SIGNS OF CHANGE

Observations of Climate Change from Samson Cree Nation and Kainai First Nation

Acknowledgments

This work would not have been possible without the dedication and commitment of the Samson Cree Nation and Kainai First Nation participatory video teams. The Samson Cree Nation team included Michelle Louis, Abbey Soosay, Candace Okeymow, and Justin Buffalo. Kaylyn Buffalo also helped coordinate and support the Samson team. The Kainai First Nation team included Diandra Bruised Head, Alvin First Rider, Deserae Tail Feathers and Trent Crow Chief.

Numerous community members from Samson Cree Nation and Kainai First Nation participated in interviews and community discussions. In particular, we acknowledge the gifted knowledge received from Elders throughout the project. They were key to the success of this project.

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About Partners

Alberta Environment and Parks, Environmental Monitoring and Science Division (EMSD)

Established in 2016, EMSD's mandate is to provide timely, open and transparent access to, and reporting on, monitoring and scientific data and information about the condition of Alberta's environment, based on sound scientific evidence and respectful incorporation of traditional knowledge (TK) of Indigenous peoples in Alberta.

The University of Winnipeg, Prairie Climate Centre (PCC)

The PCC is a research institute based out of the University of Winnipeg that is committed to making climate change meaningful to Canadians. They bring an evidence-based perspective to communicating the science, impacts, and risks of climate change through maps, documentary and participatory video, research reports, and plain-language training, writing, and outreach. Their staff have over 20 years of experience working with Indigenous communities across Canada.

InsightShare (IS)

IS is a world-leading participatory video community development organization based out of Oxford with an international network of PV facilitators based on 20 years of working with Indigenous groups. Their work captures the best aspects of communications technology and participatory techniques. Using participatory video, they support communities to explore their issues and devise solutions to the challenges they face.

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Disclaimer

We acknowledge that the information expressed through the written word within this document may be incomplete and is respectfully shared in good faith. Any knowledge translation errors are without intention and are the responsibility of the authors. Further, nothing within this report is intended to be construed so as to prejudice, abrogate or derogate from any Aboriginal and Treaty rights recognized and affirmed by section 35 of the Constitution Act, 1982.

Alberta Prairie Climate Centre insightshare CHANGE IN FOCUS

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Instructions to the Reader

The purpose of this report is to document the outcomes of the Indigenous Climate Change Observation Network Participatory Video pilot project in Kainai First Nation and Samson Cree Nation. Specifically, the report highlights community members' observations of signs of change (also known as indicators) related to climate change in their traditional territories. The report also includes the methodologies used to document these observations, as well as the observations themselves. The report was written for the Government of Alberta as well as others interested in carrying out participatory video and climate change monitoring projects with Indigenous communities in Canada. The report is intended to inform future work with Indigenous communities in Alberta.

Executive Summary

With climate change impacting both the environment and wellbeing of regional populations, it is critical that Indigenous communities have the capacity to monitor, respond to, and adapt to multiple impacts of climate change. A priority identified by many Indigenous communities is to better understand sources of vulnerability and ways they can become more resilient through developing effective climate change monitoring and adaptation strategies.

Guided by the advice of the Indigenous Wisdom Advisory Panel, the Environmental Monitoring and Science Division (EMSD) of Alberta Environment and Parks initiated the development of an Indigenous Climate Change Observation Network (ICCON). ICCON is designed to enable Alberta's Indigenous knowledge holders and scientists to respectfully work together to coproduce best available knowledge about climate-induced changes relevant to Alberta's Indigenous communities and to enhance Indigenous communities' climate change resilience and adaptation.

The first year (2018-2019) of ICCON development focused on a pilot project to test the applicability and scalability of Participatory Video (PV) as a tool for mobilizing Indigenous and scientific knowledge of climate change and informing climate change adaptation planning at the community level. PV is a community-based methodology that enables local people to document, monitor, and communicate climate change-related observations through the creation of participatory videos. A critical tool for mobilizing oral-based ways of collectively-held knowledge, PV enables the community-led and owned process of developing video materials to be shared with diverse audiences to inform into climate change monitoring and adaptation planning.

The "Signs of Change" report summarizes the culturally-relevant climate change indicators, or signs of change, identified in the PV Pilot Project and discusses the methods that were used to identify these signs of change, including PV, participatory clustering, and interview coding.

EMSD worked through the South Saskatchewan Regional Plan First Nation Sub-Table to partner with two First Nations – Kainai First Nation and Samson Cree Nation – on the PV Pilot Project. Four community members from each community participated in the project activities, including two training workshops, interviewing, filming, editing, and community screenings.

With the project facilitators, project participants worked collaboratively to create videos and identify signs of change. As a group, they decided who and what to film, and which questions to ask in interviews. After filming, team members reviewed their footage and used interview coding to log key concepts from each interview and organize them into themes, which became the basis of their videos. Open coding was also used which involves reviewing written transcripts line by line and attaching labels to the text. The labels are then grouped together into more general codes that summarize the data. The codes related to climate change were then organized into seven broad categories: Seasonal Changes; Extreme Weather; Plants and Medicines; Animals; Water; Human Health; and, Culture (more on the coding process in Appendix A and B).

Screenings and engagement sessions were held in both communities to generate further discussion about climate change-related signs of change in each community and to verify the content and gather feedback on the draft videos. Throughout this process, the teams used a participatory clustering method to create graphic representations of climate change impacts and themes based on local knowledge and experience.

Over the course of this iterative process of video production and community engagement, community members identified a range of environmental, social, and cultural changes related to a shifting climate. The detailed observations summarized in the report include changes related to the broad categories, such as water, animals, plants, medicines, seasonal weather patterns, human health, and culture. Reflecting the holistic worldviews of Indigenous communities, participants' observations were not limited to the standard scientific indicators of climate change, and they spoke about a wide range of environmental, social, and cultural changes they are experiencing. These varied from water pollution and animal migration patterns to the timing of cultural ceremonies and mental health challenges.

The PV pilot project barely scratched the surface of both local knowledge and climate change impacts in participating communities. Team members and community engagement sessions identified many additional knowledge holders to be interviewed in the future, for greater breadth and depth of thematic coverage. Many issues were identified related to climate change that could be explored and documented in more specific detail using PV, including forest fires, water, extreme weather, and climate solutions.

Introduction

First Nations and Métis communities across Alberta are—and will continue to be—significantly impacted by climate change. Despite this, traditional and local Indigenous knowledge about these changes is overlooked and marginalized in public discourse about climate impacts, mitigation and adaptation.

There are many reasons to braid Indigenous knowledge with scientific knowledge. Indigenous peoples have long-term connections to—and knowledge of—specific places. As the climate has naturally changed over centuries, communities adapted and passed down intergenerational knowledge and adaptive strategies through oral traditions and practices. Though previous changes occurred more slowly than today's anthropogenic changes, traditional knowledge systems continue to be important in helping communities adapt to environmental changes.

In March 2016, Alberta Environment and Parks (AEP) Chief Scientist, Dr. Fred Wrona, received gifted advice from the AEP's Indigenous Wisdom Advisory Panel (IWAP) in response to questions of how stories, ceremonies, relationships and songs can inform climate change observations from an oral context. The IWAP advised the Chief Scientist to further explore an Indigenous wisdom-led network of climate variability in Alberta.

Guided by advice from the IWAP, AEP's Environmental Monitoring and Science Division (EMSD), Indigenous Knowledge, Community Monitoring and Citizen Science Branch (IKCMCS Branch) initiated the development of an Indigenous Climate Change Observation Network (ICCON) to produce critical information about climate-induced changes relevant to Alberta's Indigenous communities. The vision for an ICCON is that Indigenous knowledge holders and scientists are respectfully working together to understand and interpret climate change to enhance community climate change resilience and adaptation.

The first year (2018-2019) of ICCON development focused on a pilot project to test applicability and scalability of Participatory Video (PV) as a tool for mobilizing Indigenous and scientific knowledge for climate change monitoring and informing climate change adaptation planning at the community, local, regional and provincial level. PV is a community-based methodology that enables communities to monitor, document, and communicate climate change-related observations through the creation of short videos. PV is particularly appropriate for mobilizing oral-based ways of knowledge sharing, such as Indigenous knowledge. These videos can be shared by the community with diverse audiences including other

Indigenous communities, policy makers, and the general public to inform into climate change monitoring and adaptation planning.

EMSD worked through the South Saskatchewan Regional Plan First Nation Sub-Table (SSRP Sub-Table) to partner with two First Nations – Kainai First Nation and Samson Cree Nation – on the PV Pilot Project. Four community members from each community participated in the project activities, including two training workshops, interviewing, filming, editing, and community screenings. The Prairie Climate Centre (PCC) and InsightShare (IS) were contracted to help deliver the project. The process of working through the SSRP Sub-Table and project activities are described in greater detail under the "Project Process" section in the report, *"Focusing on Climate Change: Reflections on the Indigenous Climate Change Observation Network Participatory Video Pilot Project*".

The objectives of the 2018-2019 PV Pilot Project were to:

1. Enhance local capacity by providing PV training to eight Indigenous participants from Kainai First Nation and Samson Cree Nation.
2. Engage Indigenous community members in developing climate change monitoring and adaptation approaches through interviews and screening events.
3. Create opportunities for intergenerational knowledge transfer (i.e. Elder-youth dialogues).
4. Identify which culturally relevant climate change variables and indicators should be monitored in the two participating Indigenous communities.
5. Develop video products to be integrated with and share via the Climate Atlas of Canada, as a template for ICCON scale up throughout the province.
6. Provide a "proof of concept" for a PV approach as a tool for Alberta's Indigenous communities to document and communicate their understanding of climate change, and develop a vision for community-based climate change adaptation.
7. Create photo, video and narrative reports documenting the overall process.

This report documents the culturally-relevant climate change indicators (referred to as 'signs of change') that participants identified in the PV Pilot Project. The report also discusses the community-based methods that were used to identify these indicators, including PV, participatory clustering, and interview coding.

Overall, the facilitators believe this project was a success and recommend that the IKCMCS Branch continues to expand PV projects with additional First Nations and Métis communities across Alberta. This will help ensure that Indigenous voices are included in climate change dialogues across the province.

Methodology

This project was completed using a community-based PV research approach. Facilitators and team members from Kainai First Nation and Samson Cree Nation worked collaboratively on all phases of the project to create videos and identify culturally relevant signs of change, also known as indicators. The teams used a mixed-methods approach that combined and weaved together multiple participatory methods—including PV, participatory clustering, and interview coding—which ensured a range of perspectives were included in the project.

Figure 1: Abbey Soosay (l) and Diandra Bruised Head (r) plan out a video during the first workshop in Stand Off, Alberta.

As part of these methods, the video teams hosted screenings and engagement sessions in both communities to learn about community members' perspectives on climate change and gather feedback about draft videos. In addition to these events, the PCC also facilitated community dialogues about the development of an online environmental monitoring platform focused on climate change. During these dialogues, community members shared observations of change, which have been included in this report.

Participatory Video

The teams used a method known as Participatory Video (PV) to document and highlight signs of climate change. With the facilitators, the team members planned out videos, filmed b-roll, interviewed community members, logged footage, edited multiple videos, and screened them at community events.

Through this process, the teams selected and prioritized the observations of climate change that were most significant to them. As a group, they decided what and who to film, and which questions to ask in interviews. After filming, they logged the key concepts in each interview and organized the concepts into themes, which became the basis of their videos. While editing, the teams selected what material to include and exclude from their films, and how to organize it into a narrative arc. As a result, the films reflect how the teams understand and perceive the impacts of climate change through the voices of community members.

The teams created a series of videos that highlight how climate change is impacting their communities. The Kainai First Nation team created three short videos, which they combined into one 31-minute film. These videos are: *Aohkiiyi: Cultural Connection to Water*, *Kawapaomahkaiksi: Cultural Connection to Animals*, and *Siksikaitsitapii: Cultural Chaos*. The Samson Cree Nation team created four short videos, which they combined into one 29-minute film. Their videos are: *Climate Change*, *Land*, *Water*, and *The Future*.

The films were shared with community members during local screenings to verify the content of the films and consider audiences for the films. Screenings were also used to generate further discussion about climate change related signs of change in the community. The resulting discussions influenced the content of the films and the next steps for the team.

Figure 2: The video team films an interview with Kainai First Nation Elder Beverly Hungry Wolf.

Figure 3: Trent Crow Chief, Deserae Tail Feathers, Diandra Bruised Head, and Alvin First Rider (l to r) edit their video as a group during the second workshop in Maskwacis, Alberta.

Participatory Clustering

The team members and facilitators also used a participatory clustering method to create graphic representations of climate change, which during the project were referred to as 'Climate Change Swirls'.[1] These Climate Change Swirls highlighted community members' perspectives on climate change's causes, impacts, and potential solutions.

These swirls were created through an iterative process with input from community members throughout the course of the project. During the first workshop, team members from Kainai First Nation and Samson Cree Nation recorded key points from interviews and community discussions about climate changes causes, impacts, and solutions on Post-It Notes. Over multiple days, they discussed and clustered these notes into different categories until six broad categories were decided on. These were: Animals, Land, Water, Air, Social, and Culture. However, because the team felt that many of the observations of change could fit into more than one of these categories, they decided to organize the themes into a 'swirl' that highlighted the interconnections between the discreet categories.

1 Kuivanen, K. S., Michalscheck, M., Descheemaeker, K., Adjei-Nsiah, S., Mellon-Bedi, S., Groot, J. C. J., & Alvarez, S. (2016). A comparison of statistical and participatory clustering of smallholder farming systems–A case study in Northern Ghana. *Journal of Rural Studies*, 45, 184-198.

Figure 4: The 'swirl' of Post-It Notes with climate change causes, observations, and solutions during the first workshop.

In subsequent visits and workshops, they collaboratively revisited and updated their swirls based upon insights from interviews and community dialogues. They highlighted points that community members had emphasized or repeated, which were subsequently typed in a larger font. The teams revised the swirls until a final version was agreed upon for both communities.

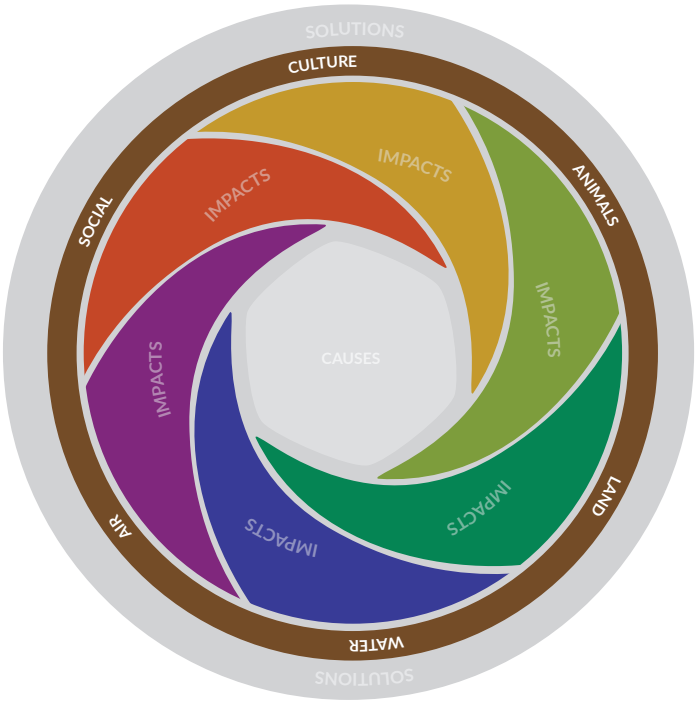


Figure 5: Blank version of the climate change 'swirl'.

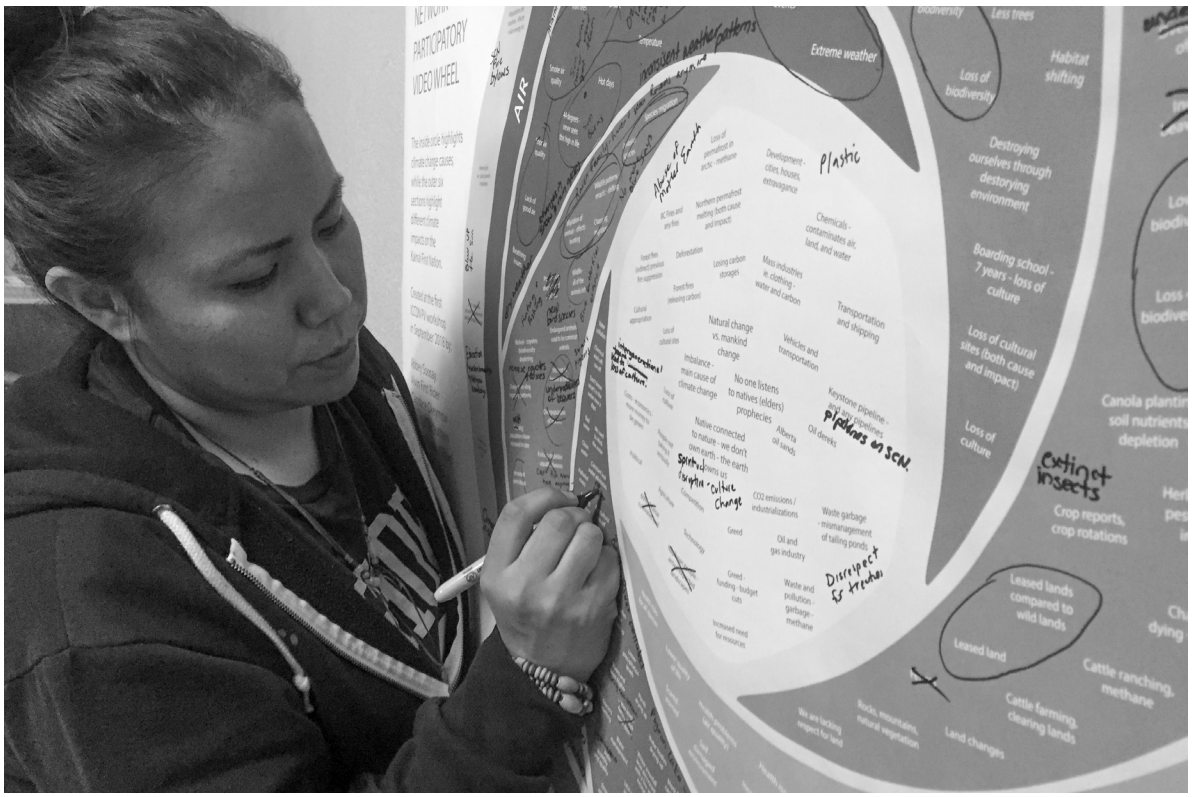


Figure 6: Samson Cree Nation participatory video project coordinator Michelle Louis updated the climate change 'swirl.'

During the final screenings, the climate change swirls were displayed and community members were invited to place dot stickers on the items that were most relevant or important to them. This process is known as 'dot-mocracy.' However, in both communities, the stickers were relatively evenly distributed across the causes, impacts, and potential solutions, which reinforced the team participants' belief that all of the impacts are interconnected and significant to the communities.

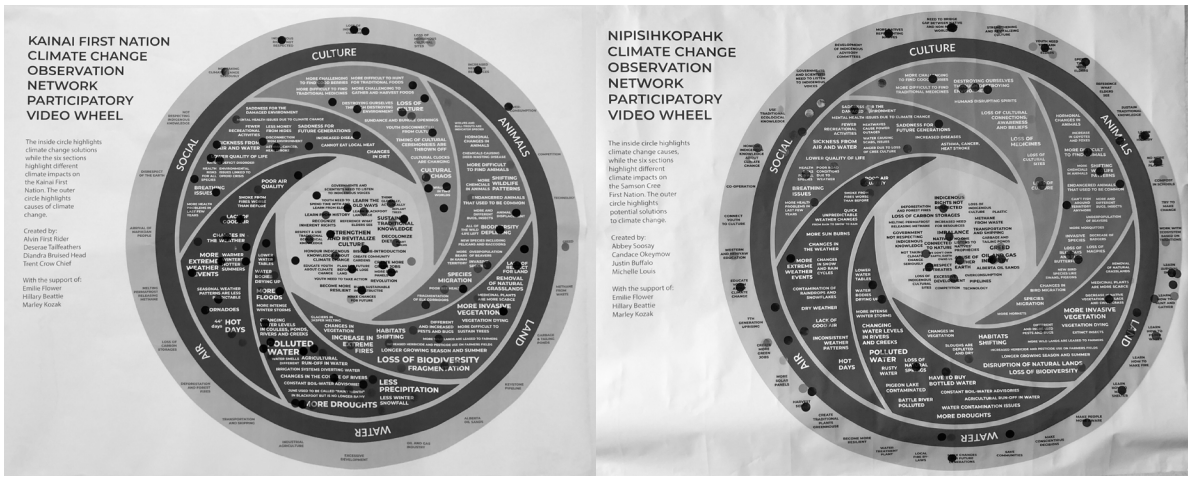


Figure 7: The Kainai First Nation (l) and Samson Cree Nation (r) climate change swirls after the 'dot-mocracy' process during the community screenings.

Interview Coding

The Kainai First Nation video team also coded their interview transcripts using a 'open coding' process. Open coding is a well known method that involves reviewing written transcripts line by line and attaching labels to the text. Following this, the labels are grouped together into larger codes, which develop into a 'grounded theory' that summarizes the data.[2] Rather than using coding software—which is costly and sometimes complicated to learn—the process was completed manually using printed transcripts and pencils.

One of the Kainai First Nation video team members was very interested in this process and led the analysis. With a PCC facilitator, he reviewed the twelve interview transcripts and developed codes that summarized the data. For example, he coded the quote, “the winter seasons are not as long as they used to be” with the code ‘shorter winter’. More examples of this coding process are included in Appendix A.

2 Urquhart, C. (2012). *Grounded theory for qualitative research: A practical guide*. Thousand Oaks, CA: SAGE Publications Inc.

Following the initial coding process, the team member and facilitator reviewed the codes related to observations of climate change and organized them into seven broad categories: Seasonal Changes, Extreme Weather, Plants and Medicines, Animals, Water, Human Health, and Culture. These categories and codes are included in Appendix B.

The coding process also informed the creation of Kainai First Nation's videos. The team used the coded interviews to brainstorm themes and find important quotes.

The Samson Cree Nation video team decided not to code their interviews. This was because they did not want to have their interviews printed out and analyzed as there was sensitive information included in some of them.

More information on the project process can be found in the complementary report: "*Focusing on Climate Change: Reflections on the Indigenous Climate Change Observation Network Participatory Video Pilot Project*."

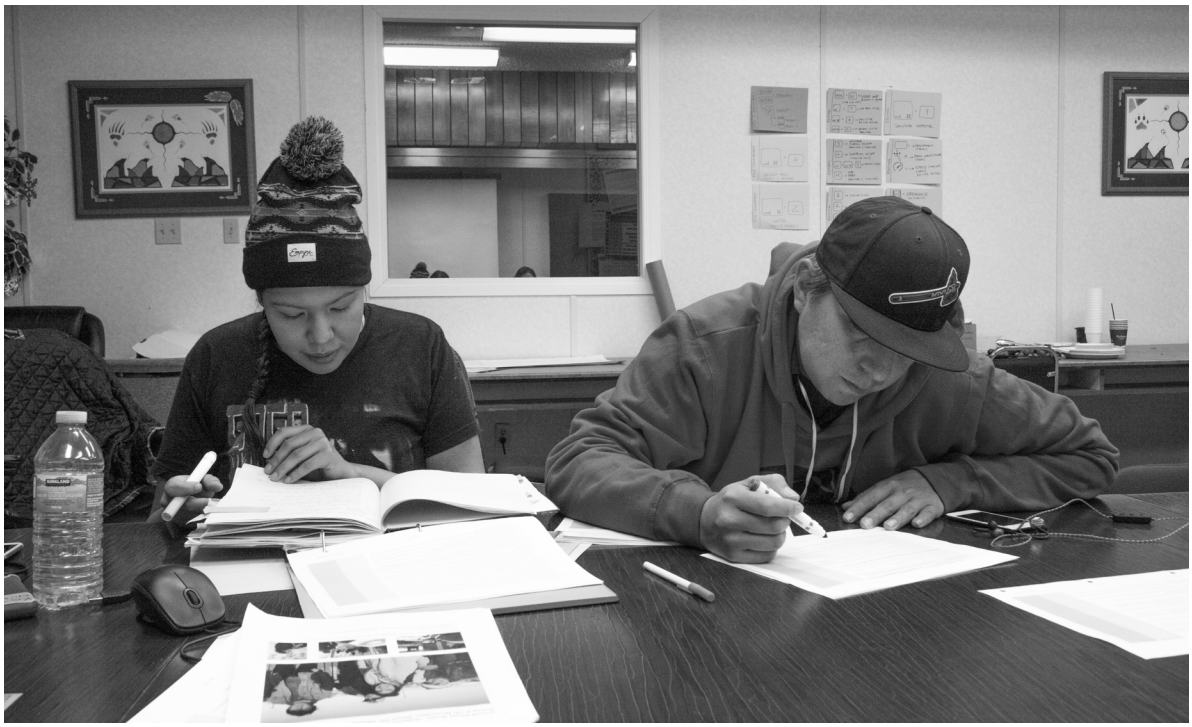
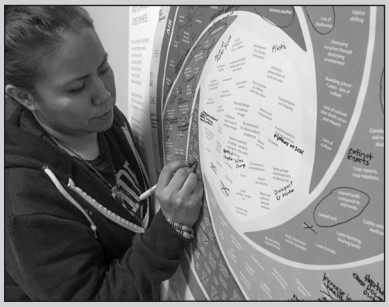


Figure 8: Deserae Tail Feathers (l) and Alvin First Rider (r) review and code interview transcripts during the second workshop.

Methods



Participatory Clustering

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Interview Coding

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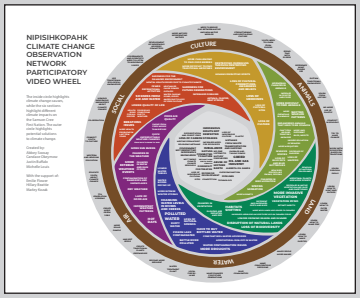

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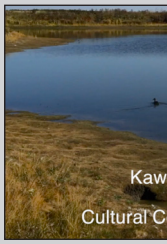

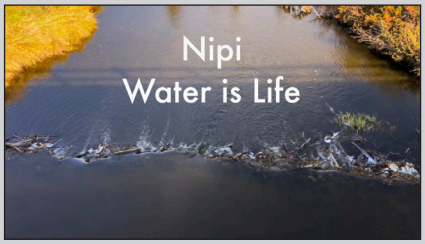

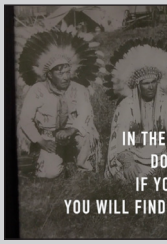

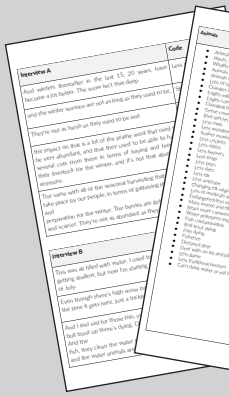

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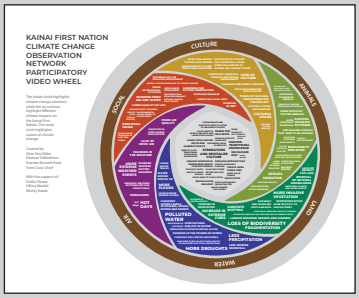

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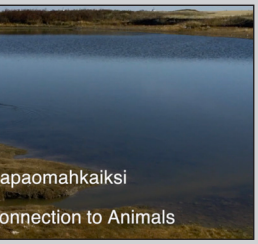
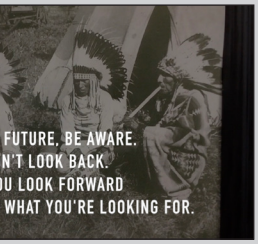
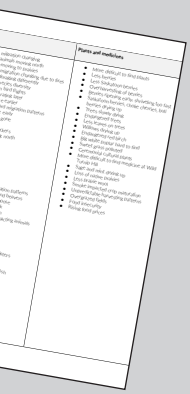


Climate Change Videos





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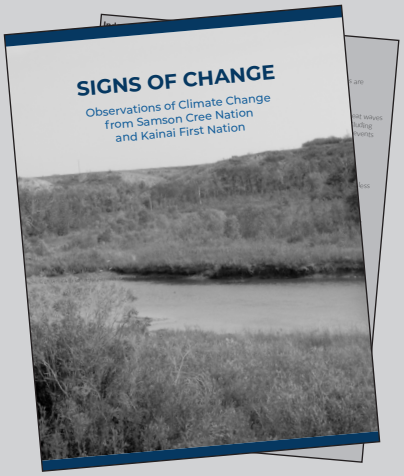

- Water
- Animals
- Plants and Medicines
- Seasonal Weather
- Culture
- Human Health

Signs of Change

In this project, community members spoke about a range of environmental, social, and cultural changes related to climate change. These included changes related to water, animals, plants, medicines, seasonal weather patterns, human health, and culture. These signs of change are summarized in the following subsections. Specific signs of change, or indicators, are highlighted in the text.

There are a few important caveats about these signs of change. First, the observations in the following subsections are not necessarily representative of Kainai First Nation or Samson Cree Nation as a whole. Rather, they represent the views and perspectives of the specific individuals from the communities who participated in an interview and/or attended a community dialogue or screening.

Second, when speaking about changes, many community members discussed signs of changes that were not explicitly caused by climate change. For example, many people talked about how fracking byproducts and agricultural runoff have impacted water quality. While they recognized these changes were not the result of climate change, they felt it was important to include in the discussion because of how interconnected climate change and other environmental changes are.

Finally, in many cases, participants did not want to share the specific geographic location where they observed signs of change. Many Indigenous communities are not comfortable sharing this type of information due to concerns over bio-piracy and bio-prospecting.[3] For this reason, specific geographic locations are not included in this report.

Water

Participants are very concerned about the impact of climate change on water. They noticed changes to rainfall and snow patterns and an increase in water pollution. This impacts their cultural ceremonies as well as the health of animals and humans.

Participants from both communities noticed changes in rainfall patterns. Samson Cree Nation community members said there are more rapid fluctuations in precipitation, including quick shifts from snowy to rainy to snowy conditions in the winter.

3 Beattie, A. J., Hay, M., Magnusson, B., de Nys, R., Smeathers, J., & Vincent, J. F. (2011). Ecology and bioprospecting. *Austral ecology*, 36(3), 341-356.

Kainai First Nation community members said that rainfall used to be relatively steady and predictable during certain times of the year. However, now there are more sudden, intense rainfall events, which sometimes result in overland and river flooding. Between these events, there are more frequent and severe droughts.

"We have more floods. We've had droughts that happen and sometimes we get a lot of rainfall and then we get none for the rest of the summer."

- Kainai First Nation Community Member

In addition to shifting rainfall and snow patterns, community members also said there is less precipitation overall. Kainai First Nation community members said there is less snow during the winter, and lower water levels in rivers and streams during the summer. Samson Cree Nation community members also observed a decrease in water. They said there is less water in ditches and fields, and water bodies are drying up. They also said their water tables are lower. These drier conditions are impacting fish as well as other animals, plants, and people.

Water pollution is another major issue for both communities. People from both Samson Cree Nation and Kainai First Nation said there are more pollutants and algae in the water, and more river-bank erosion. Community members attributed the pollution to agricultural runoff as well as oil and gas developments. In Samson Cree Nation, they said that the water tastes rusty and smells bad. It makes their mouths dry after drinking it. Elders from both communities said they used to be able to safely drink the water from their streams, rivers, and lakes but can no longer do this because of the water pollution. People also said their houses' well water is no longer drinkable and that they have to buy water now.

"Years ago, you would be able to go to the sloughs and you could drink the water, that's how clean the water was. Now the water is all contaminated due to the gas wells around the house where I am. We aren't able to drink that water."

– Samson Cree Nation Community Member

Animals

People are also worried about changes in animal health and behaviour. They noticed more diseases in animals and changes in the distribution of species in their territories, including the introduction of invasive species.

People noticed changes in animal distribution and migration patterns. In Samson Cree Nation, community members said there are less fish, beavers, badgers, butterflies and birds like magpies and blue jays. There are more coyotes, foxes and birds like swans and pigeons. Insects like mosquitoes and hornets are also more common. Samson Cree Nation community members also said bears are coming out of hibernation early to look for food.

"Growing up on the Samson reserve, it was so beautiful at the time. Animals, all kinds of birds, water animals, you saw them all the time, they were all over. Now you don't see them anymore, hardly see any birds, hardly see any animals in the lakes or rivers."
– Samson Cree Nation Community Member

Kainai First Nation community members also observed changes in local animal patterns. They said migratory bird species like geese are arriving and leaving earlier. Some people said there are less antelope, beavers, deer, elk, frogs, kit fox, moose, muskrats, otters, owls, prairie chickens and woodpeckers. Others said there are more bears, elk and moose as well as shifting cougar patterns. They also noticed new species like snakes, pelicans, and raccoons. Community members also noticed a decrease in mosquitoes and bees, and an increase in wasps.

"You can see changes in animal behaviour, changes in the flight of the birds, and the water species are being affected by climate change. So over time you're seeing dramatic changes in behaviour of all our relations on the landscape."
– Kainai First Nation Community Member

Community members also noticed changes in the health of local wildlife. In Samson Cree Nation, people found rabbit and moose with lumps on them. In Kainai First Nation, there are more diseased and contaminated fish like bull trout. Traditional hunters said they noticed there are also more diseased deer with no fat and blisters on their bodies.

As a result of these changes, many participants no longer eat local fish and wild game. Instead, they have to buy packaged and processed food from stores, which are more expensive and generally less nutritious than country foods.

Plants and Medicines

The impacts of climate change on traditional plants and medicines is another major concern for participants.

People from both communities said plants and medicines are often polluted and more difficult to find than they used to be. Traditional medicines used for ceremonial practices, like sweetgrass and sage, are harder to find.

Samson Cree Nation community members raised concerns about the impacts of hydraulic fracturing, or fracking, on plants and medicines. They believed some plants and medicines are not growing properly or at all because of fracking byproducts. They also noticed trees growing with big lumps on them and trees binding around each other in unusual ways.

Participants from Kainai First Nation said many trees—including willows, red birch, and white poplar—are endangered and dying slowly due to changing climatic conditions. They also said there are less native prairie grasses like prairie wool.

> *"A lot of the willows that I use for sweats are drying up on the river banks. Even the berries are changing, they're shriveling up in June or July. You have to start picking them when they're just small before they shrivel up. They used to be like grapes here."*
>
> *– Kainai First Nation Community Member*

People from both communities said they noticed berries—including Saskatoons, chokecherries, bull berries, and strawberries–ripening earlier and shriveling up too fast. There are less berries than there used to be, and they are being overharvested.

Kainai First Nation and Samson Cree Nation community members are concerned about agricultural products farmers use on their fields, which they say are leaching into the water supply.

Seasonal Weather

Community members also noticed seasonal weather changes throughout the year, which greatly impact their way of life.

People from both communities said the weather is less predictable now. They used to be able to predict certain events based on observations of the land, sky, and animals, but it is becoming increasingly difficult to do this.

They also said normal seasonal weather conditions are changing. For example, in Kainai First Nation, the month of June had always been their rainy season, but this is no longer the case. People also said the winter season is shorter and generally involves less snow than in the past.

Samson Cree Nation and Kainai First Nation community members said that in the summer, there are more hot temperatures and heat waves, which are especially hard on Elders. Kainai First Nation community members also noticed an increase in severe storms, including tornadoes and hail events, as well as changes to their local wind patterns.

> *"We are now being introduced to tornado weather. Tornadoes weren't very prominent in this area generations ago, but now every summer, we hear the warnings of possible tornadoes in our area."*
> *– Kainai First Nation Community Member*

Samson Cree Nation and Kainai First Nation community members also said there are larger and more frequent forest fires near their communities. Elders, children, and people with respiratory illnesses have difficulty spending time outside in the summer due to the smoke from these fires. Many people said the smoke made it difficult to breathe.

> *"I have never seen smoke like that in my life, that's the first time I've seen smoke so dense where you couldn't even see a hundred meters in front of you. It was hard to breathe, I've noticed people who have respiratory problems, asthma, young kids, old people, it seemed like those people were having a hard time coping with the smoke."*
> *– Samson Cree Nation Community Member*

Culture

Community members said that climate change is impacting their cultural traditions and practices in a number of ways. In Samson Cree Nation, people pointed out that water is a crucial part of their cultural ceremonies. Because their water is polluted, they now have to buy water for ceremonial purposes.

People from both communities said that extremely hot temperatures in the summer make it difficult for community members–especially Elders–to participate in cultural activities and gatherings.

People from Kainai also spoke about the loss of cold temperatures. In Blackfoot culture, snow cleanses the earth and the cold kills viruses. As a result, community members said there is less cleansing by Mother Nature as winter temperatures increase.

Kainai community members said the timings of certain ceremonies are connected with seasonal changes. For example, Sundances occur when Saskatoon berries ripen. They said that as seasonal patterns shift, cultural practices may also have to change.

People from both communities also spoke about the loss of culturally important animals, plants, and medicines, which are used in ceremonies and traditional practices. These include antelope, elk, moose, deer, berries, white poplar, sweet grass, and sage, among other species.

"When we practice our renewal ceremonies, when we go out to harvest and gather, whether it's medicinal plants, herbs, roots, or harvest the animals and birds that are part of our societies and bundles... It's getting harder and harder to find and locate certain plants, certain animals that are included within our bundles so that we can practice our ceremonies."

– Kainai First Nation Community Member

Community members said the loss of these species impacts traditional diets as well as cultural ceremonies and practices. Taken together, all of these environmental changes result in what one Kainai Elder calls 'cultural chaos'.

"We have Blackfoot territory and within that territory we develop a culture in relation with the sky, the animals, and the plants. All those come together and become all our relations. But when the climate changes over time, then that predictability and all the relational networks that you have with animals and so on start to change."
– Kainai First Nation Community Member

Human Health

Finally, participants are worried about the physical and mental health impacts of climate change.

Community members were concerned about respiratory health issues. People with asthma find it difficult to spend time outside in the summer due to smoke from wild fires as well as dust and particulate matter from dry weather conditions.

Heat stroke during extreme heat events is also a major issue in the summer, especially for Elders and youth. These conditions make it difficult for people to spend time outside and participate in outdoor recreational activities during July and August, resulting in what one video team participant called nature deficit disorder.

Samson Cree Nation community members raised health concerns about the water. They said people are getting sick from drinking local water, and some children seem to have scabs on them after bathing in the water. People from both communities said there has been an increase in cancer and other health problems. They wondered if environmental pollutants were the cause of these sicknesses.

Participants from both communities also spoke about the mental health impacts of climate change. They said climate change made them feel sad, angry, and anxious about their future and for future generations.

Summary of Signs of Change

Water
- Shifts in rainfall and snowfall patterns
- Intense rainfall events
- Overland and river flooding
- Frequent and severe droughts
- Lower water levels in rivers, stream, ditches and fields
- Water tables are lower
- Water pollution
- More pollutants and algae in the water
- Water tastes rusty and smells bad
- Water is no longer drinkable

Animals
- Changes in animal health and behaviour
- Changes in the distribution of species
- Invasive species like snakes, pelicans, raccoons
- Less antelopes, beavers, badgers, blue jays, butterflies, deer, elk, fish, frogs, kit fox, magpies, moose, muskrats, otters, owls, prairie chickens, woodpeckers
- More bears, coyotes, elk, foxes, swans, pigeons, moose, mosquitoes, hornets
- Bears coming out of hibernation
- Geese arriving and leaving earlier
- Rabbit and moose with lumps on them
- Diseases and contaminated bull trout
- Local fish and wild game no longer edible

Plants and Medicines
- Plants and medicines, like sweetgrass and sage, are polluted and more difficult to find
- Plants and medicines are not growing properly
- Willows, red birch, white poplar are endangered
- Less native prairie grasses like prairie wool
- Berries like Saskatoons, chokecherries, bull berries, strawberries ripening earlier and shriveling up too fast
- Less berries
- Berries being overharvested

Seasonal Weather
- Weather is less predictable
- Seasonal weather conditions are changing
- Winter season is shorter
- Less snow than in the past
- More hot temperatures and heat waves
- Increase in extreme events including tornadoes, severe storms, hail events
- Changes to local wind patterns
- More frequent forest fires
- More smoke from fires

Culture
- Loss of cold temperatures means less cleansing
- Changes to the timing of certain ceremonies
- Loss of culturally important animals, plants, and medicines including antelope, elk, moose, deer, berries, white poplar, sweet grass, sage
- Impacts on traditional diets
- 'Cultural chaos'

Human Health
- Respiratory health issues due to smoke from fires and dust and particulate matter
- Heat stroke during extreme heat events
- Difficult to spend time outside
- Nature deficit disorder
- Environmental pollutants
- Sickness from drinking local water
- Increase in cancer and other health problems
- Mental health impacts including feelings of sadness, anger, and anxiety

Conclusion

Through this project, Samson Cree Nation and Kainai First Nation community members identified many signs of change in their traditional territories. Participants' observations were not limited to the standard scientific indicators of climate change. Rather, they spoke about a wide range of environmental, social, and cultural changes they are experiencing. These varied from water pollution and animal migration patterns to the timing of cultural ceremonies and mental health challenges. Climate change is impacting nearly every aspect of their lives.

There are a few important points to make about these observations and potential next steps beyond this project. First, as stated in the introduction, not all of the signs of change discussed in this report are directly linked to climate change. Rather, some signs of change are connected to broader environmental changes related to oil and gas developments, and other industrial activities. Because community members felt these broader environmental changes were worth highlighting in the discussions, they have been included in this report. However, one of the next steps could be teasing out exactly which signs of change are explicitly linked to or exacerbated by climate change.

Second, in this project the video teams did not narrow down exactly which signs of change should be monitored in the communities. While this was an initial goal of the project, the team members and community members found it difficult to prioritize certain indicators over others due to the interconnected nature of many of the changes. The fact that many or most of the signs of change included in the climate change swirls—and these reports—were important to community members was highlighted by the dot-mocracy process used during both community screenings. For these reasons, the video teams and facilitators had trouble narrowing down exactly which signs of change to monitor and instead have highlighted many of the indicators community members spoke about in this report.

Finally, it is worth noting that this project just 'scratched the surface' in both communities. Team members and audience members at screenings suggested a number of additional people that could be interviewed for the project. The team members also said they were interested in continuing to explore issues related to climate change through video including forest fires, water, pipelines, plants, medicines, extreme weather, and climate solutions.

Many community members involved in this project were both aware of climate change and aware that they had a different perspective of climate change from that reflected in scientific narratives. This difference of perspective often emerged as a point of departure for conversations about climate change that the project initiated in the community, particularly with Elders. In addition to using the participatory films and climate change swirls developed during this project as a starting point for generating further conversations for developing community monitoring programmes and adaptation strategies, these resources are also springboards for meaningful conversations about the diverse narratives and perspectives through which we all understand and live our lives.

Glossary

In the report, the following terms are defined as:

Community members: The individuals from Kainai First Nation and Samson Cree Nation who engaged with this project during community dialogues, screenings, and other events.

Facilitators: The employees from InsightShare, the Prairie Climate Centre and the Government of Alberta who facilitated the project.

Interview participants: The individuals from Kainai First Nation and Samson Cree Nation who were interviewed by the team members for this project.

Team members: The four participants from Kainai First Nation and the four participants from Samson Cree First Nation who participated in the workshops and created the videos.

Appendix A: Sample Codes

Interview A	**Code**
And winters thereafter in the last 15, 20 years, have become a lot better. The snow isn't that deep	Less snow
and the winter seasons are not as long as they used to be.	Shorter winter
They're not as harsh as they used to be and	Winter less harsh
the impact on that is a lot of the prairie wool that used to be very abundant, and that they used to be able to have several cuts from there in terms of haying and feeding their livestock for the winter, and it's not that abundant anymore.	Less prairie wool
The same with all of the seasonal harvesting that used to take place by our people, in terms of gathering the berries and preparation for the winter. The berries are getting scarcer and scarcer. They're not as abundant as they used to be.	Less berries

Interview B	**Code**
This was all filled with water. I used to see it August start getting shallow, but now I'm starting to seeing it first part of July.	Belly River is smaller
Even though there's high snow pack in the mountains, by the time it gets here, just a trickle	Less water in rivers
And I feel sad for those fish, you know, they're dying. The bull trout up there's dying. Down here the fish are dying. And the fish, they clean the water for you. It's almost like the fish and the water animals are the filters to clean the water.	Bull trout dying

I hear less frogs. Summer. Hardly hear them.	Less frogs
And the owls, that make that sound.	Less owls
Woodpeckers, I don't even hear them. They moved on.	Less woodpeckers

Appendix B: Categories and Codes

Seasonal Changes	Extreme weather
● Unusual environmental change ● Weather in months have changes ● Rainy season has changed ● More rain ● Less predictable weather patterns ● Changing wind patterns ● Stronger winds ● Less snow ● Heavy snow and drifting ● Shorter winter ● Winter less harsh ● Frost in July	● Severe and sudden weather ● Forest fires ● More tornadoes ● Severe storms ● More storms ● More hail ● Flood water ● Concentrated rain events in short bursts ● River flooding ● Overland flooding ● Droughts

Animals	Plants and medicines
● Animal migration changing ● Plants, animals moving north ● Wildlife moving to prairies ● Animals migration changing due to fires ● Animals foraging differently ● Loss of species diversity ● Changes in bird flights ● Eagles migrating later ● Eagles come earlier ● Changing bird migration patterns ● Geese come early ● Bird species gone ● Less owls ● Less woodpeckers ● Snakes moving north ● Less crickets ● Less otters ● Less beavers ● Less frogs ● Less bees ● Less deer ● Less elk ● Less antelope ● Changing elk migration patterns ● Loss of muskrats and beavers ● Endangered/less moose ● More moose and elk ● Bears more common ● Water pollutants impacting animals ● Fish contamination ● Bull trout dying ● Fish dying ● Fisheries ● Diseased deer ● Deer with no fat and blisters ● Less game ● Less traditional hunters ● Can't drink water or eat fish	● More difficult to find plants ● Less berries ● Less Saskatoon berries ● Overharvesting of berries ● Berries ripening early, shriveling too fast ● Saskatoon berries, choke cherries, bull berries drying up ● Trees slowly dying ● Endangered trees ● Less leaves on trees ● Willows drying up ● Endangered red birch ● Big white poplar hard to find ● Sweet grass polluted ● Ceremonial cultural plants ● More difficult to find medicine at Wild Turnip Hill ● Sage and mint drying up ● Loss of native prairies ● Less prairie wool ● Smoke impacted crop maturation ● Unpredictable harvesting patterns ● Overgrazed fields ● Food insecurity ● Rising food prices

Water	Human Health
● Water pollution ● Erosion ● Siltation ● Nutrient overload in water ● Less water in rivers ● Warming water ● Rivers smaller due to melting glaciers ● Belly River is smaller ● Have to buy water	● More smoke from fires ● Dust from dry weather ● Air quality ● Asthma ● Cancer ● Pesticides on berries causing sickness and cancer ● Health issues and obesity ● Sickness and sores from water ● Diseases ● Impacts on Elders from extreme heat

Culture
● Impact on cultural ceremonies that depend on weather, seasonal changes ● Impact through loss of culturally-significant species ● Impact on culturally important sites like graves and teepee circles ● Snow cleanses earth - cleansing doesn't occur ● Cultural disconnect ● Cultural chaos ● Changing cultural norms