

Spatial Data and (De)colonization: Incorporating Indigenous Data Sovereignty Principles into Cartographic Research

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ABSTRACT

This article asks how a better understanding of Indigenous cultures as inherently scientifically rigorous can change how academic researchers do work in Indigenous communities, and how non-Indigenous researchers, particularly those in fields such as cartography and geography, can learn from Indigenous ideas of protocol and sovereignty as part of the scientific process to transform their work in our communities into something that truly benefits Indigenous peoples. In exploring these questions, this article posits Indigenous data sovereignty and traditional diplomatic protocols as a means of strengthening cartographic and geographic research in collaboration with Indigenous communities and argues that integrating these principles into such research is necessary in work that strives towards decolonization.

Keywords: cartography, data sovereignty, mapping, Indigenous, research ethics, decolonization

RÉSUMÉ

L'auteure se demande en quoi une meilleure compréhension des cultures autochtones comme étant par essence scientifiquement rigoureuses peut modifier le mode de travail des chercheurs universitaires dans les collectivités autochtones et en quoi les chercheurs non-autochtones, en particulier ceux qui œuvrent dans des domaines comme la cartographie et la géographie, peuvent apprendre de la conception autochtone du protocole et de la souveraineté dans le cadre du processus scientifique, afin de faire en sorte que leur travail au sein des collectivités représente un apport positif véritable pour les populations autochtones. Dans l'étude de ces questions, l'auteure attribue à la souveraineté des données et aux protocoles diplomatiques traditionnels autochtones un rôle de consolidation de la recherche cartographique et géographique réalisée de concert avec les collectivités autochtones et affirme que l'intégration de ces principes dans ces recherches est indispensable dans les travaux axés sur la décolonisation.

Mots clés : autochtone, cartographie, décolonisation, éthique de la recherche, représentation cartographique, souveraineté des données

Introduction

If there is one place to learn proper scientific protocol, it is at the encampment to protect Mauna Kea, which began on Hawai'i Island in July 2019. Though colonial agencies and Western scientists have framed Kanaka Maoli (Native Hawaiian) efforts to protect Mauna Kea from further desecration by telescope construction as inherently anti-science, it is clear that science pervades every moment of camp life. In my visit to the camp in August and September of 2019, I attended a class taught at Pu'uuhonua o Pu'u Huluhulu, the learning centre established at the camp, offered by Kaleikoa Ka'eo, an elder and university professor who has been

fighting desecration of the Mauna for decades. In this class, Ka'eo taught us that the Hawaiian language had words for the space-time continuum, and that Kanaka Maoli knew we as humans are made up of the same elements as the stars and that water was the basis for all life, before Western scientists could even dream of such concepts. In saying this, he reminded us that these are examples of how Kanaka culture is inherently scientific, and that expressions of Kanaka culture and self-determination are rooted in that ancestral science, and not the primitive stereotypes Western scientists and colonial agencies assume. Hearing these powerful truths while sitting on the lava beds 7,000 feet up the mountain was an affirming experience for me as an

Indigenous cartographer – in my own work on Indigenous mapping, I have also fought for our traditional practices as Indigenous peoples to be recognized as (cartographic) science within academia and professional spaces, and for our intellectual history to shed the white supremacist cloak that colonial academia has shrouded it in for so long.

However, it was not just the university classes that were guided by Kanaka science. The deep respect for the mountain and surrounding environment and the commitment to maintaining Kanaka cultural knowledge and relationships to the land and allied Pacific Islander communities were evident in every moment and every space in the camp. This is representative of deep knowledge of the mountain, the plants, the stars, the ocean, and the greater ecological systems of which we are all a part.

Moreover, the ceremonial protocols that occurred multiple times a day are a model for doing research and academic projects within Indigenous communities. In my time there, everyone from Kanaka community groups from other islands to a traditional dancer from Samoa, Maori allies from Aotearoa, and Polynesian motorcycle clubs attended and participated in these protocols. Though every group does them differently, the general principles remain the same; you cannot visit territories and communities to which you do not belong without first asking permission to be there, offering gifts and support to the people you are visiting, introducing yourself and saying who you are accountable to, and allowing them to determine if and how to welcome you into their spaces. These protocols happened in the dark under the night sky, in heavy rain, in intense heat and sun, and in near-constant wind. The dedication to these protocols set the tone for the camp and united peoples from across the Indigenous world in a shared commitment to uphold Kanaka self-determination and sovereignty. I was deeply honoured to participate in these protocols myself, and to present our traditional food and jewellery to the kupuna (elders) of the camp – it was one of the most inspiring forms of diplomacy I have ever experienced. To see Indigenous people from across the world come together and demonstrate a strengthening of our bonds as sovereign peoples through the songs, dances, and protocols that our ancestors used when they visited each other, despite over a century of colonial occupation and genocide, was a truly unforgettable experience.

This brings me to the purpose of this article – if protocols and ethics review can be a powerful, moving, and at times beautiful experience in Indigenous communities, then why do we allow Western institutions to make them intimidating, bureaucratic, and something to be dreaded? This is not to say that institutional review boards (IRBs) or other ethics boards carrying out human subject reviews should be dissolved – they serve a crucial purpose; they should protect research subjects from harm and exploitation, though they often serve instead to protect institutions

from litigation. It is simply to say that the existing system is not enough and should be enhanced or modified to better account for Indigenous epistemologies. In this way, I ask, how can a better understanding of Indigenous cultures as inherently scientifically rigorous change how academic researchers do work in Indigenous communities? How can non-Indigenous researchers, particularly those in fields such as cartography and geography, learn from Indigenous ideas of protocol and sovereignty as part of the scientific process to transform their work in our communities into something that truly benefits Indigenous peoples?

Cartography in Indigenous Communities: A Brief History of Where Things Have Gone Wrong

It is commonly understood that cartography has served as a tool for colonial occupation of Indigenous lands worldwide. Western forms of mapping, for example, have been a part of the treaty-making process and the colonial rule of law in the United States and Canada for centuries, and maps were used to clearly delineate arbitrary lines between where Indians were allowed to be and where they were not, and for which land belonged to which thieves. Mapping expeditions such as Lewis and Clark's were not just efforts to explore the terrain of the continent; they were imperialist research projects aimed at charting land and resources for the taking. Violent colonization and genocide of Indigenous peoples would not have been possible without such mapping projects, and much of the cartographic knowledge we take for granted today was engineered as part of efforts to streamline colonization.

Once methods like these were developed, they were perfected in land-based policies such as the Dawes Act, which stripped Indigenous peoples of their communally held treaty lands and transformed them into privately owned allotments, in an effort to force Indigenous people to embrace ranching and assimilate into American culture. All the remaining allotments not portioned to Indigenous people were auctioned to the general settler public. In this way, the cartographers who had the power to draw the allotment maps engineered one of the largest dispossessions of Indigenous people from their lands in US history, without ever having to leave their drafting tables, and crafted geographies that we still navigate today. [Bryan and Wood \(2015\)](#) have also written extensively on the ways in which maps have been utilized in violent colonization of Indigenous peoples. Indeed, their book *Weaponizing Maps* traces detailed histories of the ways maps have been used in colonial and imperial efforts throughout the Americas.

Yet maps are not inherently colonial; Indigenous cultures throughout the Americas and the rest of the world have their own mapping practices, and many Indigenous cartographers now use maps as a way to assert tribal sovereignty and Indigenous self-determination. Despite all of

this, the common “knowledge” that remains teaches us that maps are an invention that took place outside the Americas, and academic engagements with Indigenous communities and mapping, such as *Weaponizing Maps*, deconstruct maps as merely a colonial tool weaponized by Western cultures. In that sense, there exist a dual hyper-visibility of the violence of Western maps and intentional invisibility of Indigenous mapping practices, which bolsters ongoing settler colonization by denying Indigenous intellectual histories and silencing Indigenous expressions of title to land, self-determination, and sovereignty. Palmer (2012, 77) describes this process of extracting geographic knowledge from Indigenous peoples and then erasing Indigenous intellectual histories as “a form of cultural assimilation that incorporated the people, land, and information into the fabric of scientific cartographic representations,” arguing that this functions as a means of consolidating colonial power that continues to this day in agencies like the Bureau of Indian Affairs.

I make this argument as well, in an article titled “Indians Don’t Make Maps: Indigenous Cartographic Traditions and Innovations” (Lucchesi 2018). In it, I write that

colonial maps themselves are mobilized as weapons in ongoing occupation and theft, while scholastic and popular rhetoric on cartography as a medium and discipline function to assert colonial power of representation. This rhetoric, which has now become canonized as disciplinary creation story, tells us that Indians don’t make maps and cartography is a Western science. In this way, colonial mapping has not only denied the political sovereignty of Indigenous peoples, but also visual and intellectual sovereignty in representing Indigenous cultures, nations, and lands for themselves as they see fit . . . Honoring and reclaiming Indigenous mapping praxes is a crucial element of working towards restorative justice for Indigenous peoples. Both the historic maps and continued work [explored in this article] represent a rich intellectual history and significant contributions to cartographic science, but more largely, provide a pathway with which Indigenous people are able to reclaim their relationships and responsibilities to their homelands, and interrogate how those stories may be told. (Lucchesi 2018, 11 and 25)

With this perspective in mind, I would like to make my final argument on why current practices in cartographic research do not serve Indigenous communities – the trend of participatory mapping in Indigenous communities is not all that participatory, and largely remains exploitative and deeply rooted in colonial epistemologies. However, to the best of my knowledge, no comprehensive survey has been done to assess how many participatory mapping projects

led by non-Indigenous researchers in Indigenous communities are a product of direct and initial solicitation by members of the communities themselves. Based on my experience as an Indigenous cartographer and scholar in the field of geography, they are rare. Much more commonly, these projects are the result of a niche interest of an academic, and while they may have approval and participation from the community, such cartographic projects are not necessarily reflective of community priorities or do not sustainably build the capacity of the community to do its own mapping. More importantly, they rarely are done by Indigenous cartographers ourselves and rarely incorporate Indigenous epistemologies and mapping practices. Working from the assumption that Western mapping is the only kind of mapping, these projects import Western styles of mapping into Indigenous communities, hand community members the pencil and ask them to draw their knowledge on a topographic base map, and then leave, only to analyze the “findings” in a university office somewhere far removed from the community, with a Western frame of understanding. It is also important to note that these researchers are getting salaries, fellowships, grants, and publications from these projects, while many of the communities they work in struggle to have their basic human rights respected.

More largely, this recycled centuries-old assumption that Indigenous peoples cannot or do not make maps is couched in a broader understanding of Indigenous cultures as unscientific, which remains pervasive in academic and research circles, as well as in the popular imaginary. Maggie Walter and Michele Suina (2019) address some of these concerns in their article “Indigenous Data, Indigenous Methodologies and Indigenous Data Sovereignty,” citing a widespread “presumption that qualitative methodologies and Indigenous methodologies are natural partners and that quantitative methodologies, by nature, are Western.” They go on to debunk this presumption, writing that “Indigenous peoples are, and have always been, highly numerate in how we understand our worlds. Complex formulas and calculations underpin/ ned Indigenous cropping, hunting and navigation to name just a few traditional daily activities” (Walter and Suina 2019, 233). In this sense, scientific rigour was and remains a matter of human and cultural survival for Indigenous peoples – the cultural practices that sustain our peoples and the lands we live on require it of us. Gregory Cajete has also written on this idea in his book *Native Science: Natural Laws of Interdependence* (2016), as has Robin Wall Kimmerer in her book *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge and the Teachings of Plants* (2015).

This argument that Indigenous cultures are inherently scientific does not work from an understanding of “science” as a standard to strive to attain, nor does it presume that Western practices understood as “science” meet that hypothetical standard. Likewise, this argument is not about defending the validity of Indigenous epistemologies by

comparing them to Western practices. Instead, it seeks to position Indigenous practices as science in their own right, without a need for comparison. Indigenous science, and all the culturally specific variations of epistemologies and practices within it, does not need to prove itself (and certainly Western science never had to do so) or be measured or quantified; it simply needs to be acknowledged as valid and made space for.

Indigenous Data Sovereignty and Land-Based Best Practices

Indigenous data sovereignty is a term used to describe Indigenous peoples' rights to own data about themselves and their communities and to determine who accesses those data and how they are used and what data on their communities are collected and how. In a broader sense, it is thus a right to have leadership in production of knowledge for and about Indigenous peoples. In their edited volume, *Indigenous Data Sovereignty*, Kukutai and Taylor (2016) make a compelling argument that Indigenous data sovereignty falls within the scope of the United Nations Permanent Forum on Indigenous Issues and the corresponding United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), as part of a larger landscape of rights to self-determination. Indeed, in the opening chapter, Kukutai and Taylor (2016) describe Indigenous data sovereignty as "the inherent and inalienable rights and interests of indigenous peoples relating to the collection, ownership and application of data about their people, lifeways and territories" and affirm that "indigenous peoples have a right to self-determination that emanates from their inalienable relationships to lands, waters and the natural world, and that to give practical effect to this right requires a relocation of authority over relevant information from nation-states back to indigenous peoples" (14).

The movement to assert these rights spans Australia, Aotearoa, the United States, and Canada (Lovett and others 2019), and it is represented by a growing body of academic and political literature on its application and benefits. Tsosie (2019), for example, explores and compares varying definitions of Indigenous data sovereignty and data governance in her article "Tribal Data Governance and Informational Privacy: Constructing 'Indigenous Data Sovereignty.'" In so doing, she cites the work of Desi Rodriguez-Lonebear and Stephanie Russo Carroll, co-founders of the University of Arizona Native Nations Institute's US Indigenous Data Sovereignty Network (USIDSN), as a major contribution to the field and references USIDSN's definition of Indigenous data sovereignty: "a global movement concerned with the right of Indigenous peoples to govern the creation, collection, ownership and application of their data" (US Indigenous Data Sovereignty Network 2018). Notably, Desi Rodriguez-Lonebear (2016) has also written on what it means to be an Indigenous "data warrior" and why they

are critical to tribal sovereignty, powerfully demonstrating how data are a tool for nation-building and a frontline battle for Indigenous peoples.

Many of the rights that Indigenous data sovereignty upholds are supported by UNDRIP's framework of free, prior, and informed consent. Moreover, the Global Indigenous Data Alliance (GIDA) recently published a guide to implementing Indigenous data sovereignty using the CARE principles, building on the open data movement's FAIR principles. The FAIR principles call for data to be findable, accessible, interoperable, and reusable, and GIDA's CARE principles additionally call for Indigenous data governance to be upheld through projects that centre on collective benefit, authority to control, responsibility, and ethics. These principles are reflective of Indigenous epistemologies regarding knowledge sharing and care, and they also acknowledge the current political realities and historical legacies of settler occupation of sovereign Indigenous nations and the ways in which data can be weaponized to further entrench colonization or work toward decolonization.

The Indigenous Peoples Specialty Group (IPSG) of the American Association of Geographers created a foundation for incorporating some of these values and practices into work in geography by issuing a "Declaration of Key Questions about Research Ethics with Indigenous Communities" (Indigenous Peoples Specialty Group 2009), which outlines a series of critical questions for researchers to engage in their work with Indigenous communities, in order to strengthen the integrity and quality of the work. In this declaration they write that "Knowledge about Indigenous peoples is not the same as Indigenous knowledge, which is held by the people themselves. Mapping Indigenous lands is likewise not the same as Indigenous mapping, which uses Indigenous methodologies. Simply put, research about 'the other' can be superseded by collaborative research relationships." Though they are rare, there are some examples of work in geography that do represent true collaboration and rise to the challenge that the IPSG's questions ask of us. For example, Candace Fujikane (2016, 2019, forthcoming) has repeatedly modelled powerful collaboration with Kanaka Maoli organizing as an allied scholar and community member, and Mappingback (2019) works as a collective to bring together Indigenous and allied activists, community leaders, and researchers and scholars to share skills and empower Indigenous peoples to utilize maps in their fight against extractive industries.

I build on the IPSG's declaration by arguing that Indigenous diplomatic protocols such as those at the camp to defend Mauna Kea are an expression of political and cultural sovereignty, and their teachings can help us better articulate how to uphold data sovereignty in mapping work within Indigenous communities. These protocols are indeed uniquely suited to guide cartography projects,

because they are rooted in connections to land and territory as well as building relationships across places and cultures.

Since Indigenous trade and migration routes were so extensive, it became necessary for Indigenous peoples to create protocols for visiting and trading with one another, despite language and cultural differences. These protocols thrive today in a variety of forms, and they can include the daily protocols at special gatherings such as the defence of Mauna Kea, but can also occur in projects aimed at the revitalization of traditional cultural practices such as the Polynesian Voyaging Society's successful efforts to utilize ancestral navigational and celestial knowledge to traverse the Pacific Ocean, in activist practices that honour the sanctity of Indigenous territories and work to protect them (such as the Water Walks, which Josephine Mandamin began as a means to protect the waterways of her Anishinaabe homelands), in large annual events such as Canoe Journeys (wherein Indigenous peoples of the west coast of the United States and Canada travel to visit each other's communities in traditional canoes), and in small day-to-day interactions (for example, introducing ourselves in our Indigenous languages and protocols, which may include traditional name, clan affiliation, and lineage). They acknowledge that permission is needed to be on other peoples' territories, recognize that it is an honour to be invited or welcome to visit another community, and introduce ourselves as part of a kinship matrix that includes the people, communities, and land to which we are accountable. These protocols remain today as an important way of building relationships between communities and asserting our identities as Indigenous peoples.

A "best practice" for upholding Indigenous data sovereignty inspired by such diplomatic protocols might be that researchers approach Indigenous communities first by asking permission to be there, introducing themselves and the networks to which they are accountable, and offering their skills and gifts for the community to use as they see fit. This is a radically different perspective from the bulk of academic work done in Indigenous communities, and even the IRB/HSR process as framed by Western institutions, both of which are structured around receiving consent for the researcher to collect something he or she want, rather than asking the community what they need or want. In keeping with the broad tenets of Indigenous data sovereignty, this "best practices" model based on diplomatic protocols tasks us to work with Indigenous communities as a practice of respectful and mindful giving coupled with relational accountability, rather than institutionally sponsored taking.

In what follows, I have attempted to summarize points such as these by offering a practical guide to integrating Indigenous data sovereignty into cartographic research, based on my experiences as an Indigenous cartographer

and review of existing literature. My hope is that in so doing, I can show my peers in cartography and geography that integrating Indigenous data sovereignty into our work can be done in small, concrete daily actions:

- (1) Above all else, the protocols of the specific community you intend to map should be respected, followed, and deferred to. If you do not know these protocols, or anyone you can ask about these protocols, then you are not competent or adequately prepared to do the work.
- (2) Do not assume the community you are intending to map does not already have trained cartographers capable of doing the work you intend to do. Many tribal governments in the United States, for example, have natural resources departments and tribal historic preservation offices with staff who are trained to create maps in a culturally sensitive way.
- (3) Do not solicit Indigenous people to participate in a mapping project they did not ask for. Instead, make it known that you have skills as a cartographer and institutional power and access to funds as an academic researcher that you are willing to volunteer and mobilize to serve an Indigenous community. Then wait to be asked for this help.
- (4) Do not travel to an Indigenous community for mapping-based research if you are not willing to connect with the land *solely* in a manner that the community feels is appropriate. Do not gather plants or medicines without permission, do not arrive with a feeling of entitlement to attend religious or cultural events, and do not expect to map sacred places.
- (5) Do not travel to an Indigenous community for mapping-based research without previously extensively researching the history and ongoing legacies of violent colonization as it affects that community.
- (6) Understand that as Indigenous peoples, some of our most sacred and sensitive information is the knowledge and stories we carry about our lands and significant places. This means that if you are coming to map any of our stories or knowledge, you have a responsibility to develop the cultural and technical competence to do the work in a respectful way. This should include undergoing the community's IRB/HSR process, sharing the work you intend to do with the tribal council or leadership, gathering gifts to give to those who share their knowledge with you, and developing a data storage and use plan in collaboration with the community.
- (7) Be willing to acknowledge that open source mapping platforms could compromise the community's data sovereignty, inform them of that in the planning process, and be willing to explore alternatives and think creatively.

- (8) Understand that you may be asked to create maps that are not for public distribution, that may never be allowed to be published, because they hold sensitive information – view those moments as gifted experiences of trust, not roadblocks to publications.
- (9) Understand that the community has a fundamental right to own the data on their lands and people. Just because you gather it does not mean it belongs to you.
- (10) Do not assume that GIS or other Western styles of mapping are useful or desirable for a project in collaboration with an Indigenous community. Make those options available, but be open to utilizing their own mapping practices in the project, and be ready to defend those practices as legitimate in academic and political spaces.
- (11) Create opportunities to help in building the capacity of the community to continue to create their own maps moving forward. This may mean training interns or assistants, offering free community workshops, mentoring local high school and undergraduate students, giving the equipment and software purchased for the project to the community when the project is finished, and assisting the community with seeking additional funding to support their development and capacity to do their own mapping.
- (12) Do not expect an academic publication out of any collaboration with an Indigenous community. If this is something that you feel would be helpful to them or the project, let them know, ask for their permission, and offer them the opportunity to be co-authors.
- (13) This list comprises recommendations for actions that are largely at the level of the individual researcher; that said, institutions also have a role to play. Academic funding requirements and time limitations can present challenges to researchers, but these barriers in turn require two responses: (1) researchers should attempt to navigate around these barriers by shifting to alternate forms of funding and a project timeline that invests in the work over a longer period of time, and (2) researchers have an obligation to work to remove these barriers as scholars or members of research communities by challenging institutions to shift to better incorporate Indigenous data sovereignty practices into their frameworks.

Indigenous Data Sovereignty and Cartography: Charting a Decolonized Future

In my presentations on Indigenous mapping, I typically get several questions from non-Indigenous audience members who, with all the right intentions, ask me how

they can learn how to do mapping-based research with Indigenous communities in a good way, and support efforts to decolonize as allies. I have attempted to provide some preliminary answers to that question in this article, and would like to offer one more recommendation: it's all about relationships. As researchers, we have a responsibility to build relationships with the communities in which we work, defined by deep respect, humility, and generosity. The research will be better for it, as will our communities. No matter what culture, community, institution, or discipline we come from, we are each diplomats representing something bigger than ourselves; it is on us to represent those things in a good way, and to work with Indigenous communities and sovereign nations with the respect they command and the inherent self-determination they carry.

Integrating Indigenous data sovereignty principles into the work we as cartographers do with Indigenous communities is crucial to building new relationships across cultures, territories, and ways of knowing. It bridges people together in powerful ways through dialogue about the land and places of significance and teaches us to share and honour our differences with respect. It is one of the most literal paths to decolonization, because it requires us to have open, honest conversations about land theft and occupation, land use, differences in epistemology and axiology, and the ways in which land-based knowledge and data can collide to support both colonial and Indigenous systems of power. Doing cartography and geographic research centred on Indigenous data sovereignty and diplomatic protocols also requires an actively decolonizing framework that also centres Indigenous political sovereignty, land title, and self-determination. In this way, cartography grounded in Indigenous data sovereignty becomes a means of charting a decolonized future, in which we uphold Indigenous knowledge and epistemologies as accurate and reflective of millennia of developed expertise, and collectively we strive towards a world in which Indigenous sovereignty and self-determination are recognized and exercised in full.

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