Climate Futures: A 360 Digital Mapping Experience of Montreal Under Climate Change

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Abstract

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The planet is facing massive climate change effects; Canada itself is warming at an unprecedented rate in comparison to the rest of the world. However as inland populations living in Montreal, we don't often see these effects day-to-day. In addition, the media surrounding the future is often saturated with images of climate apocalypse that annihilate us. This makes it increasingly difficult to visualize a world that isn't hopeless, and how we will survive in climate change. In this research-creation project, I question if there are hands-on methods to visualize a future world, where we thrive despite, and alongside, climate challenges. This research-creation project looks at the interacting aspects of climate change, critical mapping, speculative futurisms, and marginalized community voices through the creation of a 'future map' of Montreal. To explore this, I collect interviews from 6 community members/activists and render their visions into 360 images built into a digital map. I provide context with theories of world-building, mapping, and the creation process itself, bringing to life the participants' visions of the future. I then describe how marginalized viewpoints and anti-oppressive frameworks build a better, tangible vision of tomorrow. I use the concept of remediation to explain the process of building futures in order to 'fix' society. To summarize, a critical mapping and 360 experience of Montreal under climate change will increase the body of work on climate change projection from a community perspective, and explore more embodied, hopeful, and grounded experience of climate futures.

Key Terms: Climate change, critical mapping, 360 images, afro/indigenous/climate futurism, new media, research-creation, place-based affect and embodiment, remediation

Acknowledgements

Creating a thesis is a large task on its own - and creating under pandemic conditions made the process even more difficult. There were moments of strangeness working on a project that looked at the apocalypse while actively living through one. I would not be where I am without the support I needed to get through this period. Being able to finish this is extremely important to me, and even though it took much longer than I thought it would, this feels like the right time.

I would like to thank my supervisor, Dr. Alessandra Renzi for her excellent support and understanding while I worked far too long on this project. I'd also like to thank my readers, Dr. Elizabeth Miller and Dr. Shauna Janssen for their advice and wisdom. I'm lucky to get to work with such incredible scholars. I am extremely grateful to the six amazing participants who bravely imagined new futures and trusted me to bring them to life. I truly hope we get the future we dream of. Special thank you and credit to Eve Parker Finley for creating the score for the final map – the soundscapes added a new element that truly gave homage to the participants words.

I would be nowhere without my supportive friends and our Friday night movies, Dezy, Keven, Patricia, Ray and Prakash (who's editing skills are revered and feared). This thesis is a win for them and how they've held me in this process. I'm proud to be the last one out of the gate, fashionably late.

To my skating pals for being a soft place to land (or fall) during a pandemic. To the many people, too many to name, who held space for me and supported me during this time. I will also thank my family too, my therapist, and my cat (who didn't help at all).

I'd like to thank as well as the countless BIPOC, disabled, queer and trans, working class, and otherwise marginalized activists, organizers, community members, friends, family, scholars and land defenders who have given me time, space and an education that I am eternally grateful for.

And to the future - I know it doesn't look good most days, but perhaps we can build something worth fighting for. As one participant so aptly stated "The future is co-created, let's do it".

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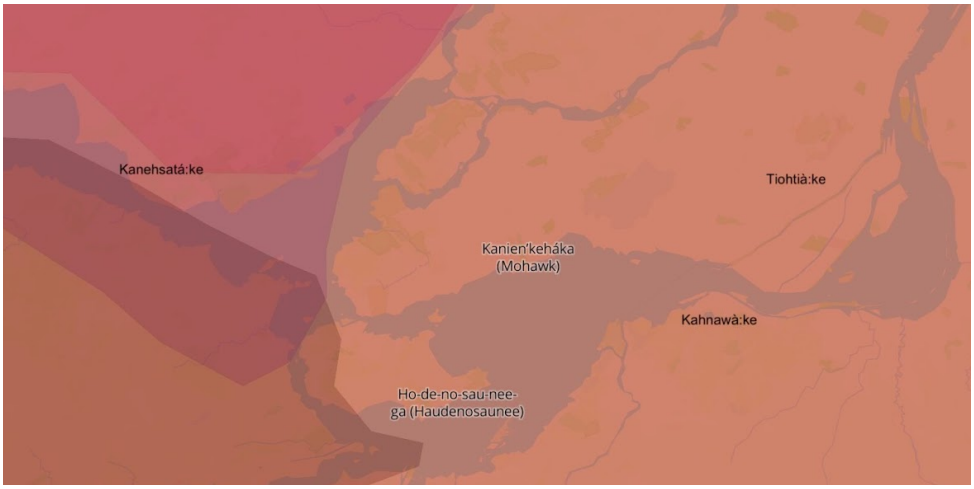
Land Acknowledgement

I will begin by acknowledging that myself and this project are located on unceded Indigenous lands. Tiohtià:ke, commonly known as Montréal, is historically known as a gathering place for many First Nations. The Kanien'kehá:ka Nation are recognized as the custodians of the lands and waters where this research takes place (Indigenous Directions Leadership Group). It is necessary for me to acknowledge this land that I live and work on given the colonial history of mapping and the past, present and *future* of my perspective as a settler on these lands.

I would like to draw attention to a number of geographies, both metaphorical and physical, that interact with this project. As Concordia's Land Recognition statement recounts:

> *"Many Indigenous peoples, communities, and Nations helped to build the foundation of Tiohtià:ke. However, it is understood and widely supported that the Kanien'kehá:ka have a strong historic and ongoing presence in the territory with two communities bordering Montréal: Kahnawà:ke and Kanehsatá:ke"* (Indigenous Directions Leadership Group)



Map by native-land.ca, outlining the territories of the Kanien'kehaka and Haudenosaunee, Kanien'kehaka communities labeled by myself

As the map indicates above, Tiohtià:ke is nestled around the two communities of Kahnawà:ke and Kanehsatá:ke. The geographical importance of this area and its marking as a gathering place is what drew settlers to the island (ibid), and thus is an important site in the history of Canadian colonization. Both colonization and Indigenous resistance have shaped this area which has deep implications for this project.

One event that has contributed to the shape of this area is the The Kanehsatá:ke Resistance, or the Oka Crisis, of the 1990s. The Kanehsatá:ke Resistance was a "seventy-eight-day armed Indigenous resistance to land expropriation. It was a spectacular event that made visible the structure of settler colonialism in Canada, illuminating its desire for land, its propensity to consume, and it's indifference to life, to will, to what is considered sacred, binding, and fair" (Simpson 147). This event occurred in Kanehsata:ke, coming to a head over the proposal to extend the town of Oka's country club golf course directly into ancestral Mohawk land (151). In the end, this massive exercise of colonial powers saw "2,650 soldiers deployed to handle fifty-five Warriors" (152). The land ownership in Oka is still in dispute to this day.

The legacy of Oka has reverberated through Indigenous communities with the use of blockades, occupations, and other direct action tactics primarily led by women (148-149). While these were by no means the first actions of their kind, they were amplified across the country through mainstream media, and inspired actions of resistance and solidarity in Kahnawà:ke and other Nations across Turtle Island. These actions, which fundamentally disrupt the movements of colonizers are tactics that have continued to be used and built upon. Of particular note here are the similarities between Grassy Narrows blockade, the Wet'suwet'en fight for their ancestral lands, and Oceti Sakowin Camp in Standing Rock, whose occupations of their land against colonizing industries share a common thread that reflects the Oka history, in particular the central organizing leadership of women, and the direct occupation of land.

The images of land defense and protection are something that I attempt to bring into my research, and I need to give respect to where those ideas came from. The events I've been exposed to and the people who have taught me, in particular those from Grassy Narrows, have constructed these images for me of what land defense looks like. As the Oka crisis fundamentally changed the mainstream view of Indigenous protest, land defense, and the Canadian state, I would be remiss if I did not recognize the ways that it also contributed to an imagery of history that influences my imagination of a better world.

Another geographic event that has fundamentally changed the topography of the region around Tiohtià:ke was the construction of the St. Lawrence Seaway. After the Canadian government began construction, the community of Kahnawà:ke lost "access to the river when the St. Lawrence Seaway was built" (Deer). Many residents were forced to leave their homes, some

with “less than six days notice” (ibid) before construction began. The move broke ties between Kahnawà:ke’s cultural connection to the river (ibid), as well impacted traditions and economic prosperity. As Elder Eva Johnson explains: “the river was our lifeline. It's where we got our food. It’s how we lived (ibid)”. When the St. Lawrence Seaway was built, thousands of Indigenous peoples lost their homes and their deep relationship to their culture for a construction job that was “in Canada's interest” (Simpson 53).

The construction of the seaway became a critical point in Kahnawà:ke's history. It amplified the necessity to maintain Kahnawà:ke's territory for future generations; the changes imposed by the Seaway brought about a rise “in the political will and self determination of the community” (Phillips; Fragnito). It inspired the community's attempt to rebuild both culturally and physically. With community-led land restoration projects in progress, there is hope that some connection can be restored, fostering wildlife and cultivating safer areas to swim, fish, and harvest. Again, I mention this because in imagining the potential destruction and also rehabilitation of the future, I must pay respect to the apocalypses that have already taken place. Kahnawà:ke is such a place, which experienced a loss in their way of life and continues to strive to rebuild around the land.

In the examples of Kahnawà:ke and Kanesatake, colonization reveals itself to be an ongoing process that changes the political landscape and the physical landscapes. In settling on this land, designing maps and interacting with the environment, it is important for me to recognize the continued connection I have with Indigenous peoples and other peoples in Montreal, as well as the future landscapes we are building together, that recognize the foundation and ongoing protection from Indigenous peoples.

As I attempt to reimagine a new future, my interpretation is always going to be impacted by the legacy that I carry with me as a white settler. I have a responsibility and commitment to decolonizing my work to the extent that I can. In the end, I am by no means the only person working on imaging the futures of this city or this land. Tiohtià:ke is home to active hubs of Indigenous futures research and creation work, in particular through the Indigenous Futures Cluster of Milieux Institute. This includes the *Initiative for Indigneous Futures* is operated by *Aboriginal Territories in Cyberspace* (AbTeC), a research network based at Concordia University, who provide support, residencies and opportunities for Indigenous visions of the

future. In addition, the cluster also includes *Inuit Futures in Arts Leadership: The Pilimmaksarniq / Pijariuqsarniq Projec*t, which supports "Inuit and Inuvialuit to become leaders within their communities in all areas of the arts, by providing innovative, hands-on mentoring and training opportunities across the north and south" (Our Mission). These hubs are the forefront of the field of Indigenous futurisms, and deserve recognition for their legacy and ongoing work.

To learn more about them please visit:

http://indigenousfutures.net/
https://www.inuitfutures.ca/

Other resources:
To learn more about the Kanehsatá:ke Resistance, see:

- Film - Alanis Obomsawin - Kanehsatake: 270 Years of Resistance
- Film - Tracey Deer - Beans

To learn more about the legacy of the St. Lawrence Seaway and Kahnawà:ke see:

- By the Rapids - Ka'nhehsí:io Deer
    - https://newsinteractives.cbc.ca/longform/by-the-rapids
- Short Film - Flat Rocks - Courtney Montour, Roxann Whitebean

To see Indigenous futurist work based in the region of and around Tiohtià:ke, see:

- Machinema Experience - Skawennati - Time Traveller
- Film - Roxann Whitebean - Tomorrow - Enhior'hén:ne
  https://www.youtube.com/watch?v=kjfAyJHdbBk&ab_channel=RoxannWhitebean

To see the mapped history of Indigenous territories, languages and treaties see:

- Native-land.ca
- Coming Home to Indigenous Place Names in Canada map - https://umaine.edu/canam/publications/coming-home-map/coming-home-indigenous-place-names-canada-pdf-download/

Introduction

There has been a wealth of research that outlines the dire situation the planet will be in in less than 40 years due to climate change. A leaked government report indicated that Canada is warming at an unprecedented rate in comparison to other parts of the world (CBC News). While our forests burn and areas break temperature records, I struggle to fathom the ways there has been complete inaction around climate change. I've been privileged as a white, queer settler woman to only have to *learn* about the intricate web of oppressions that deeply impact our world, which only deepen with climate change on the horizon. I am also a writer and filmmaker with a focus on science fiction and speculative fiction. Because of this, I know the media surrounding the future is often saturated with images of climate apocalypse that annihilate us. For myself, this makes it hard to visualize a world where we don't face complete destruction that devastates the most marginalized communities. This can't be the only way; I question if there are methods to visualize a new world, where we thrive in spite of, and alongside, climate challenges.

As Walida Imahara states in her intro to the text *Octavia's Brood*, "organizers and activists dedicate their lives to creating and envisioning another world, or many other worlds—so what better venue for organizers to explore their work than science fiction stories?" (Thomas 10). For myself, writing science fiction and community activism have always gone together. There is power in imagining better worlds that don't result solely in hopelessness, but show the community *we* want to see.

For this project, I use Montreal, Quebec as the center of visualizing climate change. It is difficult to realize exactly how Montreal's climate issues will manifest and what that might mean for our survival. Climate change itself is often seen as an abstract concept, it can be difficult to fully understand (Leviston et al 441). Change happens gradually, especially in inland communities such as Montreal, where we don't see the environment changing day-to-day. This causes climate change to be met with psychological distance (Markowitz et al 4) from our reality. On the other hand, climate change education has often been most useful to engage people in first hand experiences, for instance using VR (ibid 4). This hands-on approach closes that psychological distance. The connections between engaging hands-on and realizing the impacts of climate change are related to this psychological closeness. The closing of the distance here

means truly seeing our own neighborhoods, the places we call home, and the places we engage in activism impacted by climate change *as if we were there*.

Being there and being present has an uncanny impact on communities. Researchers found that, upon reflection of ecological changes to the places that residents called home, "people grieved for lost landscapes, ecosystems, species, or places that carry personal or collective meaning" (Cunsolo and Ellis). This "ecological grief" (ibid) is closely connected with personal identities and cultural practices connected to the land. In other words, by interacting with our environment and seeing the changes first hand, we experience an affective, personal response intimately connected to who we are. However, for inland, urban communities that grief is not a result of climate change as we encounter it, because we don't have that direct link to witnessing changes. This is an issue, and means we can't close that emotional, psychological gap.

Another problem I see is the distance that common scientific data representations on climate change create by being relatively impersonal. Climate maps do not focus on the embodied, personal and emotional reality of climate change. Projections use only scientific data, seemingly without human existence factored in—we are seldom shown what it might be like to live day-to-day with climate change. There are stories and histories (and futures) that can be explored from people working on the ground, living in their communities, who have lived through changes, and whose voices are extremely important.

With these issues in mind, how can we visualize climate change in Montreal 40+ years? How can we do so with community perspectives and a human element guiding the visioning? This research project combines creative practice and theory to study the interacting aspects of climate change, psychological closeness, science fiction, and community voices through the creation of a 'future map' of Montreal. To explore this, I collect interviews from 6 community members/activists and render their visions into 360 images built into the map. In addition, I provide context for the world building aspect and mapping process itself, drawing visual elements from the participants' vision of the future. I then discuss how our unique identities, perspectives, and visions for the future become a practice of remediation.

Environmental, site based remediation "is the process of removing polluted or contaminated soil, sediment, surface water, or groundwater, to reduce the impact on people or the environment. A polluted site can have a serious impact on human health, water supplies,

eco-systems" ("What Is Site-Remediation"). If we consider our current environment under capitalism and oppression as polluted, we can remediate society by engaging with the future as a way to remove the contaminants and put into practice our ideal ways of living together. If we were to approach life after climate change with an ethos of justice, anti-oppression, and decolonization, what world would we see despite climate effects?

This research-creation serves to build an artistic rendering of the future, and a rendering that is meant to be consumed by the public, to bring the intimate embodied experience of being within a climate-changed city. As the user navigates the map of Montreal and interacts with the 360 images, they might have a more emotive response, and that psychological distance, mentioned earlier, might close. At the very least, the participants will feel represented in their images of the future, and we can collectively experience a future not predicated on the destruction of humanity, but built on remediation of society.

Therefore, the map becomes not just projection brought to reality, but also a storytelling tool where a complex future of climate change and climate action told by everyday people can be created. I believe that this topic is best addressed within a research-creation framework.

I believe my endeavour adds to the community discourse by highlighting the visions of community members. There is a legacy of community-based environmental activism, in particular led by BIPOC organizers, that emphasizes grassroots work. To treat only scientists as the leaders of environmental justice leaves behind the voices of those fighting on the ground. By involving community organizers, I intend to pay respect to their work and intelligence and involve the human, affective element through their stories. I would like this project to be something accessible to people to view, something that could be projected and used in actions or installations, or as an educational tool that shows both the harsh realities and the fight we imagine for the future.

Finally, my work adds to the discourse on climate change mapping by attempting to portray community-based climate futures through mapping technology. Ideally, the work can be used to promote discussion in climate justice organizing in Montreal. I intend to contribute to the field by showing how marginalized viewpoints and anti-oppressive frameworks for the future build a better vision of tomorrow. I also use concepts of remediation to explain the ways these viewpoints and frameworks imagined a future while engaging with past and the present. To

summarize, a critical mapping and 360 experience of Montreal under climate change will increase the body of work on climate change projection from a community perspective, provide an accessible mapping experience for users and explore more embodied, personal, and grounded experience of climate issues.

Literature Review and Theoretical Framework

In this section, I will identify key literature and concepts that contextualize the creation of a digital map projecting the future. First, I describe literature on critical map making and research, including ways mapping has been used for/by marginalized communities. Then, I discuss foregrounding work in understanding alternative futures, in particular Indigenous and Afro-Futurism and concepts of the anthropocene. Finally, I analyze the body of work coming from the intersections of affect, embodiment and the environment to better understand how my projections of the future fit in with how we situate ourselves and our identities within our environments.

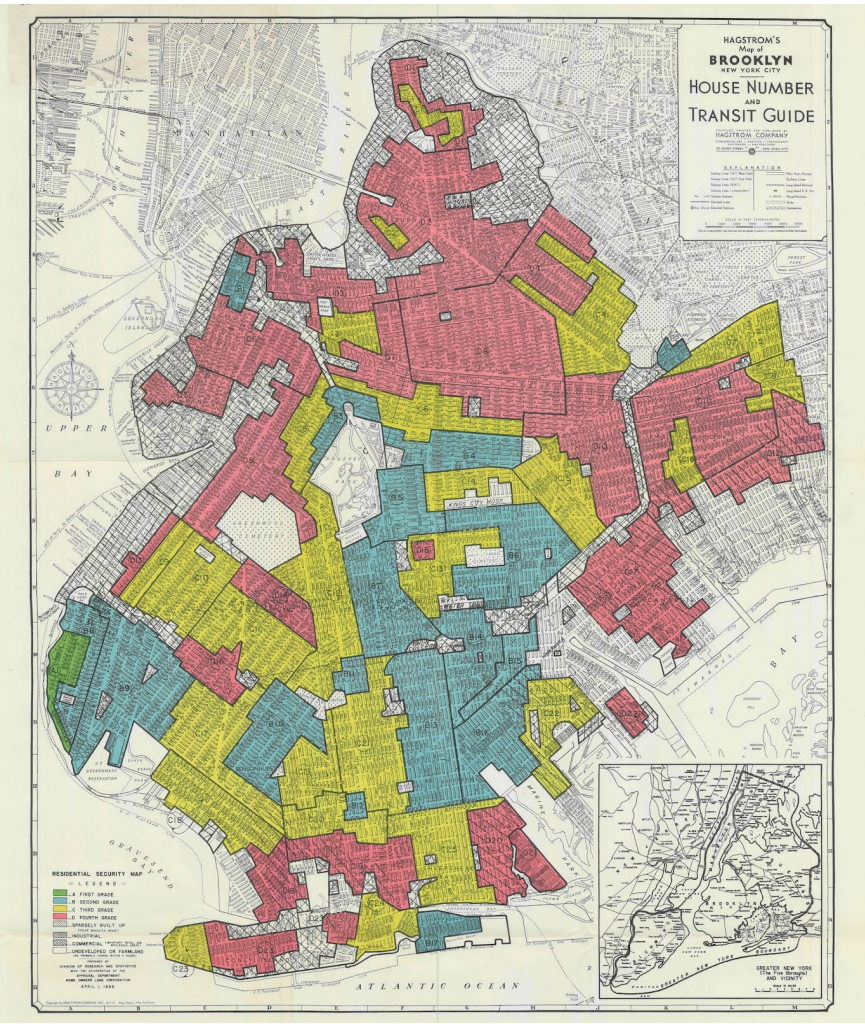
A. Mapping for Social and Environmental Action (Critical Cartography)

In this section, I will be explaining the literature of critique behind mapping, as well as alternative forms of mapping. Critique is essential because mapping as a practice is derived directly from colonization. As Lydon outlines, the "myth of discovery has guided the colonial cartographic tradition" (4), with maps becoming the tools of colonizing powers to pursue capital interests such as colonizing 'new' lands and resources. Thus, making maps became a colonial tool predicated on showing the world from a Western bias; while colonization occurred and cultures/geographies were lost, maps served to erase, record, and subjugate particular viewpoints (4). In this case, we are able to see that maps are telling a particular narrative of how the world is organized.

Maps assist in shaping public opinion (Monmonier 1), and impose their own conceptualization onto the public of what and who owns the space, where to go and where not go, where wealth *should* be distributed, with rarely room to contest. A notable example of this is the world map itself, or the Mercator Projection used for navigation, which unwittingly

“minimizes non-European or American countries and continents while enlarging privileged world powers” (Rosenberg), but was widely used in schools and education. *Google Maps*, the most widely used mapping platform (Panko), has a history of mediating reality as well. As Dewey outlines “in their attempts to dispassionately document the physical world online, tech companies often end up shaping our understanding of it, too.” For example, *Google Maps* originally had not labelled Palestinian Territories on the map, but had labelled Israel (Dewey), a move that may seem like an oversight but has political connotations in the destruction and erasure of Palestine. Oversight like this provides users with an ‘augmented’ view of reality but a reality that becomes ‘fact’.

Ways that maps create a reality can have detrimental effects on marginalized communities. For example, the term "redlining" refers originally to the New Deal’s federal government maps of every metropolitan area in the country (Gross).



The 1938 Home Owners' Loan Corporation map of Brooklyn (Mapping Inequality)

> *"Those maps were color-coded by first the Home Owners Loan Corp. and then the Federal Housing Administration ... and these color codes were designed to indicate where it was safe to insure mortgages. And anywhere where African-Americans lived, anywhere where African-Americans lived nearby were colored red to indicate to appraisers that these neighborhoods were too risky to insure mortgages" (Gross).*

Appraisers would enter communities and take stock of the maintenance, amenities, etc, going as far as to deem those marked with the lowest rating of *D* with comments such as: "Colored infiltration a definitely adverse influence on neighborhood desirability" (Badger). These maps codified racial segregation and told a story of a city which, explicitly and implicitly discriminated against neighbourhoods of colour, under the guise of housing policy.

Redlined communities became "self fulfilling prophecies...starved of investment and deteriorated further in ways that most likely also fed white flight and rising racial segregation" (ibid). Redlining maps have continued to impact racial disparities and equity to this day, affecting mortgages, generational wealth, home ownership and more. "The lines they helped draw, based in large part on the belief that the presence of Blacks and other minorities would undermine property values, altered what would happen in these communities for years to come. Maps alone didn't create segregated and unequal cities today. But the role they played was pivotal" (ibid). Maps in this case enforced a particular viewpoint which became normalized, and as it did it allowed for future oppression and negated the value of those residents and their descendants.

Given the above history of cartography, I want to prioritize a critique of mapping in order to explore divergent methods which acknowledge colonial history, and build new spaces to prioritize marginalized voices. For my project, this means looking at the ways mapping has historically erased communities and drawn borders to prioritize capital. The other part emphasizes reorganizing cities and spaces to include marginalized voices and community landmarks. In the book *Mark My Words: Native Women Mapping Our Nations*, Mishuana Goeman analyzes the stories and art of Native women alongside the established maps of

colonizers to show how the women create new futures and pasts using maps. “(Re)mapping” (3), as she calls it, is about telling underheard perspectives that challenge and understand the process of displacement to the present moment, in order to build better futures. Goeman, therefore, recognizes the colonial process (and power) of mapping that erases Indigenous knowledge, and attempts to challenge the discourse through her amplification of Indigenous women’s voices. Being aware and critical of mapping allows for me to understand this cultural production of maps and the subversion that can be created by noting the gaps and transgressions.

Goeman also touches on the same concept of knowledge and power being directly related to colonization, just as maps are directly related to that. I use this framework to recognize my preconceived bias which comes from my settler (and European background). The discourse on mapping’s intimate connection to knowledge/power helps me to analyze mapping as a form, look at what stories the maps tell, and interrogate methods of creation within my own work.

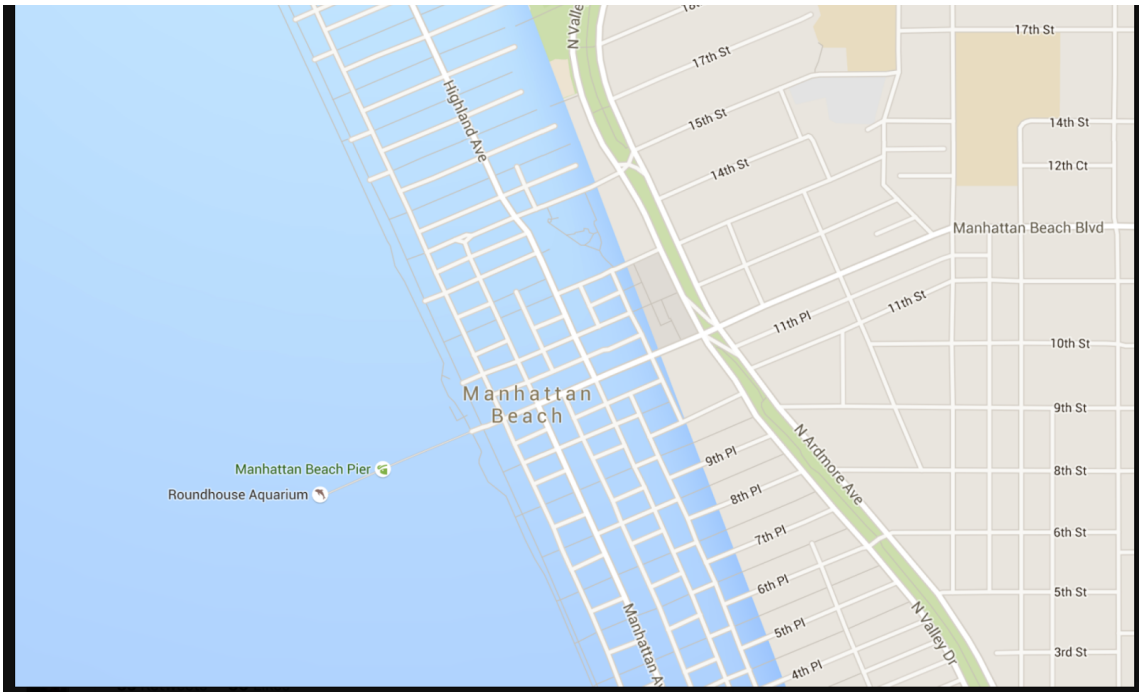
To hone in on particular methods of alternative cartography, this thesis focuses on community mapping. Community mapping is “the collective representations of geography and landscape and.... is the process to create such representations” (Lydon 2). It allows participants to think together spatially. These maps are created in a collaborative effort between participants using knowledge of the communities present and past, associated directly with their identities and memories. They can be incredible tools for taking back power within the community. For example, Indigenous mapping practice has been beneficial to land reclamation, policy and protection of traditional areas (Lydon 5). As Leanne Betasamosake Simpson explains about a mapping project with Nishnaabeg Elders, their mapping of important landmarks from memory shone light on ignored histories. “Laid out in a visual way, the magnitude of the loss cannot be explained away, the strategic nature of colonialism cannot be ignored. The driving force of capitalism in our dispossession cannot be denied” (Simpson 13). The act of alternative mapping, the kind of mapping that projects the histories of marginalized peoples, can display the truth in a glaring way.

Community mapping, therefore, is based on a knowledge built *outside* of the hegemonic and mainstream mapping practice, oftentimes revealing how exactly the colonial systems are erasing historical (and present) fact. Climate Futures intends to be a community mapping project, because the process uses collectively generated ideas based on the community members

experiences, hopes and visions for the future. Then, together we visualize and create new boundaries, areas of the city, and a new spatial area that came from our stories and imaginations. In doing so, we build community, resistance, identity, and collective memory through interrogating the map. I hope to highlight the power of map creation in amplifying the needs of the community, and the needs of marginalized peoples.

Maps as Digital Media

Alternative uses for mapping, or counter maps, can jolt users out of this falsely attributed 'reality' given by mainstream mapping. The *Google Maps* Sea Level Projection (Smith) is an example of a counter map, which showed various locations impacted by rising sea level. This was a mod or glitch, which was accessed by users for a short period of time directly on *Google Maps (see below)*. For example, it displayed New York City and Los Angeles under water, leading users who searched for particular addresses to areas around a submerged city. This kind of mapping unsettles and disorients the user into a new perspective.



Google Maps Sea Level Projection *(*Smith)

In this project, I am using *Google Maps* as a template for the 'standard', and counter maps as the inspiration for how my map can subvert the norm. The uses of critical counter

maps/community maps are endless; for example, *Palestine Open Map* is a collaborative mapping project which creates historic maps of the British survey of Palestinan maps, using recently digitized survey maps in Israel. This places the British mandate maps over top of modern maps of Israeli occupied territories (*Palestine Open Map*). This map is an example of a community map, as it is built by public mapathons and using publicly accessible archives in a way to reclaim the land and digital space.

Another example is *Native-land.ca,* which overlays the world map with the territories, languages and treaty boundaries of hundreds of Indigenous cultures. This educates users on the Indigenous land which they occupy, something that colonial maps have erased over the centuries. The most significant counter mapping technique in this map is the lack of colonial borders and landmarks, which reminds us that there is a history in which colonial borders did not exist and forces users to reimagine the space. In their words, *Native-land.ca* states that they "strive to map Indigenous territories, treaties, and languages across the world in a way that goes beyond colonial ways of thinking in order to better represent how Indigenous people want to see themselves" ("Our Mission"). Users are able to search for their street, but there are no street names printed on the map and no borders beyond the borders of Indigenous peoples, where languages are spoken, and where treaties are outlined. This work welcomes us to question our knowledge of our environment and the colonial lines that we use to define space. Since mainstream colonial mapping also neglects the lived realities of those living in the areas, scholars claim there is opportunity to use these blindspots to build different counter maps, and in turn different stories (Hunt & Stevenson, 375).

For Climate Futures, I am inspired by counter mapping projects that have highlighted marginalized groups and under-represented issues. In particular, continuing the legacy of mapping as a storytelling tool into the future allows for the entrance of science fiction and futurisms. The maps described above represent critical avenues as they provide a subversive mapping experience; *Google Maps*' view shocks users, suddenly transported into a future coastline. *Palestine Open Map* and *Native-land.ca* subverts borders and visuals to remind users of who was here in the past, present and future. After being inspired by these media, Climate Futures is primarily focused on providing a mapping experience based on a *Google Maps*

template, which subverts and challenges our view of our digital and physical environment. These media sources serve as a guiding template for what Climate Futures can expand to.

B. Imagining Creative Climate Futures (Afro/Indigenous/Queer Futurisms)

For my framework, I draw on a multitude of scholars which help expand the themes of envisioning radical futures. In particular, I am looking at work that is highlighting futures outside of/against capitalist and colonial norms. This is important because my work strives to be situated through an anti-oppressive framework which emphasizes diverse communities coming together to imagine a future outside of capitalism.

The group of scholars and concepts I am drawing from I am calling "Radical Apocalypses", which highlights work in anthropocene critique, decolonial studies, and Futurisms. These foreground divergent methods of what we define as 'apocalypse' and 'survival', and the capacity for community visioning of a different future. This project is a way to envision survival from the perspective of the community, and as such cannot deny the idea that a multitude of 'apocalypses' has already happened to marginalized communities through oppression and colonization. These communities have continued to survive, and that experience exists outside of the mainstream understanding of 'the end of the world'. By drawing on radical futures, I can help support these community perspectives in my participants' interviews and help interpret their visions towards a more equitable, anti-oppressive future.

One cannot study radical futures and not discuss the prolific works within the discourse of Futurism, in particular Afro and Indigenous futurism.

Afro-futurism was a term first coined academically by Mark Dery in his text *Black to the Future.* However, it is a concept and creative process that existed long before that, and continues to evolve and explore Black futures. Afrofuturism is a speculative tool that emphasizes "imagining possible futures through a black cultural lens" (Lafleur, Womack 22). As defined in the text *Afrofuturism : the World of Black Sci-fi and Fantasy Culture*, Ytasha Womack states that the Afrofuturism movement "combines elements of science fiction, historical fiction, speculative fiction, fantasy, Afrocentricity, and magic realism with non-Western beliefs. In some cases, it's a total reenvisioning of the past and speculation about the future rife with cultural critiques" (22).

This revisioning of the past is a key component, often imagining worlds "where African-descended peoples and their cultures play a central role in the creation of that world" (Bruce). Afrofuturism exists on a bedrock of recentring and reconfiguring the norms, prioritizing futures (and pasts) of freedom and liberation (ibid).

Afro-futurism also inspired the emergence of Indigenous futurism (Dillon 2). In Grace Dillon's key text, *Walking in the Clouds,* she asserts that Indigenous futurism "opens up SF to reveal Native presence. It suggests that Indigenous sf is not so new—just overlooked, although largely accompanied by an emerging movement" (2). These theories and practices are "used to project Indigenous life into the future imaginary, subverting the death imaginary ascribed to Indigenous bodies within settler colonial discourse" (Morgan). They are meant to envision worlds of survival and thriving people, subverted from the normal, settler-centric understandings of the future. This genre provides the guiding framework for how to approach visions of the future, as mainstream science fiction often ignores or dismisses the imaginaries of Black, Indigenous peoples, and people of colour.

Futures coming from marginalized identities also stand in stark opposition to the idea of the Anthropocene, and the visual imagery of the apocalypse. The Anthropocene is the present era wherein humans are the main driver of irreversible (and devastating) planetary change ("The Anthropocene Project"). Common projections of the outcome of the Anthropocene are that it pushes forward the idea of "dystopian or post-apocalyptic narratives of climate crises that will leave humans in horrific science-fiction scenarios" (Whyte 224). However, this belief is met with critique by marginalized scholars. As Whyte critiques, many of the destructions that worry non-Indigenous people are the ones that Indigenous people have already faced due to colonization (225). Therefore, many Indigenous people have very different perspectives on the apocalypse, and do not see the concept of the anthropocene as a way to stop the crisis, but actually serves to erase Indigenous histories of oppression (227). My project aims to understand these histories by imagining a future that requires the prioritization of those who have already gone through daily apocalypses.

In Grace Dillon's book *Walking the Clouds*, she discusses how Native SF "posit the possibility of an optimistic future by imagining a reversal of circumstances, where Natives win or at least are centered in the narrative (9). Many participants discussed BIPOC, in particular

Indigenous peoples, being in the forefront of community leadership and reorganization in the new future, centering them in the narrative. Afrofuturism also carries a similar throughline of centering "experiences, perspectives, and values actively rejected and oppressed in a society that centers white supremacy (Holbert et al, 331)", oftentimes with a reimagining of history, and therefore prioritizing Black futures. Through these futurisms we encounter a future where oppressed people are able to be centered in the storytelling. This possibility is a way to push forward the narrative of survival outside of colonization and capitalism.

I see these perspectives also informing concepts of queering the apocalypse. In her piece *Queer Apocalypse,* Kouri-Towe states "queerness is a kind of end to the norms and structures of our world, then it makes sense that queerness might say something meaningful about imagining the end" (5). Queerness itself is an apocalypse of heteronormativity and family structure, and by focusing queer perspectives we also draw futures connected to re-centering the narrative. Kouri-Towe continues to point out, the complication of reproduction and queer thinking serves as a chance to reexamine portrayals of our values in both future and present. The way that queer folks build community within necessity for survival but also for necessity of 'family' is of particular interest in my project, for projections on how queer ways of thinking can reimagine the future/community structures.

Much like the other futurisms identified above, queer and trans people of various intersectional oppressions are also living in a world that habitually has created apocalypse-like conditions. Kouri-Towe outlines that queer survival, community and ethos "might offer us some considerations for rethinking the apocalypse..." (4). As she describes, "Queer models of kinship offer alternate frameworks" that emphasize collectivity, relationships and ways of life that are "spoiling, twisting and perverting the normative narratives that dominate survivalism and stories of apocalypse" (5). I draw on these texts to help interpret the words of my participants as they emphasize the need for community and alternative modes of survival that don't necessarily mourn the fall of capitalism or normativity.

For the practice of envisioning alternative futures built on anti-oppression, I turn to adrienne maree brown and Walida Imahara. They coined the term "Visionary Fiction" to describe their practice of creating spaces for activists and community organizers to use science fiction to write the future they want to see. Visionary fiction is a way for artists, activists, movement

builders, and more to create visionary stories, to "be able to claim the vast space of possibility" (Thomas 10). The elements of it are vastly different from mainstream science fiction; they are creative while being aware of intersectional identities, prioritizing marginalized communities, cognizant of structural inequalities, envisioning worlds that are "hard but hopeful" (197), emphasizing collective change and social change (ibid). I use visionary fiction as a guiding principle for my project, encouraging participants to use their history, community organizing, and ultimate visions for the future as a way to speculate and build the communities we want/deserve.

A final futurism text is Shelley Streeby's text *Imagining the future of climate change: world-making through science fiction and activism*. This text offers an analytic look through land defense within the #NoDAPL occupation, describing the background and turning points in how social and environmental movements are imagining bold futures of climate change resistance (6), Streeby outlines that these occupations are acts of science fiction storytelling, using the speculative visions informed by the history of Indigenous peoples and people of color in climate movements. Streeby also provides a framework for how academics can engage with participants' projections of the future through speculative fiction in an accountable way. In answering the questions of how we can envision Montreal's climate issues and how it will impact us in 40+ years, the above works serve as a reminder of who often has been left out of discussions on climate issues and left out of the visions of the 'apocalypse'.

Imagining alternate worlds outside of the mainstream provides an opportunity to explore better futures. Brown, Imahara, and Streeby all contend that all organizing we do, all dreaming of a better world, is science fiction. As brown states, "science fiction is simply a way to practice the future together… practicing justice together, living into new stories. It is our right and responsibility to create a new world" (Thomas 19) We are writing stories of the world we want to be a reality. All of these texts center the richness of perspectives of marginalized speculative fiction, and primarily help us to recognize that by even imagining a new world, pushing beyond the limits pre-ascribed to us, we are brought steps closer to actually being able to achieve it and have the future we deserve. As Walida Imahara states "Once the imagination is unshackled, liberation is limitless" (10).

C. Embodiment/affect, Tech and the Environment

Critical literature on affect has mostly involved analyzing how emotions and affect operate within people's everyday lives. However, little has been researched on the relationship between affect and the climate environment (Bladow and Ladino 5). In the text *Affective Ecocriticism: Emotion, Embodiment, Environment*, Bladow and Ladino outline the ways that "affect theory disrupts both discrete notions of embodied selfhood and static notions of environment" (8), thus engaging in new discourse of the relationships between all three topics. This text is pivotal to understanding how a digital mapping experience might contribute to closing the gap of psychological distance surrounding climate change, by focusing our emotions around place.

The research linking digital media's influence on personal affectual experience is also of interest. Climate change has been a subject of popular media for many decades, with documentaries such as *An Inconvenient Truth* and *Before the Flood*. In recent years, as Konik notes, there has been a shift in cinema from fact-based documentary to personal, emotional stories, suggesting affect is a method to better tap into viewers' empathetic responses and move them to action (32). Media can and does control our affective response, and Konik suggests that might influence our overall action/understanding of an issue.

Another affect-related topic that informs this project is embodiment. Embodiment is the "notion that human reasoning and behaviour is defined by our physical and social experience and interaction with the world" (Price et al, 3). I would also argue, our affectual interaction. I am most interested in how embodiment is explored in two ways - through technology and in physical place. Ken Hillis discusses embodiment in virtual environments in *Digital Sensations*. He states that "the ability of (virtual environments) to destabilize identity formations has clear implications for what we mean by community, city, and public life" (xix). Simply put, what happens to us when we interact with virtual environments and those environments become extensions of ourselves, it shows how our own interaction with everyday life mirrors this, informing who we are and our relationships to space.

For example, for this project I use a *Google Maps* style. I use this because it imbues us with a sense of 'normalcy' and a sense of 'place' that we are used to. We are therefore embodying a digital space that we are used to. This gives us a sense of belonging and normalcy.

To continue that, I consider embodiment in a sense of physical space. In *Making Place*, Arijit Sen and Lisa Silverman outline how place "is not a neutral site into which human beings enter; our current experiences as well as memories of past events frame how we understand and reproduce it." (4). To expand, our relationship to place is constantly being influenced by who we are and what we have been through, creating a more meaningful connection and relationship to place.

Through my project, I hope to explore how this relationship with present Montreal might impact what it's like to imagine its future. Setha Low discusses embodiment and behaviour that carves out space. ""Embodied space" is the location where human experience and consciousness take on material and spatial form" (20) and goes on to describe how walking and acting in an environment give you an experience of "...knowing a space through your body" (38), like a muscle memory. I am inspired to understand how embodied placemaking and space can be placed into a digital context.

Place attachment is also an interesting field of literature employed in conjunction with affect and embodiment. The original text by Altman and Low, *Place Attachment* related primarily to the bonding of people and places (2) and has since grown. *Place Attachment* by Manzo and Devine-Wright furthers this research in analyzing how climate change disrupts "...the emotional attachments associated with such places" (165). These emotional attachments can lead to better understanding of the psychological distance between climate change and action, something I am exploring here through the interviews I conducted. For this project, being able to understand how place attachment impacts the participants helps me identify which visuals need to take priority and what aspects of a future Montreal we want to see to call it 'home'.

I look at a number of media projects which emphasize placing users in a digital landscape. For VR future projections which emphasize Indigenous futurisms, I look to *Biidaaban: First Light* by Lisa Jackson and Mathew Borrett (Jackson & Borrett). This VR 360 experience traverses the Toronto of tomorrow. Users explore this altered city that is reclaimed by nature, exploring flooded subway stations and destroyed buildings, but there are clear indicators of survival outside the destruction and an emphasis on growth and resilience. The experience is narrated in Anishinaabemowin, as well as other Indigenous languages. I was inspired by this project as its aesthetic of a climate/future changed city appeals to the idea of a 'lost city', with

focus on iconic downtown buildings that situate place and time. However, it also highlights the survival of marginalized peoples. This is a perfect example of being able to successfully create a scenario that I also want to build in Climate Futures, wherein we are struggling but thriving under the effects of climate change. These texts and media build connections between how the embodied experience of place-based encounters facilitates a deeper understanding in future climate issues and can inspire a more affective response from participants. They provide an intensive cross-section of environment, emotion and embodiment for which to draw from and provide a specific affect-inspired framework.

Climate Futures is temporally placed not too far in the future, close enough where we might be shocked by the changes. *Climate futures* also uses a critical GIS and mapping frameworks to interrogate the narratives of mapping as a form. I am informed and guided by a theory of radical apocalypses and futurisms as informed by scholars of colour and Indigenous scholars to envision a world distant and outside of capitalism and colonization. And finally, it follows the theoretical perspectives of embodiment and affect to explain how the positioning of personhood *within place* is an intimate and perspective-changing experience.

D. Decolonial Studies

This project is also framed through the lens of Decolonization Studies. Here, I am informed by scholars Eve Tuck, Linda Tuhiwai Smith, and K. Wayne Yang, who brought to the center Indigenous epistemologies and ontologies. They provide a lens to look through the colonial structures of mapping and GIS while situating Indigenous and people of colour within the discourse of climate change research. This framework also informs the theoretical lens of artists Darcie Little Badger, and Lisa Jackson ("Biidaaban: First Light"). As I am using mapping, a colonial-based practice, to project a future which I hope will be decolonial and anti-capitalist, it is essential to carry forward the education and work within decolonization studies.

Linda Tuhiwai identifies "research as a significant site of struggle between the interests and ways of knowing of the West and the interests and ways of resisting the Other…" (2). Situating research is extremely important; understanding the research as a process that is always going to be situated within a colonial, western framework helps to reorient my work and help me carve out new space. I intend to have the concepts of decolonization studies guide my processes,

reminding me to prioritize Indigenous voices and theory and focusing on accurately representing visions of grassroots community organizers. As Imahara states, this speculative process is vital to decolonization: "...decolonization of the imagination is the most dangerous and subversive form there is: for it is where all other forms of decolonization are born" (Thomas 10). By having decolonization studies as my guiding practice and ethos, I will tackle my own preconceived notions and imagination biases as I move forward with designing a map. These scholars and artistic works also help to situate myself in my research and ask self-reflexive questions like: What is my role in this work, creatively or otherwise? How can I ensure this is a guiding ethos and not an appropriation? How can decolonization not be a metaphor, but an active process?

I must give reference and honor these scholars for what they've contributed to academia, but also for what they've added to my own trajectory as an artist, academic and activist. I want to recognize that while their work inspires me, I can't take credit for originality of thought; my theories and work is informed by Indigenous and scholars of colour, and I am deeply indebted to that.

Methodology

My main method of interpreting my research is through research creation. In *Research-Creation: Intervention, analysis and "family resemblances"*, Sawchuk and Chapman describe that research creations "typically integrate a creative process, experimental aesthetic component, or artistic work as an integral part of the study" (5) Research creation projects are often projects that explore topics that cannot be explored without an artistic modality (6), and that these multimodal experiences can reach different audiences (7), making them suitable for public art works, or diverse research/public communities. As Sawchuk and Chapman elaborate, research creations challenge the "formulaic" nature of research (7), and because of this there isn't one straightforward definition or process. What they instead discuss is the fact that research creation is guided by intuition and feeling. This "presents itself as one of the strongest reasons why those who pursue research creation are committed to the methods they promote" (12). In the case of this research, research creation allows me to explore my participants' visions and creatively (and publicly) disseminate it to the public. Without following the feelings and intuition

exemplified by both the participants and my artistic practice, I would not have been able to draw specific connections that I'll elaborate on in the discussion section.

Sawchuk and Chapman state that there are four modes of research creation, however, they also surmise that they are not mutually exclusive (13). This research takes two forms. The first is as *Research-for-creation,* which is the act of doing research *in order* to create (15). My project required gathering multi-disciplinary data, such as information on climate science, mapping, and climate justice movements, in order to facilitate the artistic construction of a climate future. Second, I approach my project as *Creation-as-research* (19) where creation is required *in order* to further our understanding of the subject (19). I found throughout the process of conducting interviews and analyzing that so much of the artistic visioning and creation came from *within* the process. The action of interviewing, analyzing the data, and building the artistic renderings lead to discoveries that were unpredictable at the start. Combined, these two approaches to research and creation yield new insights into the relationship between place, attachment and climate futures, and allowed me to explore the visuality of participants' imagined futures.

Sawchuk and Chapman also describe research-creation as having the potential to aid in "providing a rich, multimodal learning experience" (19). By traversing many possible avenues of presentation and interaction, research-creation has the potential to attract and gain interest with many diverse populations. I believe the experiential interactions between critical mapping, futurism and visual renderings is research in itself, building connections that go beyond the way we normally use technology. There are multiple points of interaction in my thesis - the map, the sound scape, and the 360 videos. These are there to create an immersive, engaging digital space that large populations of people would be able to access and operate. With standard research, I would not be able to reach those audiences or disseminate the findings with as much depth and accessibility.

My primary focus was to look at the data from my participants as creative storytelling elements. Therefore, my research methodology is primarily qualitative. I used thematic and narrative content analysis to examine their answers, which were synthesized down to visual prompts for the creation of the 360 images within the map.

Thematic content analysis has been defined as “a method for identifying, analyzing and reporting patterns (themes) within data” (Braun and Clark 79). By being able to analyze the themes which tie together the interviews, I was able to produce images based on common trends, such as participants emphasizing Indigenous voices at the forefront. Narrative content analysis refers to analysis of “accounts of personal experiences, or the experiences of others, or to fictional accounts, such as stories, myths, folktales, and fairytales” (Smith 327), oftentimes to also study the participants recounting of events and what it says about their own subjectivity and culture. This is applicable to my work as I asked participants to imagine the future, which became more of a storytelling experiment. Being able to see and study where their stories connected and diverged based on the participants personal and cultural experiences with climate, migration, and social and environmental knowledge became an interesting point of research. However, because narrative and thematic analysis rely more on a loose interpretation of interviews, this gave me the creative freedom to reimagine the visions of my participants and implement them in the 360 mapping space.

Narratively, maps themselves have long been a storytelling tool in fiction, especially fantasy and science fiction. They promote world building, which is defined as the “creation of a world that is different from our own” (Richard). Cartographer Tim Paul states that with map making in fantasy books, “you can visually help set the stage in a very subtle way with how you make your map. That’s a visual form of world building” (O'Connell). Being able to create a visual component to a new world and story adds a new element, creating a deeper understanding of the new environment, ascribes meaning to place, and what makes a place a home, centre of the universe, or an imagined city.

Maps as a visual form of world building and storytelling is a methodology that Climate Futures is situated in. In this project, participants relayed information to me, which I rendered into a map to situate those visions spatially and give them a life outside of oral retelling. Being able to draw and place in the visual imagination of the participants means that together we participated in a collaborative world building. For example, participants spoke of using parks as the new neighbourhood markets, hubs, and living spaces. In order to portray this, a 360-map element takes place in Parc Jarry, displaying areas where gardens, livestock, community gathering, and other public happenings are taking place. Therefore, the map becomes not just

projection brought to reality, but also a storytelling tool where a complex future of climate change and climate action told by everyday people can be created. I hope these methods bring to the forefront the grassroots endeavor of the project, visually representing the imaginations of my participants into an embodied experience of life after climate change.

Mapping as an Interview Method

There were multiple ways to incorporate maps as a research method. Due to various circumstances, participants and I had to meet indoors to discuss their visions of the future. In order to help visualize the city, I brought along a tourist map to stimulate geographically specific conversations. The use of a map within the interviews provided space for participants to visualize where their imaginary communities would exist in the city by being prompted by the topography, landmarks, and spaces they inhabit. This also inspired conversations that allowed them to share their personal beliefs about inhabiting the city, which reflected their embodiment within the space.

Participants initially had some issues imagining what space would look like visually, although they could talk about what they wanted conceptually. David Seamon explains that looking at place from a phenomenological lens might actually articulate place in more attainable, descriptive ways referring to these challenges in articulation as what "...phenomenologists call the lifeworld - the everyday world of taken-for-grantedness normally unnoticed and thus concealed" (Seamon 12). The importance of the day-to-day, the ways we live in relation to place become so interwoven with who we are that we don't always notice them. Therefore, I surmise that imagining the future of a place that is so intrinsically part of ourselves would be difficult since we are often not noticing its relationship to us.

When shown the map however, it was easier to explain the futures of our communities outside of ourselves. Participants began to discuss which neighbourhoods would have a greater chance of survival in a climate disaster, where the most climate issues would happen, key areas of large space that could be used by people to create sanctuary and communities, and more. Bringing the tourist map to the interview created a separation of person and place, while also maintaining visual connection. Therefore, participants' visions became much more geographical and less theoretical.

Since we could not meet in the locations we were discussing, there was less site-based interaction able to take place. Seamon states that place interaction "refers to the typical goings-on in a place. It can be related to "a day in the life of a place" and involves the constellation of more or less regular actions, behaviors, situations, and events that unfold in the typical days, weeks, and seasons of a place" (16). Along a similar vein, one participant expressed their difficulty in visualizing the future based on lack of interaction:

> *"I think it's true that when you're walking through your neighborhood like, or you're walking through a space that you're in, it's easier to be like, 'Oh yeah, like that. Like I could definitely see something, something produced here or something changed here'. But when we're in like, uh, like less of that physical space, it's more (difficult)"*

The importance of being able to exist in a space physically and contextually helps in visualizing the future and is an example of place attachment. Once the tourist map came into play, participants talked more about who they are in relation to their neighbourhoods. Seamon elaborates that "Place identity and place interaction are reciprocal processes in the sense that, through place interaction, participants actively engage with place. They come to feel a part of place and associate their personal and group identity with the identity of that place" (17). Participants expanded on their personal histories in particular areas, how long they had lived here, places they did not want to see disappear because of their sentimental value, that were hubs of activity they frequented, places their families lived in, etc. By being able to see the map of their city, they could better articulate how their histories influenced what they hoped to see. A prime example of this was that when I first planned the project, I anticipated filming locations that were more iconic tourist destinations of Montreal. However, the participants all highlighted local areas of the cities where tourists do not visit frequently, where they felt a particular connection to and defined the city for them. These would be places that Montrealers would see as more significant than standard tourist destinations. This shift signified to me that the building of the 360 map would be more about who the participants are and their attachment to place, and less about the viewer interacting with them and what their expectations of place are.

This led naturally to the participants interacting with the city as a character. Seamon describes that the realization of place refers to sensing its manifestation. The association of place with our activities, significances, routines, etc makes place similar to a character, existing in a moment in time much like the people we interact within it (17). Being able to look at the map, identify things that made Montreal 'Montreal', helped participants to understand that the intent of the project was an exercise in building a future Montreal, but also one that was living and breathing.

What began to happen with the presence of the map was a collective exercise of place creation. By pointing to new areas and neighbourhoods and explaining what would happen there, participants were engaging in building, generating and improving place. In place creation, humans are active in their connection to place (Seamon 18). This type of phenomena can be described as "concerned people responsible for a specific place draw on their commitment to and empathetic knowledge of the place to envision and make creative shifts in policy, planning, and design so that place interaction, identity, release, and realization are enhanced in positive ways (Alexander, 2012)" (18). In this case, by designing new neighbourhoods and circumstances, participants are engaging with a place from one that is caring, visionary and meaningful, and that accounts for climate change.

The presence of the map in interviews, although not a replacement for actual neighbourhood walks and engagement, provided a way for participants to engage in the phenomena of place and helped ease some of the difficulties of visualizing present and future geographies. Most importantly, using the map helped participants have their homes, contexts, and selves reflected back to them so they could give more well rounded and articulate answers. This deep interwovenness between self and map throughout the interview process further helped explore the idea of map as character, with a new slate full of history, stories and potential futures.

Research Process

Participants

I interviewed 6 participants, each who had lived in Montreal, and had some connection to climate justice or community work. In all, the participants came from a number of marginalized identities, often that intersected with each other. They had varied ethnicities and racial

backgrounds, some visibly and some not. The majority of participants openly identified as LGBTQ+. The majority belonged to the same age group of 24-35. About half the participants had lived in Montreal for a significant part of their lives (+12 years) while the other half came to live here more recently (-5 years). Participants careers were primarily in the arts, community organizing and environmental fields.

The participants were selected using a snowball method, and shared on local environmental justice listservs, facebook groups, facebook and instagram call outs, and emails to community groups and educational institutions. Because of my intentions to support marginalized and underheard voices often silenced in the environmental movement, I contacted and advertised to specific online community groups. From there, participants were offered $30/h for their interviews, with interviews being 1 hour each. Participants' interviews were audio recorded. We met primarily at the Concordia Greenhouse and various locations around downtown Montreal. Because interviews began in the winter, we were not able to walk around the city or their neighbourhoods. Participants were asked 7 questions (*fig. 1)*:

Climate Futures Participant Questions

1) What does a Montreal impacted by climate change look like in 40 years from now, in your imagination? This can be landscape-based, environmental, community, whatever pops to mind.

2) What, visually, does climate justice look like in 40 years? What images and icons represent, to you, a continuing fight for change?

3) What, visually, would protest and resistance look like?

4) What are things from this current time that you think will remain in the future? What are things you think might look different?

5) Who/what is prioritized in the climate justice movement/communities of the future?

6) Are there any spots in the city you would want to see highlighted? (optional question)

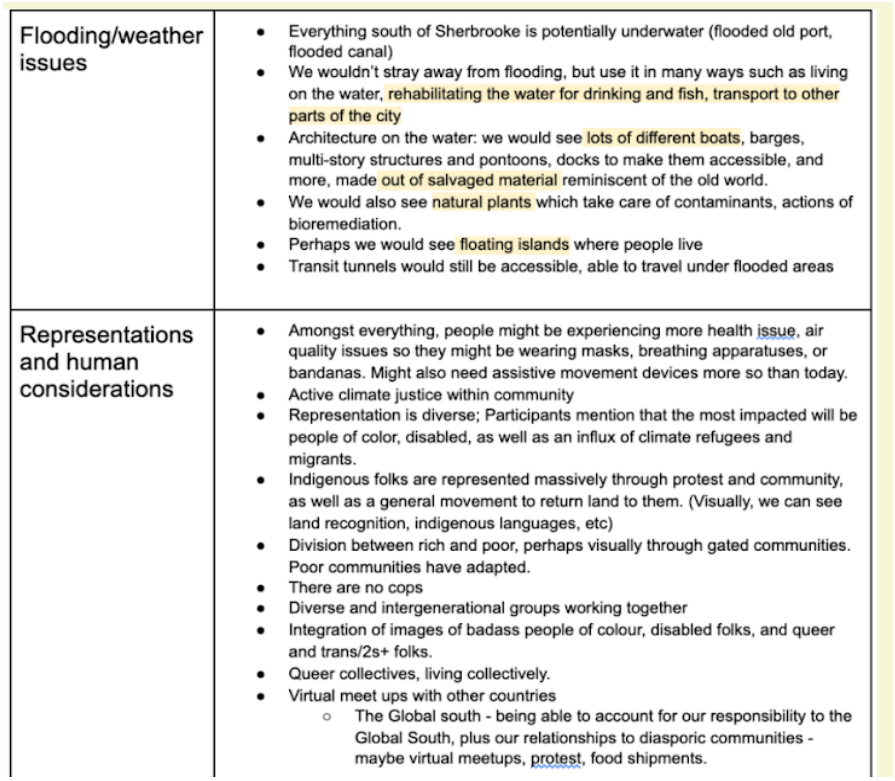
7) More free form question - When you imagine our future, what does it look like? What do you hope it looks like?

Fig. 1. Questions asked to participants

Procedure

After the participant discussions, the interviews were put into a spreadsheet, organized by question, and tagged by keyword. Since the end of the research process was meant to result in a

visual output, I analyzed each interview for elements that I could put on the map, noting what each participant chose to highlight. I then synthesized those concepts down into easy to design elements (*fig. 2*).



Flooding/weather issues	• Everything south of Sherbrooke is potentially underwater (flooded old port, flooded canal) • We wouldn't stray away from flooding, but use it in many ways such as living on the water, rehabilitating the water for drinking and fish, transport to other parts of the city • Architecture on the water: we would see lots of different boats, barges, multi-story structures and pontoons, docks to make them accessible, and more, made out of salvaged material reminiscent of the old world. • We would also see natural plants which take care of contaminants, actions of bioremediation. • Perhaps we would see floating islands where people live • Transit tunnels would still be accessible, able to travel under flooded areas
Representations and human considerations	• Amongst everything, people might be experiencing more health issue, air quality issues so they might be wearing masks, breathing apparatuses, or bandanas. Might also need assistive movement devices more so than today. • Active climate justice within community • Representation is diverse; Participants mention that the most impacted will be people of color, disabled, as well as an influx of climate refugees and migrants. • Indigenous folks are represented massively through protest and community, as well as a general movement to return land to them. (Visually, we can see land recognition, indigenous languages, etc) • Division between rich and poor, perhaps visually through gated communities. Poor communities have adapted. • There are no cops • Diverse and intergenerational groups working together • Integration of images of badass people of colour, disabled folks, and queer and trans/2s+ folks. • Queer collectives, living collectively. • Virtual meet ups with other countries ○ The Global south - being able to account for our responsibility to the Global South, plus our relationships to diasporic communities - maybe virtual meetups, protest, food shipments.

Fig. 2 - example of condensing participant interviews.

360 Images

After the interviews, I created a list of locations that brought together participant suggestions and what I deduced would be the most visually stimulating locations. Accessibility was an issue; due to the pandemic I was limited to the use of a bike, so unfortunately communities outside the city center are not represented in the 360 images. I used a GoPro 360 camera to capture various scenes, taking both video and images. Below is a map of my path (*fig 3*).

Fig. 3 - pathway taken via bike around Montreal

After shooting the locations, I narrowed down the 360 images to the ones that would be easiest to implement the participant's suggested visuals. I began to combine all the participants key points in a visual way, and as I did so the story the participants told separately began to weave into a narrative, one that created a speculative history going from the present to the future of what they wanted to see ideally. I chose Photoshop as my main area of editing, and used open source imagery to create the structures and objects participants envisioned. After those were complete, I needed to find a way to implement them into the map for users to be able to interact with.

Map Creation Tech

Finding an accessible and user friendly mapping program was an issue throughout the creation process. I knew that I wanted the map to mimic a *Google Maps* style, but being able to create that style map proved difficult. Many mapping programs were simply too expensive or too challenging to use. I eventually landed on Mapbox, and their free interactive storytelling component. With straightforward coding, beginners in mapping like myself could build a webpage that hosted an immersive storytelling experience (*fig. 4*).

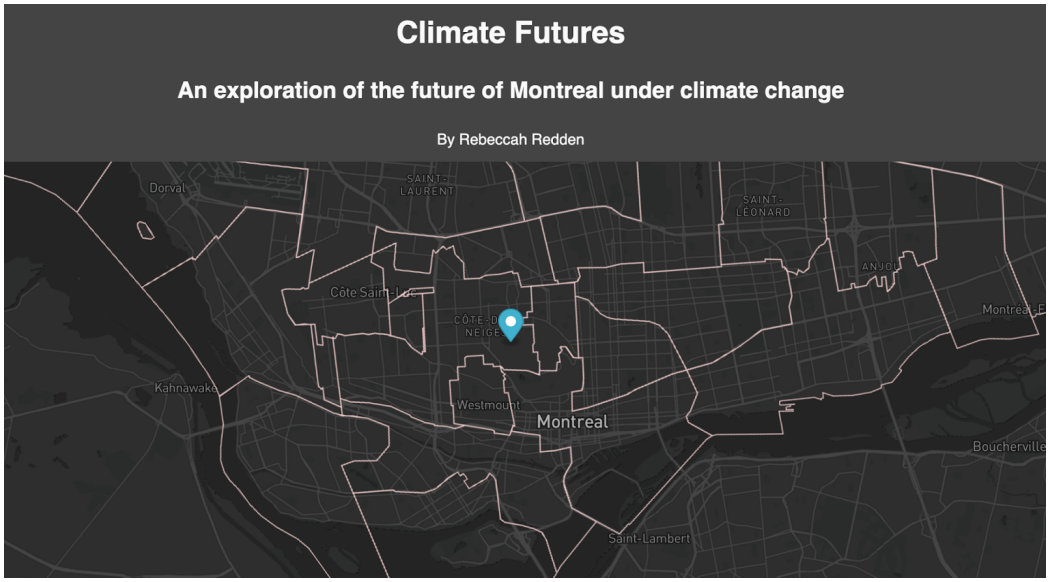


Fig. 4 - Story map intro page

I initially envisioned having the map points pop-up to the 360 images upon being clicked, with the map remaining in the background. However, this proved to be a difficult task because of the lack of integration for user-created 360 “street view” media within mapping programs. I also wished to add in a soundscape element. This soundscape, created by musician Eve Parker-Finley, was an ambient soundtrack mixed with the interviews of participants. The intent of this aspect was to allow for a more immersive experience, highlighting key points from the participants' perspectives. Ideally, this music would play in the background map, and also for each location. However, similar to the 360 images, the programs lacked the capabilities to input looping audio. I was able to solve both issues when I discovered the website *Story Spheres*. Music could be added to 360 images, and those images were then hosted on Story Spheres (*fig. 5*).

Fig. 5 - Story Sphere and 360 implemented into map

With the mapping technology figured out, I began to build the map and create narratives with the participants' projections, building a ‘future history’ that I could add in topographically. For example, some participants referenced the potential for civil war in the future due to climate change and inaction from politicians. Others imagined that, once the biggest hurdles were over, we would be able to live peacefully and without the need for strict states. A natural narrative emerged, where I could make visual reference to the struggle we will face, but also the time of tranquility participants hoped for. The above elements were indispensable to creating the map as a form of visual storytelling, guiding participants through the future using signs we use in mapping to delineate history, landmarks and importance.

Interview Discussion

Imagining New Futures

> Change is coming - What do we need to do to imagine as we prepare for it? What is compelling about surviving climate change? ... How do we prepare not just for suffering but for sharing and innovation? How do we resource the local and still honour our nomadic tendency, our natural migration patterns which we deny by trying to stay in only one place, our global interconnectedness? How do we prepare the children in our lives to be visionary until nature even when the changes are frightening and incomprehensible? To be abundant when what we consider value is shifting from gold to collard greens? How do we articulate a compelling economic vision to sustain us through the unimaginable, to unite us as things fall apart? How do we experience our beauty and humanity in every condition?
>
> - adrienne marie brown, Emergent Strategy

The above excerpt highlights the main threads of the questions participants were asked in Climate Futures. What do we imagine the future looks like, the good and the bad? How do we continue to exist in a way that gives us a quality of life and community during the changes that we are going to face? To answer these questions, participants were asked to look at a number of different areas: environmental, community, landscape, to interrogate visually what their society would look like in the future. In this section, I will highlight some key overlaps between participants and the imaginations of both future community and future crisis as it coincides with the theory. In doing so, I show how participants practiced remediation of the past to interact with the present and build their future. They also engaged with future building to envision the world they wanted to see. I contend that this practice reframes the apocalypse as the end of capitalism, allowing space for community based, anti-oppressive futures.

Envisioning Crisis

When participants were asked to visualize the effects of climate change, they explored two themes. The first was the direct climate effects, and the second was the societal and structural effects. The majority of participants discussed flooding and heat waves which both have precedent in Montreal. In summer 2021, Montreal broke heat records (Graham); In 2019, Montreal declared a state of emergency as homes were evacuated during flooding of the borough Pierrefonds–Roxboro (Perreaux). One participant imagined a future where they could see "all of the topography below the level of Sherbrooke being underwater". Another indicated: "see the fleuve st. Laurent… I mean when you look at it like the Griffintown area, all the things, old port and stuff are definitely going to disappear. I mean maybe not in 40 years, but... the level of water is going to be up". With the main climate challenges determined, the participants used these themes as the bedrock for us to collaborate in constructing a visual representation of the environment in their imagined future.

Alongside the flooding and heat, participants anticipated societal fall out. One participant noted that they "don't feel that people are ready to deal with (climate change) yet". Because of this fear of being unprepared, participants noted that other difficulties would also arise, including inflation and income inequality. One participant noted, "The rich are going to stay for a while until they realize that they're fucked and...they're going to buy their way into something else... And those that always thought that money could buy everything that were not prepared and like cannot go, are just going to have to learn how to live like the others". While most people saw the poorest communities being the most resilient in the future, they noted their fear that technocrats and industry politicians would maintain control. They anticipated that rich neighborhoods would be closed off from the masses, as well as other neighbourhoods would likely fight with each other for resources and space. Because of these issues, participants also noted that several communities would be at risk, in particular homeless and disabled communities, who would not have access to safe shelter or access to accessible services, transport, households, etc.

Due to these conditions, I observed participants building a vision of not just the future, but what the end of late stage capitalism would look like under our current view of 'apocalypse'. As one participant noted that "the climate crisis is inseparable from capitalism and the colonial

history of Turtle Island" , therefore identifying the roots of the issues that could affect not just climate, but marginalized peoples. Related to this, one participant noted that the growing tension, even today in the city and overall capitalist infrastructure coming into the future, made us vulnerable for civil violence. "There's like, I can feel this uneasiness, this, um, dissatisfaction. So yeah, in the long run, I mean I said civil war because maybe not as big as the image of a civil war that we have, but there's going to be some sort of like fighting that's going to be happening for sure". Overall, between the participants it was noted that the focus would be on surviving late stage capitalism, indicated by theft, inequalities and resources fighting.

The literature helps explain why this perspective becomes our default. When we consume apocalyptic fiction, the narrative of 'end of days' we are fed is really the "apocalyptic fantasies of late capitalism" (Williams 1), not so much concerned with the *why*, but concerned "with what happens in the aftermath" (ibid). Images of late capitalism consuming all resources, battling it out with global climate change or virus, and leaving people barely surviving does not end with a critique on the system, but oftentimes pushes the idea that the survival rests in our ability to rebuild oppressive structures and hegemonic norms. It implies that this is the only way we can live, and when that system is over, we can either suffer, or rebuild it.

When participants reference the people who are at the most risk, they also imply that those who have guaranteed survival are the ones who have societal power *under capitalism*. This perspective is highly reproduced amongst media, and echoes authors N.K. Jemisin, stating that in the duration of the genre's history, the survival stories have been focused on "white male power fantasies" (Hurley 470), which mirrors individualistic neoliberal values (Kouri-Towe) with an emphasis on storylines that mimic the "us vs them", survival of the fittest mentality of individualism. What the continuation of these problematic tropes serve to do is to mimic and reproduce the social and political conditions that create barriers to the world we want to see. It is without question that's why we often reproduce these images when we consider what might happen to our city under climate change. Images of destruction and breakdowns of 'society' have been pushed on us for generations of apocalyptic fiction.

The cultural reproduction of this type of 'apocalypse' only serves to reinforce the fact that capitalism is 'the only way to live'. There's no way out of the system but total destruction, for which we will suffer. So therefore, it's in capitalism's best interest to keep promoting that

way, regardless of the suffering, blaming survivors on their lack of ability and not taking accountability for the role capitalism has played in continuously destroying communities.

However, just because this is the messaging that post apocalyptic and climate change fiction gives us, it doesn't mean it's without merit. Participants in general took a realistic view, one that those under the pressure of capitalism feel - it might get worse before it gets better. participants envisioned the struggles and hurdles in the coming future, their fear, and their lack of hope that their visions would not come to fruition. It was a challenge to think about life outside of capitalism. As one participant explained "...this is like a chronic like illness kind of issue where like as a society we're just dealing with this like chronic pain or something like that and really like trying to manage that and exist with it", emphasizing their fear that it would last forever. After outlining how they're worried for the future, another participant noted "...I hope it doesn't (look like that) 40 years down the line, but I don't have much hope for significant changes."

While this participant described the need to have Indigenous leadership and diverse leadership in the future, they also acknowledged sadly that "more realistically" they saw the continued denial of the sovereignties and knowledge of Indigenous communities in tandem. As one participant put it while explaining the mentality of even the current climate movements - "...until the majority of the climate movement moves away from (the colonial) mentality, nothing is going to be able to change because we're pushing against the wall and asking it to be a sidewalk. It's designed to be a wall. Why would it move?". Colonialism is so deeply entrenched within society that it is a struggle to see beyond it, or to expect anything other than colonialism holding back our movements.

Finally, after participants were asked to imagine future communities, they would question if we had the capacity to fully support each other. "I mean never in history, in the history of mankind have we seen people on the same level no matter what in the world happens. So why would it change today? That's my question". Other participants echoed that it was hard to imagine total equality, and that prejudices would probably always persist despite their dreams for a better world. Overall, the interviews varied from hopeful to fearful, but all maintained the sort of emotion that the following participant expressed: "I know I'm going to sound like there's no, there's no, um, hope...unless something drastic happens in the next five years, honestly it's going

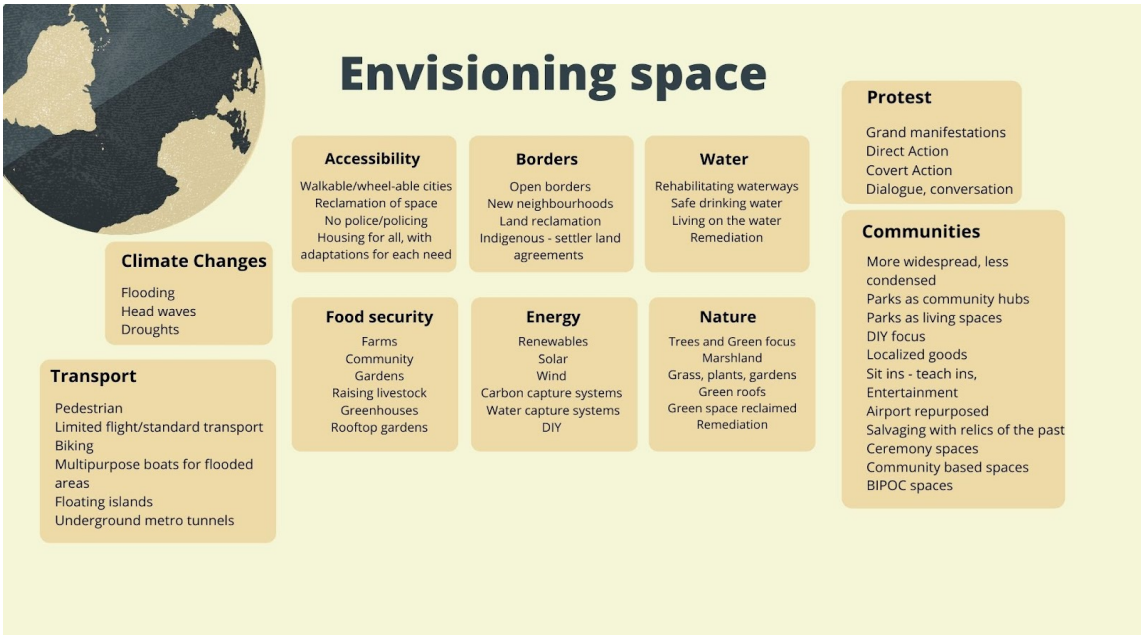
to get ugly in 20 years for sure". As William states, "We stand on the nervous razor edge of bad years bound to go worse, if we don't intervene, and we can't help but feel this" (4). We are fed this narrative of how the apocalypse will inevitably play out, but as we see oppression around us we can't help but feel hopeless.

However, participants did not only see disaster during this time period. Some had an optimistic approach, preferring to revel in the possibilities of a multiplicity of reactions to climate effects. As one participant noted, "I just think that when there's some kind of disaster that happens that is still okay...I think that that's when you see the most like coming together and the most like collaborative work. Whereas often you hear the opposite opinion or like, no, that's where you see people stealing from each other and like trying to get by and stuff. And you'll probably see both. But I have a hard time imagining that we wouldn't be coming together in a way that makes sense". Here, the point remains that in actuality, disaster actually brings people together despite what apocalyptic media says, and does not have to end at violence.

With this in mind, what I observed participants doing was using disaster to remediate the imagined environment, and reframing the apocalypse as an opportunity to rebuild. One example of this is that participants emphasized repurposing the flooding they saw to build community, industry and survival. They saw "a real build of …activities on top of water", with diverse styles of boats with different purposes, built with materials that could be easily salvageable. This meant people could thrive within the flooded areas. One participant saw this as reclamation, akin to the waterways in Venice; "We're not avoiding the water. We're actually like living, working with the water". Similar to this, another participant discussed seeing rehabilitation efforts on the water to renew the environment post-flood, and therefore have it be a healthy ecosystem where people could fish, drink, etc. To visualize this, I integrated the participants' views into a 360 degree view of the old port, complete with boats and diy floatation devices. The participants described the salvaging of equipment from these companies and companies that no longer exist, like gas and oil companies. There are labels and brands that would live on but simply become relics of an older time, now used for new purposes.

In imagining remediation of the environment, both in reimagining space and rehabilitating waterways, participants reflected concepts of anti-capitalism and decolonialism. The geographical area participants saw experiencing the most flooding also happened to be the high tourist areas and shipping areas, reaching as far up as the downtown and financial districts, all of which represent symbols of capitalism within Montreal. The seaway itself, as noted in the land recognition chapter, was a colonial project that destroyed the territory of Indigenous peoples for the pursuit of commerce. Visualizing a flooded seaway destroys the colonial structure, rebuilding on top of it, recognizing its past and creating something new. The process of rebuilding a future shows participants creating a vision outside of capitalism, and remediating the problems produced by this system. This is just one example of how participants saw a way to rebuild outside of capitalism and colonialism.

Envisioning Space



When asked to envision future space, participants' answers took two different paths - theoretical and physical. Participants knew and could easily explain what they wanted the future to look like theoretically. For example, when asked for tangible visuals, participants often relied on words used to describe future transformation like 'decolonization', 'anti-capitalist', and 'anti-racist'. However, when pressed to explain those concepts in visual ways that could be added to a map, they struggled to articulate it. The challenge to visualize these aspects provided participants with a new understanding of future visioning and these practices helped them to articulate what they actually wanted to see in the future, informed by their morals, hopes and dreams. This process of pushing to envision the future realistically reminded me of Williams, who states "the point is that apocalypse is not the clarification itself but a wound of the present that exposes the unseen - but unhidden - from which after-work can begin to dig out all the failed starts, possible histories. (6)". By participants identifying the parts of the future they wanted to see, they describe the past hurt, harm, and experiences they wish would no longer take place in this new society. And thus they open up an opportunity for the apocalypse to be a place to remediate the past, present and the future to rectify those errors.

Again, I believe the struggle to envision the new world has to do with the fact that when offered projections of the future in the mainstream, we are put in a position where we either see destruction, or we see a futurity well outside our reach (flying cars, intergalactic travel). We are rarely asked to envision a future that we want. What is of most interest here is that participants entered into visioning with the guiding principles of what they wanted the world to look like, and that strongly influenced the perspective of their visual imagery. It wasn't just imagining housing, but it was imagining accessible housing, it was the ethos that everyone deserves housing, it was prioritizing areas with BIPOC/marginalized communities and elders. It isn't just decolonization, it's what it looks like represented visually. Therefore, when we reframe the apocalypse so we can have a world without structural oppression, we build a world that is more hopeful, where people can see themselves in the future and rework our past mistakes.

This is in line with the concepts of visionary fiction laid out by Imahara and brown, who contend that visionary fiction "is not neutral—its purpose is social change and societal transformation. The stories we tell can either reflect the society we are a part of or transform it." (Thomas 197). Observing the participants engage in this form of speculative fiction, envisioning the future from their point of view and reframing our current society, transforming our past and present to build a better future showed the remediation that participants were engaging in. We weren't going to change the way the world works by reflecting it, we needed to take what worked and what we wanted and reframe our mind away from capitalist and colonial thinking.

In the structuring of neighbourhoods, many participants identified that territories would probably shift to smaller areas like boroughs rather than larger cities creating tiny city-states. To integrate this, I opted to split the city into loose boroughs, where the neighbourhoods would be sectioned into smaller communities to create smaller self-sustaining areas. I ensured that I highlighted communities that participants in particular referenced as resilient but could be under siege from climate change. This includes Hochelaga and North Montreal and their historically working class and low income communities. In addition, I provide a perspective of a new community built around a park, with a community garden and community hub to integrate the new infrastructures of the community.

Participants also suggested the repurposing of common space such as large public parks (ie. Jarry Park, Parc Lafontaine, Mont-Royal) which would include community infrastructure

like farms, living spaces, etc. The urge to do this is particularly interesting - *all* participants saw parks being repurposed, which emphasizes their prioritization of the concept of community and collective living. Most participants agreed on the fact that each community would have to be self-sustaining, and because of that they might break into smaller neighbourhoods. Each community would have its own energy, own farms, own trading areas, schools, area for community meetings, and own infrastructure made in the model of a community relying on consensus decision making. One participant again emphasized that this new living situation would emphasize collectivity: "I would love that…just like trying to connect all of the issues that we have and like bonding over something so simple as like the land we live on. I feel like that would be great.". They re-instilled the idea that we would need community to survive, and that we could build that in spaces that were already community and public spaces.

The emphasis on community and collaboration is in direct opposition to the ethos of capitalism and colonialism. For example, when discussing decolonization, one Indigenous participant (Métis-Aanishinabe) participant noted "how the actual physical infrastructure is going to look like needs to be based on the political relationships and the social dynamics between Kanewake and Tiohti:áke settlers who live in Haudenosaunee land." This means that the ideas of territories may be up in the air, but the way we follow through with reforming society must be informed by decolonization and mutual communication with the original caretakers of this land.

However, I don't make a claim on how this collaboration or community building with settlers functions. I am not Indigenous and therefore speculating on this future is not my right. Nevertheless I know that in the future that I *want* to see, and the future the participants see, there is a greater influence, leadership and prioritization of Indigenous peoples. Being able to reframe the apocalypse as a space to work collaboratively on decolonization gives us a chance to reimagine in more community oriented ways to engage in future reconciliation and respect for the original caretakers of this land.

In a continuation of this thread of remediation and imagining a new world after capitalism and colonialism, participants discussed energy, transport, and other reuse of space. Participants emphasized the need for renewables, discussing situations in which we'd run out of gas, but also the importance of diversifying renewables. For example, one participant talked about carbon capture methods, kinetic energy, solar, water energy, and geothermal energy, while

focusing on whatever can be used by people without this scientific or engineering knowledge and what can be integrated into space we already have. They emphasized the need for DIY green energy, and increased shade due to heat: “So people just, in whatever residences, um, coming up with, a lot of adaptation devices and kind of whatever techniques are at hand, either like completely non-electronic or maybe some electronically powered, uh, to just like keep ourselves physically comfortable”.

In addition, participants had a diverse understanding of what transportation would look like in the future. Many of them emphasized the need for biking and pedestrian access and referenced the lack of motor vehicles, or only mentioned the use of motor vehicles that were used for public transportation (buses). They discussed a repurposing of airports as they anticipated air travel to be significantly less. In addition, one participant emphasized the possibility of continuing to use metro stations despite flooding as an alternate way to travel through the city.

They also noted that we would probably see abandoned companies no longer needed in the new world, like gas stations, airports, parking lots, etc repurposed into community hubs. There would also be a lot of salvaging of equipment from these companies and companies that no longer exist, like gas and oil companies. There are labels and brands that would live on but simply become relics of an older time, now used for new purposes. In addition, other symbols of the state would still remain but not be in use. Police for example, would no longer need to exist according to some participants.

A major component of visualizing the community was farming. Providing food for communities became a centralizing topic for people, where it became clear we were seeing a creation of community farms, backyard farms, and parks turned into farms that would then become the central hub for the community, where people were living and spending their time. As one participant mentioned, the importance would be “going back to basics, localizing everything including goods”.

Expressing these ideas on to the map was relatively easy, but came with its own challenges that put into practice the remediation and imagination necessary to bring these visions to life. I focused on the use of parks as farms and central hubs, integrating symbols of ‘back to basics’, like having livestock in an urban area, community markets, etc. For power, I also

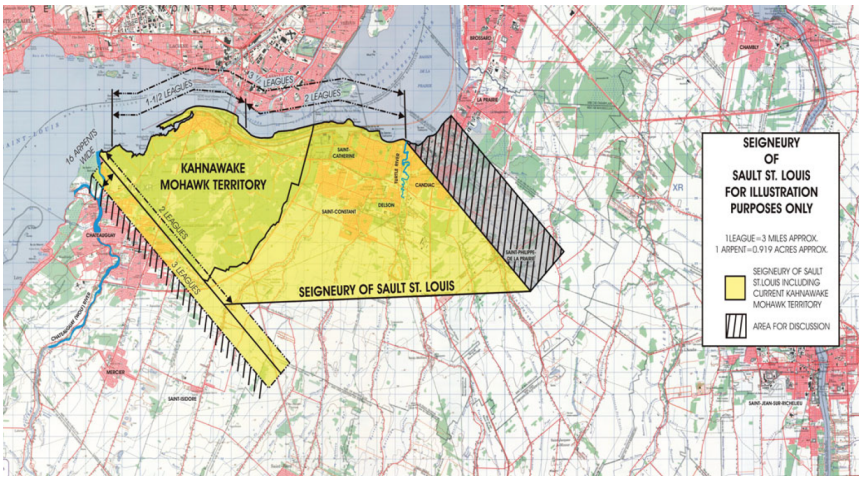
implemented visuals of solar power and wind power. For housing, I focused on showing multiple types of housing using materials salvaged from the past, such as car parts, signage, etc. There are also various types of housing, ranging from standard, apartment style housing to alternatives like storage units, tents, RVs, etc. For accessibility, I primarily focused on physical accessibility and providing visual imagery of that. Ramps, which participants mentioned, are a well known visual symbol of access, so those are integrated where applicable. I also provide visuals of wheelchairs, canes, and other adaptive devices.

For transport I collected imagery of bikes, boats, buses, and other alternatives. I provide explanations for what major infrastructural areas are being used for now. For example, the airport was discussed quite a bit by participants as a symbol of a changed world, so within the map I added its new uses into the description. I was able to take images of what was familiar, such as tents, solar power, livestock, police cars, ramps, and because we connect visually to how they affect our environment right now, I was able to imagine a new use.

Symbols of capitalism were the hardest to implement in a way that accurately explained their current use. The best example of this was the police presence: participants referenced they would no longer be necessary. How do you show the absence of something? To do this, I used symbols of policing, such as a police car, and converted it into community use - turning the police car into a garden, implying that police were no longer being used in the same way. This was a way to express that police existed in the past, and remediate both the visual of policing and the image by changing both meanings. By being a garden, it now was a symbol of the past that had a new changed purpose.

I also make visual reference to Kahnawake having a larger role with the region as a whole, showing how their borders have expanded to be more inline with traditional treaties/land claims. This of course, again comes from my interpretation as a white settler - I don't claim to know that this is an accurate depiction of the future, however, I would be remiss to create a future that left out Kahnawake, especially given their tireless work to dispute these land thefts and work to renew their ecosystems. To visualize this, I relied on maps and historical records to judge where exactly the expansion could take place. Today, Kanhawake's land is 5261 hectares, which pales in comparison to the 18, 210 hectares of the past, much of which was dispossessed lands designated to the Seigneury of Sault St. Louis (Deer). The land had been 'set aside' for

complete use by Kanien'kehá:ka of Kanewake. In disregard of those conditions, the Jesuits began conceding the lands (Mohawk Council of Kahnawake), and much of it was developed into the surrounding municipalities we know today. This is a historical land grievance (ibid), spanning hundreds of years, and is still in dispute to this day.

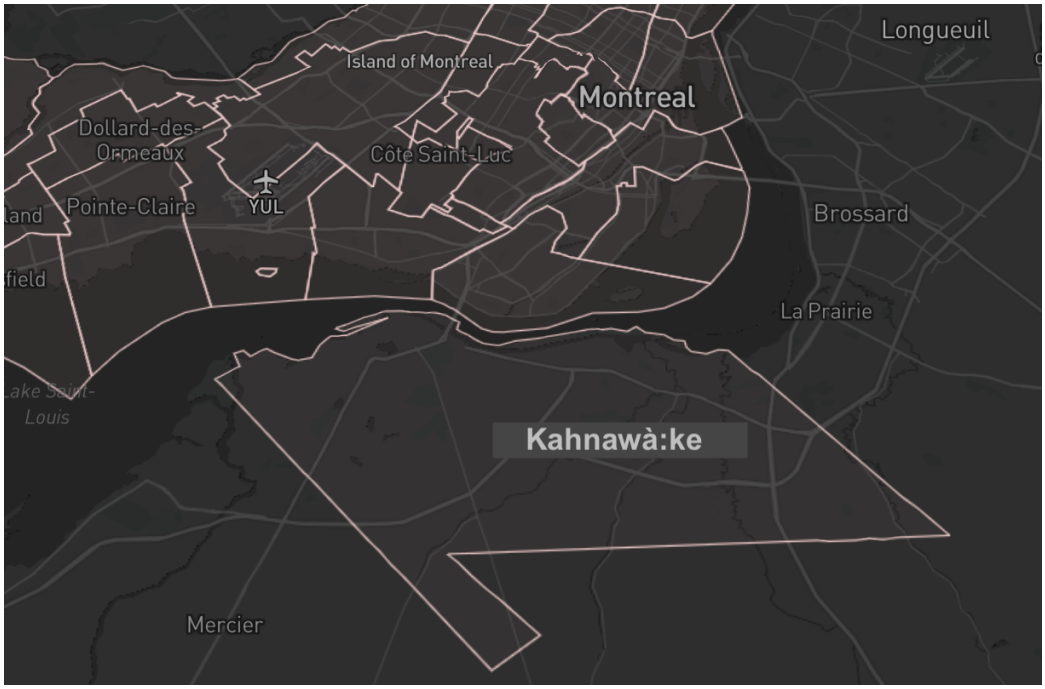


Map from *The Seigneury of Sault St. Louis* - Mohawk Council of Kahnawake

Map from *What 'land back' means for this reclamation camp in Kahnawake* - Ka'nhehsí:io Deer

With this in mind, I traced a number of maps that outlined the Seigneury of Sault St. Louis boundaries, adding it to Kahnawake territory. This is only a small action; the traditional unceded Kanien'kehá:ka territory is in actuality 3.6 million hectares of land, which goes from the St. Lawrence River Valley through the Adirondack Mountains and Mohawk River Valley in

upstate New York (Deer). As I've outlined previously, maps themselves are colonial tools, and therefore so are borders in this structure - the Kanien'kehá:ka always had ownership of this land - it wasn't the French Crown's to designate in the first place. By adding this section to the map, I hope to give visual reference to what participants outlined - greater sovereignty for Indigenous peoples, efforts towards decolonization, and an emphasis on collaboration. This does call on a gap in the research, and echoes what participants also emphasized: Indigenous people need to be heard, listened to, and spearheading sovereignty, rather than others (settler writers, researchers, activists, organizers, etc) thinking they can do that work.



Traced output within *Climate Futures*.

What I observed participants doing by interrogating the way society currently functions, reflecting, and imagining the world they wished to see, was engaging in visionary fiction building. Participants reorganized the social order and imagined new relationships and societal structures from the ground up, with marginalized people in mind. This is in line with what Streeby outlines, in how the Indigenous land defense surrounding the Dakota Access Pipeline in 2016 built communities within the occupation. NoDAPL protesters "projected a different future of climate change" (Streeby 39), by implementing aspects of a new world that did not exist yet.

For example, the camps included small schools for kids where they used solar powered tablets to explore and make videos on their experiences, had doctors and medical personnel available as well as traditional medicine and knowledge, provided education for older camp members on direct action and topics related to Indigenous sovereignty. These camps were primarily run and supported by women. They imagined a world without borders (40-43), space for all who are united under the same cause.

World-making here can be seen in parallel with this project. While land defenders in the present argue for a better world and create that better world on the ground, the participants in the research are also arguing for, creating, and building a new environment. Fiction, therefore, moves into the realm of possibility which looks to the past and present to build the future. Where people are living and communing differently and the ethos in which we met each other was one of care and consideration to our positionalities and vulnerabilities. I observed participants as they tested new ideas, coming up with new ways communities would work, the ways boundaries might work, how Indigenous relationships might take place if and when the colonial power no longer exists, imagining flooding being repurposed in multiple ways. Together we engaged in a practice of remediating the past, and pushing forward to visualize a tangible future outside of capitalism and oppression.

Community Make Up

After determining what Montreal would look like post-climate change, participants were asked to identify who would be there and what communities they wanted to see prioritized. The necessity to view the future from the perspectives of marginalized communities became clearer when participants broke down the legacy of marginalized people in experiencing/surviving the apocalypse. The work that marginalized people have done throughout their own erasure, the tactics of survival and resilience, were reused by participants as ways we could support ourselves in the future. This became an active theme within the participants' answers. Participants also imagined a world that rectified these erasures, that supported the leadership of marginalized communities and living with the community in mind (*fig. 6)*. This is indicative at every level - from who they saw in positions of power to who they wanted in their communities, *how* they

wanted to work together, and who needed the most support. These are practices of remediation - to identify issues with society and rectify them, which reframes the end of times as a way to process and renew our world, thus we believe in a better vision for the future.

Fig 6 - selected responses from participants.

Participants emphasized that in the next few decades they wanted communities such as Indigenous communities, low-income communities, and homeless populations to be prioritized because they are already the most structurally vulnerable to climate change. There was a general sentiment of being able to support each other collectively through neighborhood organizing and to strengthen community care throughout climate emergencies, as people were uncertain that governments would be able to help or were ready for that scenario.

They also determined the importance of particular *types* of community building in the future. For many participants, the first thing they mentioned was being able to be a part of communities that lifted each other up, were built on consensus decision-making, and that prioritized multi-generational and diverse leadership. In particular, a great emphasis was made on the leadership of Indigenous peoples in both society and in fighting the environmental crisis, as well as the perspective of Black communities and communities of colour, who are routinely left out of community decision making and decisions around infrastructure/climate justice issues that deeply impact them. One participant explained this "for me, one of the central points of decolonization, um, and if deconstructing capitalism is a return to Indigenous sovereignty, so letting the Haudenosaunee Confederacy and the Kanien'kehá authorities dictate which measures are most appropriate for managing the climate emergency and for managing settler Indigenous collaboration, cooperation and coordination efforts." They further explain the need for collaboration between settlers and Indigenous peoples, as well as a prioritization of Indigenous voices in the climate justice movement as "And no one knows (our specific ecosystems) better than Indigenous people". Here we see the direct want to have communities built on the leadership and guidance of marginalized communities, specifically those communities deeply impacted by colonization.

A common thread through all of the participants was an emphasis of this legacy of climate justice work, leadership, and erasure of marginalized communities in the fight for climate justice. In particular, an understanding that "Indigenous women have been doing this work for decades", and that it's the responsibility of non-Indigenous people to pay attention and learn from their leadership. Participants continued to explain that collectivity, anti-capitalism, and organizing is not a new way to manage, but a concept held by many communities. For example, one participant referenced that this (consensus decision making, community farming, etc) is how

some communities have always done things and we should look to them for advice. Another states that “a lot of communities all over the world, this is how they work”, going on to describe the collective nature of community building for many people in the global South.

When talking about migrant communities and transnationalism, one participant stated, “I think about people's relationships with environment, especially when it comes to migrant communities and like diaspora communities. Our relationships with our environments are very fluid in space and, and fluid in time”. They later state their community's way of working: “ It's taking what we did or what people did in their environments at a different point in time” and bringing it to a new location. Whether that be farming techniques or survival techniques, the gathering of knowledge and history from the past, and bringing it to the future is a key point to the remediation being done by participants, to challenge individualism and capitalist thinking.

Participants also put a lot of emphasis into who they wanted to be a part of their communities, in particular wanting communities built up in a way that reflected both their identities, and the diversity Montreal already has. For example, some participants referenced the need to prioritize queer and trans communities, different models of parenting and families. Alongside BIPOC communities, participants also emphasized that they see immigrant communities growing and changing. Many communities in Montreal are diasporic migrant communities from all over the world, and despite what mainstream visuals of ‘apocalypse’ look like (insular groups, cut off from the rest of the world, solitary), participants imagined a population who aren’t suddenly isolated from each other. People still have responsibilities, familial ties, cultural ties, and will support their communities whether here or abroad. This was an important, and often erased aspect of ‘apocalypse imagery’. In addition, participants pointed out that migration would continue to happen even after climate change occurred, if not especially during the climate crisis. One participant noted that we would need to make space for climate refugees, and those with new and different needs due to climate change.

The instinct for the participants to imagine a world where they saw anti-oppression and representation within their communities incorporates a few frameworks that we tend to view the future through. When we are asked to imagine the world through a mainstream lens, we are reminded that the genre focuses on “white male protagonists” (469), and that the erasure of BIPOC and marginalized communities eradicates the possibility of futures that *include*

marginalized people in a meaningful way. This goes beyond just story-telling and into the imagined reality. As Lothian states, “science fiction films set forth visual languages for speculative imaginaries; their images shape popular conceptions of the future and thereby influence the future itself” (179). The exclusion of marginalized communities therefore shapes the idea of who is represented in the future, and who gets to be in the future. For example, Jason Lewis specifies: “if Indigenous people are not present in the future, one wonders why the settler culture need concern itself with what happens to us now. We will, after all, be gone soon enough. (233-234). This erasure imagines a world that continues to privilege particular voices by erasing the future of marginalized peoples, which in term continues the oppression of these populations for the future-now.

The ironic part of imagining a future or even an apocalypse without marginalized communities is that in reality, marginalized communities have routinely faced apocalypse again and again. One participant I spoke to stated, “...minorities and people that have been oppressed forever and ever actually understand apocalypse because like they've experienced it already in a different way”. N.K. Jemisin corroborates this by saying “dystopia makes no sense when you’re talking to people from certain marginalized groups. Because the society we live in is a dystopia to those people” (Hurley 471). The conditions that marginalized people are forced to survive within are the conditions apocalyptic media bases their stories off of, allowing white consumers to “cosplay” as oppressed peoples without having to question what real life implications there are.

Therefore, the participants desire to have marginalized people in the front and centre of the future is indicative of the participants' understanding that these populations have already survived and continue to survive through apocalyptic conditions. It is through this knowledge, and the knowledge passed down from these communities that we stand the best chance of survival outside of capitalism, and in a climate changed world. As Williams says “the apocalypse is not the revelation of who's behind this mess: it's the fact, persistence, and resistance to thought of the mess itself” (7). In this sense, by recognizing the mess, the erasure, the previous and societal apocalypses, participants are rewriting the dominant narrative, placing the future and leadership in the hands of marginalized people, who have already been through generations of

survival. Through this visionary fiction, participants "consider what is at stake in defending a world built on cruelty and oppression—and what is at stake in ending it" (Hurley 469).

Integrating the participant visuals of the community was much more difficult than scenery, and tested the same concepts of remediation and visionary fiction that I was asking participants to work through. I was able to use signs and symbols to show that consensus decision-making was being used, for example creating signs that indicated community meetings and community spaces. The majority of scenes had to do with community gathering - from community gardens to protests. There were, however, a number of complicated issues that arose related to imagery of people's faces. This had to do with privacy as well as my personal interpretation. I opted to use as many open source and free images of diverse people as possible, but then to blur faces much like *Google Maps*. This acted as both a call back to the 'mainstream' source material of *Google Maps*, and it also helped to protect the identities of protestors, land defenders, and citizens that I myself have photographed. Although I am the sole owner of these images taken at events, and by those standards I can use them for whatever I need, the subjects still deserve to have their identities secured to the best of my abilities.

There is also an issue of my interpretation of identities. Although participants imagined worlds that are diverse, with a multiplicity of population, prioritizing Indigenous peoples at the forefront of leadership and reconciliation, I personally felt a creative impasse that needed to be interrogated. I, as a white scholar, could not in good conscience use the images of BIPOC people who had not consented to be the faces of my project. I could not repurpose their images to push forward what, at the end of the day, was my visual interpretation of the future. This also goes for any identity that I do not inhabit, but explicitly so when those identities experience hypervisibility in society.

A way I tried to mitigate this was by finding ways to represent diverse identities beyond just bodies. For example, in the image below I amalgamated street art and graffiti that amplifies modern day land defense sayings such as *Land Back*, to imply the fight for Indigenous rights continue. I ensured the Indigenous names of Montreal (Tiohti:áke) and the surrounding areas were present to exemplify the presence of Indigneous peoples without needing to show their explicit presence. Even something as small as having the three sisters (corn, squash and beans) in the Jarry Park garden stands as a subtle representation. I also used written signs and symbols to

delineate the presence of climate refugees and migrants, using flags to delineate various communities. These were ways to keep these communities in the forefront of the representation without needing to use their images. While these do not by any means solve the problem of my interpretation of the future potentially appropriating symbols, I do believe that it does help mitigate the issues I faced creatively, or at least is an experiment in mitigating these issues.

Envisioning Protest

Participants discussed what they thought protest would look like in a multiplicity of ways, outlining the benefits of both direct and indirect action. This is an important aspect because as Streeby states, actions such as land defense, etc is an example of speculative fiction, collectively imagining a different future to practice world-making (41), demanding what we want to see. In this case participants were prompted into imagining a scenario in which protest was still involved in the future, implying we would be far from utopia and committed to continued

revolution. Participants, therefore, continued to imagine a world that still struggled to reach equality, open borders, and reach climate justice.

In line with predicting the future we most wanted to see, participants outlined not necessarily the what of protest, but the who. Similar to their projections of community make up, they imagined a diverse body of people holding up contributing directly to social movements of the future, and being at the forefront of decision making. This included BIPOC leaders, but also identifying the active roles that parents, youth, and elders would take in the new world. In all, they saw "communities coming together to, to maybe, you know, speak common or collective truth or speak common or collective action items." They emphasized a growing movement of marginalized peoples joining forces to continue to build social and environmental justice, again prioritizing the leadership, influence, and inclusion of Indigenous peoples in the forefront of protest and social change.

Direct Action

Many participants described the great need for protest, especially in the form of marches or grand manifestations as a way to visualize future movements. Some participants focused on the idea of space reclamation as a form of direct action. In addition to the emphasis on protest, participants commented on the social unrest that would be visible in the future. One participant continued that the tensions would be high during early changes. That the unrest and the need to fight has always been there for marginalized folks, but now "It will be in your face that racialized people will be fighting.". Some participants directly advocated for direct action that would involve dismantling infrastructure, stating that it was the only way to do so. They emphasized the need to hold infrastructure and do efficient actions, stating: "if no one will listen to you...you need to fight back and by fighting back, if you have to like to do real actions that will just shock everything in the long run".

Covert Actions

A lot of participants noted that protest as a concept often didn't fit into their view of social change. They emphasized the need for a diversity of tactics, with one participant noting

that there's a limit to what protest can do. In particular the benefit of pursuing tactics that come from within a community, growing slowly in tandem with those tactics that are more direct.

One participant made an excellent point about the inaccessibility of protest:

> "I think manifestation is hard… I've spoken to a lot of people from different migrant communities and it's like manifestation is difficult to get into in this space because of how discouraged and how dangerous it was back home. And so for me, like manifestation is like a really important thing, but it's not the only thing. Um, I see it more in like practical actions and maybe, maybe this isn't the way that a lot of like climate justice activists think about it, but I see like activism rooted in like covert actions as well. Like, you know, when it comes to, when it comes to like community dinners or something, like people talking about climate… think it's important to show like protest in a different way,"

They go on to comment that the prioritization of protest as the only form of resistance ignores the way that a lot of communities across the globe have mobilized for change. Other participants made note of these diversities of tactics, highlighting sit-ins, teachings, boycotts, letter writings, and on the ground work especially when it comes to building an infrastructure that reflects our shared values. By integrating a diversity of tactics, this would be a way to make protest more accessible to people, especially those who cannot put themselves on the line physically. As another participant describes, protest can look a diversity of ways even on the ground:

> "I believe in a diversity of tactics, so to each his own, you know? Um, but I would really like to see more like, I don't know, like ceremony ceremonies and like, I don't know, like, um, healing the environment, healing like protesting in a way that is also healing. So like maybe protest looks like planting trees where they're not meant to be planted or like something like that, you know, or like, um, just like Indigenous ceremonies happening in places where they're usually not happening. And to like find that connection. Like to make people realize odd connections between like colonialism and the crisis, you know, and like how if we go back, we might like fix it, you know?"

Finally one participant notes: “we cannot stop the climate crisis without dismantling capitalism and ending colonialism. Now how that looks like for each individual is different”, continuing on to say that everyone has different skills to offer. They pointed out that we can’t just continue on with our tactics as usual, but we need to have a “results based approach and we need to be very critical of ourselves while still being proud of the efforts and work we've done, but realizing what has yet to be accomplished.

Visually, it was difficult to show a diversity of tactics. Images of protest and direct action are oftentimes easiest at conveying that political action is taking place. Therefore, I showed a large gathering of people, situated at Jeanne Mance Park, which is often a meeting place for protests in the present day. In order to show covert actions,. I placed signs and images to indicate that teach-ins and occupations were taking place. The graffiti that I added, in addition, used popular protest sayings and actions such as “Land Back”, also helped to symbolize that action was occurring around the community. The general reuse and reclamation of space is also indicated in general by the reuse of space that I have built in the images - for example, the encampment on top of the mountain and the reuse of space for a community garden show the covert action of rebuilding the community despite destruction.

Conclusion

Throughout the project, I observed two very interesting themes emerging from the participants. The first was their ability to translate concepts and theories into tangible visuals. The second was how they engaged in a practice of active remediation when reframing post-climate change Montreal. Participants who speculated on the process of environmental remediation outlined the benefit that this has on the community in general:

> **“...**I think that there's something really, really fun and important like remediation techniques. Like I mean that like you, you use plants and bacteria, like you cultivate plants and bacteria and fungi that can like take care of the contaminants that you're dealing with. And just by doing that and by being involved in that... you have to work as

a community and you have to like, get everyone's approval on what you're doing. It's just inherently like a collaborative experience and it's also incredibly healing. And I think that that work will be a lot more important in 40 years from now and how to use the resources around you to make a piece of land healthier so you can grow food on it. It's inherently important."

Here, the visual is extremely clear: people working together on the land to make it a better place, with 'collaboration' and 'healing' implying a space where the two can take place. However, as participants displayed, the action of remediation was not just environmental but conceptual. Participants identified the issues people have faced, the issues we deal with structurally, and the ways marginalized communities have survived throughout history to reimagine the future. They recognized current society and its serious impact on the ecosystems we live within. These new communities they built were a reflection of how they wished the world looked: an ethos of justice, equity and diversity, and led in an anti-capitalist, decolonial, and supportive way. By visioning and cultivating spaces where people can be collaborative, safe in their spaces, they were removing those toxins and pollutants. For example, ending policing is a process of remediation; this participants envisioned policing and what would occur if it was taken away:

"But I feel like if we're creating these places that are more communal, that are more local… like you knowing your neighbors, then the police become kind of like, you don't need it that much. Because once you meet people face to face and then once you know their stories, you have more empathy. Like why would you need to steal something from your neighbor when you know that they can lend it to you?"

The process of remediation here is the existence of supportive and regenerative communities that use local based techniques to bridge isolation and build trust. Infusing these things after a climate change emergency means we are trying to bring up our communities in fertile soil that we are regenerating based on sharing common interests and goals. Taking ideas that we envision, like providing an equitable society, prioritizing marginalized voices and

survival, and making protest, collaboration and living accessible, we are rebuilding to make our world healthier. As one participant put it “like you would have to actually put into practice all the things that we've been trying to like work through and deconstruct and stuff, which I think is really cool. I think it's really like an opportunity to not like dilly dally and to like to do the thing and do it right”. Through observing the participants, I saw the active process unfold and flow. Decolonization is the remediation to colonization. Anti-capitalism is the remediation to capitalism. Community is the antithesis to isolation, fear, and oppression in this lens.

When asked to envision a new world, what we are doing is an assessment of our current one. All the faults and the problems which are hurtling us towards a future projected by capitalism that ends in our ultimate destruction. Here we are looking at what's currently happening and investing in an alternate future. Shelley Streeby, when discussing author Octavia Butler, says:

> “Butler suggests that science fiction is not really about predicting the future but is rather about the present - how we in the present shape the future that is so come by thinking about it and foreseeing it. In other words, science fiction can help us take hold of the present and think about where things are headed, rather than just letting time pass by as our unconscious surround” (25).

In the future, this research can be expanded in a multitude of ways. The first is by broadening the research scope - even just the island of Montreal could provide much more information and visual representations, but because I could not travel too much, I was not able to expand to other boroughs. This framework of visionary fiction and the process participants went through can be used as well in other communities to build similar platforms and provide outlets for envisioning the future from the grassroots. Another gap in the research, as I’ve indicated, is that envisioning the future needs to come from marginalized communities. Therefore more research from within those communities, in particular visioning coming from Indigenous, Black, and people of colour and researchers is imperative to working towards building decolonized futures. The very nature of my identities means that I am rooted within a historical legacy of colonization, and further research from outside of the history of oppressors would imagine better, less oppressive and more collective futures. Finally, the next step would be to measure the

affectual response of people who are engaging with the map, to see if it helps people engage more urgently with climate change within the city. This was something I was unable to do, but something that would add to the discourse on climate projections and visionary fiction.

For myself, I was able to create this world based on participants' visions that would bring to life these remediation techniques. I was challenged to interrogate my positionality, my preconceived biases, and interpret the future that would best represent their wants and needs. I was able to place those on a map that can be accessible to the public, that could support narratively the story of the future as told by community members, and could help close the distance between the present and climate changed futures. In gathering the participants' visuals, I was able to build and create a new future with their hopes in mind. I was able to turn those words into visuals, using symbols of our current world to provoke meaning, emotions and new signification to spaces.

The participants and I invested together in an alternate future, in an active process of remediating by imagining the end game, and advocating for what we want to see. As Williams states "another world is necessary, but only built from the gutted hull of this one. (13)" With these remediation techniques, we speculated on a world that prioritized reevaluating an old world that is not serving us anymore, and engaging with the present to project the future. I am hopeful that more research into understanding embodiment, emotion, climate change, and speculative fiction will help us understand further the complexities of our collective future, and help us advocate for the progress we dream of. In the words of adrienne maree brown, "We hold so many worlds inside us. So many futures. It is our radical responsibility to share these worlds, to plant them in the soil of our society as seeds for the type of justice we want and need (197). For the participants and for what's to come, I hope this project represents our many seeds buried, aching to grow.

Bibliography

Akerman, James K. *Decolonizing the Map: Cartography from Colony to Nation*. 1st ed., University of Chicago Press, 2017.

Badger, Emily. "How Redlining's Racist Effects Lasted for Decades." The New York Times, 24 Aug. 2017. NYTimes.com, https://www.nytimes.com/2017/08/24/upshot/how-redlinings-racist-effects-lasted-for-decades.html.

Bhagat, Alexis, and Lize Mogel, editors. *An Atlas of Radical Cartography*. Journal of Aesthetics and Protest Press, 2008.

Biddle, Jennifer L., and Tess Lea. "Hyperrealism and Other Indigenous Forms of 'Faking It with the Truth'." *Visual Anthropology Review*, vol. 34, no. 1, 2018, pp. 5–14. A9h.

Bladow, Kyle (EDT), and Jennifer Ladino. *Affective Ecocriticism*. University of Nebraska Press, 2018.

Braun V, Clarke V. *Using thematic analysis in psychology. Qual. Res. Psych.* 2006; 3: 77–101.

Brown, adrienne maree. *Emergent Strategy : Shaping Change, Changing Worlds*. AK Press, 2017. Accessed 29 July 2022.

Bruce, Delan. "Afrofuturism: From the Past to the Living Present." UCLA, https://newsroom.ucla.edu/magazine/afrofuturism. Accessed 29 July 2022.

CBC News. "Canada Warming at Twice the Global Rate, Leaked Report Finds." *CBC*, 4 Apr. 2019, https://www.cbc.ca/news/technology/canada-warming-at-twice-the-global-rate-leaked-report-finds-1.5079765.

Chapman, Owen, and Kim Sawchuk. "Research-Creation: Intervention, Analysis, and 'Family Resemblance.'" *Canadian Journal of Communication*, 2012. Ares, *Atlas Systems, Inc.*, https://search-proquest-com.lib-ezproxy.concordia.ca/docview/1012150678/9DB2AC8C000C4B8CPQ/1?accountid=10246.

Cunsolo, Ashlee, and Neville Ellis. "Hope and Mourning in the Anthropocene: Understanding Ecological Grief." *The Conversation*, http://theconversation.com/hope-and-mourning-in-the-anthropocene-understanding-ecological-grief-88630. Accessed 3 June 2019.

Crampton, Jeremy W. *Mapping: A Critical Introduction to Cartography and GIS*. Wiley-Blackwell, 2010. 140515540x (hardcover : alk. paper).

Deer, Ka'nhehsí:io. "By the Rapids." *CBC News*, 18 Oct. 2020, https://newsinteractives.cbc.ca/longform/by-the-rapids.

Deer, Ka'nhehsí:io. "What 'Land Back' Means for This Reclamation Camp in Kahnawake." *CBC News*, 18 July 2021, https://newsinteractives.cbc.ca/longform/what-land-back-means-for-this-reclamation-camp-in-kahnawake.

Dery, Mark. "Black to the Future: Interviews with Samuel R. Delaney, Greg Tate, and Tricia Rose." *Flame Wars: The Discourse of Cyberculture*, Duke University Press, 1994.

Dewey, Caitlin. "Google Maps Did Not 'Delete' Palestine — but It Does Impact How You See It." *Washington Post*, 9 Aug. 2016, https://www.washingtonpost.com/news/the-intersect/wp/2016/08/09/google-maps-did-not-delete-palestine-but-it-does-impact-how-you-see-it/.

Dillon, Grace, editor. *Walking the Clouds: An Anthology of Indigenous Science Fiction*. University of Arizona Press, 2012.

Fragnito, Skawennati. *Atsa:Kta [At the Water's Edge]*. Outdoor Panel, https://www.skawennati.com/watersedge/watersedge.html. Accessed 22 June 2021.

Gieseking, J. J. "Operating Anew: Queering GIS with Good Enough Software." *Canadian Geographer*, vol. 62, no. 1, 01 2018, pp. 55–66. edselc, *EBSCOhost*, doi:10.1111/cag.12397.

Gilbert, Melissa, and Michele Masucci. "The Implications of Including Women's Daily Lives in a Feminist GIScience." *Transactions in GIS*, vol. 10, no. 5, 2006, pp. 751–61.

Goeman, Mishuana. Mark My Words : Native Women Mapping Our Nations. University of Minnesota Press, 2013. Accessed 29 July 2022.

Graham, Lori. "August 2021 Was the Hottest on Record for Montreal." Montreal, 1 Sept. 2021, https://montreal.ctvnews.ca/august-2021-was-the-hottest-on-record-for-montreal-1.5569995.

Gross, Terry. "A 'Forgotten History' Of How The U.S. Government Segregated America." NPR.Org, Autumn 2017, https://www.npr.org/2017/05/03/526655831/a-forgotten-history-of-how-the-u-s-government-segregated-america.

Hillis, Ken. *Digital Sensations : Space, Identity, and Embodiment in Virtual Reality*. University of Minnesota Press, 1999.

Holbert, Nathan, Michael Dando and Isabel Correa. "Afrofuturism as critical constructionist design: building futures from the past and present." *Learning, Media and Technology*, vol 45, no.4, 2020, pp. 328-344. 45:4, 328-344, DOI: 10.1080/17439884.2020.1754237

Hunt, Dallas, and Shawn Stevenson. "Decolonizing Geographies of Power: Indigenous Digital Counter-Mapping Practices on Turtle Island." *Settler Colonial Studies*, vol. 7, no. 3, 03 2017, pp. 372–92. edselc, *EBSCOhost*, doi:10.1080/2201473X.2016.1186311.

Indigenous Directions Leadership Group. "Territorial Acknowledgement." *Concordia University - Indigenous Directions*, https://www.concordia.ca/content/concordia/en/indigenous/resources/territorial-acknowledgement.html. Accessed 12 Feb. 2022.

Konik, Inge. "'Affective' Witnessing and Testimony in Contemporary Environmental Cinema." *Acta Academica*, vol. 50, no. 3, July 2018, pp. 29–48. A9h.

Kosut, Mary. "Virtual Body Modification: Embodiment, Identity, and Nonconforming Avatars." *Corpus: An Interdisciplinary Reader on Bodies and Knowledge*, edited by Monica J. Casper and Paisley Currah, Palgrave Macmillan US, 2011, pp. 155–70, doi:10.1057/9780230119536_10.

Kouri-Towe, Natalie. "Queer Apocalypse." *Fuse*, vol. 36, no. 3, 2013, pp. 4–5.

Kwan, Mei-Po. "Feminist Visualization: Re-Envisioning GIS as a Method in Feminist Geographic Research." *Annals of the Association of American Geographers*, vol. 92, no. 4, 2002, pp. 645–61.

Lara, Ana-Maurine. "I Wanted to Be More of a Person: Conjuring [Afro] [Latinx] [Queer] Futures." *Bilingual Review*, vol. 33, no. 4, Jan. 2017, pp. 1–14.

Lempert, William. "Decolonizing Encounters of the Third Kind: Alternative Futuring in Native Science Fiction Film." *Visual Anthropology Review*, vol. 30, no. 2, Nov. 2014, pp. 164–76. A9h.

Leviston, Zoe, et al. "Imagining Climate Change: The Role of Implicit Associations and

Affective Psychological Distancing in Climate Change Responses." *European Journal of Social Psychology*, vol. 44, no. 5, Aug. 2014, pp. 441–454. *EBSCOhost*, doi:10.1002/ejsp.2050.

Lewis, Jason Edward. "Preparations for a Haunting: Notes toward an Indigenous Future Imaginary." *The Participatory Condition in the Digital Age.*, edited by Darin Barney et al, University of Minnesota Press, 2016, pp. 226–49.

Lothian, Alexis. *Old Futures: Speculative Fiction and Queer Possibility*. NYU Press. 2018.

Low, Setha. "Placemaking and Embodied Space." *Making Place: Space and Embodiment in the City*, Indiana University Press, 2013, use.jhu.edu/book/28288.

Low, Setha, and Irwin Altman. "Place Attachment: A Conceptual Inquiry." *Human Behavior and Environment*, vol. 12, Plenum Press, 1992.

Lydon, M. "Community Mapping: The Recovery (and Discovery) of Our Common Ground." Geomatica -Ottawa-, vol. 57, 2003, pp. 131–144.

Mapping Inequality. https://dsl.richmond.edu/panorama/redlining/. Accessed 18 June 2021.

Markowitz, D. M., et al. "Immersive Virtual Reality Field Trips Facilitate Learning about Climate Change." *Frontiers in Psychology*, vol. 9, no. NOV, Nov. 2018. edselc, *EBSCOhost*, doi:10.3389/fpsyg.2018.02364.

Manzo, Lynne, and Patrick Devine-Wright. *Place Attachment: Advances in Theory, Methods and Applications*. Routledge, 2014.

Markowitz, D. M., et al. "Immersive Virtual Reality Field Trips Facilitate Learning about Climate Change." *Frontiers in Psychology*, vol. 9, no. NOV, Nov. 2018. edselc, *EBSCOhost*, doi:10.3389/fpsyg.2018.02364.

McGurk, Thomas. *Indigenous Online Mapping in Canada - Decolonizing or Recolonizing Forms of Spatial Expressions?* Concordia University, 2018. Concordia Theses, Research Papers, etc.

Mohawk Council of Kahnawake. *Seigneury of Sault St. Louis*. 2004.

Monmonier, Mark S. No Dig, No Fly, No Go : How Maps Restrict and Control. University of Chicago Press, 2010.

Mukherjee F, Ghose R. *Tracing the historic trajectory of GIS development and its effects on contemporary practices*. Journal of Urban Technology 18(3): 41–158. 2011

Nelson, Lise, and Joni Seager, editors. *Companion to Feminist Geography*. Blackwell Publishing, 2005.

Morgan, Jas M. "Visual Cultures of Indigenous Futurisms." *GUTS*, 5 May 2016, http://gutsmagazine.ca/visual-cultures/.

"Our Mission." *Inuit Futures*, https://www.inuitfutures.ca/our-mission. Accessed 12 Feb. 2022.

Palestine Open Map. https://palopenmaps.org. Accessed 29 July 2022.

Panko, Riley. "The Popularity of Google Maps: Trends in Navigation Apps in 2018." *The Manifest*, 10 July 2018, https://themanifest.com/mobile-apps/popularity-google-maps-trends-navigation-apps-2018.

Perreaux, Les. "What Did We Learn from 2017's Floods in Quebec and Ontario? Inside the Politics of Water." *The Globe and Mail*, 5 Jan. 2018. *The Globe and Mail*, https://www.theglobeandmail.com/news/national/quebec-ontario-floods-water-management-politics/article37511432/.

Price, Sara, et al. "Technology and Embodiment: Relationships and Implications for Knowledge, Creativity and Communication." *London Knowledge Lab*, 2009, p. 23.

Rankin, William. *After the Map: Cartography, Navigation, and the Transformation of Territory in the Twentieth Century*. University of Chicago Press, 2016.

"Remediation." *Cambridge Dictionary*, https://dictionary.cambridge.org/dictionary/english/remediation. Accessed 2 Aug. 2022.

Richard, Moriah. "What Is World-Building?" *Writer's Digest*, https://www.writersdigest.com/write-better-fiction/what-is-world-building. Accessed 18 June 2021.

Rosenberg, Matt. "The Peters Projection and Mercator Map." *ThoughtCo*, 21 Nov. 2019, https://www.thoughtco.com/peters-projection-and-the-mercator-map-4068412.

Schmitz, B. (. 1.)., et al. "Putting Yourself in Someone Else's Shoes: The Impact of a Location-Based, Collaborative Role-Playing Game on Behaviour." *Computers and Education*, vol. 85, 01 2015, pp. 160–69. edselc, *EBSCOhost*, doi:10.1016/j.compedu.2015.02.012.

Schultz, Tristan. "Mapping Indigenous Futures: Decolonising Techno-Colonising Designs." *Strategic Design Research Journal*, vol. 11, no. 2, May 2018, pp. 79–91. A9h.

Seamon, David. "Place Attachment and Phenomenology: The Synergistic Dynamism of Place." *Place Attachment : Advances in Theory, Methods, and Applications*, edited by Patrick. Devine-Wright and Lynne Manzo, Routledge, 2014, pp. 11–22, http://www.gbv.de/dms/bowker/toc/9780415538114.pdf. WorldCat.org.

Sen, Arijit and Lisa Silverman. *Making Place: Space and Embodiment in the City.* Indiana University Press, 2013. *Project MUSE* muse.jhu.edu/book/28288.

Simpson, Audra. *Mohawk Interruptus : Political Life across the Borders of Settler States*. Duke University Press, 2014, https://liverpool.idm.oclc.org/login?url=http://dx.doi.org/10.1215/9780822376781. WorldCat.org.

Simpson, Leanne Betasamosake. *As We Have Always Done : Indigenous Freedom through Radical Resistance*. University of Minnesota Press, 2017. Accessed 18 June 2021.

Smith, C. P. (2000). *Content analysis and narrative analysis.* In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (p. 313–335). Cambridge University Press.

Smith, Linda Tuhiwai. Decolonizing Methodologies: Research and Indigenous Peoples, 1999.

Streeby, Shelley. *Imagining the Future of Climate Change: World-Making through Science Fiction and Activism*. University of California Press, 2018. 0520294459.

"The Anthropocene Project." *The Anthropocene Project*, https://theanthropocene.org/. Accessed 24 Nov. 2020.

Thomas, Sheree R, and Institute for Anarchist Studies. *Octavia's Brood : Science Fiction Stories from Social Justice Movements*. Edited by Walidah Imarisha and Adrienne maree Brown, AK Press, 2015. Accessed 29 July 2022.

Tuck, Eve, and K. Wayne Yang. "Decolonization Is Not a Metaphor." Decolonization: Indigeneity, Education & Society, vol. 1, no. 1, 2012, https://jps.library.utoronto.ca/index.php/des/article/view/18630.

"What Is Site-Remediation and Why Is It Important?" *Ecologia Environmental*, https://www.ecologia-environmental.com/site-remediation/. Accessed 2 Aug. 2022.

Whyte, Kyle P. “Indigenous Science (Fiction) for the Anthropocene: Ancestral Dystopias and Fantasies of Climate Change Crises.” *Environment and Planning E: Nature and Space*, vol. 1, no. 1-2, 2018, pp. 224–242., doi:10.1177/2514848618777621.

Williams, Evan Calder. *Combined and Uneven Apocalypse*. Zero Books, 2010.

Womack, Ytasha. *Afrofuturism : The World of Black Sci-Fi and Fantasy Culture*. First edition., Lawrence Hill Books, an imprint of Chicago Review Press, 2013, http://public.eblib.com/choice/publicfullrecord.aspx?p=1381831. WorldCat.org.

Young, Jason C., and Michael P. Gilmore. “The Spatial Politics of Affect and Emotion in Participatory GIS.” *Annals of the Association of American Geographers*, vol. 103, no. 4, July 2013, pp. 808–23.

Mediography

Jackson, Lisa, and Mathew Borrett. *Biidaaban: First Light*. 2018.

“Native-Land.Ca.” *Native-Land.ca - Our Home on Native Land*, 2016, https://native-land.ca/.

Smith, Jack. *Google Maps Will Now Show You If Climate Change Will Flood Your House*. https://mic.com/articles/125218/google-maps-now-shows-you-if-climate-change-will-put-your-home-underwater. Accessed 4 Mar. 2019.