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Decolonizing Geographic Information Systems

By

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of the requirements for the degree of
Master of Arts

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Abstract

This thesis consists of four parts, each of which contributes to answering the primary research question: to what extent are Geographic Information Systems (GIS) a colonial technology? First, this thesis explores the ethics of GIS, responding to calls by geographers to consider the impacts on research of technologies such as GIS. An ethical approach to GIS has implications for research on Indigenous peoples, research that seeks to decolonize Indigenous lands, bodies, and identities. Second, this thesis explores the history of maps and mapmaking, placing GIS on a continuum of cartographic techniques, overlapping, but not entirely encompassing previous and current mapping methods, including Indigenous mapping. Third, postcolonial theory and critical geopolitical theory are used to posit a process of counter-mapping and a history of resistance to colonial hegemony by Indigenous peoples in British Columbia (BC) over the last two hundred years. The fourth part presents an analysis and discussion of the results of qualitative interviews with GIS practitioners in north western British Columbian Aboriginal communities. By way of conclusion, a process of decolonization is theorized, focusing on the lands of Indigenous peoples and on the practices of GIS 'experts' situated within Indigenous communities.

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Preface

In 1996, as a recent graduate of the University of Victoria with a bachelor's degree in physical geography, I used my newly acquired skills for data collection in north western British Columbia (BC). I was coordinating fisheries survey crews of displaced fishers and loggers, both Native and non-Native. Though I had grown up in the area, I gained fresh insight into the complexities and contradictions of marginalization. Each of my fellow workers and crew members was marginalized in some way, as an Indigenous person on reserve or in town, or as a non-Indigenous person living off subsistence fishing on the floodplain of the Skeena River. Picking up my crew person by person in the early morning I experienced this geography of marginalization, a common geography in Canadian northern resource towns.

In 2001, after completing training in Geographic Information Systems (GIS) at the College of New Caledonia in Prince George, BC I worked with the Gitksan and Wet'suwet'en peoples creating databases of traditional use, treaty negotiation, and forestry maps. Each paper map was assigned a unique identification number, and the type of each map was recorded. After cataloguing the maps, some were selected for digitization. Many depicted landscape features or toponyms in Indigenous languages. As I worked with these maps, I started to wonder whether GIS tools, once in the hands of the marginalized, were the same tools as in the hands of the dominant elite. These experiences have led me to pose my primary research question: To what extent is GIS a colonial technology? They have also led me to question GIS using the insights of

postmodern (but also other) theoretical “toolboxes,” as presented by Rundstrom, Harley, Pickles, Curry, and a number of other authors.

My foray into postmodern analyses of GIS began when I was nearing the end of a one year program for an advanced technology diploma in GIS. All the courses in this program (except one) were of a technical nature, focusing on statistics, databases, programming, and GIS tools. I had completed the first semester of two, and had also been placed in the work-study position at the Office of the Wet’suwet’en in Smithers, British Columbia, for the summer. I lived in a cabin at the end of a long aspen-, fir-, and alder-lined driveway that branched off a very small dirt road winding its way into the foothills of the Babine mountain range (I was housesitting for a friend, which helped save on rent). During that summer, nights, after long days at the office (using the latest ArcInfo software all day), were filled with book reading by kerosene lamp (the cabin was beyond the reach of power lines, off the grid). The books I read were varied, but included the histories of the Wet’suwet’en people before contact, before GIS, and before people like myself (non-Aboriginal), showed up with fancy programs to help the local Indigenous populations. Many questions entered my mind during those nights of reading, and I am still trying to sort out, and attempt to start to answer, some of those questions. My situation in Smithers was quite dichotomous, with high-tech days using GIS, and low-tech nights reading and thinking. It is this sense of dichotomy that has pervaded my thought ever since that summer.

After the work-study position ended, it was a tumultuous fall at school. Almost simultaneous with the start of classes, the September 11 tragedy occurred, and images of the planes crashing into the towers accompanied me to those first class sessions.

This only seemed to augment the sense of rupture that characterized my state of mind. It had been a relaxing and meditative summer, however, and I was refreshed and glad to be back at school, lucky to have some stories from that summer to tell my colleagues.

For the GIS paper that semester (the one non-technical course in the program) I decided to write about GIS and epistemology. I had done a little preliminary research in the library and was completely surprised to see that at least one paper and one book existed on my topic. The paper was by Rundstrom (1995), and the book was edited by Pickles (1995). It was the discovery of these two works that let me know I was not just whistling in the dark. I did not tell anyone what my topic was, fearing it was too subversive or strange. I just wrote the paper and handed it in. I received a better than average grade and was happy.

By including these personal reminiscences as a preface, I hope to offer some context for my reasons for writing this thesis. My interest in GIS and epistemology has not abated. On the contrary, it has only deepened, despite the fact that I have worked in fairly traditional GIS jobs, including fisheries habitat mapping, cartography, and online mapping. Since my time at the College of New Caledonia (CNC), I have done much more research into this topic, and I have realized that this debate -- over whether GIS is positivistic, and if so, whether it is compatible with Indigenous interests and aspirations -- is one of the central debates for the GIS community as a whole whether we choose to think about it or not.

1. Introduction

This project consists of four distinct parts. The first part (Chapter 2) presents a theoretical foundation for the examination of GIS in relation to Indigenous interests. This approach describes an ethics applicable to the conjunction of modern mapping technologies and Indigenous worldviews. Consequentialist and rule-based ethical theories are considered in relation to the realities of Indigenous life in Canada today, and are compared to postmodern approaches to Indigenous epistemology. An ethical approach is favoured as being the most sensitive to the topic of this thesis, and thus, ethics serves as its primary theoretical foundation. Ethics will guide and quietly inform the entirety of this thesis. Postmodern approaches are not eschewed, but are subject to scrutiny, especially through the writings of Robert Rundstrom, Michael Curry, and John Pickles. Certainly postmodernism has implications for ethics, and postmodernism will “flavour” the particular ethics mapped out here. Postmodern and other relativist approaches have implications for Indigenous peoples and for this thesis. Relativism is relevant within this thesis due to the real differences that exist across the various scales and times of Indigenous resistance to imperial and colonial hegemonies.

The second part (chapter 3) is a survey of maps and mapmaking by Indigenous peoples both before contact, and within the colonial (present) era. This introduces a critical aspect to cartography, reviewing calls by geographers such as Harley and Wood to question how maps mask the power and the social positions of their makers. Indigenous mapping holds the potential key to challenging the power of dominant maps, while running the risk of reproducing many aspects of cartographic power.

Indigenous mapping is asserted by the continuation of Indigenous ways of life, epitomized by the potlatch, as well as by newer forms of mapping that include or overlap with GIS. In myriad ways, mapping holds the potential for critical approaches to colonialism and imperialism. This complements and extends the ethical basis provided in chapter 2.

The third part (chapter 4) moves into geopolitical and postcolonial terrain while at the same time sketching out a history of Indigenous resistance to power in British Columbia. Postcolonial writers Homi Bhabha and Edward Said add to the theoretical basis of this thesis, as do theorists of critical geopolitics such as Simon Dalby and Gearoid O'Tuathail. Postcolonial theory is implicitly an ethical concern since it challenges the reified categories of colonized and decolonized, spaces that by their very rigidity and assertive inscription, lend themselves to violent interpretation. Postcolonial theory is heavily influenced by the postmodern impetuses of Foucault and Derrida, who, arguably, defined the theoretical bases of both Bhabha and Said (Moore-Gilbert, 1997). The latter two thinkers were influenced, and were interested in the ideas of, the former, to a degree that is probably unassayable. Critical geopolitical theory is similarly influenced by postmodernism, again including Foucault and Derrida. However, this thesis will not use discourse analysis nor will it use deconstruction. But deconstructive or discursive elements may enter indirectly into this thesis, and must be realized not as incoherences, but as natural exposures of the geological strata of ideas flowing through postmodernism, poststructuralism, postcolonialism, ethics, and mapping.

The fourth part (chapter 5) presents an analysis of the results of interviews that is sensitive to, and informed by, the theoretical and methodological frameworks of

decolonization. Indigenous and non-Indigenous individuals involved with the use or implementation of GIS in Indigenous communities were interviewed. This involved people from the Gitksan, Wet'suwet'en, Nisga'a, and Tsimshian First Nations. The results were surprising in terms of unexpected answers, and equally unexpected reactions on the part of both interviewees and the researcher. The assumption of the neutrality of technology was quite pervasive. Interviewees seemed very quick to answer "yes" to the question of whether or not GIS is a neutral technology. But these answers almost always had qualifying and corroborating ideas and opinions that made analysis of the interviews neither simple nor straightforward. The precise ways in which each interviewee interpreted neutrality became clear through each individual's answer to other questions pertaining to full potential use of GIS. The primary method of the interview process thus involved a semi-structured approach that kept some questions firmly in mind, while allowing other questions to enter the picture as they naturally arose. The primary lines of direction, which I refer to below as "rhumb lines" helped reach the goal of each interview. However, analogously to navigating by "rhumb lines" (radiating out of wind or compass roses, each situated precisely in space), the navigator (or interviewer in this thesis) must switch lines at some point in order to reach the destination.

An ethical approach was taken to the interview process. This approach was also simultaneously evaluative and political. Interviews began as evaluative in order to put interviewees at their ease, and usually ended with more political questions concerning colonialism and whether or not GIS is a neutral technology. In order to suggest an answer to the primary research question posited here, it was deemed necessary first to

ascertain whether or not GIS is neutral. As suggested by Heidegger, we are delivered over to technology in the worst possible way when we assume that it is neutral. For, if technology (and by extension GIS) lacks neutrality, then it cannot logically contain colonial assumptions. For a technology to contain colonial assumptions it would not then be possible for it to maintain neutrality. It would, rather, as I argue GIS does, and as the interview process suggests, perpetuate colonial processes by reproducing Enlightenment mapping paradigms such as the projection, the graticule, and the map frame. Thus GIS, it is argued here, contains colonial assumptions, and is an active part of the colonial present. Despite this conclusion, it was nowhere asserted within the interviews that the interviewees were being subjected to a colonial process. As suggested by one interviewee, the Indigenous cultures of north western British Columbia are positive cultures. How, then, do you talk about a negative process such as colonialism from an Indigenous perspective? With great care, sensitivity, and tact.

Colonialism is an active process in the world today and like Empire (Hardt and Negri, 2000), there is no more outside to colonialism. It has entered both external and internal relations between and within people, technologies, and subjectivities. It is apparent in the most minute and fine-grained way, infusing the words, attitudes, and identities of GIS practitioners and Indigenous peoples. These groups of people and many others have much in common since there is now a common enemy (colonialism and Empire). Increasing colonialism has highlighted unsettling differences. These differences need to be embraced and not erased if we are to come to terms with colonial practices. It is hoped that the present thesis goes some way towards that goal.

On that note, it is appropriate to begin with a discussion of Enlightenment thought as it pertains to cartography and mapmaking. The Enlightenment period epitomizes teleological (or goal-directed) paradigms through its emphasis on progress towards increased knowledge, civilization, and achievement through time. In contrast, postmodernism posits that Enlightenment thought constantly reifies the present moment as a pinnacle of achievement. Postmodernism deconstructs the Enlightenment by pointing out its many inconsistencies, and by clarifying the many ways in which the present represents not progress over the past, but recapitulates many of its flaws, albeit in very subtle ways (Foucault, 1995). Within this framework, GIS fits into the Enlightenment project as a technology that is constantly improving in terms of technique and capability, towards the goal of the perfect GIS. On the other hand, Indigenous paradigms are often left out of teleological accounts (Churchill, 2003). Thus the use of GIS by Indigenous peoples to promote their own interests of self-determination, identity, and nationality, is very fertile and complex territory for geographical research. It is to the task of unpacking all the different permutations of this conjunction that I now turn.

2. Counter-GIS: Towards a Visualization of Indigenous Space

[T]he essence of technology is by no means anything technological. Thus we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it. Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it. But we are delivered over to it in the worst possible way when we regard it as something neutral; for this conception of it to which today we particularly like to do homage, makes us utterly blind to the essence of technology.

-- Martin Heidegger, *The Question Concerning Technology* (1977)

“One way to get good at GIS is to get good at not-GIS”

-- Interviewee # 6

2a. Enlightenment, Postmodernism, and Hybridity

A point of tension exists between mapping and geography as part of the Enlightenment project on the one hand, and Indigenous peoples on the other hand (who are often left out of accounts of teleological movements such as the Enlightenment). Michael Edney (1999) in his “Reconsidering Enlightenment Geography and Map Making: Reconnaissance, Mapping, Archive” explicitly discusses mapping in terms of the Enlightenment. Edney notes a change in cartographic thinking starting around 1800, the start of the Enlightenment period. Prior to this date there was no term for the work cartographers do. The work of mapping was interdisciplinary before 1800, and included elaborate decorations in the blank spaces of the map, thus combining scientific

and artistic forms. In 1837 the term cartography was coined (Edney, 1999: 169). The importance of the naming and delimiting of the discipline of cartography is reflected in a change of the goals of cartography after roughly 1800. Cartography was now concerned with exactly mirroring the earth. Maps were seen to be images of the whole, regardless of how many maps it would take to represent the whole (Edney, 1999: 171-172). There was a focus on what are termed microarchives, which were comprehensive and detailed surveys (of many volumes) of specific areas of the earth, which were assembled, housed and analyzed (Edney, 1999: 170-171). The analogy to GIS lies in the quantity of information, the focus on analysis, and the systematic nature of the microarchives. There is a historical continuum of development from Enlightenment mapping to GIS, and many features that were developed and perfected in the 1800s (such as the graticule and the projection) are central to mapping today. Map elements such as the graticule represent central epistemological aspects of Enlightenment thought, which need to be assessed in terms of compatibility with alternate (Indigenous) epistemologies. Interestingly, there is also an overlap between Enlightenment and Indigenous thought systems, that of the centrality of vision. Visual epistemologies were used by Enlightenment cartographers through careful alignment on maps of multiple views of spaces (see the Delphi Map in Edney, 1999: 175). Similarly, the Tsimshian people utilize visions in the form of crests and totem poles to make sense of their world (Marsden, 2002). GIS exists not as progress over previous modes of thought or over previous epistemologies, but alongside them, and equal to them.

Chambers et al. (2004) offer a realistic assessment of the current state of Indigenous mapping, identifying gaps and problems to be addressed by any such

account. One problem is the lack of a published outline by Indigenous people themselves of the need (or conversely the lack of need) for GIS in Indigenous communities (Chambers et al., 2004: 29). In lieu of this much needed published account (it is acknowledged that such an assessment may exist in unpublished form) the authors assess whether or not GIS is an appropriate tool for the needs of Indigenous peoples. A nuanced picture starts to form, in which the differences in need between Indigenous groups become salient. Some organizations may have a need for GIS, others may not, for a wide range of reasons, from the cost for training and equipment, to ethical concerns over whether or not it is appropriate to document Indigenous knowledge, to concerns about taking time to make decisions (Chambers et al., 2004: 26). Another point is that once the decision to acquire GIS has been made, the choice of software varies (again, for a wide variety of reasons). Compatibility with government software, cost differences between various packages, and imposition by outside forces are relevant to the choice of software. Imposition by outside forces is noted as being quite common. This has to do with the fact that “communication channels for GIS tend to be ... external, top-down, and expert-driven” (Chambers et al., 2004: 26).

This problem fits into the bigger picture of related misgivings voiced by Harley (1989) and other authors about the authoritarian nature of cartography. Chambers et al. (2004) address these misgivings, and discuss the debate over cartographic epistemologies, ceding that real concerns exist about the appropriateness of modern technology for Indigenous peoples. But ultimately the authors take the middle road

between two extremes in a polarized debate and voice the need to be critical of both extremes (the pro-GIS camp and the anti-GIS camp) (Chambers et al., 2004: 29).

Duerden and Kuhn (1996), in a less theoretical vein, assess the actual use of GIS by First Nations in Northern Canada. In table form they list types of GIS used and date of acquisition of GIS. Full potential use of GIS was assessed through interviews. The results of these interviews show that while the use of GIS in the north had increased dramatically, the realization of the full potential of GIS at the time was far from complete. They note that, while cohesive and centralized organizations such as the Council of Yukon Indians use GIS potential possibly even more fully than the government agencies in the area, undertaking traditional use inventories and scenario building projects, the decision-support aspect of GIS has still not been fulfilled. For most other First Nations groups in the Yukon, and in the less centralized Northwest Territories, cartographic output of wildlife information, traditional use, and toponyms are the primary use of existing GIS systems. Duerden and Kuhn identify one of the reasons for this focus to be the nature of the training in GIS in the north, which focuses on technical aspects rather than on applications (Duerden and Kuhn, 1996: 58). This is understandable, since first and foremost the GIS must operate smoothly before it can do anything. With this limitation in mind, it is worth noting that an increase in the level of activity and planning for negotiations with the government (which involves collecting traditional information) has coincided with the development of sophisticated, user-friendly, and affordable GIS systems. Duerden and Kuhn note that “GIS are an appropriate tool for representing traditional knowledge because they allow an extensive array of environmental information to be represented and studied” (Duerden and Kuhn,

1996: 50). Keeping this in mind, it is hopeful that through GIS, traditional Indigenous knowledge will be maintained. It will be necessary however to move beyond current GIS use (focusing mainly on map production) to a more visionary GIS, incorporating alternate scenarios for land use, decision support, and even cybercartographic elements such as sound and multimedia, as we move into an ever more rapidly changing and uncertain future. In this way, new generations of Indigenous people may realize the potential for GIS to enhance, maintain, and learn about their own cultures (which will increasingly become intertwined with other cultures). And this requires a great deal of time, planning, thought, and action.

2b. Ethical Implications of Geographic Information Systems

Despite the evidence and the theoretical robustness of a universal basis for cognition, perception, and mapping (Peuquet, 2002, MacEachren, 1995), a considerable literature exists promoting a relativistic and postmodern philosophy. According to those authors sympathetic to relativism (see Harley, Wood, Rundstrom, and Pickles especially) maps primarily portray power, and rather than mirroring nature in an objective way, they are relative to the culture that produced them. The whole of western culture is (according to these authors) positivistic and objective, or even objectifying.

It will be useful here to review *Ground Truth* (Pickles, 1995), a collection of essays that broke open the discipline of GIS. The volume begins with an essay by Pickles, and this essay summarizes many of the issues in debates over whether GIS is

empowering or disempowering, issues still relevant (and even deepening) today. Looking back on this essay ten years from its date of publication it is surprising how relevant and even fresh it seems today. Hesitations over GIS have not been eliminated and the fear of GIS as a positivistic tool of power is still a valid fear. Will the tensions ever be resolved? I will argue here that GIS will continue to develop in sophistication and power, and that as GIS continues to evolve, fears about GIS (and Global Positioning Systems, or GPS) as part of an apparatus of surveillance and control will continue to arise. Part of the reason for this is that GIS is a product of a larger society of surveillance and control, even an Empire (Hardt and Negri, 2000). As part of this “Empire”, it is not GIS specifically that are to blame. However, GIS is symbolic of, and crystallizes fears about, the globalized, postmodern world in which we live.

Indigenous peoples have traditionally hunted and gathered seasonally over large expanses of territory. In the past there was very little need to inscribe maps representing the territory. Spatial knowledge was enacted by actually hunting and gathering, and by passing on knowledge orally. Today, however, Indigenous peoples find themselves in conflict with other groups of people, and with individuals and corporations, who have interests in the territory. In such a state of conflicting claims over land, GIS becomes absolutely essential for visualizing and precisely locating Indigenous interests in the land.

Pickles’ (1995) essay in *Ground Truth* is prescient because it anticipates in advance the ontological and epistemological issues that arise as more and more people join the GIS community. These issues are not all specific to Indigenous peoples. GIS is, however, symbolic of fears specific to Indigenous groups. GIS, for Indigenous

peoples, represents simultaneously two things: a technology of a colonizing, imperial apparatus (Brealey, 1995 and 1997); and a liberating tool of empowerment. The remainder of *Ground Truth* fleshes out many of the issues mentioned in the first chapter. Ethics, marketing, participatory mapping, remote sensing, social research, and poststructural issues are just some of the aspects of GIS covered in *Ground Truth*.

Of all the subjects covered in *Ground Truth*, ethics seems to recur with uncommon frequency. Ethics is defined as the systematic study of moral judgments. Moral judgments are evaluations of good and bad, of better or worse, as these concepts apply to human activity (Johnston, et al., 2000). The ethics of GIS are thus an evaluation of whether or not GIS is good or bad for human society. Discussions of the ethics of GIS are, in *Ground Truth* and other books and papers (to be discussed below), not so Manichean and black and white, but are, rather, sophisticated and include many shades of grey. The positive benefits of GIS are almost always acknowledged. They certainly are by Pickles, Goodchild, and Curry, to name only three authors in *Ground Truth* who discuss ethics. However, persistent hesitations arise regarding potential and actual negative consequences of using GIS. An assumption must be made in discussions of GIS and ethics, namely that GIS is not a neutral technology. Nor is it value-free. In much the same way as the atomic bomb was created for specific purposes during wartime, the development of GIS has often been given impetus by military concerns (Goodchild, 1995: 48-49). The first Gulf War in 1991 has been referred to as the first *GIS* war (Pickles, 2004: 151).

Curry's (1995) paper "Geographic Information Systems and the Inevitability of Ethical Inconsistency" is the most explicit ethical examination of GIS in *Ground Truth*.

In this paper (and his book *Digital Places* [1998]) Curry has gone a long way towards addressing a dearth of ethical discourse specific to GIS. He immediately addresses a common objection, that GIS is a continuation of other technologies, and is therefore nothing new, so one should look to the discourse surrounding other technologies, which will, by extension, cover ethical issues in GIS (Curry, 1995: 68). Curry goes on to point out that GIS has a sui generis existence, one that combines previous technological and ethical issues in unique ways, for which there is no current authority or source of ethical discourse (Curry, 1995: 68-69). Furthermore, Curry identifies a source of ethical inconsistency in the breaking of the bonds between traditionally related areas: research, communication, and social practice (Curry, 1995: 71).

GIS has been the catalyst within the discipline of geography for the creation of a new division of labour. GIS is in turn part of a shift in the general economy of research, which now focuses on amassing information, rather than on discovering knowledge (Curry, 1995: 72). Thus, the objects of research are objectified, “othered” (Curry, 1995: 72), and kept at a distance from the researcher. These objections are identified as being part of general criticisms of positivism and the quantitative revolution. Positivism values, and accepts only, empirically verifiable, and directly factual statements. Furthermore, these statements need (according to positivism) to add to a greater body of logically unified, scientific theory, in order to be considered valid (Johnston et al., 2000). Therefore, ethical statements of any kind are suspect because ethical statements in general do not meet positivistic criteria (Curry, 1995: 73). The specific way in which positivism operates in GIS, and the ethical implications, are as follows. In GIS, the fixation on increasingly accurate locations of objects in space has become an end in

itself. The next version of GIS is constantly awaited (causing the current version by default to be seen as less than ideal), and is hoped to be the version that will finally be able to more precisely and accurately pinpoint phenomena in the real world. This double distancing, in time and in space, causes the subjects of research in GIS to be increasingly “othered” (Curry, 1995: 79). “Othering,” also known as objectification, is a negative ethical consequence in and of itself (Curry, 1995: 79). A concrete example of “othering” is the increasing ability of private companies, through the use of GIS, to pinpoint customer preferences at increasingly fine scales, and to send promotional items geared to these preferences. This may cause the individuals receiving such items to feel that their privacy has been eroded, and that they have been subject to surveillance. This is an issue of ethical importance, related to civil liberty, and the individual’s right to privacy. In other words, to be scrutinized, individualized, and accurately located by an unknown outside force is, ethically speaking, wrong (Curry, 1995).

In *Digital Places*, Curry (1998) continues his examination of ethics and GIS, as well as other topics covered in this book, including intellectual property rights, space, optics, and philosophy. Curry is at pains to show that GIS is not a neutral technology, and that it is not value-free. This is true precisely because there can be no GIS without a GIS user. The system and the user are part and parcel of GIS. And human beings almost always have political opinions, beliefs, and values. Therefore, the uses to which GIS is put are almost always political, and almost always have ethical implications. Thus, the use of 3D models for accurate war scenario development can be viewed as wrong, especially if we consider that war involves the murder of individual human beings by other human beings (under the guise of ideological or nationalistic motives).

Conversely, the use of GIS for social purposes could be seen as contributing to the greater happiness of humankind (a consequentialist ethical standpoint), bearing in mind the many barriers to the achievement of a humane GIS. However, there is a disconnection in this simplistic caricature of ethics. The GIS technician or expert or developer usually does not know what the ethical consequences of her GIS work will be. Because of the de-linking of research from its social practice in the new division of labour, GIS and its practitioners are effectively placed in a position where they are not able to be moral. From the outside, GIS is increasingly becoming a “black box,” the outputs of which are the sole objects of scrutiny (Curry, 1998).

In my own experience, GIS practitioners create a necessary dichotomy, or dualism, within their own practice, in order to deal with ethical issues. This is a dichotomy between empiricism and emotivism (Curry, 1998: 133). When working on technical aspects of GIS, and on improving their technique, GIS practitioners are in an empirical “mode.” But when choosing *what* projects to work on, the GIS practitioner is in emotive “mode.” It is the emotive mode that makes GIS worthwhile, in my opinion. Without a passion for some specific issue such as forestry, environment, or fighter-jet piloting, the practice of GIS would be an empty undertaking. Human beings have a natural instinct for moral behaviour (deWaal, 1996). Admittedly, it may be difficult to sort out complex ethical issues in the modern world. But the choice of *what to study* and what *not* to study is an implicitly ethical decision.

This thesis reflects an ethical decision to study Indigenous peoples and how they might utilize GIS in order to better their lives. My reasons for this choice have been touched upon above. The choice of Indigenous use of GIS for subject matter is ethical

for the following reasons. First, from a consequentialist ethical view (one that assesses the ethical worth of an action based on what the outcomes of that action will be – specifically, will it, overall, create more happiness?), studying how to empower Indigenous people to use GIS for their own purposes will increase both individual and group happiness. On both levels, GIS can create jobs, it can create a greater sense of control of resources, and it can help in decision-making, all of which increase happiness (see Mill, 1972).

Second, from rights or rule-based ethical views, which assess the ethical worth of an action based on whether it fulfills some rule, the present study is consistent with a rule that says society ought to protect the rights of all members of that society (see Kant, 1976; Regan, 1983). A corollary of this rule is that it is unethical to act strictly out of self-interest, for the sake of greed, or for the interests of an elite group (see Singer, 1995; Rachels, 1986). Due to systematic economic and cultural racism, Indigenous peoples in Canada are marginalized (Peters, 2001). Therefore, it is unethical to sidestep or to avoid Indigenous issues due to self-interest, greed, or apathy.

Third, having grown up in Northwestern British Columbia, I gained firsthand experience of the situation of Aboriginal people. The reserves of Canada are still full, indicating that the processes of colonization and of marginalization are ongoing (see Harris, 2002). The reserves in towns where I grew up were very visible places of difference. This difference was often interpreted in racist ways, and the subtle historical processes that have led to high unemployment (up to 90%) and suicide rates on reserves often seem to elude racists. I believe personal experience has a place in ethics, and is a guide to action. I will now turn to an examination of ethics as applied specifically to the

conjunction of GIS and Indigenous peoples, a conjunction that exists in the thoughts of the writer Robert Rundstrom.

In his 1991 paper, "Mapping, Postmodernism, Indigenous People and the Changing Direction of North American Cartography," Rundstrom approaches postmodern mapping through an assessment of Harley's key 1989 paper "Deconstructing the Map." As Rundstrom correctly points out, Harley's paper crystallizes many aspects of a postmodern critique of mapping, a critique that may inform many other disciplines (Rundstrom, 1991: 1). This critique has sparked a debate in cartography and GIS that flared particularly in the 1990s, but also continues today (see Pickles, 2004). This debate revolves around ethics, positivism, postmodernism, and mapping. Rundstrom accepts the validity of the core of the postmodern critique of maps (namely, that maps mask power, and reflect the interests of the dominant and hegemonic members and groups of society), but he also expresses deep reservations about the postmodern critique of maps.

Rundstrom (1991) also addresses a number of ethical issues, including the ethics of representation and the ethics of appropriation (Rundstrom, 1991: 4). He notes that some non-Aboriginal people have taken an extreme position of abstaining from handling any subject matter dealing with Natives. This is a postmodern reaction, involving a "new tribalism" and a new concern for difference and identity politics (Rundstrom, 1991: 4-5). I would argue, with Rundstrom, that enough common ground exists between cultures and people (individuals) that there is similarity and equality (rather than just difference) for Natives and non-Natives to work together. In terms of our physical bodies and our basic needs, there are many similarities between all people.

One of the basic sets of categories utilized by Rundstrom (that of incorporating and inscribing cultures), contains a good deal of overlap (Rundstrom, 1991: 3).

Incorporating cultures are traditionally oral cultures, for which a performance (story, song, or dance) is more important than a product (an object). For inscribing cultures, the object (such as a map), which lasts much longer than the actual use for which it was intended, is ontologically prior to the performance for which it was intended. Two examples show how there is overlap between two types of culture. Indigenous North Americans often inscribed maps onto rocks, bark, and hides. Even though these artefacts may not have lasted very long (though some clearly did in museums), they are an example of Native material inscriptions. The second example is that of modern internet or computer mapping. Some forms of online map products may be quite ephemeral, since they are produced only onscreen for a very short period of time. For example, there are participatory mapping systems on the internet, created using distributed database networks, which can produce images of spatial distribution based on data in those databases. Unless those spatial depictions are saved or printed, they will be lost. The data is still “inscribed” in the database, but the particular selection set is usually not. This would seem to be a performative or “incorporative” aspect of computer mapping.

In terms of ethics, there is no reason given (by the authors covered in Rundstrom’s 1991 paper) why non-Aboriginals should consider it bad or wrong to work with Aboriginal peoples or materials. Given sensitivity and caution, and diligence in listening, reading, and thinking about Aboriginal history and culture, researchers should be able to carry out ethical research. Aboriginal peoples themselves have touched upon

ways of “decolonizing research” (see Smith, 1999), and these methodologies should be considered seriously within the framework of any research being done on Indigenous peoples. In order to successfully carry out decolonizing research, an understanding of present and historical colonial practices will be crucial. Therefore, the next two chapters are devoted to unpacking colonialism in all its forms, including postcolonial and decolonial processes. It will be demonstrated that colonization and decolonization are blurry terms, and that a postcolonial condition is an imaginary condition that is only approached asymptotically. A purely postcolonial space is neither realistic nor desirable. It is hoped that the reasons for this assertion become clearer through the discussions in the next two chapters, and subsequently through the qualitative interview material that follows.

3. A History of Exclusion: Colonization and the Closing of Indigenous Space

Postcolonialism, we might say, has a constitutive interest in colonialism. It is in part an act of remembrance. Postcolonialism revisits the colonial past in order to recover the dead weight of colonialism: to retrieve its shapes, like the chalk outlines at a crime scene, and to recall the living bodies they so imperfectly summon to presence. But it is also an act of opposition. Postcolonialism reveals the continuing impositions and exactions of colonialism in order to subvert them: to examine them, to disavow them, and dispel them.

-- Derek Gregory, *The Colonial Present* (2004)

“How do you talk about colonization, a negative thing, from a Nisga’a perspective? The Nisga’a are a positive culture.”

-- Interviewee #8

3a. Colonization and Decolonization

Present-day colonization and struggles against it are not easy to delineate. Both the scale and the nature of colonization have changed since the time of European dominance (Wood, 2005). Decolonization is neither a simple nor a straightforward process, and this is especially clear in the case of BC. The existence of reserves is possibly the most tangible geographic indication of ongoing colonial processes in BC (Harris, 2002). These processes include: 1. Violence, or the threat of violence as a consequence of the transgression of the boundaries or rules as set out by colonial powers (Blomley, 2003). 2. Assimilation of the Indigenous populations into the

colonizing culture under the auspices of liberal ideas of individual equality of rights and opportunities (Harris, 2002). 3. Vilification of the Indigenous population by the creation of spaces of exclusion (reserves) and the construction of the Indigenous subject as *homo sacer* (outsider or outcast who exists in zones of abandonment) (Gregory, 2004: 62).

These three processes work in tandem and each contains a similar unchallenged assumption. For instance, transgression of boundaries and rules are inevitable where those rules have been established hastily, greedily, and without consultation with Indigenous people. Indeed, this was the case in BC, where Peter O'Reilly in just a few quick tours of the province sketched by hand (often producing several per day) the reserve spaces Indigenous peoples would be confined to (and still are confined to) for over 100 years. This was argued to be 'fair' by colonial authorities, who nonetheless denied equal pre-emption rights to Natives, giving each family much less than needed to survive, without conducting a proper census, and with little consultation (Harris, 2002).

Thus, decolonization involves the long struggle of an Indigenous population against the systematic discrimination, oppression, and vilification directed against them by a foreign (colonial) power. The colonial power's means of domination may be overtly imperialistic and militaristic, or those means may be more subtly cultural (Said, 1993). Decolonization is defined by Smith (1999) as a process that engages with imperialism at multiple levels (p. 20). Furthermore, colonialism is "imperialism's outpost, the fort and port of imperial outreach" (p. 23), which means that the 'colonies' are the frontiers or outer edges of the expansion or extension of power. And finally, "imperialism can be seen as simultaneously (and sometimes contradictorily): economic

expansion; subjugation of ‘others’; an idea or spirit with many forms of realization; and a discursive field of knowledge” (p. 21). This does not mean that imperialism includes anything or everything. On the contrary, imperialism is coercion by overt or covert means, that are sometimes economic, sometimes militaristic, and sometimes cultural. Colonialism and imperialism are thus multi-faceted and vast structures that now dominate the globe.

However, resistance to colonialism is both possible and desirable. Acts of resistance in the form of territorial claims asserted through maps, these seemingly negative acts (negative in that they contradict national or provincial territorial assertions) become positive when viewed as part of Canada’s history. This history is not a single, linear narrative with one point of origin, but is rather a history with multiple, entwined trajectories, and with many origins (Harris, 1987; Sparke, 1998). The Indigenous peoples of Canada help make the national heritage through their activities on the land, and through the production of cultural artefacts, including maps. It is thus to the differences between Indigenous and European map making, which often depict activity on the land, and to which I now turn.

3b. Incorporating and Inscribing Cultures and Maps

Indigenous peoples and European peoples traditionally make maps in radically different ways. Robert Rundstrom (1991, 1993, 1995) uses the term *incorporating* to describe Indigenous maps. On the other hand, Europeans *inscribe* maps. This basic distinction is central to the main argument of the present thesis, namely, that GIS, as

part of an inscribing paradigm contains colonial assumptions. Incorporating cultures literally perform maps by singing, dancing, or telling stories that relay geographical and territorial information (Woodward and Lewis, 1998). Thus, traditional Indigenous knowledge is embodied in (part of the body of) the Indigenous person or group doing the performing. The brain and the body can be seen as spatial information systems when we realize the ways in which Indigenous peoples used cognitive and performance maps to organize, navigate, and make sense of their worlds. Cognitive or mental maps were used by the Indigenous people of the Pacific Islands to navigate by boat from island to island (Woodward and Lewis, 1998: 4). These maps were nowhere inscribed nor were they written down (as far as we know), but existed inside the brains of the people navigating the boats. Such unwritten maps are also a part of modern culture because most people, often unconsciously, carry maps around in their heads in order to navigate daily life.

Performance maps are contained in the bodies (including, but not restricted to, the brain) which perform the maps. In this way spatial knowledge is incorporated into the culture and worldview of Indigenous peoples. The Aboriginal songlines of Australia (Chatwin, 1987) are examples of performance maps that are sung in order to provide wayfinding mechanisms, such that the song and the landscape were analogous to each other, in a one to one correspondence. The songlines provide a sense of harmony between the Aboriginal people and the landscapes they are required to traverse throughout their lives. Moreover, the songlines are, by virtue of the fact that they are oral maps, communicable from person to person.

Many authors (Harley, 1989; Wood, 1992; Rundstrom, 1995) have pointed out that maps are much more than wayfinding devices. Maps reflect the perspective, and sometimes the ideology, of the culture (or even of the individual) from which they originate. Maps are saturated with power and prestige. This was probably as true for Indigenous peoples in pre-contact times as it was in the classic colonial era (an era arguably not yet over), and as it is now. However, this type of map use is most closely associated with colonial powers desiring control over the Natives.

Brealey (1995, 1997) has explained in detail how colonial powers representing Britain systematically 'mapped out' (excluded, erased or misrepresented) the various Indigenous groups of British Columbia. According to Brealey, the very layout and design of inscribed maps, and the strategic use of empty (blank) space on these maps, served important functions in resituating Indigenous peoples and in starting the process of the resettlement of British Columbia (Harris, 1997). Reserve commissioner Peter O'Reilly almost single-handedly, and in a very short period of time, mapped out the majority of the reserves still in existence in British Columbia today. His use of multiple views on the same map, spread out like pastoral landscapes, served to neutralize and contain the lived spaces of Indigenous peoples. According to O'Reilly and his superiors, the Natives were given more than enough land, ignoring the fact that a catastrophic shift and confinement of a previously nomadic and territorially wide-ranging lifestyle was at hand (Brealey, 1997). Thus, maps were truly saturated with power and they literally inscribed that power into the landscapes they were mapping.

In his paper "Travels from Point Ellice: Peter O'Reilly and the Indian Reserve System in British Columbia," Brealey (1997) explains what is meant by the

cartographic eye/I. The cartographic eye uses a visual logic at a distance to categorize and order all that is brought to its attention by the cartographic I. The cartographic eye is an outside observer, a colonial power, and a power figure. The cartographic I, on the other hand, is the individual surveyor who collects data on the ground (Brealey 1997: 182-183). The penetrating gaze of colonialism pierced the surfaces of Native space, shattering them into disconnected and eviscerated pieces. This cartographic gaze is returned only occasionally by the Natives in the form of a contesting gaze:

“There will always be the returning, contesting gaze of indigenous agency in its own element. The cartographic eye can master spaces from a point of panoramic privilege. But it cannot see all the activities *inside* those spaces. O’Reilly’s reserves have emerged as ‘power containers’: places of resistance in which alternative cultural ‘mappings’ of the space outside the reserves can be mounted” (Brealey, 1997: 235 italics in original)

It is on the strength of such observations that I now turn to an explication of precisely how and why alternative (and contesting) Indigenous mappings occurred.

3c. Potlatch as Mapping

On the West Coast of British Columbia, the negotiation of boundaries between neighbouring tribes, houses or clans was accomplished by long and complex rituals, called potlatches, involving the giving of gifts and performances that included costumed singers and dancers. Through repetitious assertions of happenings on the land by all involved in the potlatch, a decision-making and ‘law’ creating process successfully

occurred on Indigenous lands for thousands of years before contact. Antonia Mills (1997), in her book *Eagle Down Is Our Law* provides firsthand evidence of the workings of the potlatch, at least a dozen of which she attended in Wet'suwet'en territory. Mills describes a process of naming, which took place during special potlatches. Responsible individuals are given names that carry with them a duty to look after discrete pieces of territory within the greater territory of the whole nation. The taking of names corresponds to the structure of houses and clans. In Wet'suwet'en territory, the clans include frog, wolf, bear, fireweed, and beaver, indicating familial and territorial bonds. The houses, in turn, indicate even closer familial bonds such that each member of a house knows how they are related to every other member of the house. Thus, naming was central to West Coast cultures before contact, and it remains so now. What has changed in the last approximately 200 years is that now the territories corresponding to the names are not only performed but are also written down, are inscribed on maps. This represents a paradigm shift.

Inherent to the territories now are fixed boundaries, the lines that separate discrete pieces of territory from each other. Inscribed boundaries are so taken for granted in modern life that they have attained ontological status (they are assumed to exist). For example we have come to believe that the political boundaries separating countries (as shown in atlases) are real and that they somehow exist 'out there' because of the frequency with which we encounter maps depicting those lines. Those boundaries are not real in an objective sense, but are rather the result of a repetitive series of performances, of circulating references, set in motion by politicians, cartographers, historians and many other inhabitants of countries. The boundary of

what is now called British Columbia is often portrayed as a disembodied unit, cut away from its context and severing the mountain ranges and rivers that cross its boundaries.

The assertion of inscribed Indigenous boundaries upsets this territorial assumption by creating hybrid spaces that are not only Indigenous space, but are also provincial and federal land. Maps that upset taken for granted categories are often called counter-maps, which are maps that cause what we once assumed to exist geographically to become unstable. The insertion of Indigenous boundaries and epistemologies on maps is an assertion of embodied, place-specific knowledge into an inscribed and abstract epistemology. Maps and counter-maps, whether performed or inscribed, are methods in themselves, ways of assessing, upsetting and questioning what we think we know. Figure 1 (see page 31) shows the Gitksan territory situated within both Canada and British Columbia (zoomed in). This counter-map inscribes a space into taken for granted political categories that Canadians and British Columbians know. It operates at an ontological level because it challenges what is assumed to exist.



Figure 1. Gitksan Territory. Source: <http://www.ggc.gitksan.com/index.shtml>

Figure 2 (on page 32) shows the internal structure of Gitksan territory and another powerful aspect of counter-mapping: the inclusion of Indigenous language on maps. This naming of territorially discrete units in a way that upsets the hegemonic naming of territory is a powerful, but also limited, tool. It is powerful in terms of laying a claim to the land. It is limited (in Figure 2) because it excludes many useful themes such as power lines, roads, and villages.

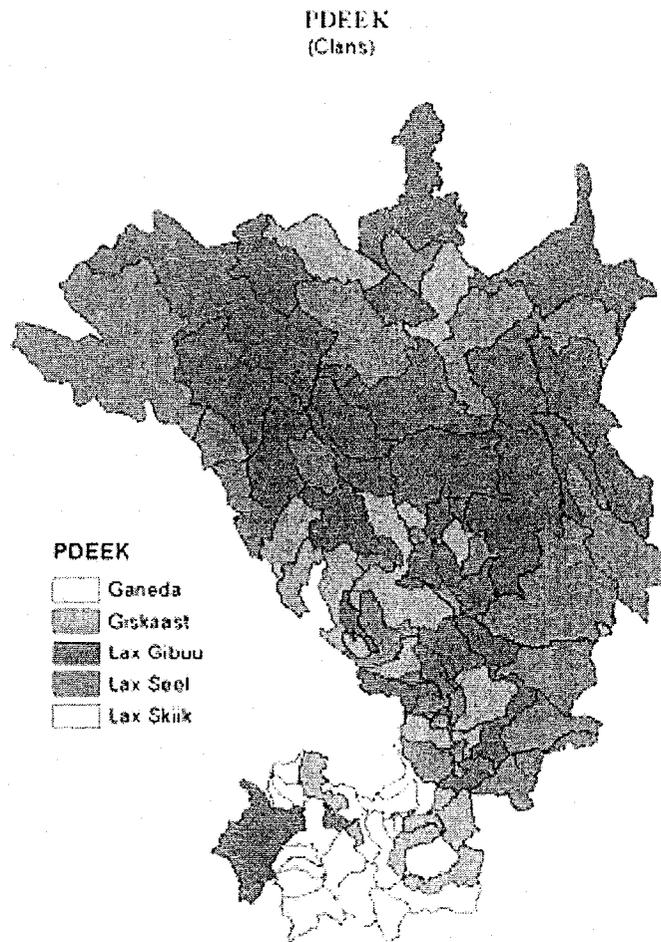


Figure 2. Gitksan Clans. Source : <http://www.ggc.gitksan.com/index.shtml>

The purpose of this map is not only single minded, it is also an exclusive celebration of the local and, as such, it does not contain any mention of the outside world. It does not show movement or connection, and it falls prey to the territorial trap (Agnew, 1998: 51), which is the fallacy of conflating identity with discrete pieces of territory. Furthermore, it could be read as an assertion of isolation and purity, given that it makes no reference to the world outside of the clans. It is as though there are walls around the territory, resisting mixture and circulation (see Hardt and Negri, 2000: 362).

In Gupta and Ferguson's words,

Keeping in mind that notions of locality or community refer both to a demarcated physical space and to clusters of interaction, we can see that the identity of a place emerges by the intersection of its specific involvement in a system of hierarchically organized spaces with its cultural construction as a community or locality (Gupta and Ferguson, 1997: 36).

Furthermore,

Territoriality is thus reinscribed at just the point it threatens to be erased (Gupta and Ferguson, 1997: 40).

It is this possibility of erasure that has led Indigenous peoples to produce counter-maps, and it is intimately tied to a history of exclusion and prohibition that led to the banning of the potlatch. This is a proscriptive and retroscriptive dance of action and reaction between colonial powers and the original inhabitants of the land, a history that is constantly (re)writing and geo-graphing the surface of the earth. It is worthwhile to continue discussions of Indigenous mapping in order to more fully understand precisely how and why counter-mapping exists in the first place.

Indigenous cultures 'knew where things were' because those things were described and their locations were re-iterated so many times in the stories and performances of the potlatch and through activity on the land. In this way, dangers or threats could also be known. Transgression of boundaries was a serious affair, a journey into realms of unforeseeable consequence, retribution or death. These might come in the form of an unfriendly human or animal neighbour. Thus, by constantly

pointing out sources of danger (at the boundaries or the edges), the potlatches were exemplary institutions for the propagation of peace and order. Potlatches named responsible figures who would guide the people of their houses in ways that respected boundaries and signs of danger. Potlatches were specific to occasions, and they were held not only for naming but also for deaths, marriages, and for dispute resolution. Thus, the concept of naming works at a higher level in West Coast cultures, at the level of naming or acknowledging the good and the bad, it helps provide balance and stability. Naming that is associated with territory is implicated also in identity formation, in the association of identity with a discrete piece of territory (Mills, 1997).

While the potlatch was never intended as counter-mapping, existing in its own right since time immemorial without the need to *counter* anything, the outlawing of the potlatch (which as I have just shown is a type of performed mapping) for many decades (Mills, 1997) meant that its performance could be taken as transgression and defiance of colonial law, and thus became a *de facto* form of counter-mapping. The introduction of GIS into Indigenous communities has in many ways recapitulated the defiance of colonial law. Before moving to a fuller discussion of counter-mapping, I would like to clarify the distinction between maps and GIS, and how the latter is a recent tool for facilitating the production of the former through the processes of mapping and mapmaking (Wood, 1992).

3d. Maps, Mapmaking, and GIS

GIS is a storehouse for massive amounts of information, structured systematically for spatial analysis. A massive amount of information is in itself not very useful. A method of selecting, analyzing and communicating some subset of that information must be implemented before the information can become useful. GIS is a new way of selecting data for maps, portrayed in a way (on layouts) that conveys a message. In this thesis GIS is often conflated with maps. This is admittedly problematic insofar as maps and GIS are not synonymous with each other, but it is useful in terms of GIS as part of the historical development of cartographic techniques. Thus GIS can be seen alongside (not prioritized above) other ways of selecting data for maps, including Indigenous and colonial mapping and mapmaking, performed maps and hand drawn maps. Furthermore, when seen as a newer mapmaking development, GIS becomes less a universal way of seeing and more a contingent historical fact. In this way GIS ceases to contain the art of making maps, nor can maps or map making be seen as fully containing GIS. They mutually inform each other. The focus later in this thesis (in the case study) on GIS to the exclusion of maps has occurred because very recently GIS has come to dominate the process of making maps (Krygier and Wood, 2005), and thus GIS often stands in, metaphorically or metonymically, for the whole of the map making enterprise.

In the context of the previous discussion of potlatch as mapping, the distinction between maps and GIS is useful. Earlier non-inscribed maps could be thought of as mappings (Cosgrove, 1999). *Mapping* is a basic survival function and a technique of

imagination used by some animals, including virtually all humans. Thus, mental maps often involve topological relationships between spatial entities that help navigate complex terrain. *Mapmaking* is more consciously intentional and involves the creation of cultural artefacts that communicate specific messages based on selections of data. Mapmaking lies more within the purview of GIS and involves the conscious (ideological) choices of data, projection, frame, graticule, orientation, and a complex array of other map elements (Wood, 1992).

Many maps have nothing to do with GIS. The converse is true as well, that a lot of GIS has nothing to do with maps. However, there is enough common ground and overlap to speak of GIS as a new cartography. This new way of making maps involves layered themes, databases, and computer technology. An older cartography involves an incredible array of tools, devices, techniques, and knowledge, but many of these older techniques are falling into disuse. While it is important to maintain useful aspects of the older techniques, it would be counter-productive to continue to use older techniques where more efficient and higher quality techniques exist.

Keeping these distinctions and hesitations in mind, it is now to a fuller examination of the origin and meaning of counter-mapping which I now turn. Counter-mapping can be both a method of survival in uncertain terrain, as well as the intentional production of (ideological) cultural artefacts. Indigenous peoples, it will be seen, have been using maps as produced by many different methods (including GIS) since time immemorial.

3e. Counter-Mapping and Contrapuntal Cartographies

A fairly recent debate over the nature of cartography seems to have started (at the latest) with Harley's (1989) paper "Deconstructing the Map." This paper touches on epistemological concerns about how maps and map-makers create valid cartographic knowledge, while excluding other (often Indigenous) knowledge. The debate focuses on maps as tools of power and of subjugation, but I will argue here that maps are much more than archives of power. Maps have the potential to be (and often are) empowering. They can, specifically, help Indigenous groups assert their identities and their places in the world.

Harley suggested that maps reflect power and that they serve to reproduce social and cultural imbalances by way of what they include or exclude. Mapmaking uses rules for constructing maps in much the same way as writing and speech follow grammatical rules. Thus, maps can be read as graphic texts that signify cultural rather than just scientific messages. By deconstructing the map, Harley upsets the supposed objectivity of the map, inserting subjectivity and power into the very nature of maps and mapmaking.

In "Images of Power: Derrida/Foucault/Harley", Belyea (1992) responded to Harley, saying he was misguided in his understanding of postmodernist theory. According to Belyea, Harley gleaned this knowledge from summaries, readers, and translations into English, resulting in a failure to fully utilize Foucault's concepts. According to Belyea, Harley remains trapped in a conventional humanistic and orthodox paradigm, unable to realize the full potential that deconstruction (showing

how the assumptions implicit in objective thought create contaminating contradictions within that thought) and discourse analysis (the analysis of how statements mask institutional power) might offer. Belyea presents compelling rejoinders to Harley's attempts at a poststructuralist cartography, and her work will (hopefully) improve subsequent attempts to deconstruct maps. We need not accept all her arguments, however. It is certainly possible for Anglophones to successfully use the tools of French poststructuralists, as the works of Harley, Wood, and Pickles amply show. There may be a certain English Foucauldian "flavour" to this work, but that does not diminish its importance. That said, there is another aspect to Belyea that is worth exploring, and is relevant to Indigenous peoples.

There is an analogy between Belyea's (1992) criticism of Harley and a potential criticism of Indigenous use of GIS. It is important for Indigenous peoples to maintain contact with their languages. There is the risk of the loss of Indigenous languages because of the overwhelming dominance of English or other western languages, the language of GIS, or the language of modern mapping. If these new languages are learned at the expense of traditional ones (so the analogy runs), something essential to Indigenous culture would be lost, namely, the verbal cues by which peoples traditionally situated themselves within, and navigated through, their worlds. This is not to disparage young Indigenous individuals who do not know their language nor is it to say that they are somehow lost. It is also not to say (analogously to Belyea) that a person who utilizes the theories of Foucault or Derrida by reading them in English translation should be disparaged for doing so. However, as Belyea points out, it is important for theory to maintain *contact* with the original texts in French, lest

something essential be lost from the theories of Foucault or Derrida. It is thus a point about language and translation, and how it is relevant to Indigenous culture becomes clear in a moment.

GIS can be a powerful tool for preserving language, through the inclusion of traditional names and toponyms on maps of traditional use (counter-mapping). In this way both individual users of GIS, and Indigenous communities might benefit from GIS. In the analogy to French texts, the translations can be seen as windows onto the thought of French writers, which may encourage readers of their works to inquire more deeply and perhaps even endeavour to learn some of the French language. Translations, then, (especially carefully executed translations) can be seen in a positive light, as a valid way of accessing the knowledge. Thus, GIS might be seen as a window onto traditional Indigenous thought and language, encouraging both young people less familiar with Indigenous language to learn it, and older people less experienced with GIS to learn this new language of mapping.

This type of mapping, combining disparate ways of seeing, is an example of what I call (after Said) a contrapuntal cartography (Said, 1993: 51). This musical metaphor refers to counterpoint (a melody that accompanies another melody in a piece of music) and it can be applied, as a metaphor, to many different phenomena. According to Said (1993) reading contrapuntally involves “a simultaneous awareness both of the metropolitan history that is narrated and of those other histories against which (and together with which) the dominating discourse acts” (51). This is important in the consideration of the ways in which Indigenous peoples might seek to assert their

own spaces and places in the world, involving the “adoption and adaption” of new technologies for their own purposes (Braun, 2002).

Maps can be read contrapuntally against the territories they claim to represent (or against other maps), with the maps never quite matching territories that shift constantly, in a proscriptive and retrospectively musical play. This begs the question: does the map precede the territory, or on the contrary does the territory precede the map? GIS recapitulates the question, adding new complexity. Satellite imagery and GPS add a salient edge to the map/territory debate, a debate that is ontological since it addresses a hierarchy of what is assumed to exist, and that is epistemological since it tries to get at how we come to know the world around us: is it primarily through the land itself, or is it through representations (maps) of the land?

At this point I will jump back in time in order to provide a historical basis for such questions. The next chapter sketches out a history of Indigenous activity on the land *vis a vis* the colonial powers as represented by the Hudson’s Bay Company, and later, players from big industry such as forestry. It will be shown that a particular contrapuntal cartography has been playing itself out for at least two hundred years, and probably much longer than that. By way of geopolitical activity on the land the Indigenous peoples and the actors of big industrial companies have clashed in complex and dissonant ways. This is a symphonic piece that reached its crescendo with the Delgamuukw trial in the mid-nineties in Smithers, BC. And, like good symphonies, the music is not over, not yet, it has subsided into quiet notes that are barely audible, but that will certainly come back in all their urgent splendour.

4. Critical Indigenous Geopolitics

Geography was not something already possessed by the earth but an active writing of the earth by an expanding, centralizing imperial state. It was not a noun, but a verb, a geo-graphing, an earth-writing by ambitious endocolonizing and exocolonizing states who sought to seize space and organize it to fit their own cultural visions and material interests.

--Gearoid O Tuathail, *Critical Geopolitics* (1996)

The term "geopolitics" is a convenient fiction, an imperfect name for a set of practices within the civil societies of the Great Powers that sought to explain the meaning of the new global conditions of space, power, and technology.

--Gearoid O Tuathail, *Critical Geopolitics* (1996)

"Our boundaries were not based on discrete lines but dare to cross into the territory of the Tsimshian you would surely die."

-- Interviewee #9

4a. . Geopolitics, Critical Geopolitics, and Indigenous Peoples

Geopolitics is a sign or a sign-system, and it is performed by lead actors of states or other inscribed "containers of power." Geopolitics is thus enacted by powerful people at whatever scale necessary in order for its place within the sign-system to allow it to function. This functioning operates within the infrastructure of a complex play of power and spectacle, dominance and submission, and many other factors, depending on a particular state of world affairs. Thus geopolitics has a history and a genealogy, and

the precise meaning of the term shifts over time, such that the infrastructure of geopolitics is constantly being (literally) remapped, in the same way as other infrastructures slowly change over time (O'Tuathail, 1996). It might thus be thought of as analagous to a series of aerial photographs of a road network taken at different points in time. The photos might show main lines that fade or disappear over time, while new side-roads appear, some of which grow and eventually become main routes themselves. Indigenous geopolitics and the actors that signify it (such as Ligeex, the powerful Tsimshian leader) have been both main road and side road at different points in history. Indigenous geopolitical tactics are being recuperated by great powers of today. Conversely, Indigenous peoples, by inscribing their own "containers of power", by inscribing their territories on maps, are using some strategies of classical geopolitics. However, it must be noted that the "tools" of classical geopolitics are different in the hands of the subaltern, than in the hands of the "master." Indeed, this is one of the main points of this thesis, and it shows that Indigenous geopolitics are inherently a *critical* as opposed to a *classical* geopolitical paradigm.

The cold war was classic geopolitics played out at a global scale. Its primary actors included American presidents (including Ronald Reagan) who came to signify goodness and rightness as opposed to communism. The cold war was about grand gestures and strategic reversals, about the meta-narrative of communism and capitalism, about good and evil. Before the cold war, geopoliticians like Ratzel (a German) and Bowman (an American) signified these attributes by performing geographical roles as adversaries within an actual war between axis and allied countries. The result of classic geopolitics was the creation of those geographical "containers" known as nations.

Those “containers” constitute “territorial traps,” confluences of identities and cultures (which contain internal differences) with sovereign and homogeneous pieces of territory ruled over by a president, a prime-minister, or some such figure-head.

The post-cold war era is postmodern, and as such, it has shifted emphasis from strategy to tactics. In the postmodern world, war takes on a different character (Hardt and Negri, 2004). In this era of the blurring of the tactical and the strategic, and of Indigenous and hegemonic categories of geopolitical activity, a truly critical geopolitics becomes possible. Critical geopolitics destabilizes the taken for granted categories inherent to geopolitics proper. Furthermore, critical geopolitics relies on “the little tactics of the habitat” (Foucault, 1980, p. 149), appropriate to Indigenous activity on the land.

Simon Dalby (2002) is the only author thus far to have mapped out a sustained critical geopolitics applicable to the environment and to Indigenous peoples. Indigenous peoples, as the original inhabitants of the land (by definition), have been erased and excluded from representations in some art (such as produced by the Group of Seven, see Manning, 2003) and on maps of that land (Harley, 1989), by way of preparation for their physical exclusion from their territories. Ironically, assumptions about the environment assume that its Indigenous inhabitants in undesirable and “other” locations such as Africa are the cause of local environmental degradation leading to violent conflict. In this way the construction of Indigenous peoples by some writers simultaneously seeks to exclude Indigenous inhabitants as active members of changing environments, but also to vilify Indigenous peoples as the cause of the destruction of the environment. Thus (according to Dalby), North American and European responsibility

for environmental degradation is elided, though the inhabitants of those continents consume vastly more on a per capita basis than the inhabitants of any other continent (consumption levels that would be not only unthinkable but ludicrously unsustainable in places such as India or Africa). Furthermore, they actively perpetuate (through the economic fundamentalism of institutions such as the International Monetary Fund and the World Bank) environmental destruction in the continents of Africa, Asia, and South America.

In terms of a critical geopolitics, Dalby has made progress by his insertion of the previously excluded categories “Indigenous” and “environment” into critical geopolitical discourse. In this way, Dalby upends the “textual dualisms” of writers such as Robert Kaplan (2002, p. 33). He applies a constant pressure upon hypocritical assumptions about the “other,” racist assumptions that assume the poor to be the causes of their own devastation, both environmentally and economically. Using a nuanced deconstructive approach, these racist assumptions are soon broken apart to reveal their lack of depth, their manifest contradiction, and their lack of geopolitical imagination. Pointing out the “territorial traps” involved in such thinking is a favored technique of Dalby’s, whereby

boundaries are confused with barriers, and flows and linkages are obscured by the widespread assumption that autonomous states are the only actors of real importance in global politics (Dalby, 2002, p. 39).

Against this “territorial trap” is the active, imaginative, and intelligent Indigenous subject, one that is allowed the freedom of difference against such homogenization, and against the assumption that the categories “Indigenous” and

“environment” are somehow rigid and unchanging. Dalby elaborates even further later on as he discusses three assumptions (adapted from John Agnew) inherent to the “territorial trap”:

First, states have exclusive powers over their territories in terms of sovereignty. Second, domestic and foreign realms of state activity are essentially separate spheres of activity. Third, the boundaries of states define the boundaries of societies contained within those states. Combined, these three elements lead to a state-territorial understanding of the workings of power that reifies the practices of sovereign states to suggest that they are autonomous permanent entities rather than understanding them as temporary, changing, porous arrangements (Dalby, 2002, p. 67).

In cartographic terms this means that

The erasure of Indigenous populations is related to amnesia in the cartographic specifications of contemporary administrative practices (Dalby, 2002, p. 76).

This brings me to the point of transition to the discussion that follows in the next section. The history of resistance of Indigenous peoples in BC to administrative practices of erasure has been long. It has involved strategies and tactics that have been geopolitical in nature (as pointed out by Susan Marsden), but that have also reflected profound geographical and spatial knowledge on the part of both colonizer and colonized. Performed geographies signified a geopolitics involving actors at state and local levels, involving the clash of domestic and foreign, and both the blurring and the creation of new boundaries of identity and of territory.

4b. A History of Resistance: Indigenous Remappings of North Western British Columbia

Historically, and before contact, the Tsimshian people were engaged in geopolitical struggle (Marsden, 2002). Perhaps because they had practice then, the Tsimshian were able to successfully deploy geopolitical strategies to maintain control of their portion of the fur trade in the face of Hudson's Bay Company (HBC) encroachment (Marsden, 1995). Ligeex, the most powerful Tsimshian leader in the 1820s and 1830s (until his death from smallpox in 1840) had a very sophisticated and realistic approach to trade with HBC. On the one hand he used his dominant role amongst the other Native groups in the area to act as a "front man" for dealings with HBC, whose fort was situated in his territory. From this, he benefited greatly, monetarily and in terms of prestige and power. On the other hand Ligeex incorporated HBC interests into his own interests, epitomized by the marrying of his daughter to a prominent HBC official. Furthermore, his (and the colonial power's) geopolitics avoided the "territorial trap" described by Agnew (1998: 51). Thus, the notion of a bounded state as a container of a people and a culture became unstable. An outside colonizing force quickly established itself and reterritorialized (see definition by Harris, (2004) below) the flows of people and goods along the Nass, Skeena, and Stikine Rivers, mixing people together who previously had little contact. An early stage of deterritorialization and reterritorialization by capital were now complete, to be subsequently recapitulated in new ways. To quote Cole Harris's summary of Deleuze and Guattari's (1987) terminology: "the spatial energy of capitalism works to

detrterritorialize people (that is, to detach them from prior bonds between people and place) and to *reterritorialize* them in relation to the requirements of capital (that is, to land conceived as resources and freed from the constraints of custom and labour detached from land)” (Harris 2004: 172, italics added).

From the perspective of the Tsimshian, the *adawx* (oral history) which tells the story of the *spanaxnox* (the territory) and the *naxnox* (spirits) that inhabit the land remain one of the most powerful tools for challenging the forces that continue to threaten a way of life. Acts of cultural resistance that assert traditional ways of life against the abstracting and dehumanizing effects of capital must be taken seriously as attempts to maintain traditional ways of life. As discussed with regard to the potlatch as mapping, the practice of traditional ways of life not only upsets the “territorial trap” but is also a type of counter-mapping.

Counter mapping is central to Sparke’s (1998) paper “A Map That Roared and an Original Atlas: Canada, Cartography, and the Narration of Nation” (hereafter, *A Map That Roared*). The first section of *A Map That Roared* refers to a set of maps used in the courts at the Delgamuukw trial, in which Aboriginal rights and title to land were asserted through the use of oral narrative histories. These maps (produced by a Coquitlam, BC mapping company supplied with information by the Gitksan and Wet’suwet’en offices) are classic examples of counter mapping. The maps contain a large number of Indigenous place names referring to fishing sites, berry picking sites, topographic and hydrologic features, and many other types of feature. On these maps the ‘up’ direction is west, orienting the map-reader towards the ocean, where the Nass, Stikine, and Skeena rivers drain, and from whence the salmon return.

The second section of *A Map That Roared* examines the *Atlas of Canada* (Harris, 1987) in terms of how it represents and redefines Canadian history, including Indigenous history. Parts of the *Atlas* can be viewed as counter mapping. Some maps include Indigenous place names while excluding non-Indigenous names. The maps described in both sections of Sparke's paper are of the highest cartographic quality, and represent examples of cartography at its finest in terms of technique, and in terms of the imagination and careful inclusiveness that went into them.

Sparke's main theoretical ally is the postcolonial writer Homi Bhabha, whose notions of hybridity and performative space are used to examine the maps described above. Also central to Sparke's (and to my) paper is the concept of contrapuntal cartography. To reiterate, contrapuntal cartography refers to the way in which hegemonic and counter-hegemonic, dominant and subjugated, clash with each other in a dissonant and necessarily heterogeneous way. Bhabha's works are relevant to, and perform, contrapuntal functions by their relentless destabilizing of binary oppositions, dualisms, and reductions in colonial identities. This applies equally to both colonizer and colonized, and is thus critically relevant to the discussion of the present chapter, and to the history of colonial resistances in general. Thus Bhabha says, with regard to colonization and its production of stereotyped identity:

In order to understand the productivity of colonial power it is crucial to construct its regime of truth, not to subject its representations to a normalizing judgement. Only then does it become possible to understand the *productive* ambivalence of the object of colonial discourse – that 'otherness' which is at once an object of desire and derision, an articulation of difference contained within the fantasy of origin and destiny. What such a reading reveals are the

boundaries of colonial discourse and it enables a transgression of these limits from the space of that otherness (Bhabha, 1994, p. 67).

Bhabha's thinking is deeply contrapuntal, and it is of compelling relevance to Indigenous mapping and identity. Indigenous maps break down distinctions between metropolitan and marginal; they represent a productive ambivalence, one that cares not about distinctions between Western technologies and Indigenous epistemologies. Bhabha's thought discards these binaries and hindrances to move forward into a hybrid, liberatory, and contrapuntal dance of ideas that supplement, suffuse and subjugate dominant discourses.

Sparke shows how *The Map That Roared*, within the courtroom setting, acted as a supplement to the dominant legal discourse, a supplementing that had a displacing effect upon that discourse. However, since the Indigenous people involved have never been a part of that discourse it is difficult to conceive of how they could supplement it. It would be more accurate to say that it disrupted the dominant discourse (Sparke, 1998). Sparke also shows how *The Map That Roared* served to signify the in between, interstitial, and unrepresented passages of colonial space (Sparke, 1998), pointing out that this also is flawed, since the toponymy on the maps in the Gitksan-Wet'suwet'en Atlas completely overwhelmed the landscapes depicted in them. Thus, the names were not just squeezed in, but asserted themselves in a counterhegemonic way. Juxtaposed with early colonial maps showing the land as empty and unused, waiting to be husbanded and tilled and fenced, the interstices would appear to be the entire landscape, which can now be shown to be fully teeming with activity, since time immemorial.

Bhabha's (1994) notion of space having a performative role in the disruption of dominant discourse is a key to the effectiveness of these maps in the courtroom setting. Disruptive representations of space performed a counter mapping function, and served to trigger a strategic reversal. This reversal became complete and served its full function (exhausting itself in the process) when the court deployed the argument that, essentially, *colonization was not working well enough* for the alleged effects on the Indigenous peoples to have occurred (erasure, displacement, and exclusion) (Brealey, 1995 and 1997). By admitting to the process of colonization, but stating that through cartographic ignorance (the area was not yet mapped well-enough in the 1700s, the time when these effects began to be fully felt by Indigenous peoples) "the area had not yet entered fully into the European epistemic empire. Precisely because *it had not been properly mapped*, it was not yet a transparent space of state power." (Sparke, 1998: 478, italics in original)

The Atlas of Canada, on the other hand, serves to turn the categories of performative space and pedagogical time (Bhabha, 1994) on their heads. Admittedly, many of the maps in the *Atlas* do serve as narratives of the naturalized space of Canada (Sparke, 1998: 483), perpetuating myths of singular national origin. Other maps present very interesting accounts of Indigenous peoples' lands, place names, and stories in the form of maps. The *Atlas* is a pedagogical device, produced with the explicit purpose of use in classrooms. Since it contains maps, and representations of space that are counterhegemonic and disruptive to dominant discourse, the categories of the pedagogical and performative are confounded. The *Atlas* is simultaneously a performative and pedagogical (according to Sparke), spatial and historical, document.

This is not so much a strategic reversal as a form of progress over older, more static notions of map and atlas that portray countries as fixed territorially, containing a single, unified culture and nation with a single origin.

In Morris and Fondahl's (2002) "Negotiating the Production of Space in Tl'azt'en Territory, Northern British Columbia," Indigenous and dominant mappings for the "visualization, organization, and use" of space exist in a relationship that I would characterize as contrapuntal. Tl'azt'en maps of Tree Farm License (TFL) 42, granted to the Tl'azt'en as part of their land claim, incorporate thirteen reserves around Stuart and Trembleur Lakes into a visually cohesive unit (Morris and Fondahl, 2002: 120). This is a "hybrid negotiated space" (Morris and Fondahl, 2002: 109) won after long negotiations and battles between the Tl'azt'en people, the government, and railroad companies. The maps (or counter maps) the Tl'azt'en have produced supplement the dominant maps and change them, if even in only a small way. The visible traces of a long struggle and transition from an isolated and self-sufficient lifestyle to seasonal work in mills and on logging operations in combination with hunting and gathering in the territories are metonymically inscribed in the material and metaphor of these maps. More recently, pressures from big logging companies have brought a regime of year-long and constant wage labour with no time for hunting and gathering (Morris and Fondahl, 2002: 114). This, combined with legislation around TFL 42 focusing on single use (forestry) (Morris and Fondahl, 2002: 119-120), to the exclusion of all other activities, high unemployment, and social problems, mean that the Tl'azt'en have many issues to deal with in the future. As shown by their ability in the past to successfully shape, differentiate, and negotiate their own space from the more abstract space around

them, the Tl'azt'en seem more than capable of rising to the challenge. The Tl'azt'en have asserted power over space and thus, have engaged in geopolitical struggle for the purposes of slowing (or simply reversing) some processes of incursion (railway lines, roads, big industry) which threaten their livelihood and their very existence. In this way, the Tl'azt'en maps can be seen as counter maps.

Blomley (1996) shows how the blockade of a transportation route (such as the blockading of the railroad by the Tl'azt'en) is a spatial phenomenon, effected and enacted by and through space. The blockade may be done by an individual or a group, in a planned or unplanned fashion. In a number of ways, the blockade can be seen as a strategic reversal, and as a form of geopolitics (the assertion of power over space). Mobility is central to the blockade, or more precisely, the restriction or control of movement at a strategic location or on reserve land. In this way, Native groups attempt to reverse "the forced mobility visited upon Native communities through economic and cultural dislocation" (Blomley, 1996: 7). There are attempts by Natives to block movement (on roads and railways) where movement itself is not an issue, as in the case of land claims; and there are blockades where movement is itself the issue, where the road being blocked is the main route for the removal of resources, such as timber, through Native land (Blomley, 1996: 12). In other words there are blockades of protest and blockades of access (Blomley, 1996). Especially in BC (with its mountainous terrain), geography defines the specific configuration of blockades, and the effects they have. Reserves and transportation routes both lie in the bottoms of very steep valleys in many BC locations. Therefore it is somewhat natural that transportation routes should be the sites of blockades (of resistance). Blockades, as the assertion by Natives of

power over space, take advantage of the spatial configurations of topography, transportation routes and reserves to turn a negative space (the reserve) into a container of power where the Natives contest and return the cartographic gaze of the colonizer (Brealey, 1997). The tables are turned, so to speak, at the site of the blockade, effectively (if only for a short time) remapping the territory.

As a form of counter-colonial struggle (Blomley, 1996: 21), the blockade has other advantages. While many blockades may spring up at the same time, there is rarely a centralized plan at a province-wide level. The decentralized and sympathetic nature of the blockade asserts Native solidarity, and reverses isolation and parochialism. In this way, adversity is turned to advantage (Blomley, 1996: 21).

The blockade also serves another purpose: it upsets the grids of the colonizer, it redefines the frontier of the colonizer, and it resurveys, with its contesting gaze, the land of the colonizer (Blomley, 2003). Rights of way and private property rights depend merely upon the threat of force in order to be effective. Likewise, the mere threat of a blockade may be all that is required in order to get the government and industry thinking outside their respective boxes.

Clayton (1992) has described well how the Natives were boxed in by the spatial tactics of the Hudson's Bay Company (HBC), by missionaries, and by government officials and police. Three sites on the northwest coast, in traditional Tsimshian territory, were established, each for a specific spatializing and controlling purpose, with spatializing defined here by Henrikson (1994: 51) as the production of "an accurate sense of the voluminousness of the world and the places within it in more or less the correct relationship to each other." The first is Fort Simpson, a trading post established

by the HBC caused major changes in the pattern of settlement of the Native people of the Skeena and Nass watersheds. Trading patterns and settlements tended, after the establishment of Fort Simpson, to focus on this “node of power,” the fort, with its layout geared specifically towards maintaining the spectacle of power (Harris, 1997: 56). Maps of Fort Simpson show how the Natives were “mapped out” (Brealey, 1995: 1), and frozen by the cartographic/economic gaze of the colonial power (Brealey, 1997). The frozen inscriptions (Clayton, 1992: 34) demarcated and separated Natives from whites, a necessary step along a continuum of increasing fragmentation of Native space culminating in the reserve system (Brealey, 1997).

If Fort Simpson was consciously set up as a trade site, Metlakatla (the second of the three sites described by Clayton [1992]) was a site, and a “node of power,” for the Christianization and individuation of Indigenous people (Harris, 1997:56). The layout of the town of Metlakatla was modeled on British attempts in urban settings to improve the lives of the working class, and to clear the slums (Clayton, 1992: 41). The layout of the town, and its spatialization, is geared towards order and control. It separated and contained the local people, individualizing them in order to prepare them for the inner, self-mortifying quest of the Christian missionaries (Clayton, 1992).

A third site, Port Essington, was established for a different purpose, that of government control and policing. Port Essington became the focus of law for the northwest coast region. Property law, contract law, criminal law, and taxes became inscribed into the landscape of Port Essington. Indigenous (mostly Tsimshian) people started to become wage labourers here, mostly in the salmon canneries, while for a time maintaining some seasonal fishing and hunting activity as well. The establishment of

property regimes of surveyed grid lines separating Natives from whites was etched into the landscape, and socially reproduced through maps showing property grids. In this way, Native-white interaction was “ordered in space” (Clayton, 1992: 56) and enforced on the ground by the surveillance regimes of the police and of the government.

The strength of Clayton’s (1992) argument lies in his deconstruction of the spatial practices and discourses of colonial power. However his account of Native *resistance* to that power is not robust. Clayton addresses this problem, noting that evidence is mainly in written form, and since the Indigenous people were excluded from the records kept in the offices of white people, it is difficult to know what the thoughts or plans of the Indigenous people were (Clayton, 1992: 57). In the absence of records of Native thought, there are two possibilities for assessing Native resistance. The first is that Native people accepted their lot within the colonial regime. The second is that Native people resisted and engaged in geopolitical struggle. There is evidence (Blomley, 1996; Marsden 1995 and 2002; Morris and Fondahl, 2002) that struggle has marked Native existence since the time of contact. There have also been long periods of quiescence (Blomley, 1996).

It is pointed out by Henrikson (1994) that one of the first actions of newly emerging nations is often to produce atlases and maps that effectively re-centre the world to assert the centrality of that new nation (Henrikson, 1994: 57). That this might be done by nations within states seeking to upset the hegemony of the state has been established in the creation of the Gitksan-Wet’suwet’en Atlas (Sparke, 1998). In this atlas, the perspective (up-direction) is west, towards the outlets (and entry points for returning salmon) of the Nass and Skeena rivers, the watersheds in which the

Tsimshian, Gitksan, Wet'suwet'en, Nisga'a and other First Nations' traditional territories lie. The Gitksan-Wet'suwet'en Atlas effectively re-centres the world as well, focusing on the northwest coast of British Columbia at a scale which excludes the rest of Canada and the U.S.

The inclusion of Native toponyms, the names of rivers, mountains, fishing and hunting sites, and the exclusion of non-Native names, upsets the conventional map of BC with its English names. These maps can speak to the need for cultural preservation through the inclusion of language elements. These maps can also speak to an individual's embodiment of the need for the visibility of a particular nation (or First Nation) within the state of Canada. Indeed, the need to constantly reassert and re-inscribe the space of the nation within the totalizing state is not unique to Canada, but is a worldwide phenomenon (Nietschmann, 1994).

Another historical example should further clarify some spatial aspects of resistance, in a way that improves upon Clayton's (1992) method. In describing and analyzing from both a white and a Native perspective, Galois (1992), in his paper "The Burning of Kitsegukla" gives a balanced account of an event that crystallizes, or condenses, white-Native relations. The context of the fire in Kitsegukla in 1872 that burned at least 12 Gitksan buildings was a time of the increased presence of white people along the Skeena River, due to the operation of the fur trade, and the establishment of forts and towns both above (upstream of) and below (downstream of) Kitsegukla. Galois utilizes written documents and oral narratives to re-create the scene, first from a white perspective, then from a Native perspective. After the fire, a blockade was effectively set up at Kitsegukla, blocking the flow of goods (but not of people).

The reason for this is that the Gitksan people felt compensation was due for the destruction of property and loss of lives (seven people were allegedly killed in the fire). The blockade was a geopolitical manoeuvre, in which movement was not itself an issue, but the restriction of movement along the river was the tactic for the assertion of power. This response by the Gitksan was both measured and proportional. The Gitksan people were asking for compensation for the destruction of property, the rebuilding of which would involve villages in the whole of the Gitksan territory. Therefore the consequences of the burning of the village (by whites who failed to extinguish their fire) were spatial (Galois 1992: 73). The response by the Gitksan was correspondingly and proportionally spatial, in that it blocked access of a transportation route (the river) which effectively cordoned off the whole upper watershed.

The white response to the blockade was also cautious and measured, and never resulted in actual violence. However, the threat of violence played a part in the whites' own geopolitical moves. In their attempts to re-secure access to the upper Skeena (and the goods it contained) Lt.-Governor Trutch, William Duncan, and others went to Metlakatla in a British gunboat to negotiate with the Gitksan chiefs (the negotiation took place on board the boat). Thus the spectacle of power (Harris, 1997: 56) came into play and significantly altered what the chiefs were willing to settle for. In effect the chiefs were 'shocked and awed' into quiescence, and into accepting the terms (potential future punishment included) of the whites. The Natives responded in kind with their own brand of spectacle, and an assertion of power, through song and dance onshore after the signing of the deal at Metlakatla (Galois, 1992).

From a Gitksan perspective, the meeting between the whites and the chiefs was like a feast or a public meeting for conflict resolution. Since in Gitksan law the guilt for transgressions extended to the whole group of people containing the transgressors (Galois, 1992: 75), the fact that the white leaders were negotiating with the chiefs was important. This showed good faith on both sides. Nonetheless, there were elements of coercion to the meeting, and the eventual settlement was less than equitable (Galois, 1992: 71). Had the Natives not resisted in the way they did, however, it seems certain that there would have been no recognition of, nor compensation for, the damage done to Kitsegukla village and its people. And this resistance, in geopolitical form, had effects that reverberated (spatially) up and down the river and through the territory.

The internal struggles of Indigenous peoples are described well by Sterritt et al. (1998) in *Tribal Boundaries in the Nass Watershed*. The context of these internal struggles was the realization that the Nisga'a people were on the verge of an historic settlement with significant territory and money attached to it. As this settlement drew closer, the area claimed by the Nisga'a grew larger, eventually conflicting with the nearby Gitksan and Wet'suwet'en peoples. This conflicting claim over territory was the impetus behind the writing of *Tribal Boundaries in the Nass Watershed*, which details the historical movements, interactions, and geopolitical struggles of Indigenous peoples in the Nass watershed. The primary modes of evidence within this document are oral and spatial. Oral histories (adaawk) have been recorded by the Gitksan and Wet'suwet'en, in which the place names corresponding to the hunting and gathering grounds and spiritual sites of these peoples are mentioned. The inscription of these place names onto maps has been necessary within the context of the current struggles

between First Nations and Canada, and between various First Nations. This inscription serves to clarify the exact locations of disputed sites in order to resolve those disputes. This is a very practical aspect to Indigenous mapping which may have less to do with counter-mapping, and more to do with legal manoeuvring and historical clarification. Nonetheless, it is another example of the use of maps and spatial concepts by Indigenous peoples in order to assert power over space, or in other words, to engage in geopolitical struggle. One drawback to the inscription of names and boundaries onto maps is that those names and (especially) boundaries become fixed, or frozen. Once fixed or frozen, not only are these boundaries more difficult to move, they also become open to exploitation. The specific location of hunting sites may expose game to the predations of guide outfitters in need of satisfying customers who have paid to take home a trophy. It can also serve to exacerbate disputes, since fixed boundaries imply an inside and an outside, with no 'give' in terms of flexibility and generosity extended by one group allowing another group temporary access to their territory. The issues are certainly complex, and it is for this reason that the land claims process is very long. The Nisga'a are only one of many groups seeking to have their claims to traditional territory recognized within the system of the law of Canada (the Nisga'a have been successful – see the *Nisga'a Final Agreement*, 1998). Because two very different systems of knowledge, one oral (or incorporated), and the other written (or inscribed), have come together, it has taken a very long time indeed for the dominant system to even begin to allow the testimony of the non-dominant (Indigenous) system to be heard (Rundstrom, 1995 and Persky, 1998). And much has been lost in the time it has taken for this to occur (Sterritt et al., 1998).

It is necessary to carefully delineate the possibilities for resisting colonization. Counter-mapping is one such way, although there may be many difficulties, especially in that it can be used against those who sought to do the counter-mapping in the first place. Inherent to the process of counter-mapping are 1. that the maps produced must speak to those whose interests and claims they are supposed to represent and 2. that the counter-maps seek to upset a hegemonic power structure. In this way, the ongoing process of colonization might be resisted.

At this point I turn to practical concerns about whether or not the capacity exists within Indigenous organizations in British Columbia to produce successful and sustainable counter-mappings. This has been attempted in order to suggest, and not to prescribe, how such a project might proceed. Already there are successes, such as the historic Nisga'a treaty, signed in 1997. However, there are many more avenues to explore in terms of counter-mapping and the insertion of Indigenous identity into hegemonic (provincial and federal) spaces. As suggested through the interview process below, much of this boils down to power and control. Control of data in a GIS organization is a new frontier on which geopolitical struggle is being conducted.

In discussion with practitioners of GIS within Indigenous organizations in BC, a number of suggestions were made for how to proceed with the resisting project, one that must ultimately move beyond resistance to an existence that is self-reliant and worthwhile in its own right.

5. Case Study: First Nations' Use of GIS in North Western British Columbia

The essence of commodity-structure has often been pointed out. Its basis is that a relation between people takes on the character of a thing and thus acquires a 'phantom objectivity,' an autonomy that seems so strictly rational and all-embracing as to conceal every trace of its fundamental nature: the relation between people.

-- Georg Lukacs, *History and Class Consciousness* (1971)

"GIS can't tell you what the people can tell you."

-- Interviewee # 2

5.1 Methodology

In order to provide an empirical basis for the theoretical discussion, it was deemed worthwhile and necessary to include some of the words and opinions of those people about whom, and for whom, this thesis is being written. Therefore, a case study focussing on the north western part of British Columbia, the area not only where the researcher has lived and worked for a large portion of his life, but also where a reasonably high concentration of GIS practitioners with experience specific to Indigenous peoples happen to reside, was completed. In this way, points of contact and common experience existed between the researcher and his researched. However, the methodology did not automatically assume this to be the case.

The primary method of data collection for the case study was the semi-structured interview, involving individuals from four different First Nations: Gitksan, Wet'suwet'en, Nisga'a, and Tsimshian (Figure 3).

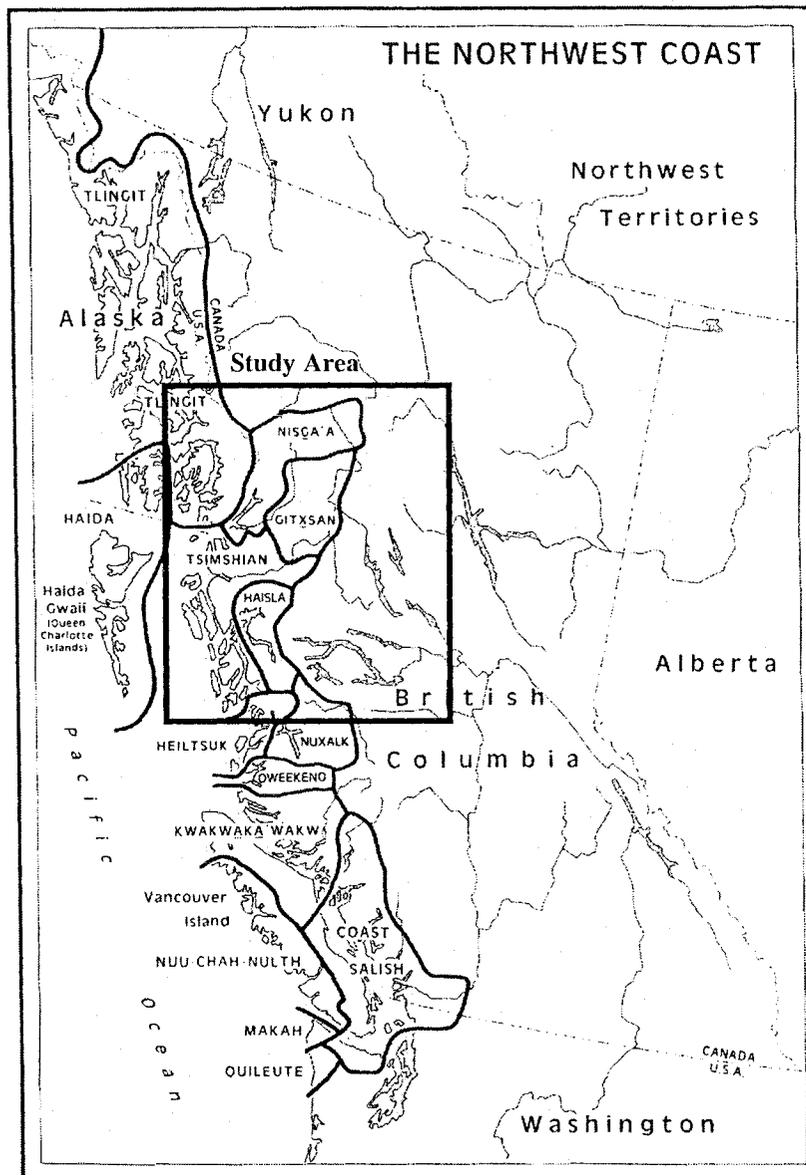


Figure 3. Study Area. Source: Cheryl Shearar. 2000.

Interviewees were chosen based on expertise or involvement in GIS within, or in conjunction with, a First Nations office, government, or band. The reason for this choice of criteria is that there are very few GIS 'experts' present in each First Nation. The semi-structured approach was chosen for its flexibility, but also for its ability to give the interviews a consistent direction independent of the individual being

interviewed. It was necessary, therefore, to steer the interviews to a certain degree. The “rhumb lines”, or lines of constant direction, were demarcated by a set of loosely connected questions that were kept in mind by the interviewer. Analogous to “rhumb lines” the interview process was somewhat goal-directed, switching direction as deemed necessary in order to reach that goal. The goal, ultimately, was to assess whether or not the interviewee thought GIS to be a neutral technology, and furthermore, whether or not GIS contains colonial assumptions. Exactly how interviewees interpreted “neutral” is indicated by their responses to other questions that came up during the interviews.

In addition, an attempt was made to capture gender, age, and class differences that may exist within and between different organizations. However, since the actual number of ‘experts’ in GIS working in First Nations organizations within the study area is, at the present time, very low, it was imperative to interview all GIS practitioners present within each organization, regardless of the differences that may exist between interviewees. It was simply not possible or desirable to discard a potential interview, as long as the interviewee had some involvement in GIS, and had worked for one of the four mentioned First Nations organizations presently or at some time in the past.

Seven formal and three informal interviews were conducted. A formal interview is defined here as an interview including discussions that covered, as a minimum, the following topics: 1. the interviewee’s involvement in GIS including projects worked on in the past, and successes or failures of such projects. 2. the potential of GIS and whether or not the interviewee feels GIS has been used to its full potential within the organization with which they are involved and whether or not use of the full potential of GIS is even desirable. 3. how the interviewee would like to see GIS used in the future.

4. whether or not GIS is a neutral technology. 5. whether or not GIS contains colonial assumptions; in essence: is GIS a colonial technology? And if so, in what way?

The reason for this particular set of questions was simultaneously evaluative and political. At the onset of the interview an apolitical, evaluative approach was taken in order to put the interviewee at their ease, and to allow the interviewee to talk about their own successes and frustrations with GIS technology. As the interview proceeded, I steered the questions to more political concerns such as the questions of neutrality and colonial bias in GIS. By gradually easing from the evaluative to the political, the two arenas were conflated, and hopefully shown to be similar or at least partially similar. For instance, an interviewee mainly working in forestry planning may not have considered forestry to be a political activity. If, however, forestry is placed within the context of the colonial assumptions of GIS, a topic formerly considered neutral and 'objective' may not be so viewed subsequently.

These formal interviews generally lasted between one and one and a half hours. An additional three informal interviews or interactions took place (one in person, and two by email), interactions that brought up information important for this study.

Of the seven formal interviews, four interviewees were from the Nisga'a government office, while the remaining three were associated with the Gitksan and Wet'suwet'en offices. In this way, there was relatively even representation across the historically contested boundary between the Nisga'a and the Gitksan-Wet'suwet'en (who worked together during the Delgamuukw hearings to challenge the Nisga'a territorial boundary but who now work separately – see Sterritt et al, 1998).

Informal interviews represent one interviewee each from the Tsimshian, the Wet'suwet'en, and the Nisga'a. Thus a voice from outside the most recent land claims dispute has been included. More Tsimshian interviewees were not included due to lack of response from the Tsimshian offices.

Table 1 shows a summary of interviewee characteristics based on gender, status (or lack of status) as aboriginal, GIS expertise, and whether or not the interview was formal.

Table 1. Axes of difference within the interview process

| <u>Organization</u> | <u>#Interviewees</u> | <u>#Formal</u> | <u>#Aboriginal</u> | <u>#Female</u> | <u>#GIS Experts</u> |
|---------------------|----------------------|----------------|--------------------|----------------|---------------------|
| Nisga'a | 5 | 4 | 2 | 2 | 3 |
| Gitksan | 2 | 2 | 0 | 0 | 2 |
| Wet'suwet'en | 2 | 1 | 1 | 0 | 2 |
| <u>Tsimshian</u> | <u>1</u> | <u>0</u> | <u>1</u> | <u>1</u> | <u>1</u> |
| Total | 10 | 7 | 4 | 3 | 8 |

Attempts were made to contact government workers in the Aboriginal Geographic Naming division of the BC Ministry of Aboriginal Relations and Reconciliation, as well as the Geographical Names and Geomatics Services Branch of the BC Ministry of Sustainable Resource Management, but no response or show of interest was forthcoming.

Table 1 shows how an attempt was made to address axes of difference within and between organizations. Thus both women and men, aboriginal and non-aboriginal,

and GIS expert and non-expert alike were interviewed. Furthermore, 'complete sets' of people were interviewed. In other words, not only were all present members of each organization interviewed (thus the term 'complete'), but the number of interviews in total, and the data obtained, have given the researcher enough information to answer the primary research question posed in this thesis. By obtaining answers first to the question of neutrality, and subsequently to the question of colonial bias within GIS, a logical sequence was followed, with the answer to the latter question depending upon the answer to the former.

As the interviewer, I chose to examine, reflexively, my position as both 'outsider' and 'insider', as 'expert' in GIS, and as white, male researcher (Rose, 1997, p. 311). I avoided initial assumptions of connectedness (p. 312), and furthermore avoided viewing differences as objective landscapes of displacement and relationality (p. 314). Instead I recognized the hybrid space of research as it occurs between the 'home' and the 'foreign' (Indigenous) language (p. 315). Identities are made and remade through the process of research (p. 315). Furthermore, the researcher is in a position of (productive) power that is by nature performative (p. 316). In other words, the very act of doing research promotes various identities, resistances, and productivities that are unpredictable, shifting, and sometimes serendipitous. Creative interaction and negotiation are therefore appropriate to the methodology of this thesis (Rose, 1997).

The quantitative tables are included for clarity's sake and to supplement the qualitative interviews. The tables are in no way meant to reduce or objectify the rich subjective and qualitative data obtained through interacting and discussing ideas with

people. Interviewees had much to say on the subjects of GIS and Indigenous peoples, and many other topics springing from the conjunction of the two. The numerical tables should be viewed as “shopping lists” or “wish lists”, itemized tables of subjects interviewees wanted to talk about, to be discarded once they are no longer useful. These lists are also like wind roses, useful to navigators for indicating lines of constant direction, lines that help us keep our bearings in uncertain terrain. Thus they are useful as points of initial contact, and for initial direction, not to be treated as the journey itself.

5.2 Results

Out of ten informants, six thought GIS to be neutral, three thought GIS to be not neutral, while one did not directly answer the question (or it was unclear what they thought). Thus the majority of interviewees believed GIS to be a neutral technology.

Consistent with the answers to the question of neutrality, the same six interviewees who thought GIS to be neutral also thought GIS to be free of colonial assumptions or biases. Noteworthy also is the fact that all interviewees who thought GIS to be not neutral were Indigenous individuals (Table 2).

Table 2. Answers to the question of the neutrality of GIS

| <u>Interview Type</u> | <u>GIS neutral</u> | <u>GIS not neutral</u> | <u>No Answer</u> |
|-----------------------|--------------------|------------------------|------------------|
| Formal | 6 | 1 | 0 |
| Informal | 0 | 2 | 1 |

As mentioned in the methodology, initial questions in the interview were evaluative, attempting to assess the past, present and future uses of GIS from the perspective of the interviewee. Table 3 shows the range of answers to these questions as well as the number of interviewees who mentioned each type of GIS project.

Table 3 is relevant to the question of whether or not GIS is a colonial technology insofar as a current focus on a limited number of projects by First Nations GIS departments may indicate what is deemed worthy of time, effort, and funding by the administrators and managers of those departments. In showing what projects are considered valuable, by contrast, what is not considered valuable will stand out more clearly. The method for coding interview statements was relatively self-evident, given that video or audio taping was not deemed appropriate to this study. In other words, the interviewees often suggested to the interviewer what they would like to see included in the interview results. Thus, the written results of each interview were already “coded” through the interaction between the interviewer and the interviewee. This begs the question of consistency between interviews, which can only be addressed through the following discussion, and by realizing the fractured nature of subjectivities as they relate to the accumulation of knowledge (Foucault, 1989).

Table 3. Answers to the question of current and future (potential) uses of GIS

| Type of GIS project | Past/Current | Future |
|--|--------------|--------|
| 1. Forestry | 3 | 3 |
| 2. Fisheries | 3 | 1 |
| 3. Municipal (in villages and reserves) | 0 | 2 |
| 4. Land Claims | 2 | 1 |
| 5. Cultural Mapping | 2 | 1 |
| 6. Tourism | 0 | 1 |
| 7. Aboriginal Training | 2 | 0 |
| 8. Large Scale Analysis/Decision Support | 0 | 1 |
| 9. Boundary Mapping | 1 | 1 |
| 10. Managerial Tool | 1 | 1 |
| 11. Maintaining Control of Data | 0 | 3 |
| 12. Co-Management of the Land | 0 | 1 |

5.3 Discussion

Some Aboriginal participants pointed out that GIS conceals colonial relations of power since it seems to exclude those who still live on reserve by not funding or not prioritizing projects to improve the infrastructures and municipal capabilities of the villages and reserves. Thus GIS is a technology of displacing and excluding the *homo sacer* (Gregory, 2004) precisely by continuing to forget and thus perpetuate the colonial processes that put Indigenous peoples on those reserves in the first place.

I am referring to specific comments made by interviewees to the effect that they would like to see GIS used for the purposes of developing infrastructure and municipal planning of the villages and reserves. Interviewees also expressed the opinion that this is not currently taking place, and that this is a shortcoming of the use of GIS. Thus GIS is not being used to its full potential in Indigenous communities, and furthermore (to reiterate) it continues to perpetuate colonial processes, mentalities, and physical structures that are directly against the interests of those whom the Indigenous governments are supposed to be representing. Ultimately this may be disastrous due to the failure of the (Indigenous) government to fairly represent the interests of its constituency, possibly resulting in resentment and breakdown of communication.

To cite more evidence, participants (Aboriginal and non-Aboriginal alike) indicated that the main uses of GIS are currently forestry and fisheries, in other words, natural resource management. Participants indicated that GIS is not being used to help inhabitants but is, rather, being subservient to the needs of big industry and capital, to the companies and governments of the south (in Vancouver and the U.S.) where most of the raw materials (wood and fish) end up (see Wilson, 1998). By Smith's (1999, p. 23) definition of colonialism, which is "imperialism's outpost, the fort and port of imperial outreach" this is colonialism indeed, writ large in an age of the unchecked expansion of U.S. imperial interests, illegal tariffs (the softwood lumber agreement), and globalized (metropolitan) capital.

A tentative solution to this problem would begin by using GIS in a more broadly social way for the purposes of developing the villages and reserves. This would entail increased self-reliance, and use of local materials for import replacement and thus

economic self-sufficiency. In this way, dependence on the demands of capital from afar, and thus the colonial mentality, would be reduced. This would also reduce bureaucracy and technocracy; it would increase feelings of self-worth by allowing participation of the Indigenous people to 'map themselves in.'

One interviewee indicated that there was a disconnection between 'the GIS people' and the people on the land. The people on the land may be mushroom harvesters, forestry workers, hikers, or GPS enthusiasts. For instance, harvesting activities, spiritual pursuits and recreation have all existed since time immemorial and continue to exist today. However, the way in which we enjoy these activities has changed, and is often mediated by different forces in the modern world. GPS is a case in point. For a geocaching expedition to be considered successful recreation, much depends on the successful deployment of very modern technology.

Interviewees also indicated that maintaining control of data was of primary concern. Currently, Indigenous organizations (like many other NGOs) depend upon the provincial government for data. It is up to the provincial government to decide what data, and the quality of data to give out. It was suggested by the interviewees that the provincial government exercises considerable discretion in this decision, since to hand over all of the highest quality data would leave the province with very little in terms of negotiating power. In other words, were the province to simply hand over all of the highest quality data at once, it would have nothing left to hold back. And it is only through holding back something it possesses, that the government is able to maintain a sense of control. And the provincial government is very much concerned with maintaining a sense of control.

There is a concern within Indigenous organizations that this situation should change. Since it is assumed that the governments will not change, it must be up to the Indigenous people themselves to make the change. This change would entail Indigenous data collection, management, and ultimately control. There would be an emphasis on high quality, robust data, collected by the most up to date means. And indeed, this is taking place within both the Gitksan and the Nisga'a offices. Programs exist within both offices for the purposes of mapping fisheries interests by using satellite imagery and GPS data.

Another way to solve the problem of data control is to use the data that the provincial government does give away in the most productive way possible. In other words, any data that exists must be maintained and used in the best possible way. That said, however, most interviewees indicated that GIS is only being used to a fraction of full capacity. This situation does not appear to be changing any time in the near future due to a lack of funding to make full use of GIS a real possibility. Full use of GIS and GIS data is part and parcel of involving the people 'on the land'. In other words, one way of envisioning full use of GIS and GIS data is to define full use as full participation. This democratic way of defining full use is related to the previous discussion around interviewees' desire to apply GIS to infrastructure and municipal concerns in the villages and reserves. By including data from those places, a reliance on provincial definitions of data might be avoided. This might alleviate some of the difficulties encountered along the road to self-reliance by starting to generate real participation by people other than (Indigenous or provincial) government officials.

One interviewee believed GIS to be non-neutral, and furthermore believed colonialism to be ongoing in the present day and active in technologies such as GIS. Programs involving technology like GPS had been carried out in the villages before. Much of the equipment remains within the villages and is in use by the participants in these programs (according to this interviewee), which often were run by universities located far away. The participants benefited from these training programs in terms of skills development, knowledge, and credit for university level courses. It may be argued, however, that there are drawbacks to such programs.

First, it has been disputed by other interviewees that the equipment is still being used by the original participants in the programs (though it is possible that these participants might in turn have trained others, passing on their knowledge). In other words, there may be no impetus or incentive to use GPS outside of a course setting. This point is debatable though, and relies on hearsay. It is equally possible that the equipment is in full use today for resource extraction, wayfinding or recreation (as well as other) purposes.

Second, and more importantly, the interviewee indicated that the assumption of the neutrality of technology was the cause of possibly unethical behaviour of the teachers and 'experts' involved in implementing the courses. Because GPS/GIS technology is considered neutral by these teachers (according to this interviewee) it has sometimes been assumed that no consultation is required with the chiefs or governmental representatives of the Aboriginal group involved. It is assumed that there are no ethical consequences or issues to be discussed, that since technology is neutral, there can therefore not possibly be any social impact whatsoever on the participants or

the communities of which they are a part. This is problematic since it can perpetuate the process of colonization, due to the colonial (non-neutral) assumptions inherent to Western mapping systems. These include strictly quantitative and grid-based abstract epistemological mapping constructs at odds with place-bound and embodied Indigenous mapping knowledges.

Another interviewee believed GIS hardware to be neutral, and that not to use it would be “stupid.” A caveat was added by the interviewee, however, that GIS software (especially older versions) rely on corporate network structures, and may therefore not be neutral. Corporate network structures are hierarchical and rigid and may not be compatible with Indigenous epistemologies. This is not to say that Indigenous cultures have no hierarchies or rigidities. It is to say that Indigenous cultures do not process information (and especially spatial information) in a similar way, or for similar purposes as corporations. This distinction has to do with the differences in the purposes, or end goals, for “collecting” or “processing” the spatial information in the first place. It can be argued persuasively that corporations or even governments often collect information for marketing, advertising, or mass persuasion programs, aimed at selling products or at convincing large numbers of people of a particular message (political in the case of governments) of the superiority of their product, ideology, or message.

Indigenous peoples in traditional times, and (maybe less so) in the present have had much less impetus to act along these lines. The purposes for Indigenous mapping have been for the location of resources for economic or spiritual well-being. In practice the economic and the spiritual may not have been different (Mauss, 1970).

Furthermore, the reasons for Indigenous tracking of resource data were not implicated in the goals of mass persuasion for the purposes of capital accumulation.

A potential response to the assertion just made (that Indigenous mapping has not had capitalistic goals) might be that Indigenous peoples *should* be more concerned with marketing, with selling themselves, with promotion for the purposes of economic self-sufficiency and survival. Indeed, this is occurring presently, though not always in a consciously spatial way. Indigenous individuals and groups are beginning to assert their economic and practical know-how through diverse projects. These projects can include such marketing tactics as the use of logos with Indigenous art work on them, which in turn might be included on maps.

An example from the Okanagan region of BC is the production and sales of wine by Indigenous individuals in the Nk'Mip Cellars wine company, which is a "joint venture between the Osoyoos Indian Band and Vincor, a large Ontario-based wine firm" (*Economist*, 2002: 36, article entitled "From Whine to Wine"). A second example is the acquisition of urban land parcels for the purposes of business development in downtown Winnipeg. This practice has been criticized by other businesses in the area as giving unfair competitive advantages to First Nations' businesses which would not pay taxes due to their "Indian" status (*Globe and Mail*, Wednesday, September 21, 2005, "Plan For Urban Reserve Divides Winnipeggers").

The *Economist* article is instructive in pointing out the positive benefits of business development for Canada's Aboriginal peoples, noting that there are now 20,000 Indigenous-run businesses in Canada in areas as diverse as sawmills to wine-making. GIS is applicable (and maybe indispensable in mapping soils/climate overlays

to locate areas suitable for grapes to go into wine) in many of these areas of business. As is well-known, GIS is a powerful marketing tool, with the ability to target potential customers at a sub-block level (Monmonier, 2004). Ethical hesitations aside, a corporate structure may be just what Indigenous organizations need. However, this does not make GIS any less a technology infused with colonial assumptions.

Another comment was made that “if people were still on the land, present day problems of overlapping territory and of conflicting claims would be fewer because people would meet their cousins.” There are a few assumptions to unpack in the statement by this interviewee. The first is the implication that the people are not still on the land. On the face of it, this would seem not to hold true. Obviously, people (Indigenous or otherwise) are on the land, as evidenced by the presence of people (and their vehicles) on the roads running through the traditional territories of First Nations peoples. It would seem not too far a stretch to say that the Indigenous people on the land are on the land *in a different way* than they or their ancestors were in the past. They may still be involved in hunting, fishing, or social activities, but the means for achieving their goals have changed.

The second assumption is that face to face interaction is qualitatively different from other types of interaction. Inherent to this assumption is that people nowadays do not “meet their cousins.” There might be a number of reasons why people don’t meet their cousins nowadays (leaving aside for the moment whether or not this is actually true). One reason might be that people nowadays do not interact. Clearly this is false, people do interact. But the way people interact involves changing technologies such as the telephone, email, or television, as well as mail and traditional, face to face

conversation. So the number of modes of communication has increased in recent history. This might mean that more interaction is possible due to the increased number of ways of interacting, which in turn might mean that the proportion of face to face interaction relative to other modes decreases.

What remains to be proven however, is that decreased face to face interactions with one's kin (cousins) results in more conflict. If conflict is predicated on rigid and hierarchical assertions of territorial identity (see Agnew, 1998; O'Tuathail, 1996; Sterritt et al., 1998) then exactly how does less face to face interaction increase conflict? It can be argued that in fact, face to face interaction is *more* confrontational than other more mediated forms of interaction (Sterritt et al., 1998).

On the other hand email, telephone, or video interaction are much more capable of breaking down or transgressing rigidly asserted national or other boundaries (gender, class or ethnic). The democratic and egalitarian potentials of the internet and related technologies have been asserted time and time again. Other authors have argued the opposite, that far from promoting interaction and equality, internet and related technologies actually promote passivity, apathy, and hierarchy (Zizek, 1997; Huws, 2003).

Moving to further comments by interviewees now, it was noted by one interviewee (#7) that Nisga'a style land claims settlements are "American style big reserves." This implies that claims such as the Nisga'a represent not progress, but a bigger cage. The increased space (an increase over reserves) allotment of the Nisga'a land overlays a municipal type government coexisting with federal and provincial controls on a portion of the traditional territory of the Nisga'a people. Furthermore, as

Richard Daly (2005) has pointed out, the Nisga'a accepted a band-style political structure that was originally imposed by federal governments. This (according to Daly) contrasts with the decentralized approach of the Gitksan and Wet'suwet'en for whom power is distributed across the land commensurate with the traditional house/clan system.

The seat of Nisga'a government in New Aiyansh is an impressive architectural and symbolic feat. Carved wood totems and artwork stand as sentinels around the curved glass and wood structure at the crest of a rise in the largest village (population approximately 1000) in Nisga'a territory. A cheerful and productive attitude pervades the offices contained within, and for good reason. "The Nisga'a are a positive people," as one interviewee put it.

The two approaches (centralized/Nisga'a and decentralized/Gitksan-Wet'suwet'en) essentially amount to the same thing: co-management of resources. While the Nisga'a have in fact achieved this laudable goal, the Wet'suwet'en have only achieved it to a lesser degree, or in a less obvious way. The Nisga'a furthermore operate within an inscribed space (denigrated by the interviewee as a large reserve) which focuses attention inward, to the centre of the territory, and to the symbolic seat of government. The Gitksan/Wet'suwet'en approach is more diffuse, though maps of their traditional territories tend to inscribe a disembodied territorial unit. Both approaches, by emphasizing inscribed spaces, are caught by the territorial trap, which is the delimiting of identity by way of decontextualized, free floating representations of territory.

A re-linking through the realization of commonality is in order. Co-management may be a desirable goal for all Indigenous groups in north western BC. Indeed, it was pointed out by this interviewee (#7) that twenty years ago, co-management of resources was not discussable. Now at least it is discussed as a real possibility for the Gitksan-Wet'suwet'en, and it has become real for the Nisga'a. The alternative is continued divisiveness between First Nations and provincial and federal government, and a perpetuation of walls that divide these camps, walls that can only shelter bigotry and misunderstanding. A blending of the concepts "Indigenous" and "government" could foster a liberating hybrid approach, moving past stalled stereotypes built in the mud of grudges.

Another interviewee (#6) said, "to get good at GIS you have to get good at not-GIS." This quote by an Indigenous GIS practitioner goes straight to the heart of ethics and GIS. The emotive/empirical divide described in chapter 2 cross cuts the GIS/not-GIS distinction, and highlights points about GIS training program curricula, which tend to focus only on GIS (and not on topics outside of GIS).

Interviewee #6, on the other hand, might be inferred to believe that GIS programs should not be so exclusive (though the interviewee did not state this). It is interesting to think about GIS in the context of not-GIS, especially in terms of formulating a more open, less reified, and critically informed practice. If GIS practitioners allow GIS and not-GIS to overlap, there will be not only a less cloistered and exclusive feel brought to the offices of the 'experts', but it might also allow for GIS to be 'friends' with other disciplines (Derrida, 1997). The irony here is that GIS is supposedly open to any and all disciplines, with its flexible and extensive software

framework. Databases (spatial or not) are not picky about types of information they include, nor are maps, but it seems to be the technicians who end up defining that status quo of GIS, which in turn would seem to introduce the bias of the technician. This bias of the technician is akin to the bias of the cartographer pointed out by Harley (1989) and Wood (1992). But the problematic of the cartographer is updated to meet the challenges of newer techniques including GIS.

For GIS to be 'friends' with other disciplines, it may (as a practice) need to become consciously political. Derrida, working Carl Schmitt's theories through deconstruction, breaks down the friend/enemy distinction until the two terms are blurred and contaminating of each other. This GIS as a practice must do, and it is the essence of this interviewee's comment. To clarify, political GIS practitioners must try to blur, to contaminate, purities that exist within GIS practice. This might be achieved by many different means, both subtle and overt, and it starts with changes in attitude and questioning, as well as the active politicization of technological issues. First and foremost technicians must overturn their belief in the neutrality of technology. This will be more or less difficult depending on how ingrained the belief in the neutrality of technology is. This is in turn possibly affected by the technician's position in society, his or her identity, class, gender, and many other factors.

Technicians, practitioners, and managers would do well to study the arts, both visual and verbal, for insights into their own practices, and for 'sensitivity training' in terms of identity formations in the visual and textual (verbal) arts. Thus, paintings and poetry, representing not-GIS, might come to inform GIS, mapmaking, and geomatic practices (Harmon, 2004). Conversely, visual artists and poets have shown themselves

more than willing to bring maps, GIS-like layering of themes, and technological devices into their art (see Graves, 1996; Ashbery, 1999). GIS practitioners may object that this is distracting, or worse, destructive of what is a methodical, logical, and positivistic (or at least objective) discipline, one that always looks for use-value. However, it is clear that both art and interdisciplinarity have use-values, and thus can be implicated to have use-value for GIS.

The foregoing discussion represents a blurring of the lines between GIS and other disciplines. This blurring, or even contamination (in which binary categories come to contain parts of their opposites), is desirable, which is corroborated by the fact that it has been suggested by those working well within disciplinary boundaries, by the GIS 'experts.' The politicization and deconstruction of GIS must continue in order for GIS itself to flourish. At this point, it does not seem premature to draw some tentative conclusions about what amounts to the decolonization of GIS. It is to this task that I now turn.

6. Conclusion and Summary

[W]here there is power, there is resistance, and yet, or rather consequently, this resistance is never in a position of exteriority in relation to power...[This] depends on a multiplicity of points of resistance: these play the role of adversary, target, support or handle in power relations. These points of resistance are present everywhere in the power network.

-- Michel Foucault, *The History of Sexuality*, Vol. I (1990)

“In general I think it is difficult to delineate a geographic area from an Indigenous perspective because of the interconnectedness of the individual and locale to the ‘universe’ perspective.”

-- Interviewee #9

If the answer to the question posited in this thesis (to what extent is GIS a colonial technology?) can be answered “to some extent” or even “to a large extent,” then how can the GIS community and concerned others begin to decolonize Geographic Information Systems? Within a discipline that prides itself upon objectivity, the laudable goal of rooting out bias should (one would think) be met with open arms. My own experience has shown the contrary to be true. GIS practitioners have been all too ready to skip lightly over, or worse, meet with hostility, dissenting views from the GIS status quo. That status quo focuses solely on technical matters to the exclusion of ethical ones. This limited focus might be referred to as the colonization of GIS practices. Thus, decolonization has a double reference: first to the decolonization of Indigenous lifeworlds (Habermas, 1989), and second to the decolonization of the

lifeworlds of GIS experts and practitioners. This double colonization of lifeworlds is a problem worth some thought.

The solution to this problem lies in changing the way in which GIS is framed and the scale, on an organizational and interorganizational level, at which it is viewed. This would be a move in the direction of a holistic (non-fragmented and non-reified) view of technology as fitting within Information Ecologies (Nardi and O'Day, 1999). In Information Ecologies (containing people, practices and technologies), the 'keystone species' (Nardi and O'Day, 1999, p. 51) will hopefully be Indigenous geographers. Boundaries in Information Ecologies, like in other ecologies, are approximations and negotiations of phenomena that, in reality, are fuzzy. The inscription of boundaries to indicate sovereign borders are incommensurate with traditional Indigenous activity *on* the land (not traditionally inscribed *in* the land with fences, markers, and maps), but they will be acceptable reifications, given that they will hopefully be embedded within a holistic structure. The strategic move of inscribing boundaries serves the greater purpose of self-determination. Information Ecologies also allow for a respect for difference. Different Indigenous organizations will structure themselves in ways they feel comfortable with. This may or may not include GIS (though it will almost certainly involve technology). By including difference, pan-Indigenous prescriptions might be avoided, so that some degree of autonomy or choice remains intact, so that rigid determinisms, or illegitimate erasures of spatial and temporal specificities, may not hold sway. Adding to the recognition that boundaries are (historically and today) porous, overlapping, and negotiated, one might attempt to sketch out the hybrid and smooth nature of many boundaries. Hipwell (2004) has explored how the spaces of difference

are inherently smooth (contrary to the notion that difference is somehow an etched, inscribed, or hard boundary). In the transition zones between different identities new hybridities can be theorized. These zones can be simultaneously seen as in-between places, or gaps, that are themselves constitutive of identity (Bhabha, 1994, p. 60). Hardt and Negri (2000, 2004) have shown how the multitude battles Empire by way of new technologies such as the internet and GIS. This involves schizophrenic de- and re-territorializations of the earth, of matter, and of subjectivity (Deleuze and Guattari, 1987). It is hoped that this thesis has shown how Indigenous peoples and their allies might join in the struggle of such a multitude to fight the homogenizing forces of Empire and colonialism.

The conclusion reached here, that GIS does contain colonial assumptions, cannot hope to quantify the degree to which colonial biases are a part of this technology. Rather it can only be admitted that these biases exist in GIS, and that they do to some degree tint knowledge gained through the use of GIS. As a concluding argument for this thesis I would like to stress that alternatives are possible, and GIS practitioners must act in such a way as to permit change. In this way, GIS practitioners might begin to decolonize their lifeworld, and those affected by their decisions; in short, to take responsibility for the *occasion* that is GIS (Heidegger, 1977). Viewing GIS as an occasion for bringing forth certain ways of seeing that are not privileged over alternate ways of seeing will be very important. This will be no easy task, but perhaps considering the ethics of GIS within GIS classrooms would be a good start. Given the reification of GIS lifeworlds too much emphasis on ethical and philosophical concerns would probably seem very odd, and would certainly be considered a waste of time by

students who are paying for hands-on knowledge. But a part of the educational process within universities and colleges, albeit within a liberal framework, should include such qualitative information alongside quantitative and technical information. In this way a more nuanced and integrated GIS practitioner might be produced.

The significance of this research and the importance of exploring the main question posited (to what extent is GIS a colonial technology?), are linked to the increasing demand for GIS by Indigenous groups in Canada and elsewhere. Such a study is warranted on the grounds that these groups of people might make better decisions about what GIS can do for them, and about the impacts of GIS on the community (Duerden, 1996). This study is further warranted on the grounds that the urgency for decolonizing projects has never been greater, given the current number of ongoing land claims negotiations in British Columbia presently, and the current political (liberal) context in that province, one that is hostile to Indigenous peoples and their land claims. By placing myself within this project, I hope to add a piece to a greater struggle, joining what might be seen as the global 'counter-struggle' of Indigenous people.

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