Indigenous Mapping in the Cloud: A White Paper on Privacy, Ownership, Access and Security issues for First Nations using Google Geo-Tools

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First Nations use a range of technologies to assist in documenting their connections to and relationships with the land. Once this knowledge and cultural practices are documented, the data can be used in a range of applications from supporting indigenous governance decision-making to supporting cross-cultural understandings about indigenous territories, both within and outside of their communities. However, while geographic information and cloud-based

First Nations concerns about the exploitation and misuse of their traditional knowledge stems from the historical and current experience of misappropriation and exploitation,[1] which is connected to a lack of respect for Indigenous legal systems. When traditional knowledge is placed on the internet, respect for indigenous laws is needed not only by members of an indigenous community, but by everyone interacting with the traditional knowledge. An example of a First Nation in Canada asserting their own laws over intellectual and cultural property in the context of research is the National Aboriginal Health Organization's (NAHO) principles of Ownership, Control, Access, and Possession ("OCAP").[2] These principles are rooted in values of self-determination and inherent rights. The OCAP principles are intended to ensure that research involving First Nations does not cause harm to the First Nation, helps to increase research capacity and interest within the First Nation, and is beneficial and relevant to the community.

The OCAP principle of ownership is achieved when "a community or group owns information collectively in the same way that an individual owns their personal information."[3] Ownership can be contrasted with 'possession', ownership is about legal

First Nations' specific interests. Canadian laws codify and give enforceability to western legal and customary regimes. Canadian privacy legislation is focused on protecting "personal information", and is not tailored to protect community knowledge.[10] Canadian intellectual property laws are not about ensuring the appropriate transfer of information according to First Nations' specific protocols and laws, but are about regulating the production of knowledge in a way that promotes the generation of wealth and encourages research.[11]

Canadian intellectual property laws protect a range of creations and inventions by assigning a bundle of legal rights to the creator or inventor. For example, copyright law protects the creator of an original work by giving the creator an exclusive right to produce or reproduce the work. Examples of copyrightable material include, "poem, painting, musical score, performer's performance, computer programs".[12] The inadequacy of intellectual property law to protect traditional knowledge can be seen to stem from the underlying commercial purpose of Canadian intellectual property laws.[13] For example patent and copyright protections have a time limit, which allows others to eventually utilize and benefit from the invention or work. This may be inconsistent with protocols that govern the transfer of traditional knowledge in First Nations communities. Further, intellectual property may work against First Nations by granting rights to those who collects, frames, or records traditional knowledge. Thus First Nations may need protection from intellectual property rights being asserted by outsiders.[14]

Intellectual property protection often requires a qualitative element, for instance copyright requires originality and patents require inventiveness. Thus though an original dance may be copyrightable, a dance that is linked in a certain way to a dance of an elder, may not be sufficiently original for protection under copyright.[15] The problem is thus two fold, the things contained in the category of traditional knowledge do not 'fit' perfectly within the category of things protected by intellectual property laws, and the protections granted by intellectual property law are not the same as the protections First Nations desire for their traditional knowledge.

Though Canadian law does not by default include First Nations legal orders, there is room for First Nations to design contracts that support their own proprietary laws and protocols. The contracts governing the use of Google services are pre-written without First Nations input. To demand that Google create individualized contracts to suit each users needs may not be technically or economically feasible. Thus, instead of the management of data being guided by the idea of informed consent, as it would in a research situation, the burden is on First Nations to understand and accept a contract in a 'buyer-be-ware' framework. It is important to both strive to make First Nations legal orders more apparent in the realm of Internet services and to explore how First Nations may navigate and understand the current terms of contract.

[10] https://www.priv.gc.ca/resource/fs-fi/02_05_d_15_e.asp (The Canadian federal legislation PIPEDA controls how private-sector organizations us

Google's Geo-tools are a wide range of programs that utilize mapping technology to display geographic information.[16] They allow users to develop products from Google's extensive base map. For instance, Google Fusion Tables turns a spreadsheet of coordinates into a map, allowing a user to spatially visualize data points. Projects such as documenting land use and occupancy, sharing stories that are intrinsically connected with place, or revitalizing place names, are well suited to geo-tools as these programs excel at sharing knowledge that has a geographic element.

Many (but not all) of Google's geo-tools utilize a technology called "cloud computing" to create accessible and collaborative tools. Cloud computing refe

A common problem flowing from the concern about inappropriate use of TK is what data to include in a mapping project and to what extent. The more precise the information included. For example, if specific locations of medicinal plants are mapped – there is a risk that persons without knowledge will harvest them improperly, harming the plants for future users.[23] A potential remedy for this situation is to map sites as large polygons, but diminished detail may make a map less useful for First Nations who are interested in creating functional community tools.

A person who understands the context of a map would be able to see that even if only a salmon fishing spot was marked on the map, that the entire watershed is necessary for the continuation of the specific site. Someone who does not understand the context of the information may assume that the only important spaces are the ones indicated on the map. In the past the government has leaned towards site-specific recognition of Aboriginal right and title, and assume that blank spots are unimportant and do not require consultation with First Nations.[24] In 2014 the Supreme Court of Canada stated that the postage stamp approach was inappropriate for Aboriginal title claims,[25] but its recent use may give First Nations fear that making public maps that contain blank space will result in government excluding them from important decision making processes.

A recent example of the problems of sharing geographic data comes from the co-management of the caribou hunt in James Bay. Here the MLCP's impact of the caribou hunt in Cree traditional territory to sport hunters began with engagement and geographic information sharing from the Cree, Naskapi, and Inuit, but ended poorly with disrespect of the First Nation groups, caribou, and the land. The Cree cited many problems with sport hunters that had gained access to their lands including "careless disposal of remains, lack of enforcement, and interference with Cree customary practices."[26] Another problems was a lack of respect around Cree camps and cabins. The CPM failed to indicate the location of camps and cabins through signage because they felt it may create a risk of vandalism and theft – but their approach lead to unsafe shooting by sport hunters around these areas, limiting Cree access to land during the sport hunt.[27] In the long term this policy has not stopped theft from Cree camps and cabins.[28]

Relationship to place is centrally important to many First Nations. Colonization often involves a destruction of the place relationship and participatory mapping can be a way to build back these relationships as well as ensure that TK is preserved.[29] Natural resource development critically affects First Nation's culture and relationship to land, being able to have control in this context is necessary to rebuilding First Nations "social fabric, culture, and traditions".[30] Mapping projects can allow a First Nation to communicate how they use their land, show continuity with past practice, and to share knowledge of sustainable relationships to land with others utilizing shared resources.[31] Mapping projects

[23] http://www3.brandonu.ca/library/CJNS/22.2/cjnsv.22no.2_pg361-398.pdf, 377
[24] http://d3n8a8pro7vhmx.cloudfront.net/ubcic/legacy_url/950/Tobias_whole.pdf?1426350787, 23
[25] *Tsilqhot'in Nation v British Columbia*, 2014 SCC 44 at 60.
[26] Colin Scott & Jeremy Webber, "Conflicts between Cree Hunting and Sport Hunting: Co-Management Decision Making at James Bay" in Colin Scott eds, *Aboriginal Autonomy and Development in Northern Quebec*-Labrador (Vancouver: UBC Press, 2001) 149 at 161.
[27] Colin Scott & Jeremy Webber, "Conflicts between Cree Hunting and Sport Hunting: Co-Management Decision Making at James Bay" in Colin Scott eds, *Aboriginal Autonomy and Development in Northern Quebec*-Labrador (Vancouver: UBC Press, 2001) 149 at 161.
[28] Colin Scott & Jeremy Webber, "Conflicts between Cree Hunting and Sport Hunting: Co-Management Decision Making at James Bay" in Colin Scott eds, *Aboriginal Autonomy and Development in Northern Quebec*-Labrador (Vancouver: UBC Press, 2001) 149 at 165.
[29] Jon Corbett, "'I don't come from anywhere': Exploring the role of VGI and the Geoweb in rediscovering a sense of place in a dispersed Aboriginal community" in D Sui, M Goodchilld & S Elwood, eds,

are an organizing tool for the "collective memory" of First Nations communities and may be a cognizable way to present information to non-land based individuals.[32] Maps can be used by First Nations as evidence to base demand participation in resource management decisions and as evidence in Aboriginal title claims.

Through *Haida Nation v British Columbia (Minister of Forests)*,[33] the Supreme Court of Canada

Canadian laws are enforceable through Canadian courts. The international nature of the Internet and Google, and the resulting issues of conflict of law and jurisdiction can make enforceability difficult.[38] A First Nation's laws are generally not enforceable in their own right through Canadian courts, but may be enforced within a First Nation through social sanctions.[39]

The Canadian legal rights a user has over content before it is uploaded to Google depends on whether or not the user has intellectual property rights in it, or they have mere possession of the content. The contracts that govern the use of content uploaded to Google's geo-tools act to modify these pre-existing bundles of rights – often by transferring rights to Google. The transfer of rights is possible because many forms of intellectual property rights may be reassigned through contract.[40] For instance, the additional terms of services for Google Map Maker grants a very broad license to Google to do almost anything with the uploaded content, including the ability to give third parties permission to use the content.[41]

storage means that unlike with many other Google tools, the First Nation would also retain possession of the data, which limits some avenues of misuse.[53]

Use 2: Educational Context

First Nations engage with Google Geo-Tools to create educational tools and archive information. Tools may include MyMaps, Youtube, Google Fusion Tables and Tourbuilder. These tools provide easy and affordable ways to collect and share data through a range of formats. These tools are interactive and can be used communally through the Google Cloud. As Google geo-tools store data in Google's cloud, this means that Google, not the First Nation has ultimate possession. As NAHO articulates, loosing possession of data opens up the possibility of misuse,[54] but it is this lack of possession that allows for the "access" advantages of cloud computing.

The potential product of Geo-tools are a wide range of things from museum exhibits to class-room learning tools. The information contained is often important to the community, and the community may have protocols for its dissemination and use. This data may have implications for Aboriginal title and rights claims, but it the data is not geared to be used in the legal context.

Compared to the Traditional Use Study, here the focus is less on confidentiality, and more about setting parameters for sharing information that follows the First Nation's protocols.[55] For example a student may film and upload a video of an elder telling a story, and plot the locations the story talks about on a Google Tour Builder map. If the student uses Google Tour Builder to create this story, then the student has the choice of setting it as open to all, open to people who possess the URL, or open to a select list of users.[56] These options allow the student to consider how problematic it would be if the data was not used respectfully, and appropriately calibrate the scope of people who have access to the file. Google, with the exception of legal requests, will not circumvent the User's sharing settings by distributing the information in a way the user has not consented to. The concern may go beyond the use Google makes of information, to potential abuse by third party viewers who either do not understand the importance of the information or respect First Nations protocols.

Use 3: Improving Google's base map

"Google Map Maker" allows an individual to edit Google's base map. This is potentially valuable to a First Nation because First Nation reserves are often not well documented on Google's basemap. A well-documented basemap is important for a wide variety of reasons including improving the navigability of a location for residents and visitors, increasing the visibility of businesses, and making clear the location of public spaces. Because of Google Maps's prevalence across multiple platforms, not being on the map can make spaces practically invisible.

When uploading content to Google Map Maker, the user is contributing to an explicitly public service – the information is available to any one who has access to Google Maps and should not be sensitive information. The contract a user enters into with Google when uploading content to Google Map Maker works to facilitate the crowd sourcing of mapping and protect Google's ability to generate revenue from its services.[57] The contract grants Google a license to use the information beyond making it available on Google Maps. A First Nation would loose the ability to prevent Google from utilizing the name or location of a place once it is uploaded to the service. Under this license, the user does not get to say which uses of the content are acceptable, so long as they fall within the broad language of the license. This is

[53] First Nations Center, "OCAP: Ownership, Control, Access, and Possession" (Ottawa: National Aboriginal Health Organization, 2007), online: NAHO <http://www.naho.ca/documents/fnc/english/OCAP.pdf>.
[54] First Nations Center, "OCAP: Ownership, Control, Access, and Possession" (Ottawa: National Aboriginal Health Organization, 2007), online: NAHO <http://www.naho.ca/documents/fnc/english/OCAP.pdf>.
[55] Cybercart and Traditional Knowledge Chapter 19, at 288.
[56] Google Inc, *Google Tour Builder Content Policy,* online: Google <https://tourbuilder.withgoogle.com/about/content_policy>.
[57] Google Inc, *Google Tour Builder Content Policy,* online: Google <https://tourbuilder.withgoogle.com/about/content_policy>.

explicitly not in line with the NAHO's principle of control because Google's ability to make decisions without specific consent means that the First Nation does not have long term control over the information management process.

Users are explicitly told to not upload creative expressions through Google Map Maker. The intended content is community knowledge or facts,[58] things that in the Western legal tradition are not protected by intellectual property law.[59] Community knowledge is often exactly the type of knowledge that First Nations wish to protect, thus caution should be taken when using Map Maker.

Policing the Internet and use of Publically/Semi-Publically Available Content

Though Google's contracts and Canadian laws may provide legal protections for content, the actual enforceability of these mechanisms is not guaranteed. Where a First Nation has intellectual property rights, they are only effective if the First Nation can afford to enforce them. If a First Nation finds that a copyrighted work that they have made publically or semi-publically available, for instance a recording of a traditional dance publically uploaded on Youtube, is being improperly reproduced – the discovery alone is not enough to stop the violation. Through an email to the violating party explaining the violation may fix the problem, in order to stop a violation a First Nation may have to engage in a legal process. These processes often require expertise, time, and financial resources. As Canadian intellectual property and privacy laws do not necessarily 'match up' with First Nations legal practices governing the use of their traditional knowledge, a sufficient legal remedy may not always be available when a First Nation sees a violation of their traditional knowledge.

Google does not actively police all the content that is uploaded to its servers or the eventual uses of the content it hosts. The Terms of Service provide that Google will respond to copyright violations, and in the case of repeat offenders terminate accounts.[60] This process requires that a complainant submit a documented legal request to Google.[61] Thus if a First Nation actively polices for the appropriate use of their content, it is possible that Google will help in this effort, but Google will only take down content that is illegal or violates its own terms of service. These policies are not necessarily in line with First Nations own legal systems for controlling the dissemination of TK.

[58] Google Inc, *Terms of Service for Google Map Maker*, online: Google <https://www.google.com/mapmaker/intl/en/mapfiles/s/terms_mapmaker.html> ("The Service is intended to reflect the local knowledge of users, and is not intended as a place for users to upload information obtained from third parties, such as directories, compilations, printed or online maps, or similar sources of information, including copyrighted content. Because the Service focuses on documenting factual information rather than creative expression, there are certain types of information that are not suitable for submission, and will not be accepted in the Service, as described below.").

[59] Robert G Howell and Roch Ripley, "The Interconnection of Intellectual Property and Cultural Property (Traditional Knowledge)" in Catherine Bell & Robert K Paterson eds, *Protection of First Nations Cultural Heritage: Laws, Policy, and Reform* (Vancouver: UBC Press, 2009) 223 at 228 (A patent can not be derived from something that is 'community knowledge' because it would already be in the public domain.).

[60] ("We respond to notices of alleged copyright infringement and terminate accounts of repeat infringers according to the process set out in the U.S. Digital Millennium Copyright Act.").

[61] https://support.google.com/legal/topic/4556931?hl=en&ref_topic=3463371

A First Nation may be concerned about the Canadian Government's ability to access data on Google's servers that the First Nation has made "private" or "protected" through either a request to Google or hacking. As the Government is in a pos

storage on a US provider's cloud. As the MLAT processes consume valuable time and resources,[70] orders are limited by criminal requirements, and Google does not automatically grant information requests, it is

When surveying Idle No More, a First Nations group, it appears that CSIS engaged mainly in monitoring through social networks and public forums.[81] This investigation would be similar to viewing an open Google Tour Builder Map or accessing a Google Fusion Table through a shared URL. It does not appear that a warrant was used in the Idle No More surveillance, or that it would be needed in the equivalent situation on Google's services. A warrant would likely be required for a CSIS s 12 investigation that uses intrusive investigative methods, including the interception of electronic communications or accessing private data.[82]

In order to obtain a warrant for this purpose, CSIS must satisfy the Federal Court that CSIS has followed the procedures as laid out in s 21. The warrant application must show that there are reasonable grounds to believe that the warrant is necessary for CSIS to investigate a threat to the security of Canada and that other investigative techniques are insufficient, impractical or unlikely to work.[83] If these two conditions are satisfied, then a Federal Court Judge may authorize a warrant.[84] In 2012-2013, 71 new warrants were received from the Federal Court of Canada and 165 warrants were replaced or renewed.[85] There is no specific data as to how many of these warrants were related to First Nations rights or governance issues.

With a section 21 warrant, CSIS may ask the Communications Security Establishment ("CSE") to engage in intrusive investigative methods. The legislation defining CSE's mandate only allows the CSE to direct its actions at Canadians or persons in Canada when the actions are taken under their "assistance mandate"[86] which allows for the provision of "technical and operational assistance to federal law enforcement and security agencies in the performance of their lawful duties".[87] When CSIS has a section 21 warrant, they may task CSE to target a First Nation's data. The warrant can approve anything from hacking into a server to access data, to asking a foreign intelligence agency for help in obtaining data – but must be approved by a judge. CSE's membership in the "Five Eyes" intelligence network means that even if CSE does not itself have the expertise to access Google servers, it may be able to achieve this through another agency.

The Five Eyes Network – PRISM and MUSCULAR

The Five Eyes is a network of intelligence agencies from the United States, the United Kingdom, New Zealand, Canada, and Australia.[88] The most recent publically available version of the agreement governing the Five Eyes network is the 1957 UKUSA

PRISM is a intelligence program enabled by the *Foreign Intelligence Surveillance Act*[91] that allows the NSA to demand that an Internet service provider (ISP) give specified data to the NSA.[92] This data can include, "E-mail, chat, videos, photos, stored data, VoIP, file transfers, video conferencing, notifications of target activity—logins etc., online social networking details, and special requests."[93] "Stored Data" could include both u

States and it is part of a lawful foreign intelligence investigation, no warrants or court orders are needed for the program per Executive Order 12333.[103] This program does not require the participation or even knowledge of an ISP to function.

The fact that intelligence operations can be run through foreign intelligence agencies, such as the five eyes network, is confirmed by a recent Federal Court judgement that clarified that CSIS does have the legal authority to seek assistance, through CSE, from foreign partners to intercept the communications of Canadians while they are outside of Canada, if there is judicial oversight.[104] The Federal Court has jurisdiction to issue these warrants "when an interception is lawful where it occurs".[105] What this judgement does not specifically state is that the Federal Court can issue a warrant that allows CSE to gain assistance when spying on a Canadian who is currently *within* Canada. This may be seen as against the 'rule' that international agreements will not be used to skirt domestic law, and the statement that the Five Eyes Network partners do not use the network to evade national laws.[106] But if it is the case that the Federal Court would grant a warrant for CSIS to pursue an investigation, and that they are merely seeking technical assistance to do what they otherwise would legally allowed to do, then they would not be using a foreign agency to avoid domestic law. CSIS is not prevented from surveying Canadians, but is required to follow legal processes when it does.

Snowden Backlash

In the wake of the Snowden disclosures, changes have been made to the way US intelligence agencies conduct surveillance of US persons and domestic surveillance. Changes in the US have lead to greater protection of US persons, but these changes do not aim to stop the US from being able to run programs that target Canadians. A similar move aimed at overbroad surveillance can be seen in Canada, where civil liberties groups have opposed CSIS spying on Canadian's exercising democratic rights. But recent changes to Canadian legislation have decreased Canadians protections from surveillance. Bill C-51 has increased the powers of CSIS by giving it 'kinetic' powers to take measures to reduce security threats[107] and also increased the ability of specific government agencies to share information.[108] The combined effect of these laws is to increase the ways in which Canadians can be surveyed and the ways in which this information can be used. Surveillance in Canada has had an 'anti-terrorism' focus, but recently there has been publicity about the monitoring of First Nations and Environmental 'radicals'.

Google and other Internet service providers have been working for more transparency about intelligence gathering processes. When Google receives a request for information it will notify the

in which the information was initially gathered imply place restrictions on how the government can use data. These limitations on government use of data provide a framework for a First Nation to make informed decisions about the use of Google Geo-tools.

Mandate of Agency Restrictions

The potential capacity of the Canadian government agencies to access Canadian's internet data is limited by the legislated rules and policies governing these agencies. Generally the government cannot engage in random intrusive searches – for instance ATU use is limited by the requirement of relation to a criminal investigation[116] and the statutory requirements for the CSIS section 21 warrant ensure proper justification for intrusive searches.[117] These requirements have the effect of preventing random searches of a First Nations internet data. The assurance provided by the Federal Court oversight of section 21 warrants may be limited by past instances where CSIS has lacked candor in this process.[118] Both of these

only exemption whose use must be reported to a review committee, indicating that it is a 'special case' exemption.[123] Sharing information relevant to a First Nations land claim may be in the public interest, but if this information has been acquired through intrusive measures then it also involved a violation of privacy. The process that approved the section 21 warrant would have occurred on the basis that the purpose of the investigation was the investigation of a security threat. Just because a court approved the violation in the original circumstances of the investigation does not mean the violation would be justified for other purposes.

Though CSIS is subject to restrictions regarding who it can share information with, the recent Bill C-51 has acted to increase information sharing between government agencies by introducing the *Security of Canada Information Sharing Act*. This act allows any Government of Canada institution to share information on its own accord, or by request, with a Government of Canada institution contained in Schedule 3 of the act, subject to any legislative provisions.[124] Though the attorney general, the agency representing the government in land claim negotiation or title cases, is not on this Schedule, the legislation shows a trend towards unrestricted information sharing amongst Canadian government agencies.

While law enforcement and intelligence agencies are subject to strict regimes controlling the spread of information, other Canadian agencies are subject to different rules. Aboriginal Affairs and Northern Development Canada's "Aboriginal Consultation and Accommodation" guidelines explicitly encourage federal departments and agencies to share information about potential and established Aboriginal rights of Aboriginal groups across Canada.[125] Both Federal and Provincial Canadian governments keep databases of information on ancestral and Treaty rights relating to specific First Nations, that are readily accessible to government agencies and departments – but not accessible by the public.[126] Information publically available or accessible on the Internet through a shared URL may be placed into these databases through the work of government researchers. Once on a database the information is available to all departments having to take strength of claim or take duty to consult actions. A First Nation should be particularly careful about information that is publically available on the Internet and linked to the First Nation as it may end up in these databases.

Use of information in land based decision-making.

Depending on how a government intends to use information it must be collected and handled in a specific manner. Evidence in court is subject to exclusionary rules and must be relevant to a material issue in litigation. Today evidence derived from CSIS investigations is used in court more frequently than in the past. This shift has occurred partially because of the increasing overlap between criminal charges and CSIS investigations.[127] The inclusion of CSIS intelligence information in court rooms has mainly occurred in the realm of immigration or terrorism charges, not in aboriginal title claims.

Intelligence information's status as admissible evidence may be revoked if it is found to have been gathered in violation of the *Canadian Charter of Rights and Freedoms*. This is possible if CSIS pursues an intrusive investigation without a warrant or it becomes apparent that CSIS used the cloak of a threat investigation to pursue information for another primary purpose. In these circumstances a court may find that the evidence was acquired in a manner that violated the *Charter* right against unreasonable search and seizure.[128] If a *Charter* violation is shown, the evidence may be ruled inadmissible by *Charter*

[123] Canadian Security Intelligence Service Act, RSC 1985 c C-23 s 19(3).
[124] *Security of Canada Information Sharing Act* 5(1)
[125] http://www.aadnc-aandc.gc.ca/DAM/DAM-INTER-HQ/STAGING/texte-text/intgui_1100100014665_eng.pdf, 37
[126] http://sidait-atris.aadnc-aandc.gc.ca/atris_online/Content/Search.aspx (ATRIS is the Federal government system used to track Aboriginal treaty and right information)
[127] Kent Roach, "When Secret Intelligence Becomes Evidence" (2009) 47 Supreme Court Law Review 147 at 162, 186.
[128] *Canadian Charter of Rights and Freedoms*, s 8, Part I of the *Constitution Act, 1982,* being Schedule B to the *Canada Act 1982 (UK*, 1982, c 11.