsan.com/territory/territory-maps	No Affilation
Not Specified	https://native-land.ca/	No Affilation
Kwi Awt Stelmexw / Squamish	http://squamishatlas.com/ (Former URL http://ohtheplacesyoushouldknow.com/)	No Affilation

Table 3.2.1 List of websites in the sample

The site selection criteria included three conditions. First, the site should be based in Canada, second, it is dealing with an Indigenous community in Canada, and third it needs to have maps.

3.3 INTERVIEWS

The interview portion of the work involves speaking with participants across a variety of scales and interests related to the topic of Indigenous mapping. However, the process was not wide open, and a decision to seek participation from three pools of experience was made. First, from persons who identify as Indigenous and are the producers and consumers of conventional and or online mapping. Second, from professionals working in conventional and or online mapping which may or may not identify as being Indigenous. Finally, from persons who are scholars or researchers working in geography, cartography, anthropology, Indigenous studies, and related fields which may or may not identify as being Indigenous. The interviews as digital audio files were coded with Atlas.ti 8.0 qualitative data analysis (QDA) software and specific sections were transcribed as needed (see Appendix 8.2). Information from the interviews is used to supplement the discussion, analysis, and conclusion sections of the work.

The interview process was semi-structured. A list of thirteen questions was prepared based on the information gained from the content analysis section of the work. A full list of the interview questions can be found in Appendix 8.2. Each participant agreed to the interview after reading an informed consent document that included the choice to end the process at any point they so desired. All participants completed the interview process in full, and no short terminations occurred. Attempts were made to cover all the questions on the list, but questions were not limited exclusively to the list. Participants were given considerable latitude in the issues they wished to address or not address in their responses. They were also encouraged and free to challenge the topics being covered by the standard interview questions if they found the question ambiguous, biased, or flawed in any manner.

Interviews were designed to last approximately one hour. Most were in the range of forty-five minutes to one hour in length. In total there were ten interviews used in this work. Five of the participants self-identified as having Indigenous ancestry. Among the Indigenous group, four were working cartographers, two identified as scholars or researchers, two as GIS technicians, one as a community worker and amateur cartographer, one as a consultant, and one as an environmental monitor. All participants in this group identified as coming from more than one perspective when it came to their professional background. Two of the five participants in the Indigenous group identified as female and the rest as male.

Among the non-Indigenous interview participants, four of the five self-identified as scholars or researchers and one as a GIS technician working with Indigenous communities. Two of the four scholar or researchers also identified as being cartographers, and one as a filmmaker. This group also included persons who identified as coming from more than one professional background. All five participants in this group self-identified as being male. Three of the five were Caucasian, one identified as Asian, and one identified as Indian American. See table 3.3.1 below for a graphic depicting the participant composition and diversity.

Participant	Indigenous	Sex	Cartographer	Tech.	Scholar	Self ID
D1	X	M	X	X		GIS Technician
D1A	X	M		X		Environmental Monitor
D2	X	FM	X			Community Worker
D3	X	M	X	X	X	Community Activist
D4		M	X	X		GIS Technician
D5		M	X		X	Anthropologist
D6		M	X		X	Researcher
D7		M	X		X	Film Maker
D8 & D9	X	FM	X		X	Consultant
D10		M	X		X	Archaeologist

Table 3.3.1 Participant interview composition

This table describes the breakdown of interview participants based on ethnicity, profession, and gender.

CHAPTER 4. RESULTS

4.1 WEBSITE COMPARISON RESULTS

The content analysis data for the websites are displayed as a raw point score, percentage score, and by ranges in aggregate and by affiliated groupings. In the aggregate, the data is expressed by a ranking and classification system that is comparative to that of a grading scale in academics. This approach allows for a big picture view of the state of Indigenous mapping websites and the analysis of their content. At a more granular level, a secondary analysis of the frequency and scoring of the traits used to identify content is attributed to each website. Also, at this level, a review of website associations by the three groupings (i.e., research group/university affiliated, NGO affiliated, or non-affiliated) is performed.

At the more granular secondary level, indicators are examined via the use of mean and median to compare how each site ranked overall and within its grouping. See Figure 4.1.1 for the overall distribution and ranking for the websites based on the information gleaned from the content analysis. The curve in figure 4.1.1 shows a typical distribution across the sample websites. A majority of the sites fall into the midrange with fewer sites scoring in the top and bottom of the range. The mean score is 48.6, and the median is 41.0 with the highest possible rating being 116 points and the lowest equal to 4 points. The range in this distribution is 105.

Site ranking is by raw and percentage scores within their given clusters (See Tables 4.1.3 and Figure Sets 4.1.3a & 4.1.3b). Sites associated with a university or research organization scored above NGO and non-affiliated sites. The University of Victoria at British Columbia achieved a mean score for all its sites of 62.8 points. The Geographic & Cartographic Research Centre at Carlton University in Ottawa Ontario achieved a mean score of 56.4 points. The NGO associated sites scored a mean of 40.7 points while the non-affiliated sites achieved a mean score of 31.8 points.

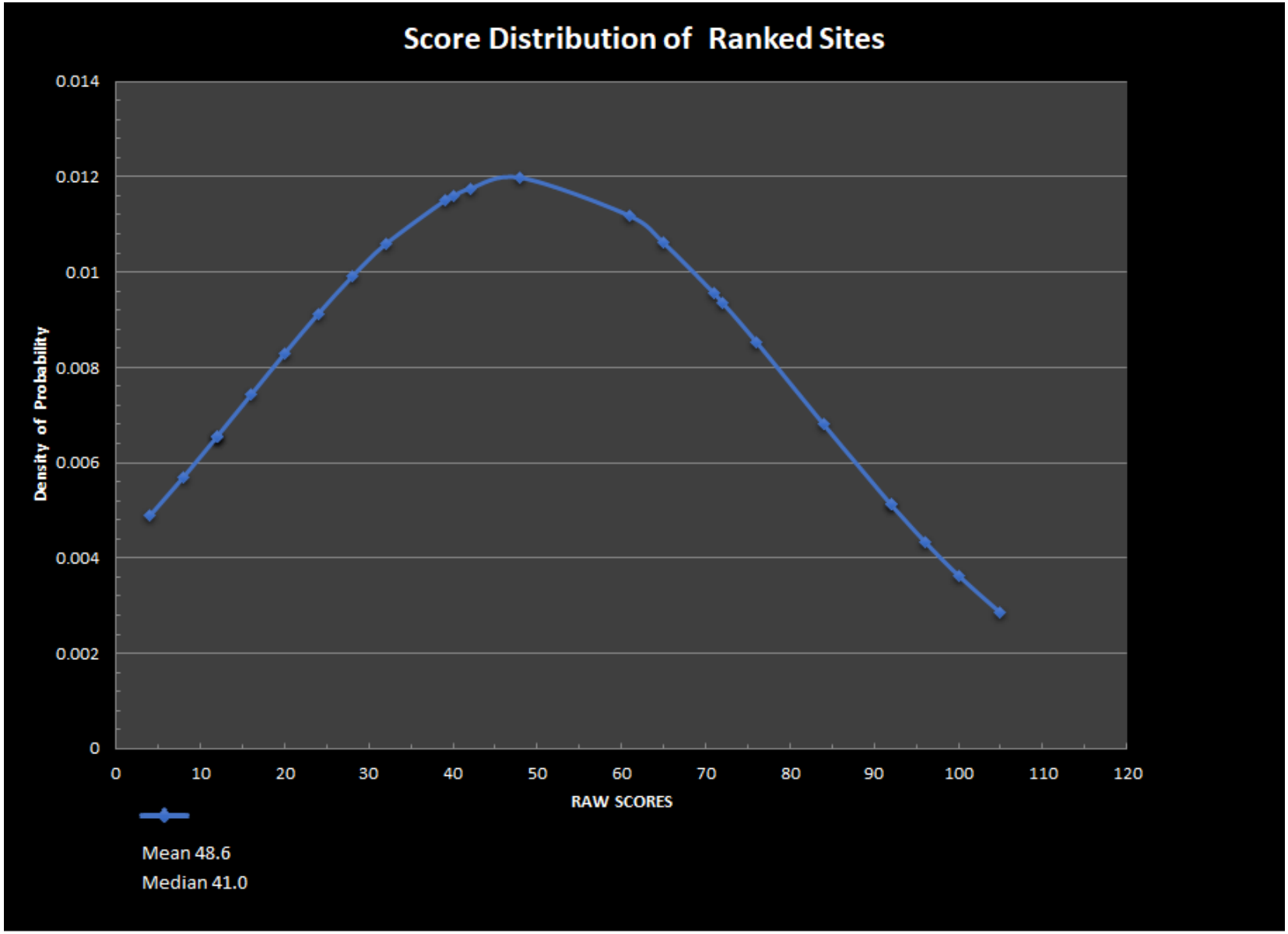


Figure 4.1.1 Score distribution of ranked websites

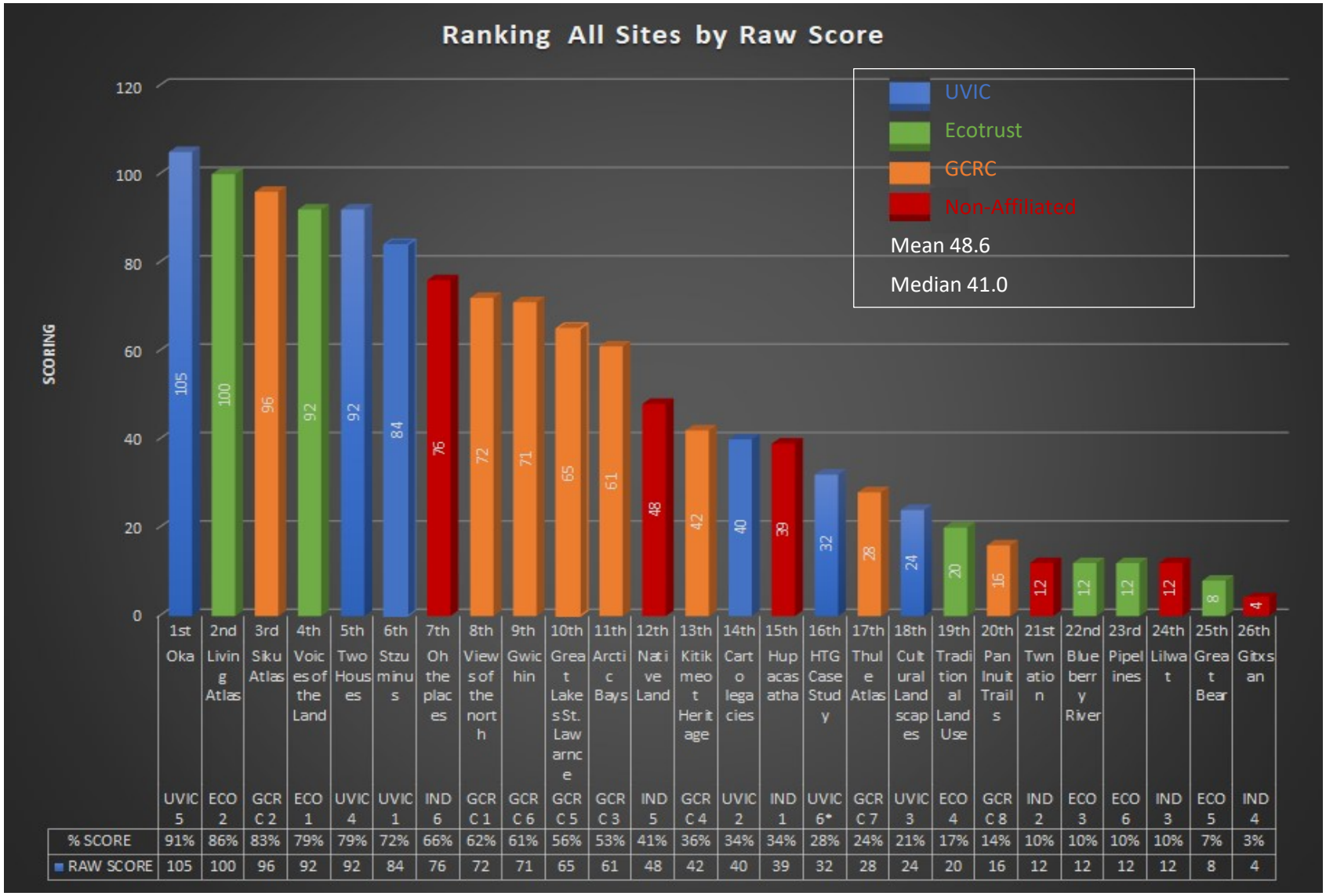
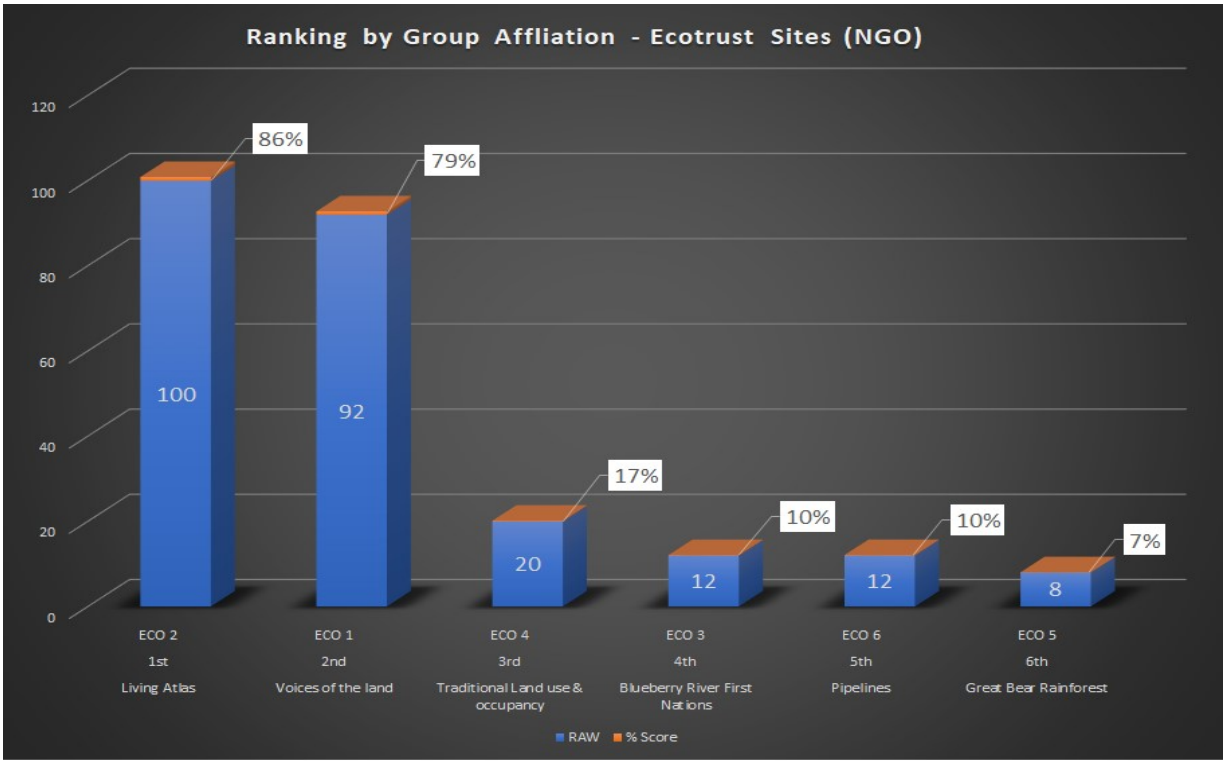


Figure 4.1.2 Website of all websites by raw score

Ethnographic Mapping Lab	University of Victoria		Affiliation	RAW	% Score	MEAN	62.8
http://www.uvic.ca/socialsciences/ethnographicmapping/projects/oka/index.php	Oka	1st	UVIC 5	105	91%	MED	62.0
http://www.uvic.ca/socialsciences/ethnographicmapping/projects/twohouses/index.php	Two houses	2nd	UVIC 4	92	79%		
http://www.uvic.ca/socialsciences/ethnographicmapping/projects/stzuminus/index.php	Stzuminus	3rd	UVIC 1	84	72%		
http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cartographic-legacies/index.php	Cartographic-Legacies	4th	UVIC 2	40	34%		
https://sites.google.com/view/htgcasestudy/	Htgcasestudy	5th	UVIC 6*	32	28%		
http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cultural-landscapes/index.php	Cultural-Landscapes	6th	UVIC 3	24	21%		
Geomatics and Cartographic Research Centre	Carleton University		Affiliation	RAW	% Score	MEAN	56.4
http://sikuatlas.ca/index.html	Sikuatlas	1st	GCRC 2	96	83%	MED	63.0
http://atlas.gwichin.ca/index.html	Gwichin	2nd	GCRC 6	72	62%		
http://dltk.gcrc.carleton.ca/viewsfromthenorth/index.htm	Views from The North	3rd	GCRC 1	71	61%		
http://atlas.gcrc.carleton.ca/glsl/Atlas_Intro/intro_page.xml.html	Great Lakes St. Lawrence	4th	GCRC 5	65	56%		
http://arcticbayatlas.ca/index.html	Arctic Bay	5th	GCRC 3	61	53%		
http://atlas.kitikmeotheritage.ca	Kitikmeot	6th	GCRC 4	42	36%		
http://paninuittrails.org/index.html	Paninuittraials	7th	GCRC 8	28	24%		
https://thuleatlas.org/index.html	Thule	8th	GCRC 7	16	14%		
NGO	Ecotrust	Rank	Affiliation	RAW	% Score	MEAN	40.7
http://livingatlas.org	Living Atlas	1st	ECO 2	100	86.2%	MED	16.0
http://voicesontheland.org/index.html	Voices of the land	2nd	ECO 1	92	79.3%		
http://ecotrust.ca/project/traditional-land-use-and-occupancy-studies-cumulative-effects-assessments/	Traditional Land use & occupancy	3rd	ECO 4	20	17.2%		
http://ecotrust.ca/project/blueberry-river-first-nations-disturbance-atlas/	Blueberry River First Nations	4th	ECO 3	12	10.3%		
http://ecotrust.ca/project/historic-land-use-plan-protects-great-bear-rainforest/	Great Bear Rainforest	5th	ECO 5	12	10.3%		
http://data.ecotrust.ca/mapping/pipelines.html	Pipelines	6th	ECO 6	8	6.9%		
Non-affiliated	Non-Affiliated		Affiliation	RAW	% Score	MEAN	31.8
https://native-land.ca/	Native Land	1st	IND 5	76	65.5%	MED	25.5
http://ohtheplacesyoushouldknow.com/	Oh, The Places	2nd	IND 6	48	41.4%		
http://www.twnation.ca	Twnation	3rd	IND 2	39	33.6%		
http://www.hupacasath.ca	Hupacasath	4th	IND 1	12	10.3%		
http://lilwat.ca	Lilwat	5th	IND 3	12	10.3%		
http://www.gitxsan.com/territory/territory-maps	Gitxsan	6th	IND 4	4	3.4%		

Table 4.1.3. Website rankings within each grouping



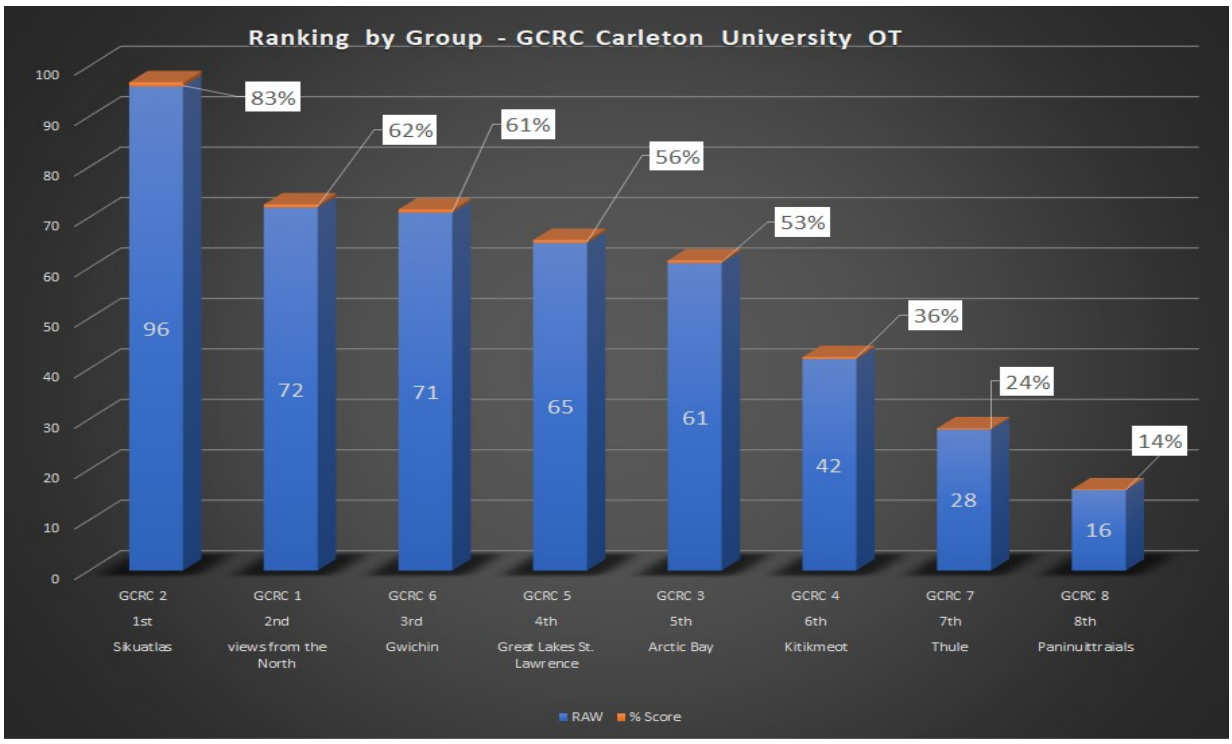
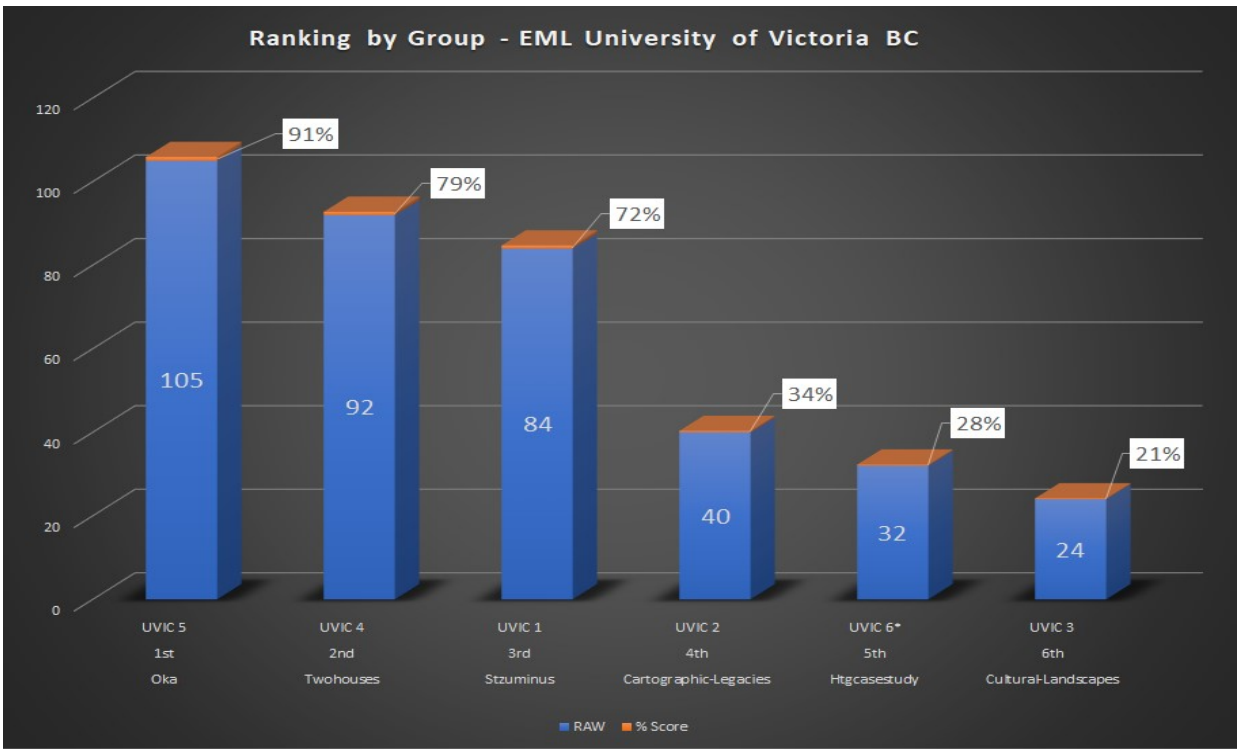


Figure Set 4.1.3a Website rankings within each grouping

Rankings for sites associated with Ecotrust Canada (top) and for sites associated with GCRC (bottom)



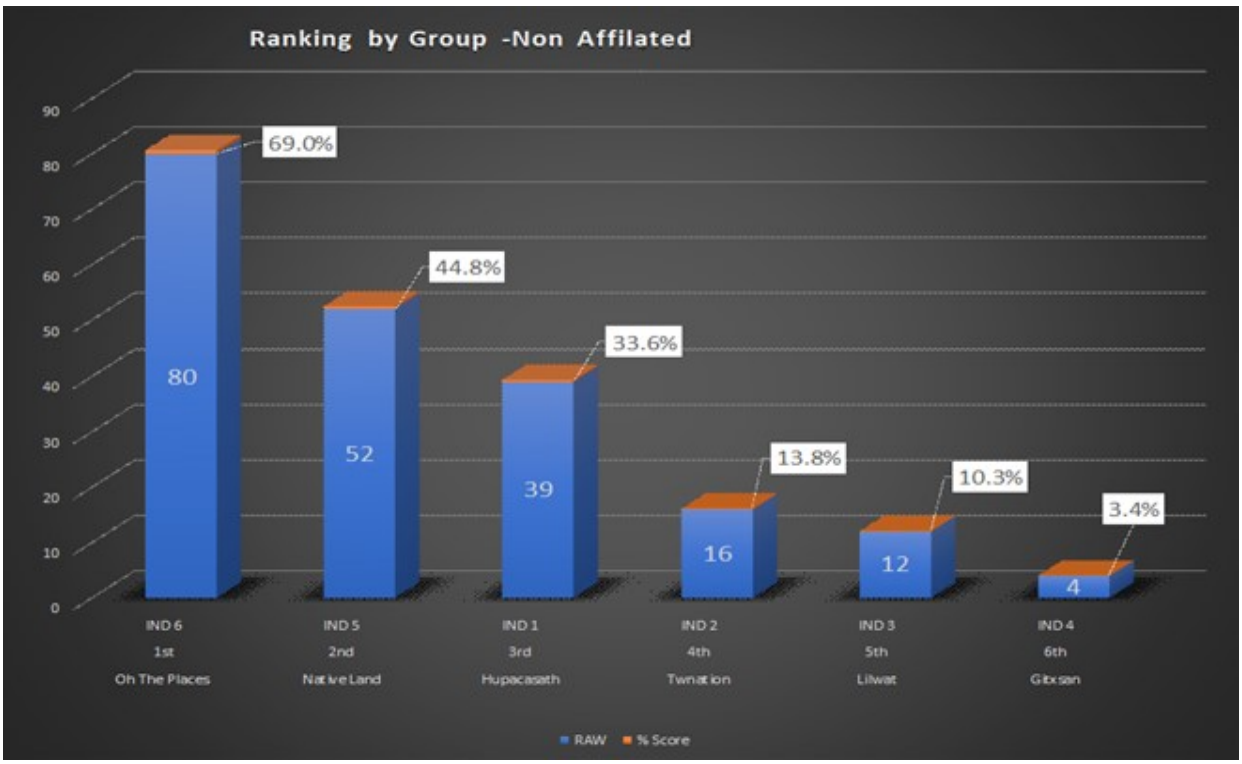


Figure Set 4.1.3b Website rankings within each grouping

Rankings for sites associated with EML (top) and for sites without a known association (bottom)

The results at this level show that sites associated with universities or NGOs tend to score better on this scale. However, it does not mean that all their sites scored well. There is a distribution within each affiliation type as well as across the entire sample. Nor do the results of this part of the work say much about the overall quality of the sites. The sites ranking in the lower end of the ranges just may not feature the type of content the scale used here is devised to identify.

The possible affiliation type relationship to the sort of content measured here might be related to issues of capacity, priority, and funding. In many situations, Indigenous groups at the band or nation level have sophisticated GIS operations. This point is expanded upon in detail in the discussion section that follows. However, as it applies here, an issue to keep in mind is that the output of these offices is perhaps focused on more pressing needs. For example, topics like impact assessment studies, duty to consult cases, and pending or future legal claims may take priority over website production. Indigenous communities and their mapping operations may see web-based mapping projects as something that they would like to do, but that is not a priority based on resource allocation. In such a situation the NGO and university-based projects may just be the best equipped and able to produce the kinds of mapping that score well on this scale.

4.2 TRAIT SCORING

Meta Criteria & Traits	Mean	Med.	Comments
A. Acquisition/Control/Ownership			
1. Claiming	3.2	4	Majority of sites had this content regardless of affiliation
2. Naming	2.9	4	Majority of sites had this content regardless of affiliation
3. Returning	1.5	0	Most sites lacked explicit content about disputed land
B. Ethnos. /Cult.			
1.Testimonials	1.6	0	Less than half had this content regardless of affiliation
2.Narratives			
2a. Narrative Storytelling	2.0	2	Half of the sites had this content regardless of affiliation
2b. Cultural	2.0	2	Half of the sites had this content regardless of affiliation
2c. Traditional	2.0	2	Half of the sites had this content regardless of affiliation
3. Survival	1.7	0	Less than half had this content regardless of affiliation
C. Indigenized Processes			
1. Indigenous voiced	2.9	4	Majority of sites had this content regardless of affiliation
2. Bottom-up Processes	2.2	3	Half of the sites had this content regardless of affiliation
D. Proactive/Change Oriented			
1. Interventionist	1.1	0	Less than half had this content regardless of affiliation
2. Revitalizing/Regenerative	1.4	0	Less than half had this content regardless of affiliation
3. Connective	1.7	2	Less than half had this content regardless of affiliation
4. Networking	1.5	0.5	Less than half had this content regardless of affiliation
E. Cautious Sharing			
1. Protective	3.0	4	Majority of sites had this content regardless of affiliation
2. Sharing	3.0	4	Majority of sites had this content regardless of affiliation
F. Critically Reframing			
1. Deconstructive	1.9	2	Less than half had this content regardless of affiliation
2. Counter Pat.	2.0	2	Half of the sites had this content regardless of affiliation
3. Gendered	1.0	0	Very few sites had this content regardless of affiliation

Table 4.2.1 Mean and median trait scoring summary (Continued on Next Page)

G. Restorative	0.0	0	Comments
1. Envisioning/Future centered	1.3	0	Less than half had this content regardless of affiliation
2. Addresses wellbeing			
2a. Spiritual Wellbeing	1.4	0	Less than half had this content regardless of affiliation
2b. Emotional Wellbeing	1.4	0	Less than half had this content regardless of affiliation
2c. Physical Wellbeing	1.2	0	Less than half had this content regardless of affiliation
2d. Mental Wellbeing	1.4	0	Less than half had this content regardless of affiliation
3. Locally Innovating -			
3a. Participatory Planning	0.6	0	Very few sites had this content regardless of affiliation
3b. Com. Based Resource Mgmt.	0.6	0	Less than half had this content regardless of affiliation
3c. Crowdsourcing	1.5	0	Very few sites had this content regardless of affiliation
3d. Vol. Geo. Info. (VGI)	0.4	0	Half of the sites had this content regardless of affiliation

Table 4.2.1 (Continued) Mean and median trait scoring summary

The top score any site could attain was 116 points. The highest score received is 109 points by "The Oka Crisis: A Digital Atlas of the 1990 Events at Kanehsatà:ke" website, which is a product of the Ethnographic Mapping Lab at the University of Victoria in British Columbia, Canada. This atlas site did well in the content analysis across all measures. It likely did well in part due to the depth and quantity of content presented on the site. Also, the subject matter of the map probably plays a role in why this web map scored the way it did. The 1990 Oka crisis was and still is an event marked by charged emotional and political contents. Issues such as colonialism, land rights, tenure and Indigenous self-expression explored in this work were also themes that arose from the events at Oka and its spinoff protests of support around Canada.

The following examples are representative of the overall qualities of some of the atlases and demonstrate how contents are often multivariate. This variability allows some material to score across a wide range of traits and the meta-criteria families described in section 3.1. The first example comes from the Oka atlas. The website mimics the format of a book. It divides topics into chapters to organize its contents in a narrative form. The use of the narrative paradigm is significant as narratives are an important aspect of life in many Indigenous cultures (Drawson et al., 2017; McIvor, 2010). In chapter 1: Turtle Island, the atlas's first entry is related

to the historical contextualization of the events at Oka from an Indigenous perspective of time and geography (See figure 4.2.2). The content and links arising from this chapter scored in various categories simultaneously (e.g., Indigenous voiced, political, reframing, narrative, claiming, naming, and returning).

In this instance, content is counted under the traits of Indigenous voice because of its use of Indigenous place names. The use of the turtle island imagery also counts under the category of critically reframing as it is posing an alternative view of North America in relation to the rest of the world's continents. The use of this imagery reminds us that there are alternative perceptions of how things are supposed to be represented and readable by imposing a different form of legibility that is not Eurocentric. The content of the page is also counted under narrative as it links out to a site that tells and explains the Iroquois legend of the Sky Woman to reinforce the turtle island reframing of space and the place names.

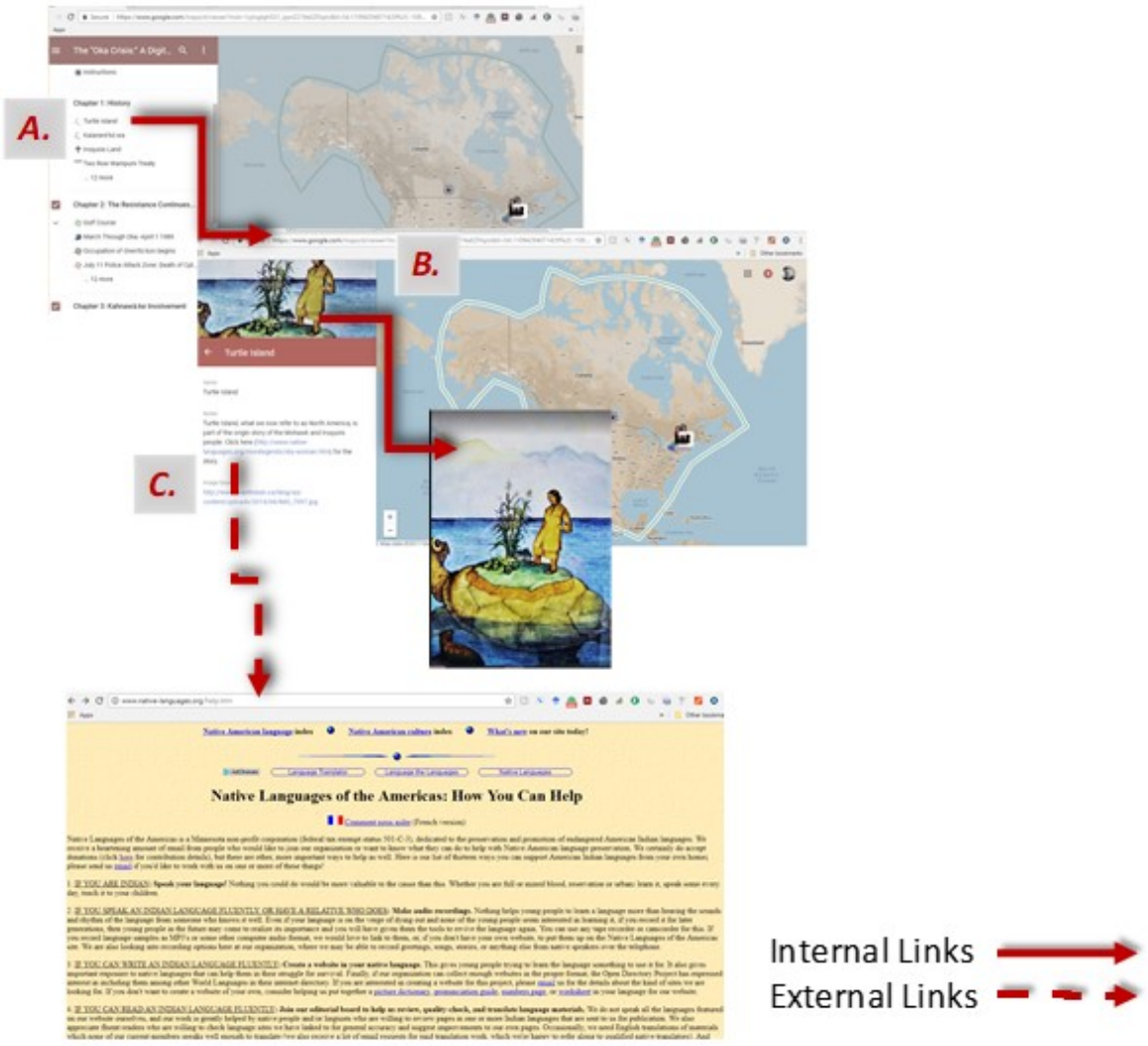


Figure 4.2.2 Example from Oka atlas chapter 1: Turtle Island

A. *Depiction of North America as Turtle Island reframing of western geographic conventions*
B. *Internal link using Indigenous art to represent an alternative worldview*
C. *External links to a language, naming, and storytelling site:*
http://www.native-languages.org/morelegends/sky-woman.htm
Non-profit organization dedicated to the survival of Native American languages, particularly using Internet technology

This figure and figures 4.2.3 and 4.2.4 following on pages 44 and 46 show examples of the overall qualities of some of the atlases and demonstrate how contents are often multivariate. This variability allows some material to score across a wide range of traits and the meta-criteria families

The example shown in figure 4.2.3 is taken from the Siku atlas, and it also scores across multiple categories and traits. First, it counts from the perspective of being indigenously voiced. On the page in the example, there are forty-one links out with information related to persons who provided content for the maps. In most cases, this includes a photograph and biographical information about them that links them to the place. The linking of the participant to the place also counts under claiming as it is an attempt to show occupancy. In the example, the participant being featured is a woman and therefore counted under the criteria of critically reframing because it is gendered content. Another link on the page takes the viewer to a sea ice map that contains links to audio files that use traditional names to describe different types of ice conditions. This content counts under claiming for its use of traditional names. It is also included under reframing as the map of sea ice conditions is abstracted and conceptualized from an alternative viewpoint and challenges standard cartographic conventions. In another example linking from this page, a map showing locations and travel routes is connected to events and people. This framing challenges the idea that these are empty, uninhabited spaces and therefore addresses issues of terra nullius, tenure, and claiming. Perhaps one of the simplest ways this atlas reframes, and challenges are its use of syllabics throughout the entire site. For example, when denoting a location by using the syllabic alphabet and spelling (e.g., ᑭᙵᓚᐃᑯ) and the English form as well (e.g., *Cape Dorset*) on the map. Finally, this atlas is developed in cooperation GCRC center at Carleton University, and it uses the Nunaliit Cybercartographic Atlas Framework. Nunaliit is an open source software designed for the use of online atlases and storytelling and its use in the creation of maps is counted as decolonializing under the criteria of critically reframing.

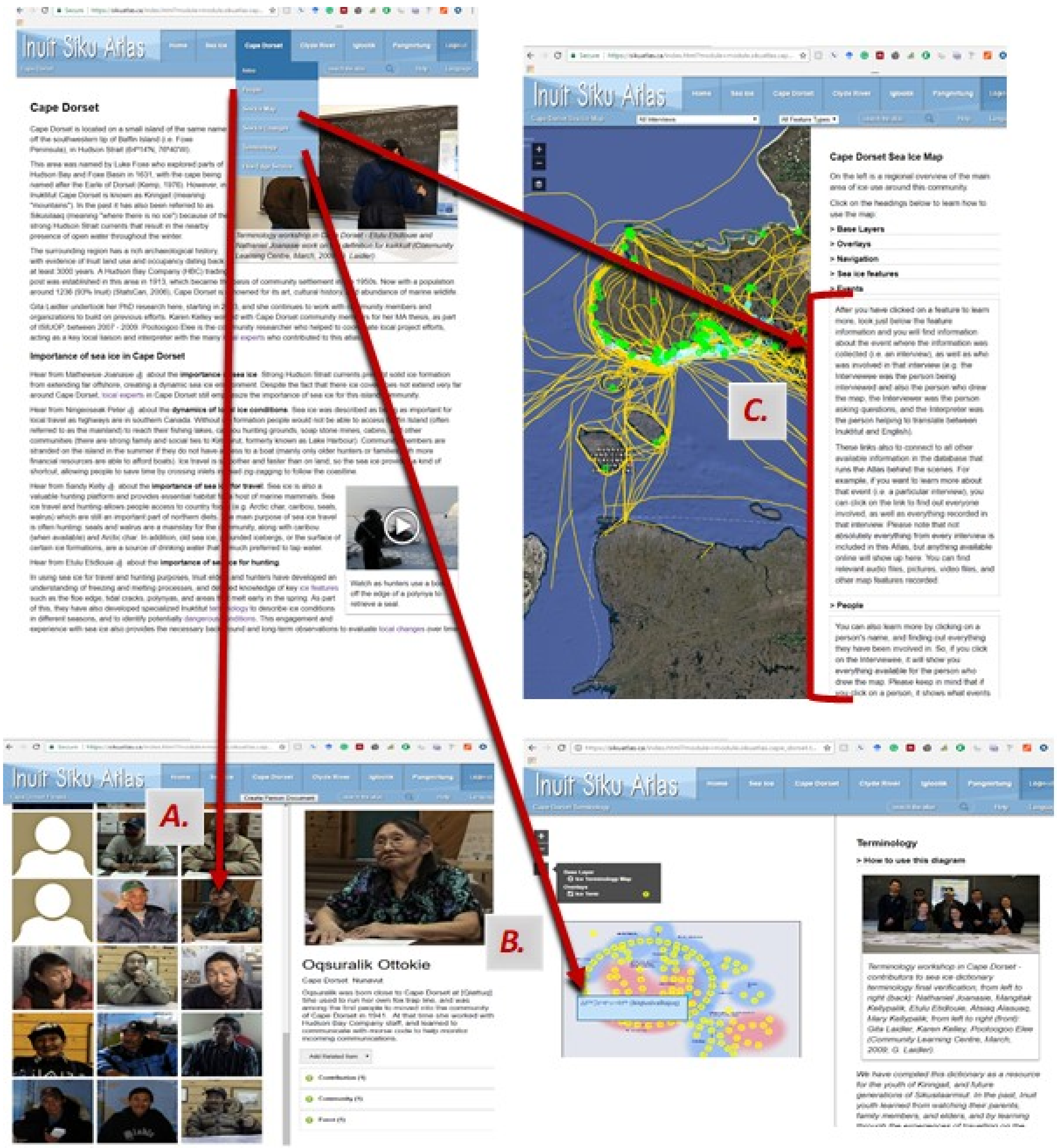


Figure 4.2.3 Example from the Siku Sea Ice atlas: ᑭᙵᒪᐃᑦ /Cape Dorset

A. *Links to narrative content that is also gendered*
B. *Links to alternative map of sea ice that also uses audio files and place names*
C. *Links to travel routs and habitation using place names and challenging terra nullius*

Examples of content that is multi-variate

Example 4.2.4 is another coming from the Oka Atlas built by the Ethnographic Mapping Lab at the University of Victoria, BC. It is from chapter 6 of the atlas and is titled "Kanehsatà: ke: 25 Years Later". This example scores well as it gives an Indigenous viewpoint on the events at Oka and reaffirms Indigenous voices present on the site. Also, the use of narrative and storytelling counts on these pages under the criteria related to ethnography and culture as well as critically reframing. It also scores under the criteria of being proactive and change-oriented under the trait of networking as it links to outside content that has relationships with the topic of Oka. Finally, as with the other site example from this atlas, there are aspects of critical reframing linked to challenges of colonial discourse found in mainstream media representations of the events at Oka.

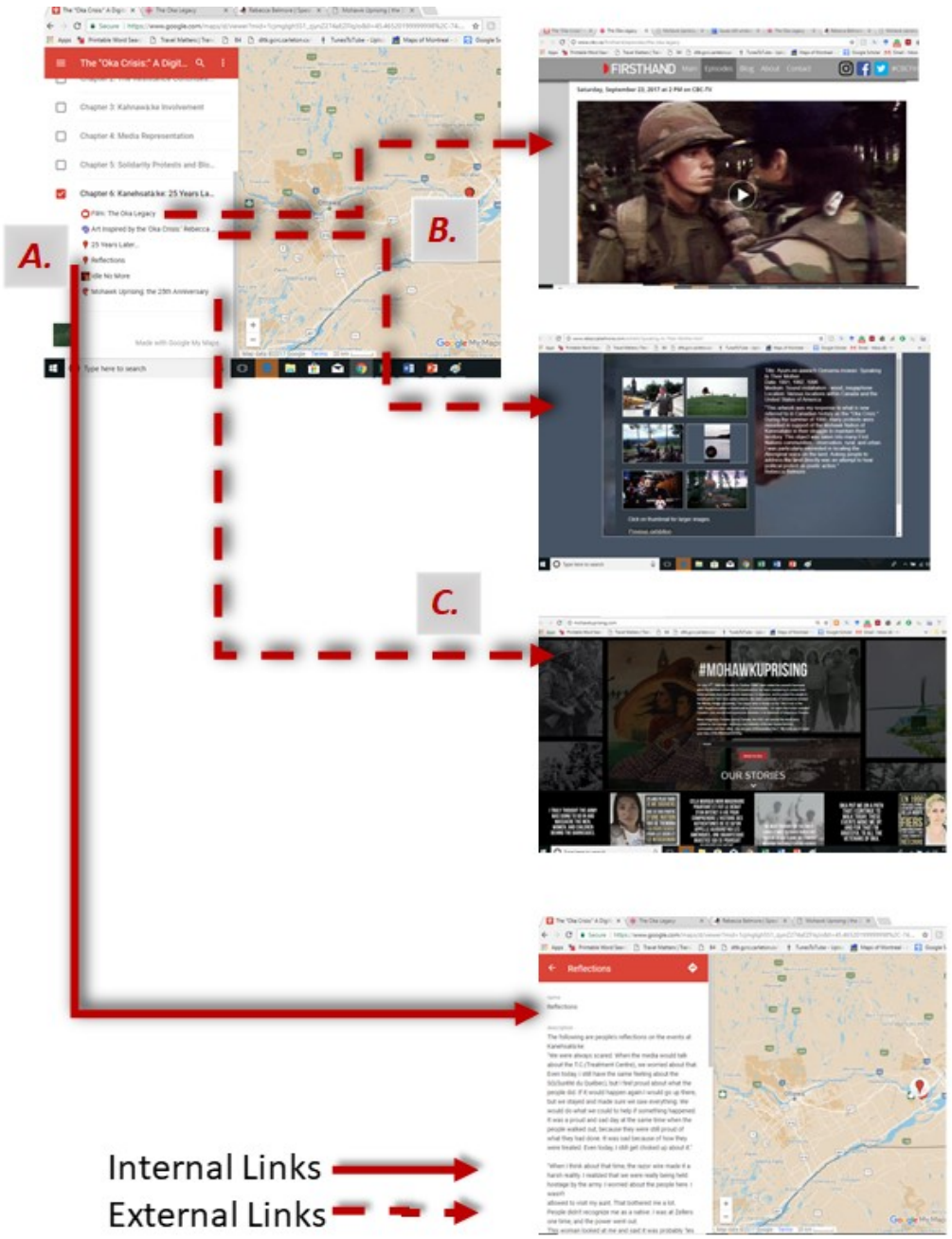


Figure 4.2.4 Example from Oka atlas chapter 6: Kanehsatà: ke: 25 Years Later

A. Internal link with narrative reflections on 1990 events at events at Kanehsatà:ke:
B. External link to CBC documentary "The Oka Legacy" and an art installation inspired by Oka by Rebecca Belmore
http://www.cbc.ca/firsthand/episodes/the-oka-legacy
http://www.rebeccabelmore.com/exhibit/Speaking-to-Their-Mother.html
C. External link to http://mohawkuprising.com/ *and #mohawkuprising sharing site for documenting personal testimonies and stories about events at Oka*

Examples of content that is multi-variate

The last example in this section, figure 4.2.5 demonstrates incidences of sites with content that did not score as well as those mentioned in the prior cases. The reason for this is twofold. First, it helps to clarify what was counted on a site and why. Second, it aims to highlight how content and implementation perhaps play a more significant role in determining the decolonialized nature of a map or atlas than the tools used. In two of the examples in figure 4.2.5 the maps are coming from GCRC and EML, the same sources of the Oka and Siku atlases noted for their multivariate decolonialized content in the earlier instances. The other example comes from a non-affiliated website.

Example A is from the non-affiliated website, http://hupacasath.ca. It shows one of two maps that are downloadable .pdf files from this site. While it scores points for its use of traditional naming on the maps the content of the website is limited to these two downloads that largely replicate standard western mapping conventions. Therefore, it does not score well in most of the other categories.

Example B comes from the EML at the University of Victoria and is called "Cartographic Legacies - Ethnographic Mapping in The Coast Salish World" while example C comes from the GCRC at Carleton University in Ottawa and is called the" Pan Inuit Trails Atlas." In both cases, the atlases are technically well executed, useful, functional, and aesthetically pleasing. The theme and concepts of both maps are similar. Both sites use a web mapping interface to overlay historical map data from past ethnographic studies on top of Google satellite and terrain views of the landscape. In these cases, the maps tended to score well under criteria that account for the use of traditional place names and with traits related to cautiously sharing information. It was rated as doing well in the latter because they are re-publishing archival data that is assumed to be public knowledge. The value of these well-executed maps is not so much in their ability to convey decolonialized content as it is in their archival qualities. It is likely that scholars, researchers, students, and others looking for baseline information would find these sites helpful. However, from another perspective, these sites may run the risk of reinforcing some aspects of colonialism by re-publishing historical maps opposed to newer content created by those occupying the land today.

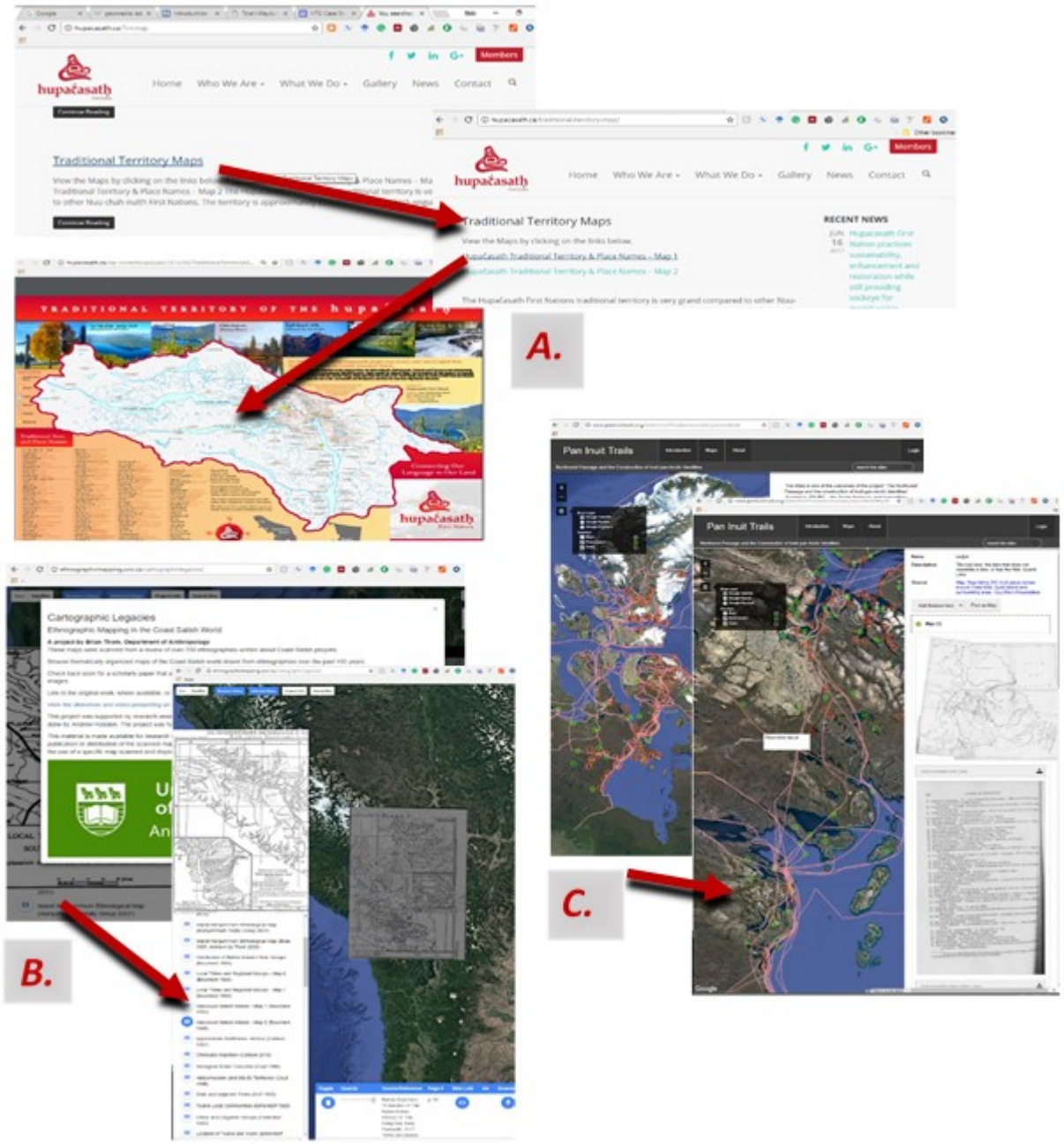


Figure 4.2.5 Examples of from sites where content is univariate or bivariate

A. *Hupačasath First Nation links to downloadable pdf maps with place names*
B. *Cartographic legacies - Ethnographic mapping in the Coast Salish world – Overlay maps*
C. *Pan Inuit Trails Atlas – GCRC –Overlay maps*

The figure shows examples of sites with content that did not score on the scale used in the content analysis.

A first look at the results of the content analysis section helps to frame some of the questions raised by this work. The results helped in shaping the interview process, which is explored and expanded upon in the following section. However, there are some general findings of interest coming from the content analysis alone. First, that websites associated with research organization or NGOs tended to score better than those that are non-affiliated. Also, the results show a typical distribution pattern with most of the sites scoring in the midranges on either side of the median score. This distribution suggests it is likely a representative sample of online Indigenous mapping websites in Canada. The examples cited in this section to explain the scoring process highlight the variability in the ratings while also bringing another point to light. Specifically, the contents and the mode of evaluation suggest that the colonialized or decolonialized nature of a site has less to do with the tools used to map than it does with the approach to the subject matter. Finally, as explained in the last example if a website did not score well on the scale used it did not mean they were poorly executed or did not hold valuable and useful information for Indigenous and non-Indigenous persons alike.

CHAPTER 5. DISCUSSION

This section critiques the findings of the content analysis by juxtaposing them with themes and ideas that surfaced during the interviews. It also tries to frame the results from both sections within the existing bodies of literature used in this work. What follows is a systematic analysis of the scores broken down by the criteria used in the website analysis. The processes of the content analysis helped to construct a few framing conventions that helped to classify the contents found on the webpages. Specifically, that the material on the websites is categorized as being decolonizing based on its sourcing, the acts or processes it depicts, the outcomes of the acts or processes, and the locations where they occurred. What follows is a breakdown of each of the meta-criteria families and their identified traits and how they fit into these broad thematic categories.

5.1. ACQUISITION, CONTROL, AND OWNERSHIP

Under the meta-criteria family *Acquisition, Control & Ownership* the content identified as decolonialized is most often linked to acts, sourcing, and location.

Trait	Mean	Median
Claiming and Land use	3.2	4
Traditional Naming	2.9	4
Returning	1.5	0

Table 5.1.1 Trait scoring for Acquisition, Control, & Ownership

Claiming – e.g. content documenting currently occupied spaces
Naming - e.g. content documenting traditional names (e.g., Points, Regions, and Landmarks)
Returning – e.g. content documenting contested space and place
See also section 3.1 Content Analysis for more details

Source and act are considered particularly relevant for the traits in this section when determining the colonial or decolonialized nature of contents on the websites. One reason for this is because these attributes present an alternative viewpoint on the fundamental nature of the locations mapped. Place names being especially pertinent as they fundamentally challenge colonial narratives about history, identity, and tenure. Sourcing, was in most cases easy to identify. In many incidents, the sites with this kind of content also used multi-media in the form

of audio or video files voiced by Indigenous community members who were in most cases elders (See Figure 5.1.1).

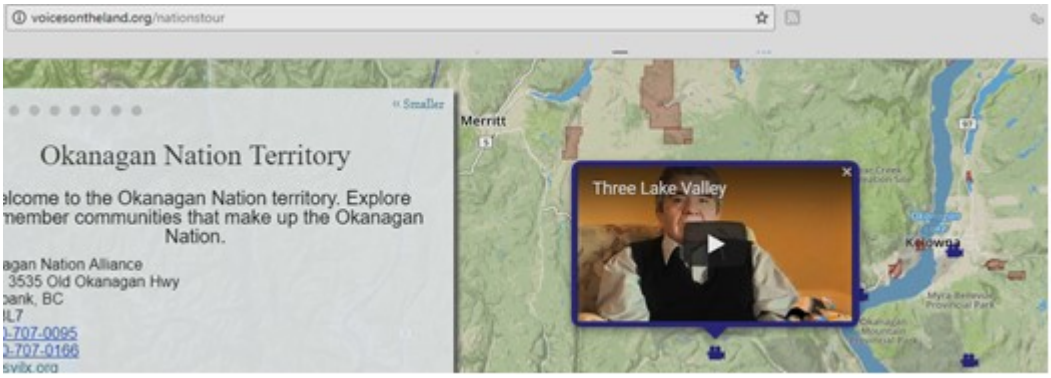
The act of placing traditional names on the map is a de facto correction of the designations of sites and locations. It is decolonializing because it reframes the space and the arguments about that space that might be subject to appropriation. The use of Indigenous place names in online maps challenges institutional aspects of colonialism in both theory and practice. It does so by disputing the concept of pre-history or the idea nothing existed in North America before European occupation (Sparke, 1998) an idea that enabled the practice of implied terra nullius in Canada (Wood, 1992; Eades 2015). Putting aside legal arguments about the official recognition of terra nullius in Canada, there are moral and practical arguments made about its actual informal use (Banner, 2005, 2009; Cavanagh, 2014; Reynolds, 2003). In other words, the functional outcome of the intentional erasure or failure to use Indigenous place names on maps is a tactic that enables terra nullius. Colonialized maps can be used as tools for appropriation when they depict areas as being empty, unclaimed, and improperly used or as one of the interview participants put it:

> There are certain western views that prevail. One is this is mine, there is also it may once have been yours, but it isn't any more……. The cruder view is it has never been yours, and the other western view of, it may have been yours, but you don't make use of it. Meaning you don't deliver the benefits you inherited. You are not cutting down the trees and making lumber out of this place. You are wasting it, it's a waste in your hands, and it's that kind of judgment that is a self-serving justification for colonial displacement. (Interview participant D7 sec. 7:13 -Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist, Film Maker)

One quality that the traits of claiming and naming have in common is their ease of identifiability. Another is that web technology allows producers various means of expressing that content online. In other words, it is easy to spot this kind of material when it appears on a map. Web maps, or for that matter any map, use conventions to organize and convey information. On printed maps, this usually plays out via the use of tools like lines, colours, and

texts to define points and draw borders and shapes around those points. The same is also possible on web-based maps, however, because of the medium new modes of expression and conventions are possible. For example, in web-based mapping the use of tools such as digital audio and video could be considered conventions. The ability to use multi-media and other digital online tools supports the idea of decolonialized content as it opens new means of cartographic expression for Indigenous actors whose needs have historically been under-addressed by producers of geospatial technologies (Rundstrom, 1995). Additionally, Turnbull (2003) and Cameron (2013) note that some forms of traditional Indigenous mapping are better served by formats that support alternative forms of expression for spatial data. Several of the websites in the sample included this kind of content see figure 5.1.1 for two examples.

Voices of the Land – Ecotrust Canada
http://voicesontheland.org/nationstour
https://youtu.be/IhbxUDwNmLk



Gwich'in Social & Cultural Institute – GCRC Carleton
http://atlas.gwichin.ca/index.html?module=gwichin.module.main
http://atlas.gwichin.ca/index.html?module=gwichin.module.main#eyJ0IjoieCIsImkiOiJhYWI2MGUyYjNkZTUyMWJhODg4ZjQzYTE3YTNlYWQ2YiIsInMiOjE1MTIwNjEyOTY3MDh9

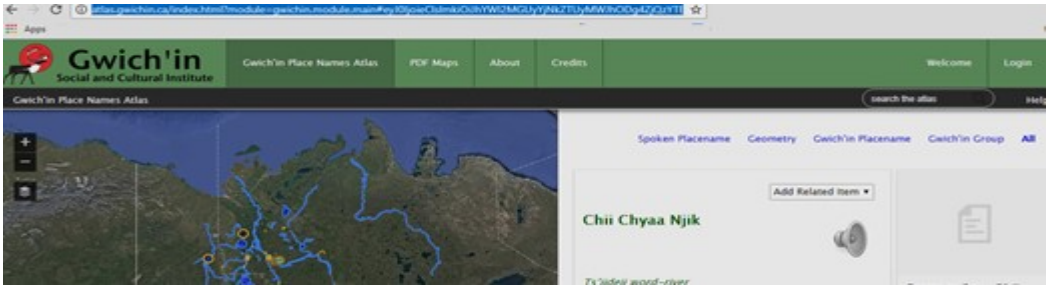


Figure 5.1.1 Voice of the Land web map.

The examples shown here are of embedded video and audio files as conventions of web-based mapping. In these cases, they are digital recordings of elders pronouncing traditional place names.

One advantage the web, its tools, and conventions have is that it allows for alternative forms of expression that may appeal to new and different audiences. It also has the advantage of presenting existing information in new and alternative formats. Specifically, formats that are more interactive and lend themselves to explaining and demonstrating ideas and information in a less formal and more personally engaging manner. As one interview participant puts it: "It's more than lines on the map or a road. It has much more depth to it actually. Then you know the people who are reading this map can maybe get more of a background and see why this is important to them" (Interview participant D2 sec. 2:9 - Indigenous Person, Female, Community Worker, and Amateur Cartographer). This participant's observation supports Eglington's (2017) ideas on the decolonialized nature of digital narratives. Eglington argues they are tools of participatory development that address uneven power relationships and open new spaces of expression for marginalized actors. As well as the concept that multi-media digital tools in the practice of online mapping are of special importance as a means of spatial expression because content like place names, stories, audio, video, and other cultural media are fundamental to our production, reproduction, and understanding of place (Graham and Zook, 2013).

Concerning the last trait in this category (Returning – Contested Spaces) it is a bit more difficult to evaluate this attribute. One reason perhaps is that incidents of this kind of content tended not to appear in online maps. There is a link between this type of information and land use and planning data that is discussed later in this section under the heading of *Restorative-Locally Innovating* contents. Explicitly, the link is that some kinds of information, for example, disputed boundaries, sacred, or ceremonial spaces are considered too sensitive to map due to the localized nature of the data. Putting this kind of information on web-based mapping platforms could be a risky proposition for some communities. The making of this information public could hurt legal cases as well as jeopardize spaces with deep traditional links and meaning. For example, as one of the interview participants explained:

> A community in the Okanagan showed their sacred places; they made it public. Someone saw this, and someone went and found one of those sites, and they spray painted it black. They desecrated it. So, these are the fears that some of these communities have and while it might be an isolated case people hear that and they are concerned about putting

that information out there. (Interview participant D3 sec. 3:4-Indigenous Person, Male, Scholar, Cartographer Community Activist)

The last trait in this grouping "Returning" is used to address the idea of contested spaces. When content that was explicitly dealing with the issue of the return of disputed land, territories, or borders was found it was counted here. However, there is an argument to be made that it could also be calculated in instances where the trait of "Claiming" was also found. The logic being that the re-naming of spaces or locations implies some form of contestation is already in play, and therefore the idea of returning of the territory is indirectly inferred.

5.2. ETHNOGRAPHIC & CULTURAL

In the meta-criteria family named *Ethnographic & Cultural*, the content of most interest focuses on narratives. In the case of testimonials, it is the telling of personal stories about an individual's relationship to place. In the cases of narratives and storytelling, it refers to texts that are shared or generally linked to the group and its culture. The power of stories is significant as they are useful and practical tools for communication not only within a given culture but between different cultures. This is especially so when they address universal themes like survival, development, self-determination, sovereignty, control, and kinship (Ahenkew, 2016; Smith, 2013).

Trait	Mean	Median
Testimonials	1.6	0
Non-specific Storytelling	2	2
Cultural Narratives	2	2
Practice Narratives	2	2
Survival Narratives	2	2

Table 5.2.1 Trait scoring for Ethnographic & Cultural

Testimonials refers to the telling of personal stories (e.g., family history, life events). Cultural narratives in this work are defined as the re-telling of myths (e.g., creation stories, naming stories, and spirituality tales). Practice narratives address the physical world and spatial aspects of the stories (e.g., sacred spaces, kill sites, trap lines). Survival narratives record day to day activities of people on the land (e.g., food preparation, fabrication of clothing). Non-specific storytelling was applied when no clear affiliation could be identified

The topic of narratives and its qualities came up in the participant interviews from at least two different perspectives. The first being on the power of narrative in general in conveying meanings and the type of media used to present the story:

> There people for whom telling a story is what matters, and the quality of telling and the quality of listening, therefore, become two things of great importance. So, the question in my mind right away is what implications does the internet have for the quality of telling, and then we can also ask what implications does it have for the qualities of listening to stories. In so far that the internet is what we are doing now, Skype, it's an image, a form of film representation really, then it seems to me tremendously congenial. The idea that you could connect up storytellers, people who perhaps don't live in the same communities but are part of the same culture, people who let's say don't have overlapping material interests but share an extended territory or a history of land use and occupation then it has very very exciting possibilities it seems to me. Because of the intercommunication issues, the ability for storytellers to have their stories recorded as a performance seems to be of crucial importance. Stories are not captured in a transcript, in the details that are extracted from the stories… If you anticipate the use of the internet as a performance, a bit like being filmed then being played back or if you could do it live even better that would seem to be a hugely exciting possibility. I am not sure if it is a game changer, but it could make quite a big difference. It could make quite a big difference to a number of things. For example, like a sense of what the community is, effectiveness, degree of being taken seriously and given appropriate respect, and things like that."

Elaborating further on this same point:

> "Film and working with film allows people to have a presence and a voice that they cannot have in any other medium that would have been available to me. When you put a camera in front of people, they are right away being invited to perform, and if that is something they want to do it gives them a platform on which to make their view of the world known and they understand there is a gesture of respect in this, I think very often. As we were talking about before with oral culture, film is very congenial to oral culture. So yes, I was very attracted to filmmaking because it allows people to be present in the work in a way that they are otherwise not able to be present. Just as I imagine internet mapping would allow people to be present in the work in a way that they have not otherwise been able to be present. So that parallel is right. (Interview participant D7 sec.7:5 - Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist, Film Maker)

The second perspective being responses related to a question about how mapping narratives online might interact with the kinds of information usually found in conventional mapping formats like TLU studies:

> I think it is valuable to building our cases. We are in the Williams treaty, so we are fighting for our hunting and fishing rights now. So, if we can prove that we are still using this land, and I actually have stories from our elders and our youth doing that, it helps proves we are still occupying and using this land. (Interview participant D2 sec. 2:3 - Indigenous Person, Female, Community Worker, and Amateur Cartographer)

Another interview participant's response to this question:

> I would not mind getting into some of the stories, there are quite a few stories and our elders are slowly passing on. I would like to get a lot of their stories mapped because there are a lot of stories that have not really been told. Most of the time it is a quick

> interview here and a quick interview there, but I know there are stories around this point or around that rock wall …. I think the stories reinforce that because a lot of the stories are from before the epidemics or pre-contact. (Interview participant D1A sec. 1:20 - Indigenous Person, Male, Cartographer, Environmental Monitor)

The information gathered during the interviews supports the use of narrative as part of decolonialized processes in at least two different ways. First, at the level of practice, it speaks to narrative's power as a means of self-expression for marginalized actors. Specifically, Eglinton et al., (2017) work on Indigenous youth and digital storytelling across networks and its ability to give voice to the historically unheard and de Jager et al., (2017) work on the posting of alternative views of oneself as a form of counter-narrative. Second, it is important as it relates to the workings of a given research method and its decolonized nature. For example, Dyll-Myklebust (2014) findings that the sharing of narratives and story helps to promote a sense of equity and respect among participants during the research process, and Wilcox et al., (2013) on minimizing the risk of interpretation bias and the perpetuation of colonial narratives when digital recording tools allow for greater sharing of primary data sources.

As shown in Table 5.2.1 there is a distinction made between testimonial and other kinds of narrative. One reason for his is that personal stories communicating information about a place carry a lot of impact. For example, in the "Oka Crisis": A Digital Atlas of the 1990 Events at Kanehsatà:ke, the use of testimonial content is particularly well done. Specifically, on this website a link to a video of Waneek Horn-Miller, who was stabbed by Canadian military personnel, recounting her personal memories of the events at Oka. Also, the link to Mowhawkuprising.org that houses a variety of testimonial narratives related to the Oka Crisis (See figure 5.2.1). The fact that mainstream media also is making use of these kinds of narratives speaks to their power in conveying information in digital formats. A possible spinoff effect happens when stories like this are covered by conventional media outlets. They can become feedback loops for those creating the websites. In other words, it helps in the dissemination of content that might be re-posted by other websites. Finally, when issues like the one in this example are covered by mainstream outlets, it can increase the reach of the types of stories Indigenous people may want to share.

While these kinds of stories are effective means for communicating ideas about the past and present impacts of colonialism they are also very personal. This profoundly personal nature could help to explain why less testimonial content was identified on the sample websites. People are perhaps unwilling to share this kind of information in a public format such as the web. This is particularly likely in cases of stories with strong emotional content, or that are mentally painful to recount. Additionally, within some Indigenous cultures, the norms about what kinds of information should or should not be shared may also play a role in why less of this type of information was found. Nevertheless, as with the examples cited here when this kind of material appears it can be compelling and instructive. It not only can counter-colonial narratives it also adds depth and meaning to the maps in a much more interactive way than traditional media can.

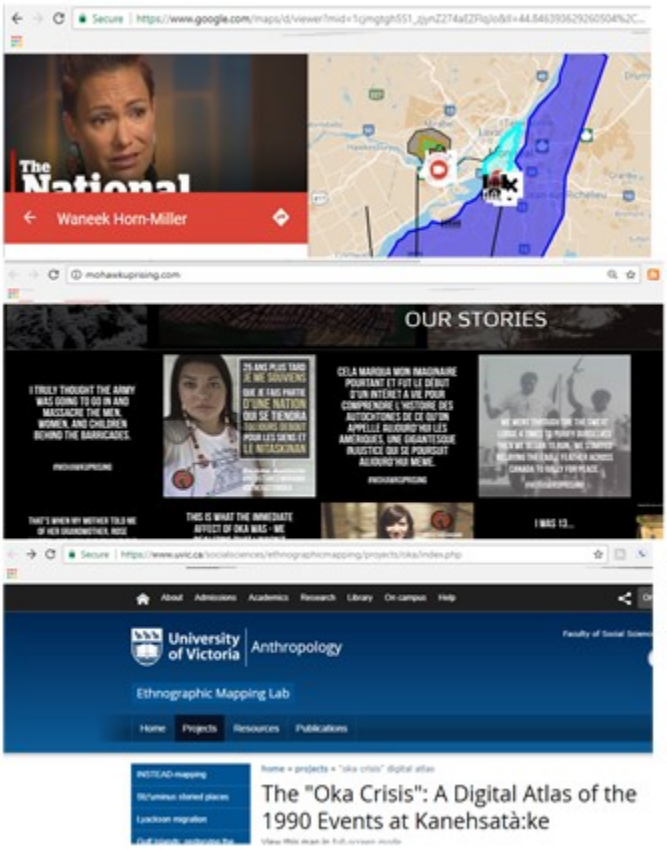


Figure 5.2.1 Example of testimonials -"Oka Crisis"
The examples on this site help to show the difference between types of narrative. In this case, these pages contain testimonial content that is directly linked to personal experiences and has the potential for being emotionally impactful.

One of the important qualities of this type of content is that it may help map viewers to better understand the links between people's identity and sense of place (Creswell, 2009). One of the possible benefits of sharing this kind of information in online maps is its ability to reach a wider audience and the possibility of opening dialogues between Indigenous and non-Indigenous persons and groups. The sharing of powerful narrative content online in multi-media formats could help to alter the perceptions about Indigenous persons and open new channels and spaces of communication. It perhaps is the opening to a space where reconciliation may occur. This speaks to Sparke's (1994) analysis of print maps and atlases and how the counterpunctual nature of counter-

mapping is associated with the concept of third space (Lefebvre, 1991; Bhabha, 2004; Soja 1996). More precisely how maps could open new ways of understanding and broaden people's perspectives on Indigenous land use and claims when contents are framed differently. In the case of this work moving beyond the idea that counter-mapping on paper and physical spaces (i.e., the courts) to web-based maps and mapping that may open virtual spaces of contention, nexus, and reconciliation where groups and individuals can share and communicate (i.e., the court of public opinion).

The remaining traits in this group are related to collective narratives and are more commonly found on the websites analyzed. At least half of the sites contained some narrative content. The traits in this grouping are divided along three lines that mirror the themes of sourcing, acts, outcomes, and location mentioned before. First, cultural stories or narratives used in the re-telling of myths. Myth is used here in the sense of a socio-cultural tool that evolved to communicate information on how to survive and live in the world. It is the pedagogic function of myths via the practice of storytelling opposed to the telling of stories that are intentionally misleading or falsehoods (Campbell, 2008). Practice narratives address the more physical, worldly, and spatial aspects of the stories. The type of content counted here is related to ritual or the acting out of myth. For example, stories documenting where and when ceremonies take place or information on kill sites would fall under this criterion. Finally, survival narratives are meant to record day to day activities of people on the land. For example, stories related to food preparation and preservation, tool making, and the fabrication of materials and clothing. This work identified instances of crossover among these traits. Narratives, in most situations, are not about just one thing. This crossover is likely the case when addressing complex matters such as culture, tradition, and survival. Examples of two websites that scored well for these traits are University of Victoria EML's "Two Houses Half-Buried in Sand: Reviving the Legacies of 1930s-era Hul'qumi'num Story-tellers" and Carleton University GCRC's "Views from the North Atlas" (See figure 5.2.2)

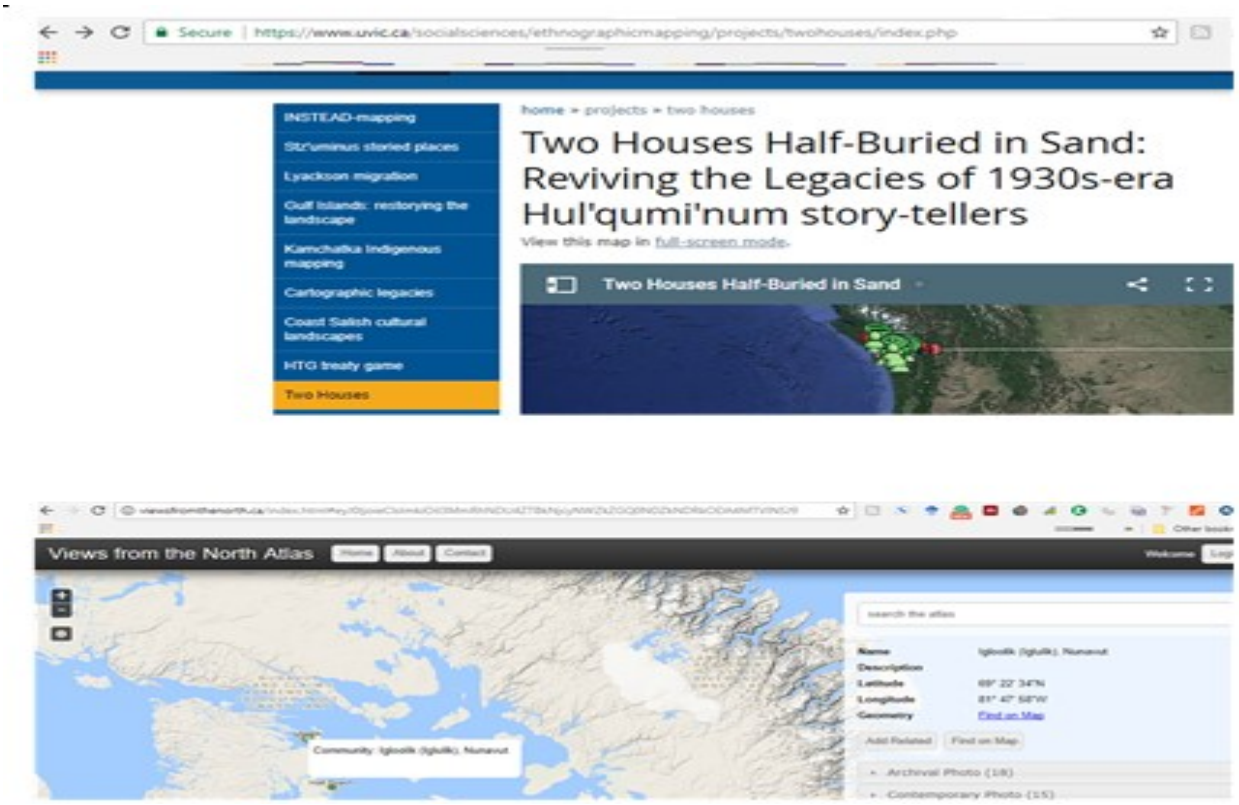


Figure 5.2.2 Two Houses Half-Buried in Sand: & Views from the North

The examples on these sites relate to content that is narrative but not testimonial. These examples also show how narratives can be multi-variant and blur the lines between culture, practices, and survival aspects of story-telling.

As for the relationship between narratives and online mapping, it supports the idea that the process of documenting social-spatial narratives reinforces people's connections between story and landscape for Indigenous people (Olson et al., 2016). Additionally, it supports Drawson et al., (2017) who claims that narrative and storytelling are useful tools in the distribution and translation of different kinds of knowledge.

The ability to tell and maps stories online, from the perspective of the Indigenous actors who are the most impacted, through various forms of multi-media is one of the more positive and compelling aspects of web-based mapping. The options it provides to tell stories from alternative perspectives points to its ability to transmit decolonialized content. Many of the websites in this study make good use of narrative and to a lesser extent testimonial content. This family of meta-criteria is likely a useful means for evaluating if the contents of a website reflect decolonialized material.

5.3 INDIGENIZED PROCESSES

The meta-criteria family of *Indigenized Processes* is aimed at finding content that is apparently sourced from an Indigenous person or community. Beyond sourcing, it also was used in the identification and acts and processes that originate from grassroots or bottom-up methods.

Trait	Mean	Median
Indigenous Voiced	2.9	4
Political	2.2	3

Table 5.3.1 Trait scoring for Indigenized Processes

The content that counted under this category relates to information that was obviously coming from the perspective of an Indigenous person and in their own voice. Content relating to the documentation of grassroots political action was also included in this category.

Content of this type was found on more than half the sights and is usually easy to identify and was well sourced. See Table 5.3.2 for examples of this kind of content. Issues of information sourcing are also addressed in the participant interviews.

Map/Atlas Name	URL	Sourceing
Voices of The land	http://voicesontheland.org/index.html	Okanagan Nation Alliance & Indigenous Partners - A Traditional Land-Use and Occupancy Study with more than 25 Elders, aged 55 and older, A Traditional Land-Use and Occupancy Study with more than 25 members, aged 30-54, A focus group interview with more than 10 members that informed the Cumulative Effects Assessment
Kitikmeot Place Name Atlas	https://atlas.kitikmeotheritage.ca/index	Kitikmeot Heritage Society - https://atlas.kitikmeotheritage.ca/index.html?module=module.about
Mapping Inuit Sea Ice Knowledge and Use	https://sikuatlas.ca/index.html?module=module.sikuatlas.about.methods	Qikiqtani Inuit Association (regional representatives and community liaisons) Inuit Tapiriit Kanatami, Nunavut Tunngavik Incorporated, & Inuit Heritage Trust - https://sikuatlas.ca/index.html?module=module.sikuatlas.ab
Boat Trip to important Stz'uminus places	https://www.google.com/maps/d/viewer?mid=1E_H17pirVICYyT2wMpojCU8O0H8&ll=49.001886260941674%2C-123.77250886279296&z=12	Ray Harris (Stz'uminus First Nation
The "Oka Crisis": A Digital Atlas of the 1990 Events at Kanehsatà:ke	https://www.uvic.ca/socialsciences/ethnographicmapping/projects/oka/index.php	The digital atlas draws from published sources and interview data and uses Google's MyMaps to locate the events, stories and voices of the resistance in place.

Table 5.3.2 Sourcing of contents found on websites: Indigenous Voice

In terms of Indigenized processes, there were some themes that arose out of the conversations. One of particular interest relates to the origin of projects and the persons associated with the work.

> The first nations members on a co-management board approached me and said we have in our strategic plan a desire to do this project, but we have no resources can you help us? And, I was like yes definitely. It is always somewhat iterative.....but on the whole the motivation for these projects comes from the community. I have never proposed something like It is never something out of the blue like I want to map this because I am interested in that. (Interview participant D5 sec. 5:12 - Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist)

From the perspective of a consultant and community activist on the grassroots nature of some projects and what he called "Citizen Science":

> Citizen science takes into account those local interests. That is what it really comes down to. Because my work is with communities and doing work about those community interests if there are more people mapping those things that matter most to communities….and if that advances communities interests to where they want to go then by all means absolutely, it should not be left to one sole cartographer to decide what should be on those maps. (Interview participant D3 sec. 3:9 -Indigenous Person, Male, Scholar, Cartographer, and Community Activist)

Another point that reoccurred in the interviews is that web-based mapping is a somewhat recent development compared to the long history of mapping by Indigenous people (Cameron, 2011). Mapping done by Indigenous communities in the contemporary context is common. Many nations and communities have been doing TLU and other forms of counter-mapping for years, most dating back to the 1980s if not before. One participant on this same topic noted the long history of Indigenous mapping in the Canadian context compared to other parts of the

world. Supporting the idea that Indigenous mapping in Canada has firm foundations and has been used effectively for some time as suggested by Eades (2015) and Wood and Bryan (2015):

> Clearly, the origin of the process (Indigenous mapping) in Canada is different, and it is clearly straightforward, and it involves a lot of map biographies. In the states, it is a totally different story. It's an available resource, and then it's about the problem of managing resources. That's a huge difference, and that is really what it amounts too. We don't have, you know really in the states the situation that the Canadian Indigenous populations have, that is to say, kind of recognition, statutory and otherwise, that gives them some position to speak and negotiate, we just don't have that. (Interview participant D6 sec. 6:4 Non-Indigenous Person, Male, Scholar, Cartographer, Researcher)

However, those maps and the information on them have not necessarily been put on the web. In terms of mapping skills and competency, the interviews indicate that there is a high level of expertise and a real depth of capacity for many Indigenous mapping offices. Also, they highlighted the differences in priorities that might help to explain why the outputs of Indigenous mapping offices differ from those of NGOs and research organizations or as it was encapsulated by a participant who stated:

> You go to these communities and their tribal GIS offices will blow you away. They are running a government in a serious and sophisticated way using serious and credible cartographic tools with data that is very rich, and I think the kind of web maps that are appearing are just shadows of these really powerful systems that are fully resourced that the tribal offices are doing. So, I think that there is kind of this dynamic when NGOs and universities are involved they come in they have three years, they do a project and they leave, there is an outcome, whereas the tribal GIS offices are processes, they are running a government they are in a program that is ongoing. They may struggle to get resources, but it doesn't have this kind of need for an outcome...the kind of outcomes we see in these

> websites. (Interview participant D5 sec. 5:17 -Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist)

Another participant stated:

> The people I have looked at this with some closeness are the Navaho. They initiated their own mapping program; they have extraordinary complex claims and ownerships situations. All kinds of strange overlapping treaties and so forth and they wanted to manage that, but they also wanted to manage the coal and the uranium, etc. etc. So, you have a very sophisticated mapping program being run by Navaho Indians who basically learned by going to the ESRI users conference every year. (Interview participant D6 sec. 6:4 -Non-Indigenous Person, Male, Scholar, Cartographer, and Researcher)

These participant comments support the idea that contemporary Indigenous mapping projects are diverse (Drawson, 2017). Additionally, they reinforce the observations of Hunt & Stevenson (2016) related to the variety of Indigenous mapping projects and selection of the mapping format that best suits the needs of a given project. While the strengths of Indigenous TLU mapping practices in Canada are real and recognized there is at least one possible issue for concern. Specifically, that the resources, processes, and tools used in this type of mapping are predominantly based in western culture. Raising a question as to how much of an impact this has on what gets mapped. For example, one participant described how and when he started mapping as a GIS technician for his community:

> So, we started developing our travel maps. They pretty much gave me the old paper maps they had; they did not have anything digital what so ever. So, I went with that and started mapping out all our travel territories. About a year later we started our traditional use study. That is what these guys were talking about in the workshops today, the government giving out all of these grants for first nations, so we built our base maps, and that was funded by the Ministry of Forests. (Interview participant D1 sec. 1:4 Indigenous Person, Male, Cartographer, GIS Technician)

Other participants from another perspective noted it might not be a matter of the tools in use:

> In general, I think that whether something colonizes or decolonizes or indigenizes, it's not the tools it's the method and the framework and the ontology and epistemology. All of those things. I would not place that in the realm of tools. Even tools that are techno-scientific tools like web-based stories or GIS. (Interview participant D9 sec. 8:7 (Indigenous Person, Female, Scholar, Cartographer, and Consultant)

A perspective coming from another participant:

> First nations have been able to harness maps and take that approach to mapping using the same techniques that were used (re: by initial settlers). I think we are seeing a big shift. We have seen that in court cases, yes first nations have had an oral history background, but it is really only in the last few decades we can see where this balance is tipping. It's like we are at a tipping point where First nations are saying we can use these tools, but they are not the only tools we can use. They are using other avenues as well, maps just happen to be a great tool to visualize space and place ……Putting those interests on maps is just one way of saying these things matter. (Interview participant D3 sec. 3:12 Indigenous Person, Male, Scholar, Cartographer, Community Activist)

In summary the traits under this meta-criteria family, voicing and grassroots bottom-up processes, were easily identifiable when they appeared on the websites. An interesting point to keep in mind is the distinction drawn between the tools used and their means of application. This point, tools versus practices, reoccurs in subsequent meta-criteria and is discussed in more detail in the conclusion. These traits are likely good indicators of decolonialized contents despite concerns over the origins of the tools being colonial.

5.4. PROACTIVE CHANGE ORIENTED

Under the meta-criteria family of *Proactive Change Oriented* there are four traits identified. The thematic links for this group are tied primarily to acts and processes and outcomes as they are related to places and mapping. Overall there was less of this kind of content found on the websites examined. Very few of the sites had contents related to the traits in this grouping.

Trait	Mean	Median
Interventionist	1.1	0
Regenerative	1.4	0
Connecting	1.7	2
Networking	1.5	.05

Table 5.4.1 Trait scoring for Proactive/Change Oriented

The type of content that is counted here relates to activities that are intended to address problems on the ground in Indigenous communities. Content that is related to reframing and solving issues from an Indigenous perspective was also counted. Additionally, it is designed to identify content that show intra and inter

The first two traits in this section, Interventionist, and Regenerative contents are in some ways linked to the characteristics of the meta-criteria family of Indigenized Processes. While the focus under that trait grouping was mainly concerned with source or voicing, the traits in this section focus on actions and outcomes that reflect a decolonialized quality. Examples of this type of content are listed in table 5.4.2.

Map/Atlas Name	URL	Interventionist and Regenerative
Inuit Siku Atlas	https://sikuatlas.ca/index.html?module=module.sikuatlas.cape_dorset.intro	Response to Climate Change -Importance of sea ice, importance of sea ice for travel, Terminology
The "Oka Crisis": A Digital Atlas of the 1990 Events at Kanehsatà:ke	https://www.uvic.ca/socialsciences/ethnographicmapping/projects/oka/index.php	Chapter 4: Media Representation, Chapter 6: Kanehsatà:ke: 25 Years Later
http://voicesontheland.org/unity_runs	http://voicesontheland.org/unity_runs	All 7 years - Year 3, 2011; Year 6, 2014; & Year 7, 2015 - Challenge Territorial Boundries

Table 5.4.2 Examples of Interventionist and Regenerative Content

Examples such as these help to expose colonial narratives and attempt to counter them with alternative viewpoints. Effectively, it is a way of reframing debates and presenting new ideas and concepts to the map viewer. Also, this type of content exposes efforts addressing and attempting to deal with issues at the local level. Here again linking it back to issues of Indigenized processes mentioned before. Connective and networking content was more common under this criterion. The distinction between connective and networking in this grouping is based on audience. Connective material is defined as contents that are intra-community while networking content is defined as inter-community. In other words, connective content seeks to identify internal information sharing while networking is applied to external content sharing among different communities and the world at large. See figure 5.4.1 for an example of content that is both connective and networking.

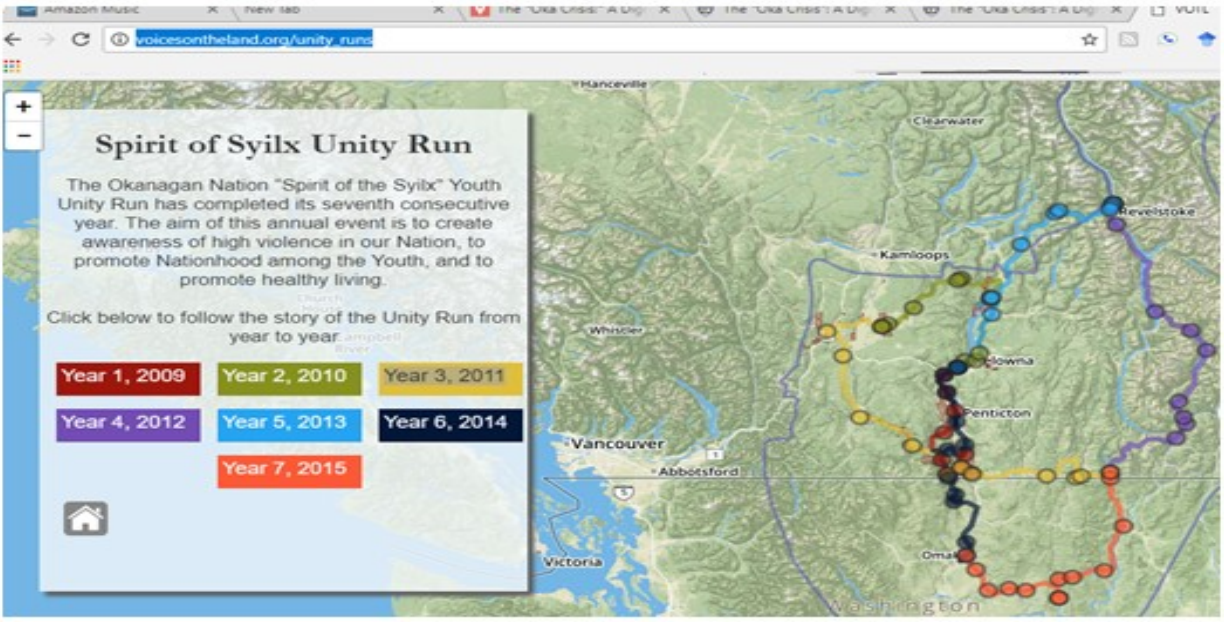


Figure 5.4.1 Examples of Connective and Networking Contents on the websites.

In this example, the content is both connective and networking. The map documents a series of intra-community events (i.e., connective) that are linked to each other by a "Unity Run" (i.e., networking) to create awareness about violence. The race course connecting communities is highlighted on the map and has links to photos and text about the race. It is also networking in the sense that it is a cross-border event that included communities on both sides of the U.S. / Canadian border.

This distinction was also covered in the participant interviews. In one instance a participant speaking about a mapping project she had initiated noted that web-based maps not only work at a local level but also serve to extend the range of internal connectivity:

> When I have showed this to some community members some of them have had tears in their eyes and they are thankful, and then they get excited and they want to start adding more. So, this is a living document. It is a good way to trace our family trees. I think it is an amazing opportunity. And, again, thinking of our youth they are very digital oriented, and this is a good way for them to learn about our culture. And for those of our nation not living on reserve, say they are living in BC then they can go to this and get a taste of home.

Adding to that:

> I am really community oriented, so this is why I would like to get other people involved. Like say people who are more hunting orientated or that might know a lot more about our medicines, I want to connect all these dots, so we could have all this information in one place to access. (Interview participant D2 sec.2:4 Indigenous Person, Female, Community Worker, Amateur Cartographer)

Clearly, the use of web-based mapping tools in this incident shows how it can connect community members across a variety of scales. Another participant talked about his experiences with mapping and how it brought together different communities that shared a common goal of language preservation:

> There is a community in Metlakatla in Alaska and they had pretty much lost all of their culture and knowledge, so a whole bunch of them came down to meet with our chiefs and elders. They wanted to communicate with us to learn the language again and learn the culture again, and the sights where their history was here. Maybe if we do something online, like google earth maybe we can show them. (Interview participant D1 sec. 1:10 - (Indigenous Person, Male, Cartographer, GIS Technician)

The observations of these participants support the findings of Eglington et al., (2017) and the use of digital narratives by Indigenous youth online and the creation of internal and external communication networks. In terms of this kind of content reflecting decolonialized ideas and concepts, it is in this case closely linked with the medium itself. Web technology and social media while imperfect represent a method of communication that is less filtered and hierarchal than most. While everyone and everywhere is not yet wired, it is at least for some, a communications portal with less gatekeeping than traditional media. It makes communication within, and between groups across a variety of scales practical and accessible, however, there still is a need to be aware of issues of access and the digital divide. As one participant explained:

> Lucky for me I have seen that whole progression go from paper mapping up to web-based mapping. And I have been really fortunate to see that trend happening over time. I have worked on a number of projects where we used web-based mapping technologies,

> not necessarily for land use or claims or anything like that, but more for health and social issues. For example, I was working for this organization called The Red Road, HIV/Aids network and we were trying to map out instances of people living with or affected by HIV/Aids and trying to connect those people to the services that might be available. It was a really interesting thing to build a web-based application like this because in the end I realized because someone had already started the project when they brought me on, I realized pretty quickly that the tools that were being used, the web-based applications that were trying to connect to people affected were not necessarily making it to those people…….It was really cool for the epidemiologist, scientist, and doctors and the professionals working in this field but the people who really need it the most it was inaccessible. It was something that they really could not access, people that might be living on the street or might be affected by this thing may not have the time to get to a web application and look for these services. So, what we did is we went back to creating paper maps. In that case, we printed 30,000 of the Vancouver maps and distributed them so people actually had a paper copy of the downtown eastside area showing all the services and what was available for people there. It really depends on what your end game is and who your audience is. I think before going down the path of building a web application you really need to know who your audience and who you are trying to build these tools for. In some cases, the internet is a perfect venue in others a paper map is even more powerful. (Interview participant D3 sec. 3:2 - (Indigenous Person, Male, Scholar, Cartographer, Community Activist)

Once again, as with many of the other groups and traits, this kind of content when found can be helpful in reframing debates and exposing new types of information within and between groups. In this sense, there are some decolonizing aspects to this kind of information when it appears on

a web-based map. However, issues such as the purpose of the map and accessibility may make the use of non-web-based mapping the more democratic and decolonialized option.

5.5. CAUTIOUSLY SHARING

The meta-criteria family related to information sharing is defined as *Cautiously Sharing.* This set of traits is in short about information gatekeeping and control.

Trait	Mean	Median
Protective	3	4
Sharing	3	4

Table 5.5.1 Scoring of contents found on websites: Cautiously Sharing

This category deals with the issues of information security and the protection of sensitive data. Data security and the protection of privileged information is a major concern especially when dealing with web mapping.

The web beyond allowing some previously unheard voices a new arena for expression also risks the compromising of sensitive data. From this perspective, information and local knowledge move from being instruments in the reproduction of local culture to a commodity for extraction. As noted prior, information and its spatial aspects are linked to power and control (Foucault, 1975). For many Indigenous peoples and communities, there is already in place a reticence about the sharing of information with outsiders that dates back long before the emergence of the web.

In terms of thematic linking this criterion much like that of Indigenized Processes has links to the sources of information. Most of the sites scored well in this category. One reason for this is that the websites in the sample were transparent about the sourcing of their data. The websites fell into two broad categories when it came to data sourcing. First, there are websites posting new content that is clearly sourced to specific Indigenous persons or communities. Second, sites that while dealing with Indigenous content was primarily re-posting existing materials to a new format, the web. In both situations, it was assumed that the data being shared was appropriate as it was being filtered by an Indigenous gatekeeper or it was information that had been published for general use in another format and therefore was already in circulation.

Overall this category and its traits while scoring well are somewhat problematic. First, because as a non-Indigenous person deciding what is or is not proper to share is difficult, if not impossible as well as inappropriate. Also, this kind of content is difficult to define whether or not the site included a clear policy statement about the sharing of sensitive information. Second, the two traits listed here, protecting, and appropriate sharing, are very similar and subtle differences between the two concepts are difficult to identify. For these reasons the distinction mentioned before, specifically cases of a clear Indigenous gatekeeper or re-posting of existing material seemed to be the fairest and most sensitive way to addresse identification of this kind of content.

It is also clear from the participant interviews that this issue is a significant concern for both Indigenous and non-Indigenous persons working in this field. For example: "Yes, there is distrust, major distrust. How many times have we let people come in and do a survey, and they used the information wrong?" (Interview participant D2 sec. 2:16 - Indigenous Person, Female, Community Worker, Amateur Cartographer). Another participant offered the following: "Sometimes when you put data on maps different communities get upset……Sometimes there are even issues about sharing information between nations." (Interview participant D4 sec. 4:9 - Non-Indigenous Person, Male, Cartographer, GIS Technician). Despite these concerns, there are likely some opportunities for web-based mapping sites to be used for information sharing in and by Indigenous communities. Besides being wary of the technology and what it might result in some participants still saw possible benefits to web maps.

> "I think before you go into building a web-based application, a web map you have to really figure out what is the story you are trying to tell. The use and occupancy approach that we take and end up using is the method that says if this is going to go to court we can stand by it. So, you are using a very rigorous methodology to go and collect that data for a very particular purpose. If I just go out and want to tell a story or talk about places I might not use this rigorous scientific research method. I might use a different method that would be able to capture that storytelling. But then I would not want to put that in front of a court. I mean there are different methods for different purposes. So before

> going out and doing a web mapping application you really have to figure out how you are going to tell that story and how you go about collecting that information to tell that story. It's the audience, figuring out who you are talking to (Interview participant D3 sec. 3:17 - Indigenous Person, Male, Scholar, Cartographer, Community Activist)

5.6 CRITICALLY REFRAMING

Under *Critically Reframing* the first two traits deconstructive and counter paternalistic appeared in about half the websites. The third trait, gender appears in less than half of the sites in the study. Also, as with previous sections traits in this grouping have links to the Indigenized Processes criteria.

Trait	Mean	Median
Deconstructive	1.9	2
Counter Paternalistic	2	2
Gender	1	0

Table 5.6.1 Scoring of contents found on websites: Critically Reframing

This category attempts to show content that comes from an alternative view point or tries to reframe colonial content from the perspective of the other or marginalized actor.

The terms deconstructive and counter paternalistic as used here are being applied to content that attempts to challenge accepted colonialist views about culture, society, economics, and politics. In other words, content that tries to reframe a worldview from the perspective of the subaltern. One measure of this would be the extent to which the content on the site relies on non-conventional sources and frames of analysis when evaluating and deciding what will be posted on the online maps. See figure 5.6.1 for websites with this kind of content.

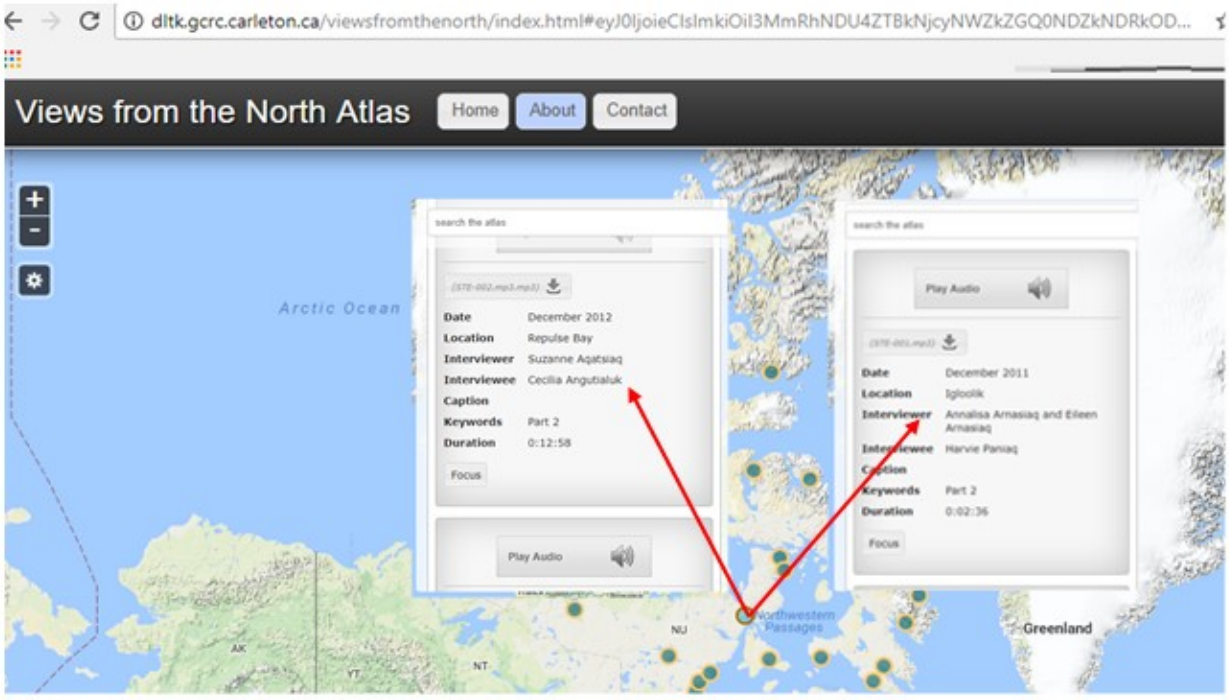


Figure 5.6.1 Example of deconstructive and counter paternalistic contents

In this example, the content is counted under deconstructive and counter paternalistic as the interviewer and the interviewee in the two incidents are both Indigenous persons. The example shows that work is at some level being driven and produced by Indigenous people. Additionally, in this example, the interviewer and the participant are both women whose voices have historically underrepresented in mapping.

Among the participant interviews opinions varied on what should be considered as reframing. But, there is general agreement that one of the visible manifestations of this kind of content would be counter-mapping. Specifically, as some participants put it: “In terms of colonialization in North America or Canada for that matter maps have always been used as tools of power, and if first nations were holding the pen when those initial settlers came to North America there would be a very different map.: (Interview participant D3 sec. 3:12 - Indigenous Person, Male, Scholar, Cartographer, Community Activist). Another participant commenting on the rise of web-based mapping and its impact on conventional cartography specifically addresses how it has reframed the practice from a realm of exclusivity, noting: "It’s astonishing that it lasted as long as it did, but it is dead now, and everybody can map now. There are a gazillion people mapping now that would not have been mapping twenty-five years ago.” (Interview participant D6 sec. 6:10 - Non-Indigenous Person, Male, Scholar, Cartographer, Researcher). Here again, other participants drew a distinction between tools and the process when it comes to the concept of the critically reframing abilities of web maps:

> I am interested in your use of the word democratizing that you used. I think the map making we did in the Inuit study of the Northwest Territories and in the Dane-azz[1] world…...The process is very democratic. In the sense that it is all completely open. We never invited people to kind of come into an office where they were locked away to do the work. It was done in the community on the floors of people's houses. No one ever worked on their own; they often had a whole extended family around watching and joining in so in the very first level of the data gathering it was democratic. And I should have said our objective was also 100% coverage of informants, we were not making a sample we aimed for everybody, so I guess that is a form of democracy.
>
> And then we made sure we shared the composite results. So, we would put together a summary of what we were finding, we would create a composite map that gave all the

[1] The Dane-azz are also known as Beaver tribe in English they are part of the Athabaskan-speaking group of First Nations people of Western Canada.

> hunting sites for seals, all the hunting for a certain area, and then we would show that to groups of elders or actually anyone who wanted to be involved and then let them comment on it. So, there was an interaction with the findings as we were working on the processes. That was a mix of democratization or I guess...intellectual clarity or I don't know what the right word is... good scholarship maybe? So, the question is there a democratizing capacity in internet mapping, is that going to be democratizing in a whole new way, a way we never anticipated. I suppose in a sense it is because by definition it becomes available to the whole world if you put this stuff online everybody has access to what you are doing and finding. But I am not sure it is inherently democratizing in any other way. (Interview participant D7 sec. 7:5 - Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist, and Film Maker)

However, some question the idea of counter-mapping in general:

> I have never called my work counter-mapping, I do not know what that is. I don't know what that would mean because I have never felt it. I have never felt, oh I am speaking back, or I am helping this community talk about this. I don't see it as that. I see expression and whatever that expression is depends on the balance of power in that context. So, if I am going to express something with power, I am going to do it with whatever way I need to depending on the audience or who I want to listen to me. So, if I am mapping internally in a ceremonial situation it has to be tools that are there in a good way, in a ceremonial way. Those are going to be different than the tools for expression that need to speak powerfully to the local newspaper or a federal funding agency or to people I don't know on the web. It’s going to be whatever tools that are needed.

(Interview participant D8 sec. 8:10 - Indigenous Person, Female, Scholar, Cartographer, Consultant)

The last trait in this grouping is that of gendered content. The content analysis of the websites identified that many but not all of them overlook issues of gender. For example, the sites referenced in figures 5.6.1 the "Voices of the North Atlas" and 4.2.3 "The Siku Sea Ice Atlas" both make efforts to feature the voices of women as participants and as researchers. However, the findings of the content analysis when viewed comprehensively for this trait shows that gender and gender-based issues achieved a mean score of 1 and a median score of 0 in a zero on a four-point scale. This score means almost none of the sights in the sample regardless of affiliation exhibited gendered content in their maps. This, in theory, means at least half of the stories held by what are predominantly oral cultures are not being heard and therefore not being mapped.

This lack of content is particularly interesting as interviews brought to light that some types of knowledge in Indigenous cultures are gender specific. It is put perhaps best and most succinctly by one participant who in response to questions about gendered knowledge stated: "They know different things than the men." (Interview participant D1A sec. 1:26:19 Indigenous Person, Male, Cartographer, Environmental Monitor). At least one reason why this lack of content is concerning is that it can play a role in establishing and supporting occupancy and use claims. For example, one of the reoccurring discussion points in the interviews was about how women's knowledge related to cultural practices like hunting and harvesting helped to show links to place. As one participant described his experiences of working with gendered knowledge and hunting put it:

> The men tell us how they go, how they get there, and why it is important to go kill those animals, but it's the women who tell us why those resources are so important to the community…...Those points (re: locations of subsistence activities) are literally anchor points to wider practices of activity that is being represented. So, the practice is much wider. The points are literally representative of a practice that is more holistic and

> communal in nature. (Interview participant D3 sec. 3:19 - Indigenous Person, Male, Scholar, Cartographer, Community Activist)

Another participant speaking from personal experience of his studies of rice harvesting practices hit upon similar themes saying:

> I had ignored the fact that they (re: women) had to process it, they had to dry it, organize it, and get all this stuff ready. They had to cook it, then husk it, and store it, so the actual ricing in the water is about five hours right, but the rest of it is like forty hours. Well, guess who does the five and who does the forty? And I did not even notice this; I was completely oblivious. The moment the men take it off the boat the women are the ones who organize. It is their domain, it is not the men's domain. (Interview participant D10 sec. 3:19 - Non-Indigenous Person, Male, Scholar, Archeologist, Cartographer)

This kind of information helps to build cases of long-term occupation from a different perspective. The intergenerational passing of cultural details demonstrates that traditional practices such as hunting, harvesting, and foraging have a spatial component and are linked to specific locations. The telling of women's stories adds another layer of information and evidence about occupation and claims. In situations where data security is not of concern the leaving of that information off the map is a missed opportunity.

This lack of representation raises many questions the most obvious being why it is being overlooked. Is it an inability to map the kind of information women are holding? Is it that the information they possess is more sensitive and should not be publicly mapped? One possible reason we do not see more gendered information is a likely inherent male bias in the field of cartography. This idea is supported in part by statistics on male and female participation rates in the field. For example, a 2014 survey by gislounge.com (Dempsey, 2014), reports that of a worldwide sample of 1186 people working in GIS related jobs, 63% reported being male while 37% reported as female. This is also supported by information gathered in the participant interviews and speaks to a historical absence of gendered information in mapping. The early developers and scholars behind map biographies and counter-mapping practices also likely

underrepresented gendered content and knowledge in their print maps as one interviewee described:

> Going back to the work in the 1970s we made many mistakes, but the biggest mistake we made was to not look at gendered landscapes. Not to look at the nature of female relationships to resource base as a thing in and of itself…...It is significant and important to note the rather large contribution that women trapping was making to economic wellbeing. (Interview participant D7 sec. 7:15 & 7:16 - Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist, and Film Maker)

This participant went on to explain that in his subsequent film work women's voices and stories were compelling. Suggesting that film is a better format for proving how salient their voices were in campaigns of recovery. Sighting that women's voices and the roles they played better articulated the social and cultural pain they and their communities experienced. Given the nature of the internet and its multi-media abilities, this kind of content, filmed stories from and about women and their spatial practices would find a welcoming home on the web.

Returning to the question of why this kind of content is not showing up on web-based maps a common theme arising from the interviews was that of an institutionalized male bias in the field. The consensus as to why this type of content was not being found centered on the argument that mapping has historically been gendered and male orientated: "Tech is a fetish that is dominated by men." (Interview participant D1A sec. 1:26:19 - Non-Indigenous Person, Male, Archeologist, Cartographer). Another participant noted: "It's a big issue. Our cartographic tradition and our common law sets us up for a very gendered view or a view that favors men's opinions over women's." (Interview participant D5 sec. 5:18 - Non-Indigenous Person, Male, Scholar, Cartographer, Anthropologist). While another talked about her own personal observations of participatory mapping projects said:

> Well the people giving the information were women, and the people with the tools were men……So, if we are talking about participatory mapping projects, I have been struck by how many times I see a photograph of a participatory mapping project, globally its predominantly men in the picture. Occasionally women, and if women are present, they

> are in the back row. I think people are more aware of that or trying to become more aware of that. (Interview participant D8 & D9 sec. 9.2 & 9:3 (Indigenous Person, Female, Scholar, Cartographer, and Consultant).

The same participant also made an observation about the lack of women's voices in cartography and how their perspectives can impact the types of maps being made:

> Mapping as it is defined academically is highly gendered and predominantly male. How many native women it strikes me are strong voices in scholarship on literature and story. I don't know if you have seen Mishuana Goeman's book "Mark My Words"? She writes about how she wanted to map histories and map intersections of knowledge of native people and how she can do that in a woman's way. And to do that in a woman's way she did that through words. And I think for her, and she is a writer, it would not be a graphic map. That gave me a lot to think about because my projects are very word-oriented. (Interview participant D8 & D9 sec. 9:2 &9:3 Indigenous Person, Female, Scholar, Cartographer, Consultant)

What is clear from this work is that the issue of gender in mapping needs to be explored in more depth. The extent of this study only serves to expose this problem and propose additional questions for future work. It is clear based on this work that women's voices in mapping are likely underrepresented across the board. Additionally, based on the interview responses, one avenue of exploration to consider is how we can address issues of institutional bias that discourages or prevents women from entering the field and having their voices heard.

5.7. RESTORATIVE CONTENT

The last meta-criteria family *Restorative Content* attempts to address issues of restoration and is perhaps the most problematic to define and operationalize. This grouping contains a significant number of traits and for the sake of clarity it is divided into two sub-categories. The sub-category, *Envisioning and Wellbeing* attempts to address the non-physical aspects of restorative processes. While the second, *Locally Innovating* is geared towards content that deals

with the physical indicators of restorative processes explicitly related to tenure and control of land.

Trait	Mean	Median
Envisioning	1.4	0
Spiritual Wellbeing	1.4	0
Emotional Wellbeing	1.4	0
Physical Wellbeing	1.4	0
Mental Wellbeing	1.4	0

Table 5.7.1 Scoring of contents found on websites: Envisioning & Wellbeing

Envisioning and wellbeing content relates to the non-physical aspects of restorative processes. Content in this category is difficult to identify. Issues of positionality need to be considered when searching for this kind of information on websites. The identification of content related to the welfare of individuals or groups needs to be approached from a culturally sensitive perspective

Less than half of the websites contain the kind of content identified in this family (see table 5.7.1). Unfortunately, the participant interviews did not shed much light as to why this type of material may be missing from the websites. One possibility is that this kind of content is indirectly manifested by other sets of traits in the list. Another that I suspect is highly probable is that as a non-Indigenous researcher, it is not possible to define what an Indigenous person might find envisioning or in support of their well-being. In retrospect, the decision to use this set of traits is highly paternalistic. Also, while most of the characteristics listed in the other meta-criteria have a sense of quantifiability (e.g., data sourcing, location, physical activities, and processes), it is less so the case for the traits in this grouping.

The second grouping of traits in this meta-criteria family is called *Locally Innovating* and is designed to address the physical aspects of restorative processes. They are based on the concept that the return of control and tenure of land and territories reflects a tangible measure of restoration, particularly when it relates to mapping.

Trait	Mean	Median
Participatory Planning	.06	0
Community Based Resource Management	1.5	0
Crowdsourcing	0.4	0
Volunteered Geographic Information	2.0	2

Table 5.7.2 Scoring of contents found on websites: Locally Innovating

Locally Innovating is geared towards identifying content that deals with the physical indicators of restorative processes explicitly related to tenure and control of land. This kind of information was not found on many of the websites. This is possibly due in part to issues of data security and the protection of privileged information.

Here too very few of the websites have this type of content. This was initially somewhat surprising as the idea behind this grouping was to document practices that by their nature would lend themselves to mapping. Explicitly, because all the traits in this group address issues of land use and planning. However, when considering the larger picture and the relationships between this and other meta-criteria families, it is perhaps less of a surprise. Specifically, when considering its links between this group and the trait of Claiming and Land use found in section 5.1 and the traits in section 5.5 Cautiously Sharing. It is possible this data may not be online due to real and valid concerns about privileged information. This idea is reinforced by comments from the participant interviews, as one participant puts it:

> I do not think I have worked on any project in the last 4 years that has published data publicly on a web-based application…. This kind of information Land use and occupancy is a very sensitive topic because having that data online for people to see, it can be very detrimental to people's interests.

The same participant later talking about the use of the direct to digital method of mapping and data security concerns:

> We work with communities to go out and collect the data; Google does not collect the data that goes onto those maps. So talking to individuals, interviewing them, pointing out locations on the map, adding those points and documenting the land use activities in all of

> our cases none of our communities want that information to go public….The only reason why we can use a tool like Google Earth is because it is stored on the computer and you can control how and what goes on to the internet or not. (Interview participant D3 sec. 3:4 (Indigenous Person, Male, Scholar, Cartographer, Community Activist)[2]

Like the other subcategory in this section, Envisioning and Wellbeing, the qualities that Locally Innovating is devised to identify are likely addressed by other meta-criteria and traits. For example, the sharing of some types of land use and planning data may fall under the category of *Cautiously Sharing*. Additionally, some of the information it attempts to identify does not appear on web-based mapping platforms. This sub-grouping and for that matter, this entire meta-criteria family are likely not good indicators and should be removed from contention in possible future research.

[2] See also quotes in the section 5.5 Cautiously Sharing pages 75-76.

CHAPTER 6. CONCLUSIONS

This work began with a focus on the cartographic experience of the first contact between the Indigenous peoples of Canada and European explorers. It raised questions about how each group used and understood maps and mapping. It argued that there are links between our spatial understanding, systems of knowledge, and our worldview or cosmovision that impact our concepts and production of maps in the physical world. The hypothesis proposed is that web-based mapping and digital communication provide a location and an opportunity for Indigenous people to tell their stories in a decolonialized manner. In addition, I argued that the internet and cyberspace can be conceptualized as a third space and the possible location where nexus and reconciliation could occur.

Of the sites examined, there are a few standouts that reflect decolonialized ways of mapping. First, the "Oka Crisis Map" from the University of Victoria, second the "Voice of the Land Map" from Ecotrust in Vancouver BC, and third the "Inuit Siku Atlas" from GCRC at Carleton University in Ottawa. Oka stands out because of the content and the perspective it takes on telling the stories related to the Oka crisis. It is also one of the few sites that in terms of its pedagogic functions attempts to be interactive by asking challenging questions about the content in its online texts and downloadable lesson plans. The "Voices of the Land Map" stands out because of the quantity and quality of the information on the map specifically as it relates to place names and multi-media content. The "Inuit Siku Atlas" is notable for its gendered content as well as for running on open source software. None of these websites or the maps produced is stand alone. In all cases, they are either associated with a university research centre or an NGO. As noted in the participant interviews one possible explanation for this is that of priorities. While many Indigenous communities in Canada have mapping offices, their focus is likely not on web-based mapping. They are more likely to focus on pressing land use and legal battles as opposed to the types of content seen on sites associated with outside organizations.

Regarding what the idealized decolonialized web mapping website would look like, it would draw inspiration from the three examples above. Its content would be in line with Oka and the Siku websites in that it would be engaging and inclusive. Also, like the Siku atlas, it would be built on open source platforms. Regarding what we can take from "Voice of the Land" it would be driven by the community and make good use of multi-media and especially place

names as a tool for recognition of habitation and tenure. In addition to borrowing these traits, it would also include more options for users to tell their stories and have an impact on the content of the maps.

This investigation into online Indigenous mapping and its relationships to colonial discourse lent itself to an approach that was both quantitative and qualitative. The content analysis and the participant interviews managed to shed some light on the current state of Indigenous online mapping, its relationships to colonialism, and third space. However, issues of methodology related to the content analysis need to be addressed. First, the use of Smith's (2013) work as the basis of a content analysis for the evaluation of Indigenous online mapping in its current format is a tool in need of refinement. Some of the meta-criteria and traits should be combined while others should be discarded. For example, the attributes under the meta-criteria of Ethnographic and Cultural relating to narrative content should be grouped together. Also, the traits associated with Cautiously Sharing should be combined into a single characteristic that is aimed at the concept of data protection.

Other groups such as Restorative Content should be discarded. It should be removed because the traits under that section relating to envisioning and wellbeing are paternalistic and inappropriate. As mentioned prior in the statement of positionality I am a non-Indigenous researcher. For that reason alone, it is inappropriate to attempt to define what kind of content might be considered envisioning or addresses issues of wellbeing for an Indigenous person. The other traits in this group related to planning, land use, tenure, and information gathering should also be removed. Primarily because of issues related to data security much of this type of information just does not and should not appear on web maps.

One positive aspect of the method and the approach is its value in recognizing themes and trends of content types appearing or missing from the websites. Specifically, the issue of gendered material comes to mind. Despite, the fact that the focus of this work is not gendered content it is rather interesting how it rose to the top as an issue in online mapping. Questions relating to why it is being overlooked are the most obvious and pressing and should be investigated in greater detail. The information gleaned from the interviews suggests the possibility of an inherent male bias not only in cartography but the tech sector in general. An observation that is at least anecdotally supported by informal surveys related to the gendering of

GIS office workspaces (Dempsey, 2014). However, the question of why there is a lack of gendered content on the sample sites cannot be answered by this work.

In conclusion what can be said is that there is a potential for the web to become the preferred medium for decolonized mapping practices and the home of a third space of dialogue and reconciliation. I believe this to be the case for a couple of reasons. First, as noted in several locations in the discussion section the use of narrative seems to be relevant to many of the meta-criteria families. Narratives and storytelling are an important part of many Indigenous cultures (Drawson et al., 2017; Olson et al., 2016; Wright et al., 2012; McIvor, 2010). Also, according to Smith (2013), the use of narrative is one of the characteristics associated with decolonialized ways of doing things. Furthermore, the participant interviews support the idea that the web is likely a suitable medium for the sharing of narratives because of its ability to disseminate information via digital video and audio formats. While imperfect the web and internet-based mapping represent a medium that is less filtered and has fewer gatekeepers than conventional mass media. Therefore, the web provides at least some degree of greater accessibility, however limited it may be, for Indigenous and other marginalized actors to tell their stories.

Second, the participant contributions and the literature support the idea that digital communication technologies like the web enable some aspects of decolonialization. More explicitly as it relates to the role of technology in the production of counter-narratives and issues of equity and respect for the producers of web content (Jager et al., 2017; Dyll-Myklebust, 2014). Additionally, the technology may have decolonializing aspects in and of itself. Because of its ability to document, record, and distribute narratives and other information in a more direct manner, with fewer gatekeepers, it may reduce the risk of interpretation bias by enabling participant voices to be heard in more direct and unfiltered ways (Willox et al., 2013). Further, because the tools and technology can foster participation, be used to address uneven power relationships, and open new spaces of expression for marginalized actors an argument can be made that they mirror some aspects of the concept of radical democracy (Eglinton et al., 2017).

However, the interviews show an argument can be made that it is less about the technology and the tools than it is about intention, practice, and content. While the technology may enable some practical aspects of democratization and decolonialization, it is the content depicted and the perspective of the author that determines the decolonialized nature of the expression. In other words, the web and digital technology can be used to promote decolonized

ways of thinking or just as easily be used to reinforce existing colonial paradigms. That said, no tool is perfect, and there are aspects of any tool that have likely been inculcated by colonial forces at some level. Even when imperfect and where accessibility issues have been addressed there is support for the idea that the internet and digital technologies have some decolonializing potential.

As for the idea of online mapping being a form of third space, it is unclear if that statement can be supported based on this project. As noted before, Soja (1996), Sparke (1998), and Bhabha (2004) envision third space as a location where contradictions and counterpoint are expressed and the home of nexus and interaction. While some of the websites investigated in this work have content from the viewpoint of the other and address the topics of counterpoint and contradiction the issues of nexus and interaction are harder to assess. One reason the latter traits are difficult to identify is that most of the websites in the study were not interactive in the way that allowed the posting of externally generated content. The content of the sites tended to be pedagogic in the sense they are designed to convey information, not for the exchange of material related to differing points of view. In other words, they are acting like texts as opposed to teachers. In this way, they mirror Rundstrom's (1991) idea about cultures that value product over processes. This practice challenges the idea of the web as a home of decolonized material as the content being posted mirrors a Western model of thinking that values object over process.

Regarding web space as a location of reconciliation, it too is unclear if this work can support that claim. Here also it is an issue of feedback being supported on the websites. Reconciliation requires some acknowledgment of a wrong or disagreement between parties, and if a website does not provide space or opportunity for discussion or alternative views, then reconciliation is not likely. In the case of Canada, it is even difficult to make the argument of some form of implied recognition. Specifically, because critiques of the government's efforts at reconciliation note the terms of any agreements historically have been one-sided and primarily dictated by the state (Coulhard, 2014). What can be said about third space as it relates to this thesis is that Lee's (2016) description of third space as a location where Indigenous cultural identity can play out is supported by this work. Specifically, it supports her claim that hybrid spaces are locations where native actors can examine and reclaim the sites of knowledge production. However, it is unclear based on this work if the web represents a space of

reconciliation that is the home of counterpoint, discussion, and nexus as most of the websites found today lack effective tools for feedback and ongoing discussion and debate.

7. REFERENCES

Agrawal, A. (1995). Dismantling the divide between indigenous and scientific knowledge. *Development and Change*, 26(3), 413-439.

Ahenakew, C. (n.d.). Grafting Indigenous Ways of Knowing Onto Non-Indigenous Ways of Being The (Underestimated) Challenges of a Decolonial Imagination. https://doi.org/10.1525/irqr.2016.9.3.323

Ahn, J., Borowiec, A., Buckley, K., Cai, D., Chmiel, A., Czaplicka, A., … Cohen, J. E. (2007). CYBEREMOTIONS–collective emotions in cyberspace. *Procedia Computer Science*, *7*, 210.

Ahn, J., Borowiec, A., Buckley, K., Cai, D., Chmiel, A., Czaplicka, A., … Gobron, S. (2011). CYBEREMOTIONS–collective emotions in cyberspace. *Procedia Computer Science*, *7*, 221–222.

Andreotti, V. (2016). (re) imagining education as an un-coercive re-arrangement of desires. *Other Education*, *5*(1), 79–88.

Baldwin, A., Cameron, L., & Kobayashi, A. (2011). *Rethinking the great white north: Race, nature, and the historical geographies of whiteness in Canada*. UBC Press.

Banner, S. (2005). Why Terra Nullius? Anthropology and property law in early Australia. *Law and History Review*, *23*(1), 95–131.

Best, A., & Holmes, B. (2010). Systems thinking, knowledge and action: towards better models and methods. *Evidence & Policy: A Journal of Research, Debate and Practice*, *6*(2), 145–159.

Bhabha, H. K., Krämer, N. C., Neubaum, G., Eimler, S. C., & Silverstone, R. (2004). *The location of culture*. *Digital media revisited: Theoretical and conceptual innovations in digital domains*. Springer.

Brody, H. (1981). Maps and Dreams: Indians and the British Columbia Frontier. Douglas and McIntyre, Vancouver. *British Columbia, CA*.

Brody, H. (2002). *The other side of Eden: Hunters, farmers, and the shaping of the world*. Macmillan.

Bryan, J., & Wood, D. (2015). *Weaponizing maps: Indigenous peoples and counterinsurgency in the Americas*. Guilford Publications.

Cameron, E. (2011). Copper stories: Imaginative geographies and material orderings of the Central Canadian Arctic. *Rethinking the Great White North: Race, Nature and the Historical Geographies of Whiteness in Canada*, 169–190.

Cameron, E. (2012). New geographies of story and storytelling. *Progress in Human Geography*, *36*(5), 573–592. https://doi.org/10.1177/0309132511435000

Campbell, J. (2008). The hero with a thousand faces (The collected works of Joseph Campbell). *New World Library*.

Caquard, S. (2013). Cartography I: Mapping narrative cartography. *Progress in Human Geography*, *37*(1), 135–144. https://doi.org/10.1177/0309132511423796

Cavanagh, E. (2014). Possession and dispossession in corporate New France, 1600–1663: debunking a "juridical history" and revisiting terra nullius. *Law and History Review*, *32*(1), 97–125.

Chapin, M., Lamb, Z., & Threlkeld, B. (2005a). Mapping Indigenous Lands. *Annual Review of Anthropology*, *34*(1), 619–638. https://doi.org/10.1146/annurev.anthro.34.081804.120429

Chapin, M., Lamb, Z., & Threlkeld, B. (2005b). Mapping Indigenous Lands. *Annual Review of Anthropology*, *34*(1), 619–638. https://doi.org/10.1146/annurev.anthro.34.081804.120429

Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. University of Minnesota Press.

Cruikshank, J. (2012). Are glaciers "good to think with"? Recognising indigenous environmental knowledge. In *Anthropological Forum* (Vol. 22, pp. 239–250). Taylor & Francis.

Cunsolo Willox, A., Harper, S. L., & Edge, V. L. (2013). Storytelling in a digital age: Digital storytelling as an emerging narrative method for preserving and promoting indigenous oral wisdom. *Qualitative Research*, *13*(2), 127–147. https://doi.org/10.1177/1468794112446105

Cunsolo Willox, A., Harper, S. L., Edge, V. L., Lab, "My Word": Storytelling and Digital Media, & Government, R. I. C. (2013). Storytelling in a digital age: digital storytelling as an emerging narrative method for preserving and promoting indigenous oral wisdom. *Qualitative Research*, *13*(2), 127–147.

De Certeau, M. (1984). Walking in the City.

de Jager, A., Fogarty, A., Tewson, A., Lenette, C., & Boydell, K. M. (2017). Digital Storytelling in Research: A Systematic Review. *The Qualitative Report*, *22*(10), 2548.

Dickason, O. P., & Long, D. A. (2016). *Visions of the Heart: Issues Involving Aboriginal Peoples in Canada*. Oxford University Press.

Drawson, A. S., Toombs, E., & Mushquash, C. J. (2017). Indigenous research methods: a systematic review. *The International Indigenous Policy Journal*, *8*(2), 5.

Dyll-Myklebust, L. (2014). Development narratives: The value of multiple voices and ontologies in Kalahari research. *Critical Arts*, *28*(3), 521–538.

Eades, G. (2015). Maps and Memes. *Redrawing Culture, Place, and Identity in Indigenous Communities. McGill-Queen's University Press, Montreal*.

Eglinton, K. A., Gubrium, A., & Wexler, L. (2017). Digital Storytelling as Arts-Inspired Inquiry for Engaging, Understanding, and Supporting Indigenous Youth. *International Journal of Education & the Arts*, *18*(5).

Ellis, S. C. (2005). Meaningful consideration? A review of traditional knowledge in environmental decision making. *Arctic*, 66-77.

Elwood, S. (2006). Critical issues in participatory GIS: Deconstructions, reconstructions, and new research directions. *Transactions in GIS*, *10*(5), 693–708.

Graham, M., & Zook, M. (2013). Augmented realities and uneven geographies: exploring the geolinguistic contours of the web. *Environment and Planning A*, *45*(1), 77–99.

Hall, R. J. (2015). Divide and Conquer: Privatizing Indigenous Land Ownership as Capital Accumulation. *Studies in Political Economy*, *96*(1), 23–46.

Harley, J. B. (1988). *Maps, knowledge, and power*. *The Iconography of Landscape*. https://doi.org/10.1177/1474474000901600101O6

Heidegger, M. (1971). Building dwelling thinking. *Poetry, Language, Thought*, *154*.

Herlihy, P. H. (2003). Participatory Research Mapping of Indigenous Lands in Darién, Panama. *Human Organization*, *62*(4).

Hunt, D., & Stevenson, S. A. (2017). Decolonizing geographies of power: indigenous digital counter-mapping practices on turtle island. *Settler Colonial Studies*, *7*(3), 372–392.

Ingold, T. (2000). *The perception of the environment: essays on livelihood, dwelling and skill*. Psychology Press.

Kitchin, R., & Dodge, M. (2007). Rethinking maps. *Progress in Human Geography*, *31*(3), 331–344.

Kitchin, R., Linehan, D., O'Callaghan, C., & Lawton, P. (2013). Public geographies through social media. *Dialogues in Human Geography*, *3*(1), 56–72. https://doi.org/10.1177/2043820613486432

Krämer, N. C., Neubaum, G., & Eimler, S. C. (2017). A brief history of (social) Cyberspace. In *Cyberemotions* (pp. 11–35). Springer.

Krell, D. F. (1993). Martin Heidegger: Basic Writings. *San Francisco: HarperSanFrancisco*.

Lee, P. (2016). Journey Through the Third Space: Performing Aboriginal Identity Through Historic Re-Enactment Sites. In *Constructions of Self and Other in Yoga, Travel, and Tourism* (pp. 19–28). Springer.

Lefebvre, H., & Nicholson-Smith, D. (1991). *The production of space* (Vol. 142). Oxford Blackwell.

Lewis, M. G., & Lewis, G. M. (1998). Maps , Mapmaking , and Map Use by Native North Americans. In D. Woodward (Ed.), *Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies, vol. 2, bk. 3, of The History of Cartography,, G.M.artography in the Traditional African, American, Arctic, Australian, and Pacific Societies, vol. 2, bk. 3, of T* (pp. 51–182). Chicago: University of Chicago. Retrieved from http://www.press.uchicago.edu/books/HOC/HOC_V2_B3/HOC_VOLUME2_Book3_chapter4.pdf

Louis, R. P. (2007). Can You Hear us Now? Voices from the Margin: Using Indigenous Methodologies in Geographic Research. *Geographical Research*, *45*(2), 130–139. https://doi.org/10.1111/j.1745-5871.2007.00443.x

Lynch, K. (1960). *The image of the city* (Vol. 11). MIT press.

McIvor, O. (2010). I am my subject: Blending Indigenous research methodology and autoethnography through integrity-based, spirit-based research. *Canadian Journal of Native Education*, *33*(1), 137.

Miller, R. J. (2009). Beyond Conquest: Native Peoples and the Struggle for History in New England. *The American Indian Quarterly*, *33*(4), 587–590.

Natcher, D. C. (2001). Land use research and the duty to consult: a misrepresentation of the aboriginal landscape. *Land Use Policy*, *18*(2), 113–122.

Olson, R., Hackett, J., & DeRoy, S. (2016). 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*, *7041*(July), 1–8. https://doi.org/10.1080/00087041.2016.1190146

Pasternak, S. (2015). How capitalism will save colonialism: The privatization of reserve lands in Canada. *Antipode*, *47*(1), 179–196. https://doi.org/10.1111/anti.12094

Peluso, N. L. (1995). Whose woods are these? Counter-mapping forest territories in Kalimantan, Indonesia. *Antipode*, *27*(4), 383–406.

Pickles, J. (1995). *Ground truth: The social implications of geographic information systems*. Guilford Press.

Pred, A. (1984). Place as Historically Contingent Process: Structuration and the Time-Geography of Becoming Places. *Annals of the Association of American Geographers*, *74*(2), 279–297. https://doi.org/10.1111/j.1467-8306.1984.tb01453.x

Rathwell, K., Armitage, D., & Berkes, F. (2015). Bridging knowledge systems to enhance governance of environmental commons: A typology of settings. *International Journal of the Commons*, *9*(2).

Raymond, C. M., Fazey, I., Reed, M. S., Stringer, L. C., Robinson, G. M., & Evely, A. C. (2010). Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management*, *91*(8), 1766–1777.

Reynolds, H. (2003). *The law of the land*. Penguin.

Ritzer, G., & Jurgenson, N. (2010). Production, consumption, prosumption: The nature of capitalism in the age of the digital "prosumer." *Journal of Consumer Culture*, *10*(1), 13–36.

Rundstrom, R. A. (1991). Mapping, postmodernism, indigenous people and the changing direction of North American cartography. *Cartographica: The International Journal for Geographic Information and Geovisualization*, *28*(2), 1–12.

Rundstrom, R. A. (1995). GIS, Indigenous Peoples, and Epistemological Diversity. *Cartography and Geographic Information Science*, *22*(1), 45–57. https://doi.org/10.1559/152304095782540564

Sletto, B. (2009). Indigenous people don't have boundaries': reborderings, fire management, and productions of authenticities in indigenous landscapes. *Cultural Geographies*, *16*(2), 253–277. https://doi.org/10.1177/1474474008101519

Sletto, B. (2016). Indigenous mobilities, territorialization, and dispossession in the Sierra de Perij??, Venezuela: Rescuing lands and meanings in H??bitat Ind??gena Yukpa, Toromo-T??tari. *Geoforum*, *74*, 117–127. https://doi.org/10.1016/j.geoforum.2016.06.003

Smith, L. T. (2013). *Decolonizing methodologies: Research and indigenous peoples*. Zed Books Ltd..

Soja, E. W. (1996). *Thirdspace: Expanding the geographical imagination*. Blackwell.

Tobias, T. N. (2000). Chief Kerry's moose: a guidebook to land use and occupancy mapping, research design, and data collection.

Tobias, T. N. (2009). *Living proof: the essential data-collection guide for indigenous use-and-occupancy map surveys*. Ecotrust Canada Vancouver.

Turnbull, D. (2007). Maps Narratives and Trails: Performativity, Hodology and Distributed Knowledges in Complex Adaptive Systems ? an Approach to Emergent Mapping. *Geographical Research*, *45*(2), 140–149. https://doi.org/10.1111/j.1745-5871.2007.00447.x

Usher, P. J. (2003). Environment, race and nation reconsidered: Reflections on Aboriginal land claims in Canada. *Canadian Geographer*, *47*(4), 365–382. https://doi.org/10.1111/j.0008-3658.2003.00029.x

Usher, P. J., Tough, F. J., & Galois, R. M. (1992). Reclaiming the land: aboriginal title, treaty rights and land claims in Canada. *Applied Geography*, *12*(2), 109–132.

Wood, D. (1992). How maps work. *Cartographica: The International Journal for Geographic Information and Geovisualization*, *29*(3–4), 66–74.

Wood, D. (2010). *Rethinking the power of maps*. Guilford Press.

Wood, D., Fels, J., Sparke, M., Smith, L. T., Rathwell, K., Armitage, D., … Banner, S. (2015). Mapping Indigenous Depth of Place. *American Indian Culture and Research Journal*, *32*(3), 107–126. Retrieved from http://www.metapress.com/content/N7G22W816486567J

Wyatt, S. (2008). First Nations, forest lands, and "aboriginal forestry" in Canada: from exclusion to comanagement and beyond. *Canadian Journal of Forest Research*, *38*(2), 171–180.

APPENDIX

8.1 SURVEY QUESTIONNAIRE

Questionnaire

Indigenous online Mapping in Canada - Decolonizing or recolonizing forms of spatial expressions?

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Interview Questions–

1. Could you give me some background information about your experiences with mapping in *(your community – OR - the communities that you have worked with*)?

2. What are your general impressions of how mapping is being used in (*your community – OR- the communities you have worked with*)

   Clarify or contextualize - e.g., Strengths, weaknesses, anecdotal impressions?

3. Can you tell me about how the mapping projects you have been associated with got started and what are your impressions on the process?

   Clarify or contextualize - e.g., self-generated by the community/outside assistance/combination/ no idea What did you like or dislike, would you do it again?

4. Can you tell me how recent technological changes (i.e. the Internet) have changed indigenous cartographic practices? (within the community and between the community and different bodies and institutions)

5. Maps can be used political tools. In a content analysis I conducted of Indigenous peoples use of web-based mapping & atlases (i.e., *Cybercartography*) I found that all of the case study examples were using mapping as a tool for land claims in one form

or another. In essence, the Indigenous groups doing the mapping are adapting what could be described as colonialized processes, practices, or concepts about land and ownership. What are your impressions of this finding?

Clarify or contextualize – e.g., this is what indigenous peoples should be doing/not doing with online mapping, is it just a necessary "evil," co-opting this paradigm should/should not be done, etc.

6. In the content analysis, I did not find a lot of examples of content related to contested or disputed spaces. Nor did I find much content related to the return of these spaces to Indigenous control. In other words, all the groups doing the mapping seemed to be very good at defining their territory but not disputing the claims of others. Why do you think this is the case and what are your reactions to this finding?

7. Based on a content review I conducted it appears that a majority of the more interactive or "cybercartographic" content appears on sites that are affiliated with either NGOs or research organizations. While sites run independently by Indigenous communities appear to feature more conventional static cartography (i.e., downloadable or viewable maps that appear to be generated by conventional GIS applications). Why do you think this is the case? How does this coincide with your perceptions about Indigenous mapping on the web?

8. What I found in the analysis of the sites is that very few of them were using maps and mapping as tools to solve local problems or intervene in processes related to solving immediate or pressing issues related to a given community. For example, the use of VGI (Volunteered Geographic Information) to address an urgent community need or problem. Why do you think this is the case?

9. With the expansion of web-based geospatial technologies, arguably there is a greater risk of information that is privileged or insider information becoming part of the public domain. With that in mind how big of a role should the web play in Indigenous cartography? What kind of information should be mapped and documented and what should not? In your opinion where is, or is there, a balanced to be achieved between sharing and protecting information when dealing with web-based mapping?

10. According to the content analysis of the case study sites, those associated with outside organizations such as research groups or NGOs appear to use mapping more effectively as a means of preserving and disseminating cultural information. Do you think that the use of web-based geospatial technologies represents a paradigm shift relative to democratizing and providing alternative viewpoints and interpretations about place, space, identity, and culture for Indigenous peoples and communities?

11. In the content analysis, I conducted seems to indicate that there is a lack of content on Indigenous mapping sites related to issues of gender and gendering. Does this find surprise you? Do you think it is accurate? Why do you think this is or is not the case?

12. In the pre-interview information I sent you there were some examples of online mapping sites did you have an opportunity to review any of them? If so what are your impressions of the example sites? What did you like or dislike?

13. Are there any other people you know that might be interested in being interviewed?

8.2 WEBSITE LIST

Indigenous Group	Website URL	Affilation
Okanagan Nation Alliance, BC	http://voicesontheland.org/index.html	Ecotrust
Carrier Sekani Tribal Council, BC	http://livingatlas.org	Ecotrust
Blueberry River First Nation	http://ecotrust.ca/project/blueberry-river-first-nations-disturbance-atlas/	Ecotrust
Various First Nations, BC	http://ecotrust.ca/project/traditional-land-use-and-occupancy-studies-cumulative-effects-assessments/	Ecotrust
Heiltsuk Nation, BC	http://ecotrust.ca/project/historic-land-use-plan-protects-great-bear-rainforest/	Ecotrust
Carrier Sekani Tribal Council	http://data.ecotrust.ca/mapping/pipelines.html	Ecotrust
Nunavut Sivuniksavut Students	http://dltk.gcrc.carleton.ca/viewsfromthenorth/index.htm	GCRC - Carleton University
Nunavut and Nunavik communities	http://sikuatlas.ca/index.html	GCRC - Carleton University
Nunavut Youth Consulting, Inuit Heritage Trust, Nunavut Arctic College, & Arctic Bay Communities	http://arcticbayatlas.ca/index.html	GCRC - Carleton University
Kitikmeot Heritage Society	http://atlas.kitikmeotheritage.ca	GCRC - Carleton University
Aboriginal people in Ontario	http://atlas.gcrc.carleton.ca/glsl/Atlas_Intro/intro_page.xml.html	GCRC - Carleton University
Gwich'in Social and Cultural Institute (GSCI)	http://atlas.gwichin.ca/index.html	GCRC - Carleton University
Kitikmeot Heritage Society	https://thuleatlas.org/index.html	GCRC - Carleton University
Eastern and Central Canadian Arctic Inuit	http://paninuittrails.org/index.html	GCRC - Carleton University
Stz'uminus First Nation	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/stzuminus/index.php	EML University of Victoria
Coast Salish	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cartographic-legacies/index.php	EML University of Victoria
Coast Salish	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/cultural-landscapes/index.php	EML University of Victoria
Hul'qumi'num	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/twohouses/index.php	EML University of Victoria
Kanien'kehà:ka - Oka	http://www.uvic.ca/socialsciences/ethnographicmapping/projects/oka/index.php	EML University of Victoria
Hul'qumi'num Treaty Group	https://sites.google.com/view/htgcasestudy/	EML University of Victoria
Hupacasath First Nation	http://www.hupacasath.ca	No Affilation
Tsleil-Waututh Nation	http://www.twnation.ca	No Affilation
Lil'wat Nation	http://lilwat.ca	No Affilation
Gitxsan Nation	http://www.gitxsan.com/territory/territory-maps	No Affilation
Not Specified	https://native-land.ca/	No Affilation
Kwi Awt Stelmexw / Squamish	http://squamishatlas.com/ (Former URL http://ohtheplacesyoushouldknow.com/)	No Affilation