What shall we map next? Expressing Indigenous geographies with cartographic language

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The question of whether something is mappable has been an ongoing presence in my life, or rather, a persistent thorn in my side, as so often when I undertake a project, people say to me, "you will never be able to map that." Would they say to another artist – you will never be able to film that, or paint that, or tell that story in a novel? Why cast doubt only where maps are involved? My experience tells me it might have something to do with societal assumptions and expectations about the content, appearance, and function of cartography: how maps are obligated to look and what they are obligated to include and achieve, and their capacity and potential to do more. When someone then further elucidates, "you will never be able to include everything," I know they assume the map is an inventory, a definition for map with its roots in the information extraction industry of colonial economies. When someone tells me, "a printed map can only take you so far; you need to add video and interactive features," I know they assume the map is essentially a digital technology, improvable by increasing the presence and functionality of additional technological features.

Another way to think about maps is to assume cartography is a mode of creative expression structured like language, akin to the creative languages of music and architecture, and sharing qualities with speech and writing. These assumptions have always felt natural and logical to me because I came to cartography from writing, lured by the way cartographers describe the form as made of graphic marks (functioning like words), combined together in symbols (functioning like phrases), and mapped according to rule systems such as projection, classification, and layout design (functioning like grammar) (MacEachren 1995: 269–309). A form whose grammar can be intentionally broken at certain times, for particular reasons. Like the other expressive languages, such a cartography is not a universal language; it is culturally con-

structed (Pearce 2009). Indeed, as Lisa Brooks and others have demonstrated, cartography more closely resembles North American Indigenous traditional expression than written words arranged in typed lines on the pages of a book, because of its relationality to traditional Indigenous inscriptive languages, its utility as a mnemonic device, and its power to represent situated narratives, and so must be given equal consideration for telling Indigenous stories (Brooks 2008; Pyne/Taylor 2012: 92-104; Goeman 2013).

If we begin that way, by assuming cartography is language, we can expect it to be capable of infinite creative expansion if we have the courage, craft, patience, and dedicated practice to imagine it so. That is, the same expectations and discipline we already bring to words. How often do we say it's hard to use words to convey differences in the ways we experience time and space, yet we still try? Spoken conversations are capable of leading us to insights and understandings that can only arise from that dialogical exchange, and we can hope we find our inner capacity and conversation skills to arrive at those understandings. Indeed, some of our most profound understandings of ontological differences may have come from speech or writing.

I remember exactly where I was standing when I first picked up Hugh Brody's *Maps and Dreams,* in the now defunct Globe Bookstore in Northampton, Massachusetts. I remember the aisle, I remember it was on the top shelf in the middle of a short bookcase, slightly to the right of my gaze. I must have bought it, because my next memory is of reading it back on my college campus. As I read, I came to a gradual understanding of the differences between two ways of mapping, because of what he said, and also, because of the way he said it: the interleaved structure of numerical evidence and stories about peoples' lives, and the tone he sets. The book has been with me pretty much ever since. Re-reading it many times with students over the years, different aspects of the story became important to me as my own research experiences changed which questions were foremost on my mind.

Maybe you had the same experience with this book, or maybe another writer comes to mind, whose effectiveness on paper is not because they write with a particular typewriter or software. It is because of what is said, and how they say it, with a structure that shapes an emergent feeling of understanding in the reader's consciousness.

In their 2017 workshop and edited volume *Crumpled Paper Boat,* a team of anthropologists came together to reimagine ethnographic writing to "convey more elusive truths in experience," ontological truths, through new ways of working with language. Each had decided to respond to "problems of under-

standing" through a "deflection" to, for example, narrative prose fiction and other forms of writing that foreground feeling, intimacy, and uncertainty, forms resistant to closure. "Writing with the force of passage is what equips us to think otherwise, to bend our concepts to the concepts of others" (Pandian/McLean 2017: 4-5).

In her research on Maasai wildlife conservation, Mara Jill Goldman demonstrated that the *structure* of these new forms of writing must necessarily follow the expressive structures of the people whom she writes about. To convey the ways that Maasai people engage multiplicity in decision-making dialogues moving towards consensus, Goldman's "deflection" is to undertake their *enkiguena* as the conceptual structure for both her research method and her writing structure, to bend closer to the traditional ontologies of her subject. Such an approach by definition requires the tools of narrative prose fiction (in her case, theatrical dialogue), to imagine an *enkiguena* onto the page, creating an environment for building respect and cooperation across knowledge worlds, and for knowledge production itself (Goldman 2020: 22, 26, 242; see also Goldman 2011).

I agree, and look to cartographic language for my deflective form. Cartographic narratives work on us over time, making ruminative spaces to visit and re-visit in our minds, as we move towards new understandings and insights, including insights for what Ute Dieckmann highlights as the places where conventional settler[1] cartography is weak and Indigenous geographies strong: the presences of humans, beyond-humans, dreams, spirits, and sounds, and the qualities of relationality, perspectivism, situatedness, temporal fluidity, ambiguity, and humans as part of an integrated ecology.

But how to get there? In my experience, Indigenous presences and qualities do not manifest in the map as *things*, for instance, as a palette of symbols or other objects to place at locations in the map. As markers for Indigenous ontologies, they coalesce in the map when a cartographer Indigenizes the mapmaking process by incorporating Indigenous methodologies, pedagogies, and epistemologies.[2]

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1 I use the term "settler" throughout this article to refer to non-Indigenous people in states created by settler colonialism.

2 There are a range of other approaches in use by Indigenous communities and their collaborators, including the design of culturally-relevant symbols (Tobias 2000), the use of film and animation to cartographically explain change over time (Remy 2018), painting place name sites in collaboration with Elders (Enote/McLerran 2011), hand-drawn maps (Stephansen 2017) and development of interactive online maps

Their coalescence also depends on our attention to the mapping process as one of translation, and our awareness of the translator's tools for mediating when a translation should feel familiar, and when it should feel unfamiliar (Venuti 2008). Like all translations, not everything can be re-expressed; the translation is always partial and provisional. Our responsibility is to learn what must be kept and what let go, for one map moment in time. The goal of this Indigenized map translation is not to duplicate what can already be said with words, but instead to *parallel those words in a complementary way,* focusing on what maps do so well, that is: to draw our attention to the situatedness, the relationality, and the categories present in geographical narratives. All qualities essential to understanding ontological differences. With such an approach, I believe ontologically expressive vocabularies can reveal themselves.

Emotion, place, and the reader

The first time I decided to take cartographic language apart to make room for new structures was not for Indigenous geography. The project was to map the journey of North West Company clerk John Macdonell into the Pays d'en Haut in 1793, in a way that would evoke the emotional depths of a clerk's recollected journey as he travels into a world utterly unknown to him (Pearce (as Journey Cake) 2005; Pearce 2008). I created a six-foot base map of the rivers, lakes, and streams of his trip by tracing the water features from digital scans of paper maps and printing this base on a single long roll of paper. Then I read his diary carefully and in tandem with other Canadian canoe memoirs, and drew in each place he mentioned for each day.

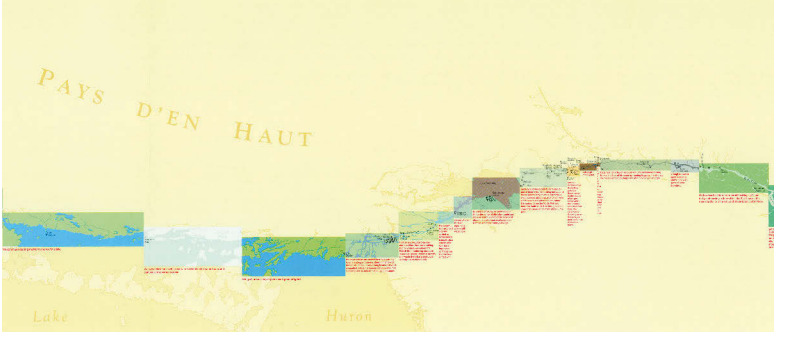
Tracing is slow, meditative, and can be as intimate as reading. Tim Ingold writes of tracing, of "re-tracing", as a way of inhabiting the page or paper as one inhabits a landscape (Ingold 2007), and this has been true for me. Repeated readings of Macdonell's diary entries gave me the rhythm of his story, one of extreme brevity as he wrote notes where and when possible. The process of drawing while reading encouraged me to imagine the places and motion more specifically than just reading, and gave me a body memory for the stories as I marked each place in pencil, while showing me the visual, locational

(Thom/Colombi/Degai 2016; McGurk/Caquard 2020), to name a few. I respect these projects while also taking a different approach, as you will see in the article.

rhythm of his memories as a whole. While working, I was guided by writings on the way place and narrative are co-constitutive (Entrikin 1991; Casey 1993), and techniques for generating that condition in collaboration with the reader (Iser 1974; Casey 1993; Berlant 1998). And then there was this six feet of map in my house, always present, like a family member. This project was not an Indigenous map project, yet I look to it as a turning point for what have become significant aspects of my process: the pace and intimacy that comes from tracing, the deeper attention levels and engagement that come from drawing while reading, and the necessity of dwelling with the map on paper until it enters into dialogue with the environment it resides in.

These methods moved me towards a new way of mapping (Figure 1). To convey the feeling of looking back on a journey, I translated narrative techniques of focalization, voice, and brevity into cartographic technique to create intimacy, ambiguity, and sense of place in the map. There is little in the way of explanation in the map overall; instead, I used brevity to create ambiguity about the meanings of those palettes, which the reader must then resolve by drawing on their own travel memories. Outside the palette of his daily joys and fears, the map is mostly empty.

Figure 1: Pearce 2005



As I circulated my drafts, and my intentions for the work gradually became known, people (cartographers and other colleagues) began to tell me how these techniques would be untenable: that readers would not understand the reasons for the changing hues, and more information would need to be supplied; that it would be confusing not to include familiar geographi-

cal markers outside the route frames; and that in general too much was left without explanation along the route. These objections arise from assumptions that the map is an explanatory, scientific document, and the reader is a passive consumer. But the purpose of this map was to convey an emotional landscape.

Heteroglossia

A few years later, Michal Hermann and I collaborated on a map commissioned on the occasion of the 400th anniversary of Samuel de Champlain's founding of Quebec City (Pearce/Hermann 2008; Pearce/Hermann 2010). Champlain was an explorer, colonizer, and cartographer whose ability to travel and survive depended on the knowledge, diplomacy, assistance, and advice of many Indigenous people over time, especially Wendat, Innu, and Algonquin leadership. Our purpose was to map Champlain's travels during the years he was scouting and then building the city, by drawing on his published journals, and to make room for Indigenous voices and intentions in the context of those reported travels.

Again, cartographers and other colleagues told us those Indigenous voices would be unmappable, as there are no corresponding Indigenous published journals from that same context. People also objected that, whereas the voyageur map followed one person's journey in a single direction at a fixed geographical scale, Champlain's travels could not be mapped similarly because they extended over many years, with multiple directions and at multiple scales. To develop any visual alternative to a line for expressing these multiplicities would only be confusing. These objections assume that maps are diagrams that exist independently of the theoretical debates and breakthroughs of colonial and Indigenous histories, and that lines on a map are clarifying.

Assuming cartography is language, the presence of dialogue is logical and sometimes expected, and Mikhail Bakhtin's approach to history through dialogism is relevant to addressing these skepticisms. In Bakhtin's concept of heteroglossia, or speech diversity, history is conceived as "a system of intersecting planes" composed of multiple languages, styles, and voices. Heteroglossia is then a narrative structure where an author gives unity to the form, but not to the voices themselves (Bakhtin 1981: 48). It was a quality to pursue in the project.

We printed a large base map of rivers and lakes, and over four days, read the journals out loud from start to finish, and marked by hand everything that seemed important. The process of close listening to Champlain's journals drew our attention to when, where, and how Indigenous people were mentioned, as well as emotional landscapes Champlain allowed to be visible. Whereas in the voyageur map, my awareness of all the voyageur ignored or missed led me to seek a fidelity with the narrowness of his experience in the map, with Champlain, the obstinate myopia and judgemental tone of his narrative felt unconscionable. We were obligated to speak out.

When we finished the journals, we spent three snowy weeks retracing by car the route Champlain traveled by boat or on foot over the course of years. Cartographers often speak of fieldwork as a locational fact-check and clarification stage of the mapping process, but it is also a way of getting a body feeling for the map. It is another kind of tracing, as important to dwelling in the project as tracing on paper. Though we were not traveling at the same pace, our ability to stand in place, look in the same direction, and imagine, made all the difference. Tracing on the ground showed us the relative sizes of places and stories and the distances between them, while also connecting us to how Canadians were interpreting the same stories. The Quebec anniversary was getting underway, with tributes to Champlain already in the museums and bookstores. These public histories broadcasted repeating tropes that taught us which stories loomed large in the public imagination, and which ignored. This was a new kind of untenable myopia, compounding Champlain's narrow account with contemporary prejudice and reaffirming the cartographers' obligation to intervene.

The trip also yielded a trove of photographs, videos, and post cards recording the colors, textures, and sounds to be brought back to the studio, none of which directly contributed to the composition. Instead, like the novelist who keeps a map of their story without including the map in the book itself, our research and collections of impressions formed deeper images of place held in mind while we found a visual rhythm for marks and stories on the map. They gave a certainty to the map's marks that could not have been there otherwise.

In the resulting map (Figure 2), dialogism describes route direction on the ground, and dialogical layouts translate conflicting perspectives (individual and collective, Indigenous and European) on the same events, with cartographer's voice interjecting to comment. To place Indigenous voices in equal exchange with Champlain, we drew on Indigenous oral history, ethnohistory, and archaeology to create imagined voice, in the same typeface. All

three voices take different positions with respect to the reader, sometimes addressing them directly and sometimes speaking around them; the reader, meanwhile, is free to explore a map with designated point of beginning but no specific path from that point. The multiple directions and ambiguities of Champlain's route are further described by a shifting route ribbon, rather than a line (Figure 2).

Like Frederik von Reumont (this volume), I too look to the language of sequential art for its potential to transform cartographic structures, a way of inserting new spaces with different visual grammars in the space of the map. In the Champlain map, we created a device called sequential insets (Figure 3), blending the detail function of the inset map with the temporal, scalar, and heteroglossia possibilities of sequential design. Sequential insets opened flexible spaces for following narratives across time in a particular place, for following the scale-changes of those narratives, for interjecting Indigenous commentary and cartographers' commentary, for blending emotional and environmental qualities with color, and for blending dreamed and imagined geographies with those of the world as lived during the day. We also incorporated the presence of multiple cartographic languages, translating the grammar of Champlain's cartography into the main map, insets, and map elements, a heteroglossia of cartographic narratives of the same events in space.

Indigenous ontologies

Meanwhile, Renee Pualani Louis, Ev Wingert, and I collaborated to re-map the Na Pali cliffs on the island of Kaua'i in Hawai'i (Pearce/Louis 2008). We were inspired by David Turnbull's idea that technoscience (including digital cartographies and GIS) must be reframed through the transmodern, that is, in a middle ground of practices from Indigenous and non-Indigenous map traditions (Turnbull 2000: 3). We set out to demonstrate that Indigenous ontologies could be expressed through U.S. federal digital data if we only pay attention to the ways that data expressed time and space. Our process was to examine which aspects of a U.S. Geological Survey map were inconsistent with Indigenous Hawaiian ontologies, and correct for some of those inconsistencies by changing only the discursive structures in the map and not the data itself. To guide us on the qualities of Hawaiian ontologies, we looked to the *ahupua'a,* the units of land at the foundation of their traditional land division and governance. *Ahupua'a* are marked on the land but not fixed in

Figure 2: Pearce and Hermann 2008

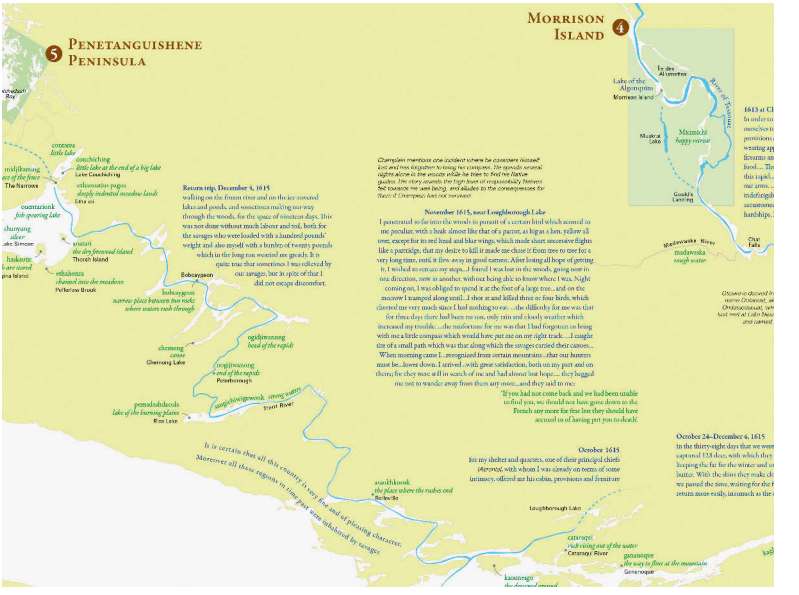
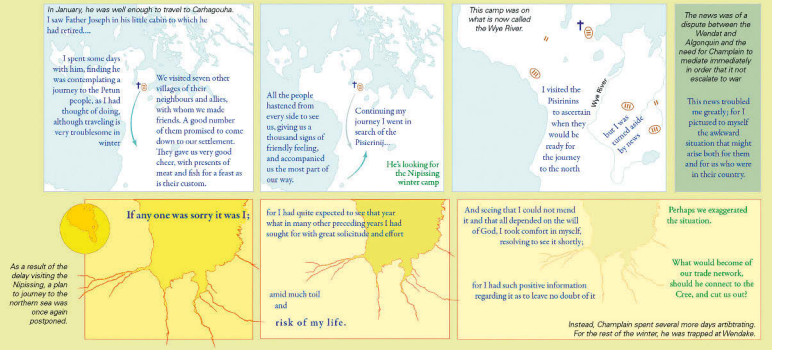


Figure 3: Pearce and Hermann 2008

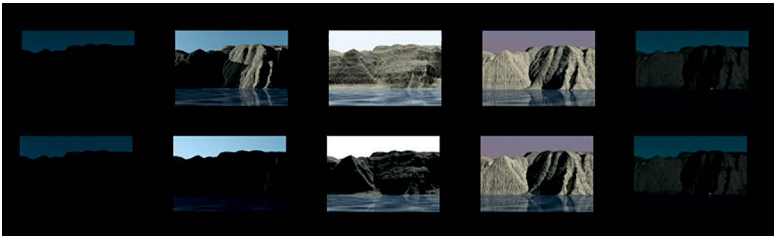


place; their edges expand or contract to follow seasonal and diurnal changes in the microclimates enfolded within the steep, mountainous terrain. So, too,

then, must the map also follow seasonal and diurnal change, moving with the environment and the families and governance structures interwoven in that environment.

Like the voyageur map, this project was also a narrowing down, in order to focus on one aspect: demystifying ontological difference by reimagining cartographic grammar. The *ahupua'a* led us to focus on light angle, viewing angle, and viewing position as ontological agents. The map sequences we created (Figure 4) explore the portrayal of sensory elements of shadow and season, specifically, the agency of shadow and season to shape *ahupua'a* boundaries at Kaua'i. The sequences also explore the importance of shifting viewer positions and angles as foundational to Indigenous Hawaiian ontologies.

Figure 4: Pearce and Louis 2008: 121-122



In keeping with our intention to uncover a transmodern technoscience of mapping for Hawai'i, that is, a technoscience woven from both traditional Hawaiian science and Anglo-American science, the maps don't entirely substitute Hawaiian ontology for U.S. Geological Survey ontology. They portray some Indigenous Hawaiian assumptions about how to accurately represent time and space, including boundary ecologies, respectful protocols of perspective, and the priority of tides over the concept of coastline. The maps also include U.S. Geological Survey assumptions about how to accurately represent space on a map: the maintenance of uniform scale, the absence of sentient beings, and the portrayal of elevation as a series of measured points on the ground, the so-called bare earth Digital Elevation Model (DEM).

Indigenous methodologies

Soon after the Kaua'i project, I had the opportunity to collaborate with Penobscot Cultural & Historic Preservation for a new map of the place names of their territory encompassing the Penobscot River watershed in Maine (Pearce/Penobscot Cultural & Historic Preservation Department, 2015; Pearce 2014). The purpose was to support language revitalization in a community with few speakers of the language, to clearly convey Penobscot territory and sovereignty to outsiders, and to collaborate with community members to express the ways traditional place names emote culturally, politically, and spiritually. One way people (colleagues and friends, both Penobscot and non-Penobscot) told me the intentions were unmappable related to tribal members themselves: if there are few speakers of the language, how will you involve the Penobscot community if they don't know the traditional place names (the assumption that Indigenous tradition lies only in an authentic past)? Other people commented that a paper map was a weak choice for conveying the depth of place names' meanings, in need of augmentation from video storytelling and online interactivity (the now-familiar technology assumption).

Our process was guided by Indigenous methodologies prioritizing values of respect, reciprocity, and responsibility in how we worked together, how we worked with community members, and how the map took shape (Wilson 2008; Smith 2012). Penobscot traditional pedagogies for teaching and learning language through immersion, and place names through story, also guided the structure and content of the map. Just as *ahupua'a* comprise a genre of Indigenous cartography at Kaua'i, so too does the web of place names and story comprise a genre of Penobscot traditional cartography. Translating traditional, land-based pedagogy into the map thus becomes translating Indigenous cartographic language into non-Indigenous cartographic language, blending cartographic grammar from both traditions.

One way we worked on the names with community members was to organize an Elders' cafe open to all ages, with food and maps, to start the conversation. At the cafe, people began remembering the names they grew up with, names constructed mostly from "English" words but which are only used by Penobscot people, appearing in no US Geological Survey map nor Google database. To widen the conversation, we then left the map on the wall in the Council Chambers and in the Elders' lunchroom so people could add to it themselves whenever they remembered a name, with the result in the

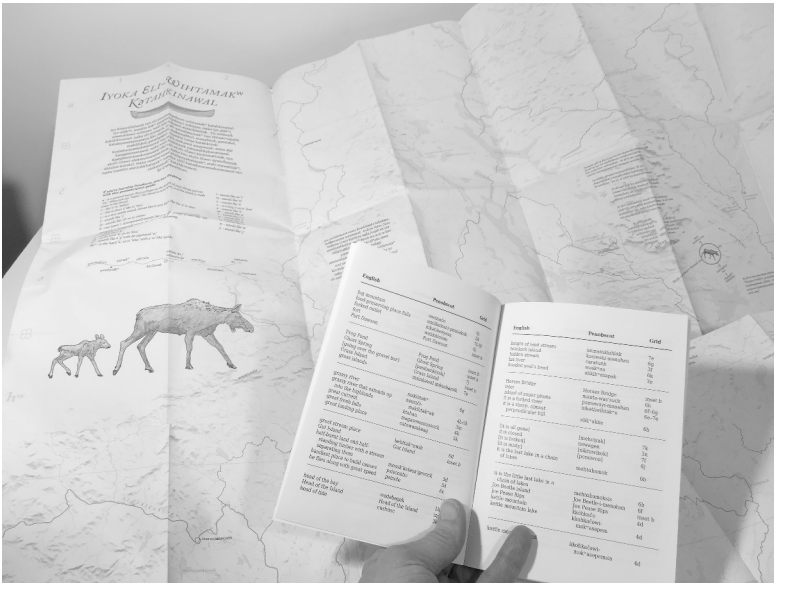
map that the Penobscot side includes all Penobscot place names irrespective of which languages they draw on. As William Meadows (2008) shows us in his work with Kiowa place names, all of the names, no matter which time scale they come from, are Penobscot names; all name the land together, and all form the basis of identity.

The format we chose for the resulting map also acknowledged Penobscot tradition across time (Figure 5). We made the map two-sided, separating Penobscot names from English translations, to facilitate language learning and to mimic Penobscot pedagogies: one side expresses what is heard, the other side expresses the meanings of what is heard when one speaks the language. This separation extends to all aspects of the map, from descriptive text to place names and grid labels. We sized the map to fit Penobscot people's bodies, as wide as an armspan in a truck or a canoe, and sized an accompanying gazetteer to fit in their hands or pockets, as a personal, intimate portal into the map. The gazetteer connects the content of the two sides, serves as a handheld rubric for memorizing language, and invites rumination about the connectivities between places, as names with the same stem naturally group together alphabetically.

Traditional pedagogies showed us that stories are central to learning and inextricable from the place names. But how to respectfully share that in the map? At first, I tried to make graphic symbols to represent story events in the map with pictures, rather than words. But Indigenous story events are not 'things', objects to be located in the discourse of settler cartography. They are inextricable from voice, the Penobscot speakers whose words are quoted for the stories, and the ancestors whose words are quoted for the place names. These spoken stories produce places, in the literal sense by enacting the creation of landforms, and in the wider sense by producing imagined geographies in the minds of listeners. The voices would have to bring the names into the map.

In Figure 6 is an example from the English-language side of how that was done, with a story about their ancestral hero Gluscabe, threaded through and including the place names. Reading from the translated meanings, we learn that the place names teach where to do something ("handiest"), and what the landscape looks like ("half standing"), and form pools of associations ("kettle" names). We learn that the story teaches how to do something (get flint stone at kkineo, kill and eat a moose), and itself forms a map by telling events in sequence that refer to directions on the land. The cartographic force of the story is reinforced by an adapted north arrow, a "story arrow" centered on a

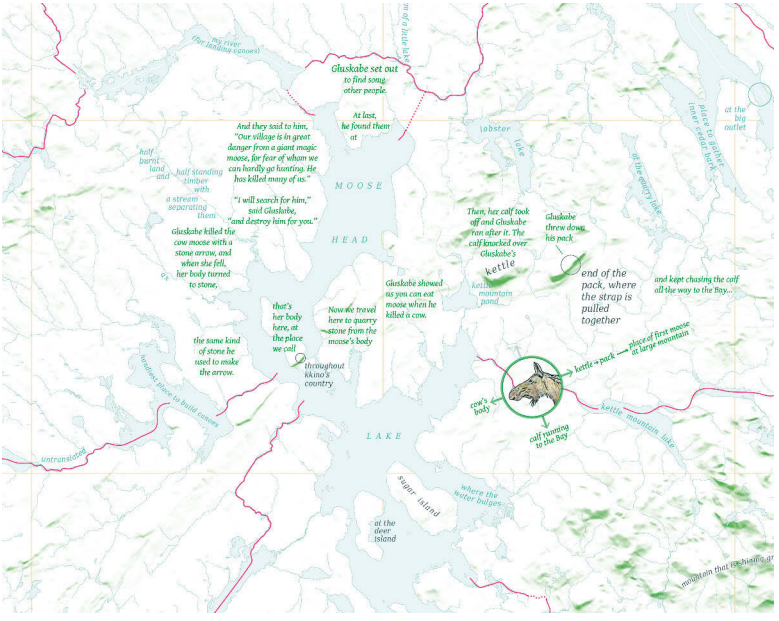
Figure 5: Pearce and Penobscot Cultural and Historic Preservation Department 2015



moose head, which orients us not to the cardinal directions but instead, to the locations of story events. None of this structure is explained elsewhere in the map, but instead, again following pedagogy, revealed in context to the reader who assembles the concepts in their mind. The map only includes two stories, but we don't have to include every story for the reader to understand that there are many stories.

The stories bring with them the presence of spirits (in this case, their ancestral hero Gluscabe), not as graphic pictures on the map, but as graphic pictures in the reader's mind as they listen and interpret what they hear. The stories heighten the reader's awareness of the same presences in the place names' translated meanings, along with other ontological differences revealed there, including the presence of all time scales, and traveling as a kind of witnessing of Gluscabe's landform creations. Translating structures of Indigenous pedagogies in this way, the map enacts epistemological difference by demonstrating how place names are traditionally taught in a Penobscot way (using the two sides of the map, incorporating story, and leaving closure of meaning

Figure 6: Pearce and Penobscot Cultural and Historic Preservation Department 2015



to the reader), and how they are traditionally taught in a non-Penobscot way (the presence of the map itself, and the device of an accompanying gazetteer).

Self-determination

I again had the opportunity to work entirely in Indigenous place names on the occasion of the recent celebration of Canadian confederation known as Canada 150 (Pearce 2017; Pearce/Hornsby 2020). The purpose of the map was to honor Indigenous sovereignties in the year that Canada celebrated its sovereignty, by remapping Canada only in Indigenous place names, by permission of the communities to whom the place names belong. This time, cartographers and other colleagues had many things to say about why it was both impossible and a bad idea. Their objections focused on my inability to ever "fill it" with names (the inventory assumption), that no one agrees on

what the names are (the assumption that there must be agreement within and between Nations), that it would be ridiculous to ask permission for so many names (the assumption that Indigenous methodologies do not scale up, that they are "extras"), the impossibility of portraying which names were "first" because people move around so much (the assumption that linear time is relevant), and the impossibility of determining "correct" territory boundaries (the assumption that Indigenous territories would be represented by lines).

Assuming cartography is a spatial language for telling stories, there is no inherent need to fill it with anything (nor can all stories be shared at once), nor is there a requirement to express time and space in any particular way. In previous projects, I had experimented with new grammatical structures to encode narrative in the map, but this project required a specific grammar for reasons of power and political context. I set the size, scale, and projection of the map to match exactly with the same parameters used by Natural Resources Canada for their national map posters, in order for the two maps to converse on equal footing.

The task of looking for place names involved hundreds. of communities, yet included no travel funds for visiting even a small number of those communities. I worked by researching communities one by one, then emailing or calling to present the project and ask permission, and ask if they would be interested to contribute. And then followed person to person, asking each to share a list of names, or even one name, and listening to what people told me. About half of the communities or individuals I connected with declined to participate, and for many dozens more, I was never able to make that initial connection.

The grammatical constraints and possibilities of the cartographic language (scale, size, projection parameters) and the particular, contributive nature of the mapping process both influenced the ways Indigenous ontologies manifested in the final map. Indigenous permissions encircle the map in a font size larger than the place names, offset by their own hue, to indicate that respect for these permissions is the first order of the map (Figure 7). The permissions form portals from each of four directions through which to enter into the place names. Their protocols are not uniform, and include individuals, councils, Nations, and cultural organizations. Their diversity teaches that everyone is in a different place with how they work on their names, and what or who constitutes authority in the protocols surrounding the names.

The density of diverse Nations at the limited scale of the map, and the nature of contributing and building trust at a distance, made it impossible and inappropriate for stories to be present as spoken narratives, as in previous projects. Yet story is present nonetheless, referenced in the place name translations themselves. Sometimes these stories are evident to outsiders, but oftentimes not, when the translated meaning sounds deceptively generic ("Like a lake") yet figures prominently in their literatures. The brevity of the meanings and their locations protects cultural property from extraction by outsiders, while simultaneously building intimacy for those who understand their references, knowing the names are speaking to them and them only. So, too, do translated meanings bring dialogism into the composition, when ancestors' voices speak to each other and to the map reader, and the reader responds by repeating the names. The presence of ancestral voices is particularly strong when they tell us unambiguously to pay attention ("Place to take a wrong turn," and "Shallow. Hazardous", Figure 7).

There are several regions where the map continues without the presence of place names, where neither contributing project partners nor cultural property permissions allowed place names to be reproduced. In solidarity with the work of Audra Simpson, Eve Tuck, and K. Wayne Wang, I honor those refusals as part of the narrative whole, which is itself inextricable from self-determination (Simpson 2007; Tuck/Wang 2014). They are not missing information, they are part of the lesson. I speak to these silences in the map introduction by indicating the names are not all of the names, nor the Nations all of the Nations. In this way, the silences constitute one of the many places in the map where readers must close the gap with curiosity and personal responsibility.

Sometimes people told me stories as a way of telling me about the names, and this sensibility influenced the way the names are placed, and the type styles I chose. At first, I differentiated the names only by whether they were primarily about the water (blue) or the land (black). Gradually, I understood I must also ligature all the names, an extension of honor and affection to the smallest scale, though invisible to most readers. Rather than use the lines formed by the digital data, I re-drew by tracing all of the land, water, and road lines, for a softness and fluidity that digital data lines cannot achieve, and for the inhabiting that tracing generates. This network of intimate highways places the names in a web of responsibility by indicating our obligations to visit, and fusing time scales of the past and present as always simultaneously relevant to Indigenous ontologies.

Figure 7: Pearce 2017

By excluding story as narrative between names, the map reveals the power and agency of place names to bring dialogism and ontological fluidity into the map. The names tell us the sounds, feelings, wind, and textures of places in the voices of the ancestors, forming pictures in our minds. They direct our attention to the presence of spirits and multiple time scales. And they ask the reader to dwell on them by the brevity and ambiguity of their translated meanings. Each name is like a puzzle, the way a poem is a puzzle, a concept or message to be taken up for consideration by the reader.

On first glance, the result is a highly conventional map. With reading, and the accumulation of meaning that comes from that reading, the map gradually reveals ontologies erased by conventions of settler cartography.

Reflection

The point of all this is to demonstrate that, in my experience, there are no universal techniques for translating the presences and qualities of relational on-

tologies into cartographic language.[3] The cartographic manifestation of those qualities arises from particular projects, situated in time and place. Each is a chronotope, a unique assemblage of time and space generative of its own narrative character (Basso 1996, 62; Bakhtin 1981: 84).

Intimacy in one map comes from typeface and ligature; in another, from a palette of emotional hues. An aerial viewing angle in one map might signify detachment, but if paired with voices becomes intimacy, or authorial empowerment. Likewise, an oblique angle can be used in one map as a sign of respect, then in another map as a sign of confusion. Motion may arise in stepped surfaces, or the fluctuations and rhythm of a ribbon-like route, or a line tapering to white to indicate something rushing through the composition. Time may manifest in the cadence of sequential comic panels, in the direction of story across the page, or in the temporal scales referenced by place names.

Yet when I look back on these projects, I see qualities in common to all: the presence of situated stories, the resistance to closure, the incorporation of the reader into the narrative structure and story, and the agency of stories as portals to relational ontologies. There is also an empty space where a new project must sit: a project in search of a heteroglossia of Indigenous and settler ontologies leading not to conflict and mistrust, but to consensus made from (and respecting divergences among) multiple voices. A map expressing relational ontologies (Alberti 2013; Blaser 2013) as though our lives depend on it, because they do.

Moving forward: relational ontologies

Which brings me to my work in progress, Mississippi Dialogues. The project is to portray public opinion about flood management in an Indigenized map of the Mississippi River. The larger intention is to move seemingly intractable debates about Mississippi flood management out of spaces shaped by settler assumptions about space, time, and relations between humans and beyond-humans. In keeping with methods from previous maps, I work towards no predetermined outcome, but instead seek to learn what becomes possible. The destination is a series of large-format map panels installed at publicly-

3 For more details about the methods, setbacks, and lessons of each project, read Pearce 2008; Pearce/Louis 2008; Pearce/Hermann 2010; Pearce 2014; and Pearce/Hornsby 2020.

accessible sites along the river, with accompanying guidebook, supported by public programming. I began this work in late 2018, with hope to launch it in 2022.

By "Indigenized" river I mean a river defined as Indigenous place names and their meanings; Indigenous ways of thinking and talking about water, flooding, and living with the river; Indigenous visual grammars from each region of the river; and the shorelines, wetlands, sand, mud, rocks, islands, and flooded forest lands from before the major public works projects of the U.S. Army Corps of Engineers. How can we talk about living with the river, when it is defined only as a series of locks, dams, spillways, pools, levees, and floodways? My project moves away from maps assuming human control of the river, and moves towards maps assuming human collaboration with and obligations to a beyond-human river to create a space for a shared vision about flood management.

You can see from this description how the project builds on and expands the theories, processes, techniques, insights, and lessons of previous work. My projects have moved from mapping place names as archival sources for Indigenous historical voices, to mapping names for language revitalization, to mapping names as evidence of political and cultural obligations and territories, and now to the current project, to map the names as agents of lessons critical to our ability to understand our individual and collective responsibilities for climate action. The work follows Jean-Sébastien Boutet's inquiry into the multiplicity of Indigenous ontologies in play in every region, and Caroline Desbiens and Étienne Rivard's demonstration of the ways that Indigenous and settler ontologies are co-constructed. It is particularly inspired by the work of Julian S. Yates et al., who show us that, "if we take seriously the possibility of multiple water worlds" (2017: 807), then the site of ontological analyses must be on the waters themselves (Boutet 2014; Desbiens/Rivard 2014; Yates/Harris/Wilson 2017).

All kinds of people tell me my intentions are unmappable. Some of their reasons are familiar, including, that I will never get permission from "everyone", and what will I do if some communities decline to participate, or have no names to share? Some of the unmappable reasons are new, related to concerns that the project does not reflect the interests of communities along the river, that the scale and expense of the project are too great, and that multiple ontologies of water is too much to ask of one map design.

I share these concerns, but they don't lead me to conclude the project is unmappable. The cartography I know is language. With an Indigenized trans-

lation process, I can feel my way forward to a map whose appearance I cannot yet know. You can guess which qualities are on my mind: dialogism, intimacy, brevity, heteroglossia, affection, fluidity of space and time, and categories and relationalities of human and beyond-human. I trust the design process to show the way.

Closing

Cartography as language moves away from the map as inventory, the imposition of uniformity, the binary of map as art or science, the focus on an 'authentic' past, and the mandate of explaining at the reader. Cartography as language moves towards narrative, dialogue, intimacy, ontological fluidity, focus on discursive structures (within or across communities), activating the reader's imagination, memory, and responsibility, and the possibilities for expressing relational ontologies. Indigenizing the mapping process leads to insights regarding how to articulate ontological differences critical to the readers' understandings. And Indigenous place names and voices activate relational ontologies, dialogism, and intimacy, simply through speaking.

This mode of working is not a 'solution' for every context. I present it as a way of working that I enjoy, one that is inseparable from my identity as an artist living in the world, just as a novelist or poet may feel inextricable from their ways of writing. The more I work, the more I feel cartography remains a nascent form. We must use our courage to ignore those who tell us it can't be done, our imaginations to explore possibilities, our perseverance to practice technique, and our patience to refine through revision, to nurture and expand this form. We must learn to say with a map what we feel to be falling through the cracks between words, yet which we know must be said.

What shall we map next, together?

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