CHAPTER 4: "A RETURN *TO* AND *OF* THE LAND" INDIGENOUS INITIATIVES ON CLIMATE CHANGE ACROSS THE CANADIAN PRAIRIES

NOTE: This is a draft paper. The text and videos within are still being revised according to participants' feedback, and have not yet been released publicly. Please do not share this paper or the videos within. A final copy which can be shared will be sent to you once all revisions have been made.



Figure 1. Several of the Indigenous initiatives in the Prairies included in this project

"A RETURN TO AND OF THE LAND": INDIGENOUS INITIATIVES ON CLIMATE CHANGE IN THE CANADIAN PRAIRIES

Abstract

There has been growing engagement and collaboration between Indigenous communities and researchers on climate change in Canada, the vast majority of which has taken place in the Arctic. Relatively little work has sought to document Indigenous perspectives and knowledges on climate change in the Canadian Prairies, a gap which this paper aims to address. Herein an Indigenous community-based research approach was adopted which employed semi-structured interviews and participatory video to explore some of the ways in which Indigenous peoples in the Prairies are experiencing, understanding, and responding to climate change, and how their stories can be mobilized within and beyond the academy. Ten video interviews were conducted with members of eight communities in Nations across the territories of Treaties 1, 4, 6, 7, and 8. An integrated process of video editing and qualitative content analysis of transcripts was conducted and eight short videos were produced, which are included here. The results indicate that participants across diverse Nations and territories are experiencing changes in their environments - resulting from combined and compounding impacts of industrial development, climate change, and other colonial influences – which have significant impacts on their social and cultural wellbeing. At the same time, communities are pursuing a range of solutions – such as land-based and cultural education initiatives, community-based renewable energy projects, grassroots action and activism, cross-cultural dialogues, and ecological restoration initiatives - which serve to address interrelated environmental and social problems. Across these solutions, six common themes emerged: exemplifying Indigenous leadership; building capacity and self-sufficiency; generating sustainable economic development; connecting with and sharing Indigenous knowledge; connecting with and learning from the land; building relationships and bridging Indigenous knowledge and western science. While it is increasingly recognized as critical to heed Indigenous voices on climate change, this paper makes a significant contribution to understanding the diversity and parallels in the ways in which Indigenous communities are being impacted by and responding to climate change in the Prairies, as well as collaborative and creative methods for sharing these perspectives across cultures and geographies.

4.1. Introduction

Despite centuries of oppression and genocidal attacks (Gross, 2014), many Indigenous peoples of Turtle Island have maintained their traditional knowledges and ancestral ways of being, and are bringing them forward to address the environmental crises of today. There has been growing recognition of the unique and valuable insight of Indigenous peoples and their Indigenous knowledges (IK) in the context of climate change in political and academic arenas over recent decades. Indeed, climate change scholars are increasingly engaging IK through collaborative initiatives between researchers and Indigenous peoples, which have helped document climate impacts and identify opportunities for adaptation and mitigation. In Canada, the majority of this research has taken place in the Arctic, where the impacts of climate change on northern communities and landscapes have been the earliest and most drastic (e.g. Aporta et al., 2011; Berkes & Jolly, 2002; Cuerrier et al., 2015; Furgal & Seguin, 2006; Krupnik & Jolly, 2002; Laidler, 2006; Nichols et al., 2004; Pearce et al. 2015; Riedlinger & Berkes, 2001). Inuit and northern peoples have, in some ways, become the global face and story of climate change that has humanized the narrative and countered the globalized western discourse on this issue (Martello, 2008; Smith, 2007; Watt-Cloutier, 2015).

While there has been extensive collaboration and documentation of IK in the North, there are fewer studies from communities south of the 60th parallel, particularly in the Canadian Prairies. This geographic gap in the peer-reviewed literature on IK and climate change is particularly significant considering that the Prairies are expected to be one of the most severely climate-affected regions in Canada in the coming decades (Sauchyn, 2010). The Prairies have some of the most variable climates in the world and scientific projections predict that this variation will be amplified by climate change, creating even greater departures from historically normal conditions (Prairie Climate Center, 2017; Sauchyn, Diaz, & Kulshreshtha, 2010; Sauchyn & Kulshreshtha, 2007). Based on the literature reviewed, there are only a few studies that focus specifically on Indigenous perspectives on climate change in the Prairie region, such as those by Magzul (2009), Pittman (2009; 2010), and Ermine and Pittman (2011) which examine vulnerability and adaptive capacity in the communities of Blood Tribe, James Smith, and Shoal Lake First Nations. Additional "grey literature" exists – non-peer-reviewed reports from communities, governments, non-governmental organizations, and other agencies – such as those written by the Prairie

Adaptation Research Collaboration (e.g. Ermine & Prince Albert Grand Council, 2004; Ermine, Sauchyn, Vetter, & Hart, 2007; Ermine, Sauchyn, & Pittman, 2008), the Center for Indigenous Environmental Research (CIER) (e.g. AFN & CIER, 2006; CIER, 2007; CIER & UBC, 2011), and some others (e.g. Wittrock et al., 2008). For instance, in 2012 the CIER facilitated a gathering of Indigenous leaders in climate adaptation from across the continent, to discuss and share solutions in a three-day forum which brought together 55 people from 7 provinces, 3 territories, and 4 states in Akwesasne First Nation (CIER, 2013). Many communities have also undertaken to produce their own environmental plans, such as the Athabasca Chipewyan First Nation's stewardship strategy *Nih boghodi: We are the stewards of our land* (ACFN, 2012). These reports demonstrate the impacts of climate change for Indigenous communities and environments in southern Canada, as well as their observations, vulnerabilities and adaptive capacities. However, few of these studies and reports focus on Indigenous-led solutions to the climate crisis.

Documenting and understanding Indigenous knowledge, perspectives, and solutions to climate change is critical, not only in helping western society 'solve' the problem of climate change, but more importantly in strengthening the self-determination of Indigenous communities in addressing the challenges climate change brings to their lands and livelihoods (Whyte, 2017a). Unfortunately, the publication trend to date often only recognizes and includes IK in climate research when it is seen as valuable to inform western priorities and solutions. And, in part, because capacity and training opportunities that truly support Indigenous peoples conducting their own academic research based on their worldviews and ontologies is a relatively new area (Bullock et al., 2017). Thus, there is very little academic literature published specifically with and by Indigenous communities regarding their own climate solutions.

Indigenous communities are often burdened with the direct impacts of fossil fuel and resource extraction; yet many of these same communities are standing up in resistance to destructive development and paving the way for alternatives (LaDuke, 2014; Lowan-Trudeau, 2017b). Winona LaDuke (2014) describes how Indigenous communities, guided by their traditional teachings of intergenerational equity and respect, are "building an economics for the seventh generation." For example, Indigenous communities across Canada are pursuing renewable energy development (e.g. Krupa, 2012a; Krupa, Galbraith, & Burch, 2015; Ozog, 2008) and land-based activities and education initiatives (e.g. Ballantyne, 2014; CIER, 2005; Lowan, 2007) as ways to

mitigate environmental impacts and strengthen self-sufficiency and cultural connections to land. Many First Nations, Inuit, and Métis communities have demonstrated leadership and resilience by initiating solar, wind, and small-scale hydro projects, with an estimated 300 Indigenous clean energy proposals and projects documented to date in 194 communities across the country (indigenousenergy.ca). These projects have been mapped by Lowan-Trudeau and colleagues as part of the Indigenous Renewable Energy initiative (**Fig. 2**). Such community-driven and environmentally sustainable projects illustrate some of the ways in which communities are drawing on both Indigenous and western paradigms to forward goals of energy sovereignty, arguably exemplifying pathways to what Corntassel (2008) calls 'sustainable self-determination.' While several of these case studies of Indigenous renewable energy projects in BC and Ontario have been documented in the literature (e.g. Krupa, 2012a; Moore 2013; Ozog, 2008), few have been fully documented across the Prairie region.



Figure2. A map of Indigenous renewable energy projects in Canada (as of Fall 2016) from indigenousenergy.ca

This research seeks to address the geographical gap in the literature of IK on climate change in the Prairies. Our specific research questions include:

(1) what are some of the ways in which Indigenous communities in the Prairies are experiencing, understanding, and responding to climate change?; and

(2) how can participatory video methods be used to help share communities' stories within and beyond the academy?

The research team engaged and collaborated with participants from Indigenous Nations across the Prairies to explore these research questions. Our research approach combined Indigenous research with community-based and visual methodologies designed to honour and extend the reach of community voices and knowledge across the Canadian Prairie landscape.

4.2. Methodology and methods

With recognition of the importance of documenting and engaging with Indigenous knowledges and solutions to climate change through research, come important considerations with respect to the context and methods of knowledge exchange. As the literature on IK and climate change has proliferated in recent decades, a critical dialogue has emerged on the limitations, weaknesses, and critiques of engaging with IK through academic literature. IK is embedded within a worldview that is epistemologically different from western scientific knowledge; in contrast to western positivist knowledge which claims to be universal, detached, and transferable, IK can be understood as dynamic, place-based process that contains material dimensions as well as foundational spiritual dimensions (Battiste & Henderson, 2000; Berkes, 2009; Johnston, 2003). Smith (1999) contends that "[t]he values, attitudes, concepts, and language embedded in beliefs about spirituality represent, in many cases, the clearest contrast and mark of difference between indigenous peoples and the West" (p.74). These fundamental differences in the knowledge systems and ways of knowing present important considerations, and in some cases limitations, to the documentation and sharing of IK in the context of research. Williams and Hardison (2013) discuss the complex social, cultural, legal, risk-benefit and governance contexts of knowledge exchange, advocating for measures to implement free prior and informed consent (FPIC) for decision-making and exchange of IK for climate change adaptation. Other critiques and considerations raised in the literature include: the traditionally oral nature of many Indigenous societies; epistemological differences between western researchers and Indigenous Knowledge Keepers; the context in which IK is recorded and presented; the accessibility of the knowledge; representations of Indigenous peoples in climate discourses; and issues of power and voice in research with marginalized communities (Aporta & Macdonald, 2011; Martello, 2008; Mistry & Berardi, 2016; Spivak, 1999; Watson & Huntington, 2014; Williams & Hardison, 2013).

In response to these considerations, some studies have pursued alternative methods beyond academic writing for documenting IK on environmental change, such as through oral history projects (e.g. Igloolik Oral History Project) and participatory and documentary video (e.g. Willox et al., 2015; Kunuk & Mauro, 2010). It has been suggested that such audio and visual methods better align with oral traditions of Indigenous societies, and may be an effective tool for bridging cross-cultural understandings (Aporta & Macdonald, 2011; Baele, 1994; Halseth et al., 2016). Addressing criticisms with representation of Indigenous communities in conventional research, methods such as participatory video enable communities to play an important role in representing themselves and deciding which images are produced and included (Evans & Fosters, 2009; Magallanes-Blanco, 2015; Mistry & Beradi, 2012; Mitchell, 2011). Furthermore, the integration of interviews and visual information merges verbal and non-verbal data, which is otherwise lost in transcriptions or written text (Crichton & Childs, 2005). Video methods can allow more dimensions of participants' presence to be expressed: their physical bodies and voices, their language, and their cultural and geographic context. A combination of these methods was used to study IK and climate change across the Prairies.

Ten interviews were conducted with members of communities in Nations across the territories of Treaties 1, 4, 6, 7, and 8 in July 2017 (Fig. 3). Participants were Blackfoot from Kainai First Nation; Cree from Montana First Nation and Lubicon Lake First Nation; Woodland Cree from Amadu Lake; Cree and Saulteax from Cowessess First Nation; Dënesuliné from Athabasca Chipewyan First Nation; Métis from the Northern Village of Green Lake; and Anishinaabe from Sagkeeng First Nation (Table 1). These participants were identified through existing relationships of members of the research team and snowball sampling (Maxwell, 1996), with the general criteria being community members that were working on climate-related initiatives and were interested in collaborating. This was not aimed to be an exhaustive or representative sample of Indigenous communities in the Prairies, but rather an exploratory study to illuminate some of the experiences of peoples on the frontlines of climate change and associated Indigenous-led solutions. The research team conducting fieldwork – consisted of Laura Cameron (a settler-descendant Masters student), Kevin Settee (an Anishinaabe undergraduate student), and Marcel Kreutzer (a settler-descendant videographer) – travelled to communities in July 2017 and conducted a series of semi-structured interviews (while Ian Mauro, a settler-descendant Professor supervised and supported from afar). While main topics and sample questions were prepared in

advance, they were not strictly adhered to, and conversations were allowed to evolve and new questions emerge (Dunn, 2005). Interview questions all related to the research questions, but were tailored to the participant depending on their specific project, position, and/or experience. In addition, the interview methods were chosen with consideration of place, recognizing how place shapes the knowledge produced (Peters, 2017). Interviewing people in their local geographies can influence both what they share, and how that knowledge is understood by the audience. Particularly important in film interviews, location gives context and adds depth to the stories shared. In advance of some interviews, tobacco was passed to knowledge holders in recognition of the traditional protocol around knowledge sharing in their Nations. The interviews were conducted in conjunction with the Prairie Climate Center's Climate Atlas of Canada (climateatlas.ca), a larger project aiming to capture diverse voices and stories on climate change across the country.



Figure 3. Map of the Treaty territories in the Canadian prairies (source: native-land.ca) with the interview locations: (a) Lubicon Lake First Nation (b) Edmonton (c) Montana First Nation (d) Lethbridge (e) Northern Village of Green Lake (f) Cowessess First Nation land (g) Sagkeeng First Nation

Participant name	Interview location		Home community (if different)	Nation	Prov	Role/position
Melina Laboucan- Massimo	а	Lubicon Lake First Nation		Cree	AB	Community member, Indigenous Knowledge and Climate Change fellow with the David Suzuki Foundation
Billy-Joe Laboucan	а	Lubicon Lake First Nation		Cree	AB	Chief of Lubicon Lake Nation
Leonard Cardinal	a	Lubicon Lake First Nation	Amadu Lake	Woodland Cree	AB	Knowledge Keeper, Founder of Thunderbird Traditional Land-based Teachings Inc
Eriel Tchekwie Deranger	b	Edmonton	Athabasca Chipewyan First Nation	Dënesųłiné	AB	Executive Director of Indigenous Climate Action
Vickie Wetchie	с	Montana First Nation		Shoshone- Bannock/Cree	AB	General Manager, Green Arrow Corporation Akamihk, & Economic Development Manager for Montana First Nation
Leroy Little Bear	d	Lethbridge	Blood Reserve (Kainai First Nation)	Blackfoot	AB	Scholar and Professor at the University of Lethbridge, member of the Indigenous Wisdom Advisory Panel for the Government of Alberta
Ric Richardson	e	Northern Village of Green Lake		Métis	SK	Mayor of the Northern Village of Green Lake
Cadmus Delorme	f	Cowessess Wind Site	Cowessess First Nation	Cree/Saulteaux	SK	Chief of Cowessess First Nation
Lionel (Rook) Sparvier	f	Cowessess Wind Site	Cowessess First Nation	Cree/Saulteaux	SK	Councilor and former Director of Economic Development for Cowessess First Nation
Dave Courchene	g	Sagkeeng First Nation		Anishinaabe	SK	Knowledge Keeper, founder of Turtle Lodge

Table 1. Participants, interview location, home community, Nation, province, and role in the context of the research. Interview locations correspond to the study area map (Fig. 17)

Interviews were documented on video and short videos were made using a modified participatory video (PV) approach that allowed community members to shape the narrative and have influence over how the messages were conveyed and presented. In academia, PV as a method has grown popular in part due to the increased desire for more emancipatory and decolonizing

methodologies (Milne, Mitchell, & De Lange, 2012). Our modified PV approach draws on the *community-collaborative approach* developed by Elder and Kamerling (1995). The approach was guided by several principles: (1) relinquishing control of the project direction and outcomes to the community; (2) community self-determination, through community control over representation and empowerment; and (3) community ownership of footage and video(s) produced (Elder, 1995; Gubrium & Harper, 2013). The videos were created through an iterative process of participant feedback, and the participants had final approval of the videos, ownership, and control over their dissemination, in accordance with OCAP principles (www.fnigc.ca/ocap).

The interviews were transcribed in full, and content analysis was conducted to identify themes and patterns within each interview (Patton, 2002; Massey, 2011) through an integrated process of video editing and transcript analysis. Video interviews were watched first and themes were identified and organized through the keyword function in video editing software Final Cut Pro. Memos and notes on themes and ideas were also created during the process, outside of the video editing program. This produced a primary list of themes for each interview, at which point the researchers reviewed the transcripts twice to confirm and add to each list. Once the main ideas were identified for each interview, ideas and themes were compared across interviews to illuminate similarities, differences, and other patterns. The researchers did not develop a single coding scheme to analyze all interviews due to the different Nations and knowledge systems of participants. Videos were created from the main themes of each interview, and sent to participants for feedback and to ensure that the videos produced were reflective of their ideas and input, further affirming the process and associated results. The videos are shared along with the written results of the content analysis in the following section.

4.3 Results

4.3.1. Impacts: Climate change and identities

When asked about the changes they have witnessed, most participants reflected upon and referenced their own experiences growing up on or close to the land. All participants noted changes in their environment. As Leonard Cardinal described, "There's been a lot of big change since I was a young child because we live close to the land. We drink the water from streams, from the musk, from the lakes... We watch the animal behavior, even the trees." Vickie Wetchie noted that

"climate change is here. I can feel it, I can sense it, I can see it...". Almost all participants described changes in the weather, such as warmer temperatures and more "erratic" weather, while several participants from Nations in Alberta emphasized increasing winds. Some people also talked about extreme events in relation to environmental changes, such as increased forest fires (e.g. Fort McMurray of 2016; and Slave Lake in 2011), as well as flooding (e.g. Calgary floods of 2013). Other changes in the environment and landscape noted include: lower air quality from industrial pollution; increased earthquakes from fracking; and contamination from oil spills.

Another common theme was changes in animal and plant species: changes in caribou, bison, moose, and bird migratory patterns; decline in moose, rabbit, and fish populations; new/invasive species and their impacts on native plants and animals; increase in algae in lakes; and contamination in animals (e.g. fish, moose) and plants (e.g. berries, medicines). Several people commented on the decrease in abundance and reliability of culturally-significant plant species, such as medicines, berries, and sweetgrass, having the combined effects of negative health impacts as well as disruption of cultural practices and traditional knowledge pertaining to those species.

One of the most common concerns across communities was not having safe drinking water, with Melina Laboucan-Massimo remarking for example "we can't drink the water anymore" and Chief Cadmus Delorme explaining "one of the biggest challenges when it comes to climate change... is water." Elder Dave Courchene talked about the changes his community has witnessed in the waters of Lake Winnipeg which they have depended on for generations: "All the waters from the east, the west, and the south empty into Lake Winnipeg, so we get all the waste, the chemicals that are used on the farms, all of that eventually ends up into our waters." Other impacts discussed related to changes in water included: decreased precipitation, lower water levels in lakes and rivers, increased water temperatures in lakes, water pollution and contamination, and overall drought causing dryness of the land.

From an understanding that they are related to the earth and all living beings, common across many Indigenous cultures, participants described the immense impacts and risks climate change poses to their identities. As Melina Laboucan-Massimo articulated: "we are the land and the land is us, there is no separation." And, Eriel Tchekwie Deranger similarly stated, "we are of

the land. Dënesuliné means 'of the land,' Denendeh is 'people of the land.' These are who we are, and you can't separate it." Deranger explained what environmental impacts mean for her community of the Athabasca Chipewyan First Nation:

When you damage the delta where we come from, when you compromise it in any way, either through water withdrawals from the oil sands, or through precipitating the amount of greenhouse gas emissions in order to have massive climate change, you are effectively damaging the ecosystems that are a part of who we are. A land use plan framework looks at the land as something separate, and they never calculate... the human interaction of Indigenous peoples' cultures and identities in developing those frameworks.

In this light, the impacts of climate change on the land are not something relegated to realm of the 'environment' but are deeply human; when one species or area is changed that can have great impacts on Indigenous identities. For example, Leroy Little Bear described how removal of the buffalo from his ancestral territory has made him "a whole lot less Blackfoot." Leonard Cardinal spoke of the history and cultural significance of certain places on the land, which have been disrupted through development:

We used to have trails there that were there for thousands and thousands of years... That's where our history, our people migrated through those trails to the rivers...[Now] those trails are all broken, they're lost. Camping areas, traditional areas. With that clear-cut logging... a lot of that history there is kinda disappearing.

On this note, many community members discussed the linked impacts of industrial development in their territories, such as tar sands and other oil and gas development (extraction, through open-pit mining and fracking, as well as transportation), logging, industrial agriculture, and mineral mining. For example, Eriel Tchekwie Deranger talked about the impacts of uranium mining on her family's traditional trapline in northern Saskatchewan, Chief Delorme discussed the contamination of water sources through fossil fuel extraction, Chief Laboucan talked about the impacts of logging on moose and other wildlife habitat, and Melina Laboucan-Massimo talked about the health effects of tar sands industry on her community.

Some people expressed concern that because of these changes, future generations will not have the same opportunities and experiences out on the land as they had growing up. As Vickie Wetchie described: "There is a lot of things that have changed, and a lot of experiences that I had as a kid that our grandkids are probably not going to have." Eriel Tchekwie Deranger shared a similar sentiment:

There's a huge risk that the amount of damage that is happening, and climate [change] that's happening, is going to disconnect this new generation from being able to experience the things that I experienced as a child: hauling water to drink every day. building a fire in the morning. going out and checking the fish nets.

In general, there was an understanding shared by many community members that climate and environmental changes are interacting with and compounding other threats to their cultures, identities, livelihoods, and security, particularly the legacies and ongoing impacts of colonialism. Communities are concerned not only with environmental integrity, but with their economic security, cultural survival, health and safety.

4.3.2. Problems: Disrespect and disconnection from Mother Earth

Understanding climate change from an Indigenous perspective, Leroy Little Bear explained, begins with an understanding of the Indigenous paradigm that "everything is animate... everything has a spirit." Participants contrasted their worldviews and embodied connections with the land to that of a western worldview, which views the land as inanimate and humans as separate from, and superior to, nature. Some participants shared beliefs that these western ideologies and separation are at the root of the ecological imbalance that humanity faces today, treating lands and resources as commodities without considering the costs to the environment and social impacts to Indigenous peoples. This separation has distanced people from the land, and some said has also created divisions and competition among people. Dave Courchene described the root of the problem as disrespect, for the earth and for each other, saying humanity has "become obsessed in our minds with power, and having these values of greed that are destroying us." Eriel Tchekwie Deranger linked this mindset of human control over the environment to patriarchy: "climate change is an imbalance… and I think patriarchy is part of that… Man's domination over nature is sort of the foundations of capitalism; it's like everything can be exploited and commodified. And I think a lot of that has happened because of the imbalance of the powers between men and women."

The ways in which these western ideologies have been perpetuated through historic and ongoing instruments of colonialism – such as residential schools and public education systems, the reserve system, and government legislation – were also discussed by many. As Melina Laboucan-

Massimo described: "The reserve system and the Indian Act have really separated people into these little confined spaces... [and] have really severed our connection in that way to our cultures and traditions..." Chief Laboucan, Eriel Tchekwie Deranger, Dave Courchene, and others discussed how the tools of colonization which aim to disconnect Indigenous people from their cultures and lands, are directly linked to the environmental and climate changes they are witnessing. For example, Chief Laboucan described how colonial government legislation has been designed to appropriate Indigenous resources and accommodate industry: "With a lot of the different laws like the Natural Resources Transfer Act, 1930, they just more or less took over our lands and resources..." At the same time, some community members expressed more understanding or gratitude towards state governments. Leroy Little Bear shared a belief that governments are in a difficult position: "[The Alberta Government is] caught between a rock and a hard place... On the one hand, yes, our government really wants to do something about the environment... But then, on the other hand, we depend on royalties from oil and gas." Others such as Vickie Wetchie, Cadmus Delorme, and Lionel Sparvier applauded the support of the provincial and federal governments for community-based solutions, as discussed below.

4.3.3. Solutions: Reconnecting and relating

While some community members discussed mitigating greenhouse gas emissions and shifting energy systems, others discussed more holistic solutions to climate change and the broader, related problems based on reconnecting with the land and rebuilding relationships between Indigenous communities and among all of humanity. Some participants explained that taking action to reconnect explicitly aims to repair and heal the disruptions and disconnections caused by colonialism. Solutions were described as acts of resurgence, re-empowerment, revitalization, reconnection, and decolonization. Eriel Tchekwie Deranger said, "I think that real climate solutions are not caught up in maintaining the status quo of capitalism, of colonialism... that real climate solutions are rooted in a return to the land, a return to and of the land, and are rooted in decolonization." Across communities it was clear that people were bringing forward solutions not only to address climate change, but to work to better the broader social and environmental circumstances for their communities. As most people discussed, their communities are facing many existing and more immediate issues than climate change, and therefore are pursing solutions that offer other benefits – from providing employment and economic development, to inspiring

education, to strengthening community culture and pride. In this sense, for many it is not just about mitigating environmental impacts, but is about re-establishing Indigenous peoples' identities and working for justice for their communities. In discussions of solutions, community members drew on their experiences in five areas of action: (1) land-based and cultural education, (2) community-owned renewable energy projects, (3) grassroots action and activism; (4) cross-cultural dialogues; and (5) ecological restoration initiatives. Case studies and results for each area are discussed in the below, followed by a discussion of themes across participants

4.3.3.1 Land-based and cultural education

The research team was invited to participate in and learn about Lubicon Lake First Nation's land-based culture camp (**Fig. 18**). Chief Billy-Joe Laboucan, community member Melina Laboucan-Massimo, and Knowledge Keeper Leonard Cardinal explained that the camp was about reconnecting to the land and to their identity, through teaching traditional skills, activities, and protocols (e.g. drying and smoking meat and fish; beading and dress making; drumming and drummaking; canoeing; storytelling; conducting and participating in sweat lodge ceremonies). It was also about teaching leadership, transferring knowledge from Elders to youth, and creating a positive healing space for the community. It was the fourth year of the camp, and was a memorial camp for Bella Laboucan-Massimo, a community member who passed away in 2013. Melina described the significance of the camp to her:

This type of Culture Camp and being out on the land is a type of resurgence. It's a type of re-empowerment and reconnection to who we are as indigenous people... Because the colonial imposition and the colonial laws have really severed our connection in that way to our cultures and traditions, because they haven't been passed down. That's why it's so important to have Culture Camps like this.

Leonard Cardinal, founder of Thunderbird Traditional Land-based Teachings Inc., was there helping at the camp and explained how land-based learning is important for young people especially, to connect with their identity of who they are, to bring out their strengths, to find their gifts, and to understand that they have a purpose. It can also prepare them for the future, to be more self-sufficient and less dependent on systems that are harming the earth. This learning has benefits for people from all walks of life, he explained: Land-based learning teaches you how to connect to your environment, how to respect the plants, the animals and your surroundings, because you need your surroundings to exist... It helps you to reconnect to who you should be, not who somebody wants you to be.... Land-based teachings teaches you to be more of a community to help one another out for the betterment of your environment.

For Chief Laboucan this camp was a step towards returning to their Indigenous knowledge through traditional ways of learning, thereby regaining control over their own education.



Figure 1. Video stills from the Lubicon Lake's land-based culture camp video https://bit.ly/2xJywqd

4.3.3.2. Community-owned renewable energy projects

The researchers also spoke with several communities that have pursued community-owned renewable energy development: Montana First Nation, Lubicon Lake First Nation, Northern Village of Green Lake, and Cowessess First Nation (**Fig. 19**). All four communities expressed an understanding that renewable energy development aligns with Indigenous philosophies, principles, values, and responsibilities. As Mayor Ric Richardson explained:

Our people, the Métis and the First Nations, have used the opportunities presented by nature for time immemorial. Whether it's drying berries using the sun, drying meat, drying fish. Many different things have been a product of recognizing the opportunities in the

environment and taking advantage of them. So it wasn't a stretch at all when we started talking about renewable energy to the community.

Discussing their community-owned and operated solar energy company in Montana First Nation, Green Arrow Corp., General Manager Vickie Wetchie described the process as "going back to renewables, going back to low impacts. And thinking that way, "scientifically" but not really, because that's just how we were already. It aligns with our values, it aligns with things that we already believe in, and protocols and traditions, they match."

Other motivations and benefits of the projects discussed by community members included: providing local training and employment for community members in sustainable industries; contributing to energy sovereignty and lowering reliance on the grid; lowering dependence on boom-and-bust economies and industries; providing a more reliable energy source for remote communities; providing a demonstration of alternatives, serving to inspire community members and others; economic profit and/or savings for the community from energy production; providing an avenue for communities to participate in the economy; instilling pride in the community; and lessening their impact on the land and water. The importance of partnerships – with governments, research institutes, business consultants, non-profits, and other organizations - were emphasized across communities as well. At the same time, there were different comments on the role and support of government, with some applauding government support for community renewables projects, and others expressing a desire for better government policies to support decentralized energy systems. For example, Ric Richardson expressed a desire for the Crown corporation SaskPower to raise their limitations on the amount of power that community grid-tied energy systems can sell into the grid. Reported challenges in the projects varied across communities, including: securing the capital for the initial infrastructure investment; issues of land jurisdiction; limitations of power purchasing agreements; securing buy-in from Band councils and community members; and delayed timelines. Several participants also mentioned the negative environmental impacts of renewables, though less than non-renewable sources. Nonetheless, all four communities reported positive experiences and are each undertaking or are interested in pursuing more renewable energy development in future.



Figure 2. Still images from videos highlighting community renewable energy projects:
(1) Montana First Nation's community-owned solar company. <u>https://youtu.be/Q2g6MdOFfR8</u>
(2) Lubicon Lake First Nation's Pitipan solar project. <u>https://bit.ly/2xTc3Gm</u>
(3) Community solar in the Métis village of Green Lake <u>https://bit.ly/2ImDBIW</u>
(4) Cowessess First Nation's wind battery project. <u>https://bit.ly/2N8qGLI</u>

4.3.3.3. Grassroots action and activism

While these land-based cultural education and renewable energy projects are examples of community-led initiatives, Eriel Tchekwie Deranger spoke more broadly about the importance of community-led and grassroots action for decolonial climate solutions (**Fig. 20**). Changes in discourse and policy – from the international to the local level – do not happen automatically; they are the result of people standing up for their rights and making their voices heard, Eriel said. She explained why this type of action is particularly important for Indigenous peoples:

Grassroots activism here on the local level is going to be super critical because, we have to stand up against the injustices that we see on the land. Because as Indigenous people, the injustices that we see for our people, are injustices against the land, because it's one and the same... So, I think that grassroots resistance, struggles - whether that's intervening,

protesting, challenging, petitioning, letter writing, hosting ceremony and having ceremony, continuing language revitalization, land-based learning, community-based monitoring, sovereignty over their lands and territory... are things that we have to maintain in order to have that connection to the land. And when we are doing language preservation and cultural preservation, it becomes just as critical as putting up solar panels, and changing our energy efficiency. Because it's reconnecting and maintaining those connections to land that become so critical.

One example of an Indigenous grassroots organization is Indigenous Climate Action – a network of Indigenous people across Canada to create and share resources on climate change rooted in Indigenous perspectives and traditional knowledge (indigenousclimateaction.com). Eriel helped create the network to address the fact that, though Indigenous peoples have deep understandings and knowledge of the land, they were not being included in conversations on climate change and did not have the information or resources to make informed decisions. As Eriel explained, "the colonial machine was somewhat successful in the divide and conquer tactic... I want those walls to come down, and I want those networks to start talking again, so that ... we can share ways to move forward to address climate change."



Figure 3. Eriel Tchekwie Deranger, Executive Director of Indigenous Climate Action, speaking on the importance of grassroots activism for decolonial climate solutions. <u>https://bit.ly/2xITzJA</u>

4.3.3.4. Cross-cultural dialogues

Elder Dave Courchene spoke about his vision to convene the Onjisay Aki International Climate Summit, which brought together Indigenous Knowledge Keepers, scientists, and other climate leaders in a cross-cultural dialogue on Indigenous-led climate solutions in June 2017 (**Fig. 21**). Courchene shared his understanding that prophecy foretold of the current time of *onjisay aki* ("our changing earth" in the Anishinaabe language) in which Indigenous peoples of Turtle Island

would once again be recognized as leaders and bring forward knowledge to help all of humanity reconcile our relationships with the earth. For Courchene, the Summit was about bringing together the diversity of the human family to share a way of life of Indigenous peoples – particularly their relationships with the spirit and with the land – which could provide a foundation for collaborative actions to address the environmental challenges at hand.



Figure 4. Overhead view of Turtle Lodge from a video of Elder Dave Courchene discussing Indigenous leadership on climate change and the Onjisay Aki Climate Summit. <u>https://bit.ly/2zDwUzL</u>

4.3.3.5. Ecological restoration initiatives

From the University of Lethbridge, renowned Blackfoot scholar Dr. Leroy Little Bear explained the importance of initiatives for buffalo restoration that he is involved in (**Fig. 22**). He described the deep cultural, spiritual, and sustenance relationships that the Blackfoot people have with the buffalo: "The Buffalo embodied us and we embodied the Buffalo. And when it was gone, we still have the beliefs, but I'm a whole lot less Blackfoot because the Buffalo is not [there] on a daily basis." Buffalo restoration is not only important for Blackfoot culture and identity, but also for addressing the imbalance in the environment that climate change represents, as he described:

The Buffalo is the best environmentalist you can have. In fact, wherever the Buffalo is, birds that you've never seen before all come back. Plants that you don't see any more end up coming back and so on. The Buffalo is... a keystone species with regard to environmental issues. It's not just about trying to bring that Buffalo back just to see it out there. It also brings about environmental changes and brings about that ecological balance.

Little Bear spoke about buffalo restoration in relation to the paradigm of constant flux in native science; understanding that things are changing all the time – forming, reforming, transforming – "if we added something new to the pot, it may just be what's going to bring about balance."



Figure 5. Dr. Leroy Little Bear discussing the role of buffalo restoration in addressing climate change from a native science perspective.

4.3.4 Themes across case studies and solutions

Across participants and case studies, several interconnected themes emerged in discussions of solutions: Indigenous leadership; building capacity and self-sufficiency; generating sustainable economic development; connecting with and sharing Indigenous knowledge; connecting with and learning from the land; building relationships and bridging Indigenous knowledge and western science.

Indigenous leadership. Almost all participants emphasized that Indigenous peoples have a critical role to play as leaders in addressing climate change, in light of their unique knowledges, worldviews, and ancestral connections to their homelands. Melina Laboucan-Massimo and others underscored the ways in which Indigenous communities are already leading climate action and mitigation – with projects such as community-owned renewable energy – despite the high levels of poverty and crises in their communities, from housing to youth suicide to addiction. Eriel Tchekwie Deranger, Dave Courchene, and Leroy Little Bear all discussed prophecies of their peoples that foretold of this time of change, and highlight the importance of Indigenous unity and

leadership. At the same time, some participants noted barriers or challenges to recognition of Indigenous communities as leaders, including: exclusion of Indigenous peoples from governmental conversations on climate change; the gap in accessible information, tools, and resources on climate science and policy available to Indigenous communities; the difficulty in securing capital for infrastructure investments in small communities; the lack of relationships and knowledge sharing on solutions between Indigenous communities; and the positivistic western framing of climate change in the mainstream discourse.

Building capacity and self-sufficiency. Across the case studies of climate solutions discussed by participants, there was widespread recognition of the importance of building capacity, increasing self-sufficiency and self-determination, and decreasing dependencies of communities. Chief Billy-Joe Laboucan and Leonard Cardinal remarked on the importance of culture camps and land-based learning for increasing independence and self-sufficiency to survive off the land. Others described the increased sovereignty gained through energy projects, by bringing local training and employment and decreasing reliance on public utilities. For the Northern Village of Green Lake, their solar project provides greater independence by mitigating against problems of high voltage drop and frequent power outages of grid power to their rural community. At the same time, Mayor Ric Richardson views their community-owned solar development as an opportunity for social change: "we're looking at this as an opportunity...there's a larger picture that we're looking at other than just power." Many participants commented specifically on the opportunities for young people, as Lionel Sparvier described of Cowessess' wind project: "it's good for our community. It gets our younger people interested...there's other opportunities now." In the example of Montana First Nation's solar company, Vickie Wetchie explained that "you hire your own people, by your people, for your people" to provide sustainable, self-sufficient employment opportunities for community members and upcoming youth.

Generating economic development. Related to increasing capacity and independence were many comments on the economic benefits of climate solutions, particularly in communities with renewable energy projects. Chief Cadmus Delorme and Lionel Sparvier discussed the importance of the Cowessess wind turbine and battery project as an asset of the community, that can allow them to generate profits and participate in the economy. Vickie Wetchie emphasized the savings from their Montana First Nation's solar and retrofit – around 60% of the band office power bills –

which they have invested into clean water infrastructure for the community. She described it as a "win-win" for the community, lessening their bills and environmental impact.

Connecting with and learning from the land. Many participants talked about reconnecting and strengthening their ancestral relationships with the land as part of the solution to climate change. Understanding the land as a source of knowledge, Leroy Little Bear said spending time on the land "is where the real learning will take place." Leonard Cardinal emphasized the value of land-based learning for people from all walks of life. Similarly, Dave Courchene described that it is their ancestral connection to land and to spirit that has allowed Anishinaabe people to survive, and that will be key for their survival into the future. He said "if there's anything we can do to inspire our fellow human beings when it comes to climate change I would say go to the land, go and sit on the land, go and be with the land. Open yourself to hear the voice of the land. Open yourself to feel the land."

Connecting with and sharing Indigenous knowledges. Another common theme was the importance of reconnecting with Indigenous knowledges, transferring these knowledges to younger generations, and pursuing actions that align with the values and philosophies of these knowledge systems. Connecting with this knowledge can not only bring people closer to the land, but to elements central to their cultures and identities, histories, and spiritualities. Vickie Wetchie emphasized that documenting this knowledge will be important, but also understanding that it will and must change, because "to survive is to change." For Eriel Tchekwie Deranger, connecting with Indigenous knowledge in the context of climate change is an opportunity "to not just leverage our knowledge to help climate stabilization, but to really help ensure that our cultures, our identities, and our people's cultural survival is upheld." Five participants commented on the importance of languages for holding and accessing traditional knowledge. Leonard Cardinal explained the importance of language from his perspective: "The language is the story. The language is the teachings. The language is a spirituality. The language is everything." Similarly, Leroy Little Bear described language as "a repository... where all this knowledge and experience that you have with the land [is]... Consequently, if you speak the language you can draw on that repository." Chief Laboucan emphasized the role of education systems in maintaining Indigenous knowledges and languages: "We wanna take over our own education, we don't want education to be used as a

weapon against us anymore. We wanna be able to access the Indigenous knowledge from Elders." Dave Courchene echoed this understanding that education grounded in Indigenous knowledge is central, and also emphasized the importance of sharing this knowledge with others: "I believe that is where Indigenous peoples can have a very important role in sharing this knowledge, these protocols, that we all need to have in terms of having a relationship with the land itself."

Building relationships and bridging Indigenous Knowledge and science. At the same time, most participants also talked about the role of western science and technology in addressing climate change, and the need for building relationships and partnerships to bring together IK and science. Leroy Little Bear asserted that we must move beyond the either/or mentality of western thought: "we're not talking about either Western science or native science. What we're talking about is a marriage of the two because that'll bring about enrichment. That's what we refer to as a holistic approach." Little Bear shared about his experience on the Indigenous Wisdom Advisory Panel with the Government of Alberta, which he views as a successful example of working with both knowledge systems on equal level to offer new perspectives on addressing environmental change. At the same time, several participants emphasized that traditional knowledge must be recognized as equal and "uplifted just as much as western science" in order for these partnerships to be respectful and successful. Community members from Cowessess First Nation also emphasized the importance of bringing together Indigenous and non-Indigenous knowledges through trust-based partnerships. As Chief Delorme said, "you have to be open-minded, you have to trust, you have to gain relationship... When you deal with First Nations bands, First Nations in general, it's always about relationship."



Figure 6. Examples of Indigenous solutions (inside) and common themes (outside) from interviews with 10 participants in the Canadian Prairies.

Overall, there was a sense that Indigenous-led solutions – through restoring their traditions and knowledge, and working towards self-sufficiency as communities and Nations – must involve a shift away from ideologies of separation, superiority, and competition. While some participants shared their beliefs that commitment to action must start at an individual level, all participants talked about the need for collaboration. People discussed the different information and gifts that people from all walks of life can bring to enrich solutions, and the need to move from competition to cooperation and open-mindedness. This need for an ideological and social shift was seen by some as the solution, not only to address climate change, but to decolonize society and reconcile human relationships with the earth more broadly. An overview of the examples and themes across communities is shown in **Figure 23**.

4.4. Discussion

4.4.1. Climate change challenges and opportunities

Perspectives from Indigenous communities across the Prairies reflect diverse experiences, understandings, and responses to climate change. In many cases, community members shared understandings of climate change as related to broader environmental and societal issues, and in some cases as directly connected to colonialism. Often the environmental impacts of climate change and those of industrial development were inseparable for participants, such as community members from Lubicon Lake who discussed compounding impacts of extraction and climate change in tar sands region of their homelands. Canada is the fifth largest fossil fuel producing country in the world; the industry has seen massive growth in recent decades, with bitumen extraction from the tar sands increasing tenfold between 1990 and 2014 (CAPP, 2016). The disproportionate impact of extractive industries, particularly the fossil fuel industry, on Indigenous peoples in Canada has been documented in the literature (Booth & Skelton, 2011; Laboucan-Massimo, 2017), and parallels injustices of environmental racism from extraction in petrostates around the world (Perkins, 2017).

While numerous participants drew connections between climate change, fossil fuel industries, and colonialism (and its associated values), this stands in contrast with the literature, in which the colonial context and extractive dimensions of climate change are often overlooked (Cameron, 2012b; Ford et al., 2016). Many Indigenous and allied scholars are working to draw these connections and bring colonial dimensions into the climate discourse, with some contending that climate change is a continuation of the anthropogenic environmental change that Indigenous peoples in Canada have been experiencing since first contact with settlers (Whyte, 2017a; Wildcat, 2009). Whyte (2017a) and Wildcat (2009) argue that distancing and displacement of Indigenous peoples due to climate change today is just a new form of removal by colonial governments, following the geographic removal from their homelands through settlement, social removal of children through residential schools, and ongoing psycho-cultural removal through colonial institutions. As Whyte (2017a) asserts, "anthropogenic climate change makes Indigenous territories more accessible and Indigenous peoples more vulnerable to harm, just as did laws, policies, boarding schools, and the like in previous episodes of colonization" (p. 157). The understanding shared by many participants – but not all – of colonialism as both a driver of climate change as well as a major influence on Indigenous communities' vulnerabilities and adaptive capacities begs further exploration of these connections and attention to colonial contexts in climate research. Since this is an exploratory study, more research is likely required to fully appreciate the extent to which Indigenous people's experience with colonialism is directly or indirectly linked with their understandings and experiences with climate change in the region. However, based on these findings, it is recommended that climate change research consider the

broader social, political and economic processes and contexts that surround Indigenous peoples, their lifeways and knowledges. It is no longer – and never was – appropriate to simply view Indigenous knowledge as a data point to confirm western perspectives regarding climate change.

While participants discussed communities' vulnerabilities to the impacts of displacement, extraction, and environmental change, they also highlighted communities' perseverance in pursuing action. As Wildcat notes, for Indigenous peoples who have survived the continued removals and dispossession there is trauma, but also "tenacious resilience" (Wildcat, 2009, p. 3). This resilience is clear in the solutions brought forward by the community members interviewed. While there was variation in the motivations and priorities of each participant and community – from environmental protection and climate mitigation, to economic development and employment, to sovereignty and control over resources, to education and relationships – across projects it was clear that most people envisioned solutions through a holistic lens that drew on their cultural values and ancestral experiences to work for both human and ecological benefits.

Several areas of action were highlighted from the experiences shared by participants: renewable energy, land-based education, grassroots action, cross-cultural dialogue, and ecological restoration. While there exists literature in some of these areas – such as Indigenous community-based renewables (Henderson, 2013; Hunter-Loubert, 2016; Krupa, 2012a; Lowan-Trudeau, 2017a), cultural revitalization and land-based education (Lowan 2007, 2009; Wildcat et al., 2014), and grassroots action and activism (Lowan-Trudeau, 2017b; Perkins, 2017; Whyte, 2017a) - the present research presents a unique opportunity to look at the ways in which each of these actions can be understood as contributing to a holistic response to climate change. Though, it is important to note that drawing these perspectives and projects together in a discussion of climate change is not to overlook or sideline communities' goals of sovereignty, cultural revitalization, and so on; as Jaffar (2015) illustrates, it is critical not to counter or co-opt indigenous narratives and pursuits in the name of sustainability. Rather, the aim is to show how interlinked these goals may be, and how addressing an issue as monumental as climate change can provide opportunities for simultaneously better understanding and further supporting Indigenous initiatives and processes of self-determination.

On the whole, the solutions show that Indigenous communities are taking actions in diverse ways – in some cases working to shift away from western ideologies and reconnect with their

ancestral knowledges, skills, cultures, languages, and lands; while in other cases embracing western knowledges and technologies such as wind and solar when they align with their Indigenous values and benefit their communities. These different pathways for climate action may be considered to share principles with the multiple pathways to Indigenous freedoms advocated by Anishinaabe scholar John Borrows (2016). By both engaging western technologies and systems and moving outside and beyond them, communities are responding to Borrows' (2016) call to challenge colonial constructions of Indigenous societies as "past-tense peoples" and pursue a plurality of approaches to freedom in relation to western systems (p. 33). Taken together, the interviews indicate that these communities are doing just this, engaging with governments and policies, industry partners, and western institutions in some cases, while also working among themselves to convene conversations, build alternatives, and return to knowledges and relationships that predate the settler state.

4.4.2. Sharing stories: Video methods in Indigenous climate research

While this research sought to document and connect Indigenous knowledges and responses to climate change in the Prairies, it also explored the opportunities and limitations of using visual methods to do so. Participatory video was used to address some of the critiques and considerations regarding representation of Indigenous communities in conventional research, with particular attention to the embodied and place-based aspects of Indigenous Knowledge. Video methods were proposed by the researchers, and participants were receptive of, and generally excited by, the video component of the project. The short videos created to support participants and communities in sharing their stories with wider audiences ensure that they are centered as the storytellers, which Branch (2011) argues is a way of empowering participants in research. The videos represent research products that are accessible to communities, and which they own, control, and can use for their own purposes – may that be in grant applications to pursue funding for further initiatives, to share when they go to talk about their work with other communities, or otherwise. This responds to Evans and Fosters' (2009) assertion that despite increasing use of videography in CBR, there remains a need for more research products that are accessible and relevant to communities.

The accessibility and mobilization of this knowledge through the videos made is further enhanced through sharing them in the Prairie Climate Centre's (PCC) Climate Atlas of Canada – an interactive online platform that aims to combine science and storytelling on climate change to support communities, policy-makers, and researchers in understanding and responding to the challenges we face (www.climateatlas.ca). An Indigenous Knowledge section of the Atlas is being developed in consultation with Indigenous advisors to highlight the videos overlaid on an interactive map of Indigenous communities and territories in Canada. This allows the local, specific, individual narratives of each video to be connected across communities and geographies, letting broader narratives emerge that can inform policy, research, and learnings at a larger scale. This mirrors both the place-based nature and the commonalities of Indigenous paradigms (Little Bear, 2009). It also increases visibility and accessibility of the videos for a wider audience. This is not to say that all of the participants' stories fit perfectly into one broad narrative; each participant and community has their own experiences, and the differences and heterogeneity therein may be equally as important as the commonalities. Nonetheless, sharing the videos through the Atlas extends the participatory nature of the research to the audience, allowing users to move between the individual and collective narratives and draw their own insights and conclusions.

While the visual methods used herein, combined with the PCC's interactive platform, aim to innovate and address some of the criticisms with conventional research processes, they are not without their own considerations and limitations. In this case, videos were shaped collaboratively through conversations with communities and feedback on video drafts, however the researchers still maintain a significant amount of power and control over the narrative, particularly through the editing process. The power imbalances in participatory video are well-documented in the literature (e.g. Bali & Kofinas, 2014; Ball & Janyst, 2008; Evans & Foster, 2009). Through the editing process researchers "make aesthetic, technical, contextual and structural choices which we feel make the film accessible to western [audiences]" and risk deconstructing and reconstructing another's knowledge (Elder, 1995, p. 94). These considerations were addressed in part in this project by sending full transcripts and videos to participants ahead of sending the first video draft, to ensure that there were no critical parts of their message omitted or misrepresented in the edited cut, and then seeking input and feedback on the video drafts. Nonetheless, editing involved the researchers choosing points that were considered most powerful, salient, and relevant to the research questions, which is inherently a power-laden process (Gubrium & Harper, 2013) and deserves particular scrutiny given the colonial context. Further power imbalances in videography existed in terms of access to resources, equipment, and technical expertise that the researchers were afforded through their positions within the western institution of the University.

An additional consideration in the PV process includes the quality and length of the videos produced. In this research, videos were intentionally limited to 3-5 minutes to suit modern patterns of online media consumption, with the ability to reach a wider audience with shorter, more 'concise' messages. Evans and Foster (2009) discuss the balance between the participatory nature of the process on the one hand, and the quality and appeal of the video product enhanced by technical expertise of the researchers on the other hand, arguing that more attention should be paid to audience/viewer engagement. Johansson (2006) also suggests that the question of who is operating the camera equipment in PV is less important than whose perspectives are being shared. While this approach of creating short, high impact videos may reach a larger audience online, we recognize that it plays a role in shaping the knowledge and message shared to an extent. While we sought to find a balance between participation and guidance from the communities, and quality and reach of the videos produced, how successful we were in this aim can only be determined by the participants.

It is worth noting two other areas of opportunities and limitations in the research process, namely scale and language. While the majority of studies in the literature document IK at the community level, looking at this knowledge across communities and wider geographic areas could: provide a better understanding of the common aspects across Indigenous knowledge systems in relation to climate change, facilitate knowledge sharing between communities, and address power imbalances embedded in the localized framing of IK. The results of this research show that it is not only elements of philosophies and worldviews with respect to the environment that are shared among many Indigenous Nations, but there are also commonalities in understandings, experiences, and responses in the face of climate change that are revealed through storytelling across the landscape. Many participants expressed the importance of knowledge sharing between communities for learning and collaborations, which regional research such as this can aid.

However, while there are benefits of working across scales, there are also limitations in that the research design and analysis do not find an epistemological foundation in any one particular Indigenous knowledge system when participants come from many different Nations. In this case the research framework drew on common principles of IK (Battiste & Henderson, 2000; Cajete, 2000), rather than focused on one specific knowledge system. The larger geographic scale of research also presents challenges for the degree of participation of community members and the

ability to develop meaningful relationships with limited face-to-face interaction. These challenges were addressed in part in this research through communication (mail, email, and phone conversations) before and after in-person meetings and interviews. Further, in this case, research at a broader scale raises important consideration of language in documenting IK. While video methods have the potential to increase inclusion of Indigenous languages in academic research through speaking and subtitling, we did not have the capacity to edit and translate in the numerous different languages of participants in this project and thus did not include participants speaking extensively in their native languages. These methodological challenges and opportunities are further discussed in Chapter 5.

Finally, while it is clear that methods and modes of documenting and sharing IK on climate change should be selected according to the community and context, exploring diverse and alternative pathways for knowledge sharing may support the mobilization of knowledge from the academic into the public sphere. Pushing the boundaries of communication in research in this way is particularly important considering the role that the academy has had and continues to have in the colonization of Indigenous peoples in Canada and the marginalization of non-Western knowledges.

4.5 Conclusion

Through a process of community-based research employing collaborative participatory video methods, we examined some of the ways in which Indigenous communities in the Prairies are experiencing, understanding, and responding to climate change. The results indicate that participants across diverse Nations and territories are witnessing changes in the environment and are. being impacted by them, resulting from combined and compounding impacts of industrial development, climate change, and other colonial influences. These environmental changes have serious social implications for communities, challenging their identities, health, security, and cultural survival. Many participants expressed an understanding of climate change as a result of broader issues brought by western systems and ideologies, causing disconnection among humankind and between humans and their environments. At the same time, communities are undertaking diverse, Indigenous-led solutions to climate change through land-based and cultural education initiatives, community-based renewable energy projects, grassroots action and activism, cross-cultural dialogues, and ecological restoration initiatives. Communities are pursuing action

through many pathways, not only to ameliorate 'environmental' problems, but to strengthen their own cultures and knowledge systems, economies, and self-determination. Across these solutions, six common themes emerged: exemplifying Indigenous leadership; building capacity and selfsufficiency; generating sustainable economic development; connecting with and sharing Indigenous knowledge; connecting with and learning from the land; building relationships and bridging Indigenous knowledge and western science.

In the process of exploring the research questions, we used video methods to look at new opportunities for mobilizing IK on climate change within and beyond the academy. In consideration of the distinct characteristics of Indigenous knowledges and epistemologies, and methods of engaging with them through academic research, we suggest that video can be a useful tool to address concerns of power and voice and create an accessible research output that can mobilize IK beyond the academy. Herein we created eight short videos which are owned and controlled by communities, and will be shared with their permission through the Climate Atlas. These videos can help bring visibility to communities' perspectives and initiatives, and facilitate broader learning across the landscape. At the same time, we find these methods come with their own considerations and obstacles with respect to narrative construction through the video editing process, technical skills and resources required in film-making, capacity-building, and balancing participatory process and audience engagement through the quality and length of videos.

We also discussed the scale of research undertaken, and how scale interfaces with the community-based and participatory nature of the methods employed. We have argued that, while many community-based studies focus on localized and individual stories, research extended to the regional scale as undertaken here is valuable and can bring to light unique learnings, parallels, and variation across communities and geographies. Visual methods and outputs such as the videos shared here can be useful in bridging research across scales, maintaining individual voices and stories while allowing broader narratives to emerge.

While there has been very little documentation of IK on climate change in the Prairies of Canada in the academic literature to date, this research marks a significant contribution in this area, showing that communities in this region are both experiencing and responding to changes in their environments in powerful ways. The participants and initiatives surveyed here are only a few examples among the actions being led by Indigenous communities across the Prairies. Echoing many Indigenous scholars, we assert that respectfully engaging with Indigenous peoples and their knowledges on climate change can not only help inform more holistic approaches to the problems and solutions, but can simultaneously illuminate and support better understandings of Indigenous pathways to self-determination. This is not to dismiss Indigenous communities' vulnerabilities to climate change – due to existing socio-economic challenges such as health, housing, and unemployment resulting from ongoing colonization – but to draw attention to their often-overlooked strengths and resiliencies. There remains a need for further collaborative and creative research in this field, to highlight the diverse knowledges and initiatives being undertaken in a region which will be one of the most severely affected by climate change in Canada. To ensure mutual benefits, researchers and academic institutions, funding bodies, and policy-makers must broaden their understandings of climate change and seek to better appreciate how it intersects with and influences Indigenous cultures, identities, and knowledge systems. In the process, we must continuously foreground the colonial origins and contexts of climate change, and seek to subvert these power dynamics through systemic, decolonial research and solutions.