

Climate Change and the Tourist Economy of Churchill: Perspectives of Local Residents

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Abstract

This research examines how the citizens of Churchill Manitoba perceive climate change, because global warming is a threat not only to the local habitat and wildlife, but also threatens the economy and livelihood of the town as well. Potential solutions, or adaptations that the community will have to employ in the wake of climate change, envisioned by local residents, are also examined. This research acknowledges the importance of local knowledge and solutions when addressing social, political, economic, and environmental concerns. As hypothesized, through interviews with local citizens, business, owners, and town/government officials, it was found that climate change is an issue of concern for local residents because of the potential impacts it could have on local wildlife, habitats, and in turn, the town's economic stability as tourism (based entirely on exploiting the natural attractions of the area) is the single largest and most vital source of income for the community.

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Introduction

The purpose of this research is to examine how the citizens of Churchill Manitoba perceive climate change, as global warming is a threat not only to the local habitat and wildlife, but also threatens the economy and livelihood of the town as well. Potential solutions, or adaptations that the community will have to employ in the wake of climate change, envisioned by local residents, will also be examined. Acknowledging the importance of local knowledge and solutions when addressing social, political, economic, and environmental concerns is a new and vital approach to tackling social, environmental, and economic problems (Simpson, L., 2003). Centralized agencies that have traditionally developed and legislated solutions to such problems lack specific insight because of a lack of input from the people such legislated measures are designed to aid, as illustrated by the mishandling of fishing rights in Atlantic Canada.

Because of a heavy reliance on eco-tourism, and relatively small population, the already lean economy of Churchill could collapse if tourism were to decrease dramatically. It is logical to hypothesize that a loss of natural resources, habitat, and wildlife that would undoubtedly come in the wake of significant climate change, could have lasting negative consequences in terms of the economy, employment, and community growth. Specific attention will be paid to local knowledge regarding climate change, more specifically in terms of the concerns, expectations, and coping strategies.

It is fair to assume that the controversy surrounding the creation of a new national park in the region-Wapusk National Park (Martin, T., Falvo, M., 2002); is creating a diversion from what can be seen as an urgent and significant threat. The park was created in an effort to protect local habitat while ensuring that the growing tourist industry would

not be disrupted. It was also a goal to ensure access to the park and be compliant with local treaties regarding the hunting rights of local aboriginal peoples. However, Churchill residents do not see much good in a national park protecting habitat that may very well not be there in the near future. Climate change has negative effects on arctic wildlife that rely on the present and past climate for survival. If the popular local wildlife attractions like the polar bear and beluga whales were to disappear, so might the economic viability of the town. Based on this rationale, the issue of climate change was examined more closely to collect knowledge, opinions, and potential solutions from the community's perspective. Through individual interviews with citizens, various government employees: both federal and regional, and members of the sizeable local aboriginal population; this research provides an understanding of how the local populace views global warming, the potential effects to their community, and also explores possible solutions/adaptations offered by the local residents.

This research document is divided into the following sections: First we will examine the scientific data on climate change, provide information on Churchill's local economy, and examine the link between the local climate and economy. The next section will outline the theoretical framework of this research. Moving on, the third section will outline the method employed in the carrying out of this research. After detailing the methods employed, the discussion will then turn to the results of the survey. Data will be examined in the following groupings 1) Demographic info; 2) Climate Change info; 3) Future Adaptations and Tourism Development; followed by a summary of results which will link the data together. The fifth and final section of this document will restate the research objectives and state conclusions. Research materials (survey/consent form) can be found at the back of the document in the appendix.

Climate Change and Churchill's Tourist Economy

Churchill Manitoba is well known for its incredible biological and cultural diversity earning an international reputation as a Mecca for some 25,000 beluga whales, 1,200 polar bears, and a large variety of birds (Earthwatch Institute Journal, 2001). The human population of the town as of 2001 is 963, down from 1,089 in 1996 for a decrease

of 11.6% over five years (Statistics Canada, 2003) Roughly 50% of the local population is of aboriginal descent. The economy of the town is heavily centred on ecotourism, with people from all over the world coming to witness the abundance of local wildlife, historic sites, and environments (Selwood, John H., Lehr, John C., 1999). If there was to be a negative impact on local wildlife and habitats as a result of climate change, the town of Churchill would face economic hardship and the town's viability would be in substantial risk.

Climate change, also known as global warming and influenced by the accumulation of greenhouse gases in atmosphere, has already begun to impact local arctic wildlife and habitats (Ellis, L., Kerry, M., 2001; Johanson, Bruce E., 2002; Levi, Barbara G., 2000; Senkowsky, S., 2001; Earthwatch Institute Journal, 2001). The effects of climate change can be observed in changing weather patterns, the shortening of the winter season, declining ice thickness, the polar bear population, and changes in the migratory patterns of birds and other wildlife.

Because of the extreme climate associated with northern hemispheres, the effects of global warming are manifest in northern habitats first, and are the easiest to observe as they are more pronounced (Berkes, F., Jolly, D., 2001). There has been a noticeable increase in the average yearly arctic temperature, a shortening of the winter season, and a longer, warmer summer season. For example, on July 28 2001 the temperature in Iqaluit Nunavut rose to 82 degrees Fahrenheit, 35 degrees higher than the July average of 47 (Johansen, Bruce E., 2001). When asked about the uncharacteristically high temperatures Ben Kovic, Nunavut's chief wildlife manager was quoted: "We have never seen anything like this. It's scary, very scary" (Johansen, Bruce E., 2001). Summer ice, necessary for traditional hunters and trapper is a vital source of sustenance, and temperatures have been forecasted to increase in the northern hemispheres over the coming decades (Berkes, F., Jolly, D., 2001). As the ice melts earlier each year and becomes thinner, it is likely that traditional ways of life will become more hazardous and less viable.

According to the UN's Intergovernmental Panel on Climate Change, global temperature averages will increase by as much as 5 degrees Celsius over the next 50 years (Earthwatch Institute Journal, 2001). To put this in perspective, the average global temperature during the last ice age was 5 degrees Celsius less than it is now (Earthwatch

Institute Journal, 2001). The declining temperature has an impact on arctic wildlife in terms of body weight, feeding patterns, and migration. Drastic climate change could lead to the extinction of many species of wildlife; like the polar bear for example, who rely on the arctic ice cover to hunt on the Hudson's Bay for their primary food source, seal (Berkes, F., Jolly, D., 2001; Ellis, L. Kerry, M., 2001). If the polar bear-the central tourist attraction in Churchill, were to leave the Churchill area, the impacts on the community's economy could be disastrous.

The question of climate change and its potential effects on the local habitat-which would ultimately effect the towns economy and way of life for it's residents, was also examined. It was revealed that there is very little common or shared knowledge regarding climate change. People do not share a perception of what the immediate effects would be, or felt that the problem could be fixed with relative ease. A significant number of interviewees were not highly concerned with the issue of climate change, and/or were of the opinion that the matter is simply out of their hands. Those that were concerned recognized that climate change threatened the livelihood of the community, but were not sure of an adequate way of expressing these concerns.

The fact that climate change has already begun to effect northern hemispheres is supported by a large body of research showing the negative effects on wildlife, thinning and receding artic ice cover, and warming weather patterns leading to earlier spring, a longer summer, and shorter-not too mention milder, winter (Berkes, F., Jolly, D., 2001; Ellis, L., Kerry, M., 2002; Johanson, Bruce E., 2001; Levi, Barbara G., 2000). This could be disastrous for local polar bear, whale, and seal populations whose natural habits occur with the changing seasons (Berkes, F., Jolly, D., 2001; Ellis, L., Kerry, M., 2001; Wilson, J., Chaikin, D., et al., 2002). Within this research, a focus will be placed upon potential adaptations that local citizens perceive the community may have to undergo in order to survive in the wake of climate change, as the community is dependant upon local wildlife and habitats for survival. Adaptation shall be defined in the usual evolutionary sense meaning any response to new phenomena or changes in one's environment that increases a population's probability of survival (Berkes, F., Jolly, D., 2001). A longer summer would mean no ice for polar bear to set out upon to hunt for their primary dietary staple, the seal. A warmer winter would lead to thinner ice cover, which would in turn melt

faster, limit the hunting season for polar bear, and make the ice particularly dangerous to humans and wildlife alike, increasing the chances the ice will break under smaller weights. Seasonal hunters and trappers are a group that would be negatively impacted by such seasonal changes.

Theoretical Framework

There is a lack of research that focuses on how communities and peoples adapt to environmental change (Berkes, F., Jolly, D., 2001). Usually it is only the scientific data pertaining to climate change that gains attention by researchers and academics, ignoring the impacts on the people, their communities, and Traditional Ecological Knowledge (TEK). TEK is often used only to exploit (Simpson, L., 2003). Climate change, theorized to be the result of industrialization and the accumulation of greenhouse gases, is an imminent threat to northern habitats and traditional ways of life. However, it is because of this threat that Traditional Ecological Knowledge is important when addressing social concerns as Churchill has a rich and vibrant aboriginal culture and history. There are many efforts by local Aboriginals in Churchill and the northern hemispheres as a whole, to regain their traditional ways of life, living off the land (Simpson, L., 2003). In fact, over the last few decades there has been a greater emphasis on indigenous knowledge pertaining to the environment as indigenous peoples have worked to protect, maintain, and nurture knowledge during times when colonial practices are aimed at destroying traditional cultures, values, and traditional ways of life (Simpson, L., 2003). However, “Traditional Ecological Knowledge” was most often used as a means of furthering economic gains to outside investors or was/is ignored altogether (Simpson, L., 2003). Researchers were only interested in information that would further their own interests, and not for the well being of those who’s lives they would soon be disrupting. There are numerous examples of this phenomenon in hydroelectric projects across the country.

It must be noted that TEK is vital in understanding how phenomena such as global is viewed by local citizens. It is this traditional ecological knowledge that forms the basis of understanding for this particular group, as social theorist Pierre Bourdieu would phrase it, their *habitus*. Aboriginal peoples face some of the most devastating

effects of environmental destruction in Canada from the Yukon, where local populations are battling toxic contamination brought through long range transport; to Nunavut, where climate change is having dire consequences for local peoples and their communities (Simpson, L., 2002). According to aboriginal tradition, the people and the environment they occupy are one and the same. If the humans in essence are the environment, then when the environment is sick, the human population will also be sick, “This comes from an interconnection and inter-dependence that aboriginal peoples have on the land, the waters, the air, the sun, moon, animals, plants, and spirits” (Simpson, L., 2003 p4). Due to the largely aboriginal population in Churchill, it’s people, customs, and modes of sustenance are still based within traditions. If global warming were to have adverse effects on the local habitat and wildlife, it would surely result in adverse effects on the people and culture of the community. It is also for this reason that a focus on traditional knowledge when addressing current and future concerns is of vital importance. It allows research based in the community, with the community, and for the community; ensuring that the values and traditions of the local population have been honoured and furthered.

Methodology

This research is the second stage of a sociological analysis on how citizens of Churchill Manitoba are adapting with political, economic, environmental, and cultural changes that are occurring in Canada’s northern communities. The research has been conducted by Michael Chotka as part of his honours thesis under the supervision of Dr. Thibault Martin, of the Sociology department at the University of Winnipeg. The research involved person-to-person interviews with local citizens, local aboriginal representatives, business owners, and town officials. Each person was asked to answer roughly 20 questions regarding climate change (See Appendix #1 for questionnaire). The interviews were roughly 30 minutes in duration, on average. 25 interviews were conducted for the project. A personal qualitative account of peoples’ actual thoughts on the topic of interest will offer a rich and descriptive analysis of how climate change is perceived, and how they intend, or are intending to adapt to the consequences; from the perspective of the people that the research is ultimately intended to benefit. This type of

ethnocultural research is an approach to the social sciences and is widely employed in impact studies and cultural research that has taken place all over Manitoba. James Bay, and Churchill dealt with impacts recent government projects have had on their communities, from the perspective of the residents. The work of Canadian born sociologist Erving Goffman, author of the ground breaking works Interaction Ritual (1967) and Asylums (1963); illustrates the effectiveness of this ethnocultural approach.

The researcher travelled to Churchill from Winnipeg to conduct the interviews. Interviews took place in businesses, on the street, town offices, community centres, and the Arctic Studies Research Centre, located outside of the town. Following the interview process the data was transcribed and coded. Through observing patterns in the data we intend to provide a general community perception of climate change, and significant topics related to the matter, according to local citizens.

Ethical Considerations

The research conforms to the ethical guidelines of the University of Winnipeg in regards to human sciences. Each participant was asked for their consent and required to sign a consent form prior to the survey. A detailed description of the research was provided prior to obtaining consent. Each participant was given the choice whether to remain anonymous or not, and indicated so on the consent form (See Appendix #2). Participants were given the right to opt out of the survey at any time for any reason without consequence or prejudice, even if the survey was not complete. Although they were encouraged to answer each question to their fullest, participants were notified that they may omit any number of questions for any reason. They also could choose not to be tape-recorded; in this event the researcher took notes. 10 of the 25 participants wished to be cited in the research document.

In order to maintain confidentiality and the security of the data, all documentation regarding the survey was available only to the research team prior to the completion of the research, and the original cassette tapes have not been destroyed. Participants were provided with the contact information of the University of Winnipeg Departmental and Senate ethics committee in order to address any questions or concerns regarding the research and how it was conducted. Copies of this report and subsequent

publications will be accessible through town offices, the Churchill museum, community centers, and public libraries. The community is encouraged to react to the results.

Discussion of Results

Demographics

The questionnaire contained 12 questions split into 2 sections (See Appendix#1). The first for questions identified the participants age, ethnic background, occupation, and name. NOTE-only in cases where they wished to be quoted was the participants name collected. The second section was designed to target the key research focuses and collect participant's thoughts on climate change, Churchill's economy, local wildlife, and practices. The results of the survey revealed a community that is deeply connected to the local environment and wildlife.

We will first examine demographic information relevant to the sample. The total number of participants was 25, all citizens of Churchill. The length of residency ranged from 2 months to 50 years, with a mean length of residency of 11.9 years (N=22). One person did not report, and 2 others were seasonal residents, and therefore excluded from the tabulation. The people were recruited from a variety of positions and held occupations ranging from janitorial staff, librarians, RCMP, local merchants, Parks Canada officials, town council members, and employees of the Regional Health Authority. Ethnic background was collected only as a means to illustrate the ethnic breakdown of the sample. This factor will not be used as an identifier when discussing the data. The decision is also due to the low number of aboriginal participants. The participants reported a wide variety of ethnic backgrounds, illustrated by the chart below:

Ethnic Background of Participants (N=25)

<i>Caucasian</i>	16 (64%)
<i>Aboriginal</i>	6 (24%)
<i>Other</i>	1 (4%)

None reported

2 (8%)

The “Caucasian” category included people who reported to be of European descent, be it French, Irish, or Canadian. “Aboriginal” included those that reported to be Dene, Metis, or native (status and non-status). Though equalling half of the population of Churchill, it was aboriginal community that was the hardest to target, and therefore the number of those interviewed is not proportionate. Those that were interviewed shared a feeling that the local aboriginal people were shut out of jobs and not offered the same opportunities as others, and often, lose out to jobs from outsiders who have no history in the community. Is the low number of aboriginal respondents a reflection of this? The survey was conducted at random, with interviews being completed or arranged on the spot. This was done to eliminate bias. Still, it would be recommended that a similar research be carried out focusing on primarily aboriginal people, as a means of establishing a common perception. Moving on, we shall now turn our attention to the second part of the survey, which deals with the topic at hand, climate change.

Climate Change

The second part of the survey contained 8 questions dealing with climate change, the local tourism industry, and the potential impacts a significant change in the local climate would have on the local environment, the wildlife, and in turn, the tourism industry in Churchill, on which the local economy is primarily based on. The questions were structured to gradually incorporate the research hypothesis as the interview progressed. Beginning with queries regarding general knowledge about climate change, and progressively incorporating the issue of the town’s economy, and the relationship shared between the local habitat and the economic structure of the community. While some questions seemed similar to others before it, the structure was intended to encourage respondents to look at the single issue of climate change, from a variety of different perspectives.

The first of the eight questions asked whether climate change was a concern for the individual and why. The majority of respondents stated that it was a concern for them-72%. The following chart provides a quantitative outline of participants' responses:

Residents Concern About Climate Change (N=25)

<i>Concerned</i>	18 (72%)
<i>Not concerned</i>	6 (24%)
<i>Neutral</i>	1 (4%)

The respondents shared a variety of similar reasons for their concern. Even some of those who stated they were not concerned still confessed that it could become a concern for them in the future. The first reason for concern is the current (observed) and potential effects on the local wildlife and habitats; Dianne Howell-Assistant Director of the Churchill Northern Studies Centre had this to say:

It is a concern particularly because of the potential harm to the ecology and the balance for the wildlife (#24/q5).

Another example of this reasoning from another participant that wished to remain anonymous:

I am concerned for the polar bears and the other things in the arctic (#6/q5).

Another reason offered as a cause for concern was the effects on the local environment and habitat because some people, particularly aboriginals, still survive off the land:

It is a concern because it affects my people (Dene) as they get their livelihood from the land, though I have a white man's job (#3/q5).

Only one question into the climate change section of the survey and people were already drawing connections between climate change, the wildlife/environment, tourism, and the local economy. This is integral, as it supports the principal hypothesis of the research project that any negative effects on the local ecosystems would in turn have negative

consequences for the principal industry (tourism) that relies upon it. The following selections illustrate this point; Darren Ottaway-Chief Executive Officer for the Town of Churchill had this to say:

It is a topic of concern largely because of the impact it has on the municipal economy especially in the light that our major industry is shipping and tourism (#11/q5).

A local businessman echoed this sentiment:

I guess it is a concern because of the bears being the main tourist attraction here. It would affect what goes on with the tourism (#10/q5).

Other respondents went beyond the local to express that climate change was a global issue, with global responsibility, and global consequences:

It (climate change) is a whole world thing, a global thing (#16/q5).

It is a huge topic of concern for me because perhaps humans have been a factor in causing climate change. I think we, as humans need to address that and find out if this is indeed caused by us, or part of a cyclic phenomenon (#22/q5).

Ron Harmen- Director of Primary Health Services for the Churchill RHA, discussed this notion in greater detail:

Number one it is globally, the Earth, our mother that has to be protected. I do not subscribe to the Judaeo-Christian ethic that the earth is here just for our use. We are part of it and we have to take care of it. It's just way to casual about the earth. I've lived in mostly remote area's and I have spent 7 years practicing in the biggest cities around the world in the US and elsewhere. Nature is something you have to take care of and not many people realize that. When you come back to a place like this you get a real good sense of what is going on concerning the land and whatnot. So when you see things changing and the seasons extending and the bears getting thinner and weighing less, and starvation, it looks real bad. You can actually see things. When you talk to the elders and the game is disappearing and the hunting season is shortening, it becomes a concern (#8/q5).

The reliance on fossil fuels and the pollution that comes with it was a common example given by respondents and is of importance, as will be further demonstrated throughout the discussion. The issue of climate change is of particular relevance to local residents due to their arctic location. Community members see global practices negatively impacting not just their community, but communities around the globe. However, despite a large body of scientific research to support these claims, there are those who are not concerned about climate change in at all. In some cases, they perceive the phenomena as a good thing citing longer summers and an extension of the tourist season. And others, perceive the

supposed “warming trend” as merely a dip in the ebb and flow of the Earth’s atmospheric evolution:

Not particularly because looking at the rise and flow over the years global warming has gone up and down over the generations. It hasn’t always been as hot as it is now, it hasn’t always been as cold as it is now. It’s been fluctuating since the beginning of time (#20/q5).

As has been demonstrated by the preceding section, there is a general concern among Churchill residents about the potential impacts climate change will have, and reportedly has already had on the local seasonal temperature, wildlife, and habitats. There is a fear amongst a number of respondents that these changes will ultimately be detrimental to community economic development. Although 25 is a relatively low sample size, the marked difference in number of those who state climate change as a concern for them (x=17, N25) would indicate that the consistency would be maintained across a larger sample. The following is a breakdown of what respondents believed to be the root causes of climate change, ranked in order of occurrence in participant responses to question #6 (see appendix#1):

Causes of Climate Change According to Churchill Residents (N=25)¹

Pollution 11
Don’t know 8
Depletion of ozone 4
Greenhouse effect 4
Natural cycle augmented by human factors 3
Vehicles 3
People 2
Deforestation 2
Natural Phenomena 2

*Measured by number of times mentioned in participant responses to question #6.

Other reasons included were urbanization, industry, loss of habitat, and interestingly enough-greed. It is curious that “I don’t know” was the second most popular answer to this query. It can’t be assumed this response necessarily shows any sort of lack of knowledge on the subject, but to contrary, quite the opposite. The following selection from the qualitative data collected illustrates this point:

¹ *More than one answer permitted per respondent (cause or causes)*

I'm not exactly sure what they (the causes) are. I don't know if we as humans are a causal factor in climate change or just some part of a peak and valley's of a large geometric history of climate, a natural cycle. If by putting stuff in the air, knocking the ozone out, I'm not sure if that is the cause of climate change and I don't know if we will be able to pinpoint that (#22/q6).

Based on the data collected, respondents appear to perceive climate change as part of a global phenomena caused by either A) a natural warming trend; B) pollution caused by the industrial processes of human society; or C) both A and B. Specialists on the subject are also divided as to what the exact causes are, but the point is, there is a consensus that there is a significant warming trend, that seasonal weather patterns are becoming harder to predict; there is a solid body of evidence to support that the climate is indeed changing. With this in mind, the participants were then asked about the relationship between the local economy and climate, what changes they believe have or will take place, their potential impact on the tourist economy, and what they could foresee as potential adaptations the community would have to undergo to remain viable.

The first and most common issue people wished to talk about was the polar bear, and how irregular freezing on the Hudson Bay is having detrimental effects on the local population. Not one person failed to mention the polar bears in their interview responses. Bears have been seen as emaciated in comparison to the past, more bears are being found in the local dump and in turn, being rounded up by government employees and placed in "bear prisons". I had the opportunity to not only have visited the "Polar Bear Prison", but was also privy to seeing a local bear being airlifted out of the Churchill Dump. It is a lack of food that draws the bears to the dump, and sometimes, into the town itself. This creates a hazard for local citizens. It is not a healthy scenario for the bear, or local peoples. If the bears cannot go out on the ice to feed on seal because of a late freeze, it leaves hungry bears on shore looking for food. Also, other local species like the arctic fox depend on the bears as they follow their migration, scavenging on what the bears leave behind. It is in reference to the polar bear that direct evidence of peoples understanding of the relationship between the local climate and economy is made clear. The climate effects natural process, these processes have an impact on the living organisms, and in turn, the people and communities that are dependent upon them. The thought of the extinction/relocation of the regions polar bears was met with unanimous worry, and almost all felt it would have disastrous effects on the town's economy. Some people felt

that perhaps the tourist industry would instead focus on the other local attractions more, and take the emphasis off the polar bear, which they felt was overshadowing a number of other worthy natural attractions.

The following section presents a cross section of respondent's thoughts about the polar bear, and its crucial link to the community's economy. Speaking on his own behalf, Raymond Girardin, a 23-year resident of Churchill and employee of Parks Canada explained what he has observed over the years:

It (climate change) could be very negative. I've been here, working here for last 20 years. 10 years ago it was absolutely sure, there was no question of having a bear before mid-July. I stress that very much. There was no question about having a bear because they were still out on the platform of ice eating the seals. For at least the last 5 years we have seen on a regular basis bears by the 1st of July, or the last week of June. That means that the ice is no longer there to support them and they are forced to come back on shore much sooner. They are much leaner, if it is a female the bear will produce less cubs, or only have one and that bear will not be in as good of shape because mom was not in so perfect a condition. I can see also in the process of habituation or food conditioning would increase the fact that the bears need to readjust. All of that would be negative for the town (#15/q8).

Building upon this, other residents illustrated the link between the bears and the local tourist industry, and the potential effects the phenomena could have on the community:

The main attraction is the polar bears, there is whaling and birding, but compared to the bears that is a side issue. The main tourist season is during bear season, if we lose the bear season would probably fold this town and leave. There will be no real reason to remain open (#8/q8).

Yes, if the ice doesn't freeze then the bears will go further North where the ice freezes sooner. They (the bears) bother people and may have to be put down, and that is not good for tourism, upon which our economy is based. It is not on mining or other industry (#9/q7).

An employee for the Churchill Town Centre Complex had this idea of the potential consequences, and expanded the consequences to other local species:

There won't be any tourism left because the polar bears will not stay here anymore. They will go somewhere else, because they will starve if the Bay doesn't freeze on time, they will go further north. By the time it freezes the bears are real skinny. There will not be a dump here anymore next year, what will the bears do? They will starve or start going to people's porches. It will be dangerous and the tourism will not be here any more. We've had very weird winter and summers here as well. I have been here 3 years and it has been very different than what the locals are used to. There is a big change. There is going to be consequences and not only on the polar bear, but every arctic animal (#6/q9, 10).

The majority of respondents had similar sentiments regarding the polar bear, and the preceding comments speak for them as well. Of course, to simply focus on the ever-popular polar bear would be an oversight, as Churchill boasts a host of other natural

attractions as well, that would also be effected by changes in climate. Participants were also eager to share their thoughts on the local whales, birds, and fauna:

Well I see the potential impacts would be a shortening or lengthening of a particular season (polar bear, or the bird watching in the spring). If there was a gradual warming effect it would change would change the species of birds here. If the ices freezes later or melts sooner it would impact the polar bears. Changing water temperatures would affect the beluga whales. If it hurt the bears it would be detrimental (#11/q8).

An employee of the local RCMP expressed this opinion in regard to the impacts of climate change:

I know that if there is climate change a lot of the animal species will not be here long like the arctic fox and the polar bears and the whales (#14/10).

Carley Basler, a student/researcher and seasonal resident staying at The Churchill Northern Studies Centre implied that climate change would not necessarily be an entirely bad thing:

The amount of time the tourists will spend here will change. It will probably be longer. I guess the birds will come here sooner and leave later. The bears will come on land sooner and disappear later. The whales might hang around longer. It might be good (#19/q9).

With this in mind, it would be beneficial to provide a breakdown of those who responded whether climate change would be a positive or negative thing for the area. The following table illustrates the results:

Residents Perception of Climate Change (N=25)

<i>Positive</i>	3 (12%)
<i>Negative</i>	12 (48%)
<i>Both/neutral</i>	7 (28%)
<i>Don't know</i>	2 (8%)
<i>N/A</i>	1 (4%)

Just under half the people interviewed perceived climate change in a negative light, citing the impact on the local wildlife and the implications that it would have for the town's economy. People who were neutral reported that there would be pros and cons to a warmer climate citing that while there would be some damaging factors, there would also be some good in the form of a longer summer, milder winter, and the lengthening of the

time the bears stay on land-some feel that the lengthening of the time bears were on land would be a good thing as the polar bear tourist season could be lengthened as well. However, this last point neglects the fact that if the bears are trapped on land, they are starving, and at risk of disappearing forever. Others stated that if the longer summer would result in the extension of the also (but to a far lesser degree) popular bird watching and whale-watching attractions, the tourist season would experience greater viability year round.

Those that viewed climate change as a positive are in the minority, and gave reasons similar to the above, citing warmer temperatures as a good thing. However, the results show that roughly half of those interviewed see climate change as a predominantly negative thing.

To some residents, climate change is not a topic to be discussed in the future tense. In fact, a number of people interviewed report that changes have already been taking place. Though this point has been alluded to before in our discussion, it would now be beneficial to illustrate this point by turning to the qualitative data collected. Residents have reported changes in water levels, the health of the bears, the length of the bears stay on land, and the longer period until the freeze up of the Hudson Bay. Michael Goodyear, Churchill resident and Executive Director of The Churchill Northern Studies Centre provided this detailed description of what changes he has witnessed:

Some of the biggest impacts would be on the Hudson Bay, and the ice on the bay. In terms of that being significant habitat for polar bears, if the warming trends continue the way they are, it would completely destroy that habitat. People have to realize and understand that the ice is a habitat. That is where the bears spend the majority of their time. It is the habitat for the seals as well. The terrestrial environment would change more slowly over time. Not to say it wouldn't be reasonably dramatic, but over a longer time-scale. What that would mean for wildlife like caribou, it is hard to say. Some animals would benefit from a more boreal habitat, and others from a more tundra environment. We have seen changes in the wildlife here, and that is hard to say whether due to natural cycles or not. People around town seem to be talking about more moose, more flora. Certainly the research on polar bears is showing that the bears are returning to shore later and at lower body weights. Most of the other perceived changes in wildlife are more anecdotal, we may see a bird we haven't seen before. That's not significant unless you begin to see these things on a regular basis (#17/q10).

A local employee of Keewatin Community College shared his perception of what was already happening locally, echoing the enormous concerns for the local polar bear population:

The bears come into town earlier than normal because it is warmer and it takes longer to freeze so the bears stick around longer. Same with the waterfowl. Just last week people still see flocks of geese

around here. The bears are a lot smaller than they used to be, but there are extremes. It is hard to say (#12/q10).

An employee of the Churchill Town Centre Complex had this to say:

Well, some years the bay freezes late. We've had very weird winter and summers here as well. I have been here 3 years and it has been very different than what the locals are used to. There is a big change. There is going to be consequences and not only on the polar bear, but every arctic animal (#6/q10).

Only 6 of the 25 people interviewed reported that they did not see any changes taking place to support the claim that climate change is already having an impact on their community. The majority of people interviewed cited the deteriorating condition of the polar bears, and the declining sea ice year after year as the main evidence to support their claims. The general consensus is that the wildlife is already being negatively impacted, and this threatens the livelihood of the entire town. For this reason, climate change is a topic of great concern for a large number of local people. They are already witnessing the impacts, and are beginning to think about the future, which brings us to our final section of our discussion of results, which will describe the potential adaptations, and current ideas intended to bring greater stability to the town's economy now, and in the future.

Future Adaptations and Tourism Development

The final section of the survey asked respondents about how well the town was prepared to deal with current and future changes in climate, and whether further tourism development was a viable means in which to promote the town's economy. The results supported the notion that there is very little preparation at all by town officials, and citizens alike. In fact, it was Town Officials who gave the highest marks regarding the town's preparedness to deal with potential changes, despite the fact that the majority of respondents felt that there had been very little preparation, or that such changes are not generally planned for. Perhaps because economic coping strategies largely take place behind closed doors, average citizens are just not aware of coping strategies already in development. Otherwise, judging from the data it would seem that there is little preparation for potential impacts to the regions climate, wildlife, and the tourist industry. The following table summarizes the results regarding how well the town is prepared to handle future changes in climate:

Community Preparedness for Climate Change (N=25)

<i>Very Prepared</i>	3 (12%)
<i>Somewhat prepared</i>	3 (12%)
<i>Not at all prepared</i>	14 (56%)
<i>Don't know</i>	4 (16%)

Potential adaptations given by respondents ranged from putting more promotion into the other natural attractions of the area, expand on other local industry such as the shipping industry as Churchill is Canada's northernmost seaport, and lessening the community's reliance on tourism:

Communities have to have significant economic diversification, if they have tourism they also have to have a very good transportation infrastructure and they need to be concerned about that. Because we receive so much media attention because of the bears and the port and there is always talk of it being shut down, tourism is seen as saving the day. No one looks at the statistics; they don't recognize what percentage of money people living elsewhere the rest of the year are providing to businesses. It is one very important part in the town's economic stability. The tourism itself could be diversified with the northern lights and the whales. If we keep depending on the bear thing then we will be neglecting our economic stability (#18/q12).

Expansion of the tourist industry is the number one option given by respondents, as there is a strong perception that there is room to for growth. Regarding tourism development, respondents indicated that there was room for the tourism industry to grow so long as it is done responsibly, and not to the detriment of local wildlife and habitats. It was found that citizens expect to expand on such attractions as bird and whale watching, historical tours of the area, fishing, camping, and the Northern Lights in the winter months. There is a desire to take the focus off the bears, which is seen in economic terms as a "one trick pony". 18 of the 25 participants cited that tourism development was a good way to promote future economic development:

Our economy is centred in the tourism sector and I think that is something that will continue to happen for quite some time. I think that it will develop over time. There is room for growth in other tourism sectors. Not so much bears but birds, and looking at Northern lights. I think there is room to grow and that growth will come and we certainly are seeing that to some extent. We'd love to see it become more year round. It would be ideal to have a tourism season year round as we are at about 6 months now (#11/q11).

Some people agreed that tourism can be expanded upon, but improvements must be made to the town's infrastructure to handle a larger volume of people on a year round basis, any sort of economic developments must not be carried out at the community's expense:

Yes, there is more room to develop the tourist industry. Winter tourism could be developed more. The 6 months of tourism we already have and could be developed more. The problem is that the infrastructure is not set up to receive so many visitors. We have a very poor infrastructure to receive them. Would new infrastructure be profitable year around? (#15/q12)

Continuing with this notion, another person said this:

Yes, any sort of sustainable non-consumptive wildlife viewing is viable around here. The community is small but there are a lot of tourists around here, a lot of walk-ins, especially during the summer, people who take the train. They don't come for the educational tours but come up here for a couple days looking for a different experience. I think there is still room for sustainable tourist companies to continue to contribute to the local economy (#16/q12).

However, some respondents felt that the tourism industry would be hard pressed to experience any actual growth unless the emphasis is taken off the polar bears:

I think that they should promote other aspects of Churchill because the bears promote themselves. There is so much advertising for bears (#19/q12).

Despite this, the majority of people were of the opinion that without the popular polar bear attraction and the tourism the bears generate, there was little that the community could do to survive, let alone expand upon what is already there. The following selections from the qualitative data demonstrate this point:

I don't know what else would be here if not for tourism...the community would be wiped out (#1/q12).

I think the economy itself thrives from the tourist. Without it, there would be problems. If we didn't have tourism the town would struggle. The port is limited in what it can do. The economy does centre on tourism, and if you took out tourism, this town would cease to exist. There is room for it to grow, it could use something on a year around basis, it hasn't been tapped into yet (#12/q12).

Tourism and tourism development is very important to the community; it could not survive without it (#13/q12).

The data collected in this study reveals a perception that tourism is indeed the central source of economic survival for the community, and there are still avenues in which it can be expanded. The tourism industry is central to the community's survival. The expansion of the tourist industry promotes adaptability to future changes in the local dynamic. The central reliance on the polar bear has created a potential problem if the population were to migrate further north, come in lesser numbers, or be wiped out

completely. However, the data has revealed that the town's people have put significant thought into expanding the emphasis on the area's other natural attractions.

Summary

It was our hypothesis that climate change and the negative impacts on the polar bear population, other local wildlife, and habitats threatens the economic stability of Churchill MB because of the local economy's dependence on ecotourism for generating revenue. The basic quantitative and rich qualitative data collected in this research supports this conclusion. Because of the issue's particular relevance to the community under study, it was thought that there would be a great deal of understanding on the subject and a general concern amongst local citizens. The data supports this assumption as well.

70% of respondents were concerned about climate change because they have already witnessed its effects on the local polar bear population, the Hudson Bay freezing later each year, and that the town's economy would be adversely effected by the changes taking place as the polar bear is the central tourist attraction. Although a number of people are not exactly sure what causes climate change. Those that did offer reasons listed pollution, and other factors attributed to the greenhouse effect, or a natural phenomenon augmented by these human factors. The scientific data on the causes of climate change also supports these reasoning's (Johansen, 2001; Earthwatch Institute Journal, 2001). 46% of respondents perceive climate change as being a negative thing, though 28% felt that it could be either positive or negative. Though almost all agreed that the polar bears would be put a risk if the climate continues to warm. 76% of respondents had claimed to have already witnessed the effects of climate change on the polar bears who are appearing for longer periods of time, weigh less, and come into public areas more often. Also witnessed is the declining ice cover on the Hudson's Bay, and a later freeze-up accompanied by an earlier break up in the spring.

Nearly half of those interviewed felt that the town was in no way prepared to deal with these, and future changes in climate. Potential adaptations offered ranged from an expansion of the tourist attractions into other areas besides polar bears to investing in

expanding on the shipping capabilities if the Hudson Bay were to remain navigable for longer periods of time due to a warming climate. Tourism is the central source of revenue for the community, and local residents are aware of the community's dependence on the tourist industry for survival. It is because of this there is a concern for the future of the community in the wake of climate change, as it endangers the central tourist draw for the community. You cannot have a "Polar bear capital of the world" with no polar bears. It is really this simple.

With this in mind, the majority of the people see tourism as a not yet fully realized resource. "The polar bear capital of the world" need not be so dependent upon them for economic stability. 18 of the 25 of participants (72%) felt that the tourism industry could be expanded and promote the other things the area has to offer like the local beluga whale populations, outdoor activities, bird watching, fishing, and historical tours. However, in order to increase tourist volume, the town's infrastructure must be expanded in order to accommodate a rise in numbers, and make tourism viable year round. Some members of the community feel that tourists are often put first, at the cost of local citizens. Careful planning is required so that the town does not stretch itself beyond it's capabilities trying to expand the tourist industry, and to ensure that any actions taken do not adversely affect the quality of life for local citizens, disrespect aboriginal rights to the land, or harm local habitats.

Taking this information into account, we can say with confidence that climate change does indeed threaten the economic stability of the town, and that the topic is one of importance that demands further investigation. Unless there is a diversification in the town's resource base, and industry (the tourism industry included), climate change is a significant threat to the town's economic stability. This sentiment has been expressed by local peoples, and supports our assumptions regarding climate change and its implications for Churchill. Diversification of the local industry will improve the adaptability of the community to new and unknown factors in the future.

Through the collection of perceptions regarding climate change from local residents, this research has provided an accurate and coherent picture of how climate change and its implications for the community and surrounding habitat are perceived by the local populace. The information should be considered accurate, as it is provided by

the people who live day to day in the community, and are therefore the most knowledgeable when it comes to what is actually happening in the community. This research was conducted in the community, with the community, and for the community.

Conclusions

For the citizens of Churchill MB, climate change is an important issue, and this importance has been reflected throughout the data collected during this research. There is a great desire for further resources to be put into examining the phenomena of climate change and the impacts it has on northern communities. Based on the data collected, we can say with confidence that climate change is a global issue that has observable impacts on people's communities, traditions, and environments. Due to a heavy reliance on the tourism industry for economic stimulus, the small community of Churchill MB faces a potentially challenging road ahead if there is no diversification in already established tourist industry in the wake of considerable climate change. While proposed adaptations seem far and few between, local citizens do have ideas about how the community would cope with a change in their environment. Citizens are concerned that unless this issue is treated seriously, their community may not be able to survive.

Through an analysis of information provided by local residents it has been established that the local climate is indeed changing, and that these changes are attracting the attention of local citizens, business owners, and local government officials. There appears to be a strong belief that the present tourist economy could be expanded to compensate for potential losses in tourism attracted by the polar bears. This does not change the fact that the community is concerned with the well being of the polar bear, as it is part of their identity as a community. Without the polar bear, the general perception is that the community would fold as it is their primary tourist attraction, and therefore, the town is dependent upon the polar bear population for survival. Climate change is perhaps the biggest threat to the local bear population, and it has already resulted in observable negative impacts in terms of body weight, migration, and the overall health of the bears. What is a threat to the local polar bear population is in turn a threat to the well being of the town, as it's economy depends upon the visitors who primarily come to see the bears.

However, there is little the community can do to reverse the effects, as climate change is believed to be the result of global human practices. The best they can hope is that their story will be heard, and perhaps influence policy to reduce toxic emissions and slow the accumulation of greenhouse gasses. It is for this reason that adaptations are important, as there is seemingly little that can be done to reverse the phenomena. This research is to be the first of a larger series of researchers involving northern communities and the global issues that effect them, and it is hoped that the information contained within this document be of value to local peoples, businessmen, policy makers, and those seeking to gain a deeper understanding of not only the environmental, but human consequences of climate change. It is an issue of great importance that has only just begun to be understood and deserving of greater analysis; especially in regards to the consequences it has for wildlife, natural habitats, and human communities.

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Appendix#1

Survey # _____

Climate Change and Community Economic Development in Churchill MB

The purpose of the following survey is to examine your views on climate change and community economic development. You have the right to refuse to answer any question at any time and may stop the interview at any time for any reason. Remember, your answers will remain anonymous unless otherwise indicated.

Section A (General Information)

1. Do you wish to be cited in the research document?
 - a. Yes
 - b. No

*If yes, please state your name _____

2. Are you a resident of Churchill?
 - a. Yes
 - b. No

* If yes, how long? _____

3. What is your current occupation?

4. Do you wish to state your ethnicity?
 - a. Yes
 - b. No

* If yes, _____

Section B (Long answer)

5. Is climate change (global warming) a topic of concern for you? Why or why not?
6. To the best of your understanding, what are the root causes of climate change?
7. Do you see a relationship between the local climate and economy? Explain.
8. Would you view climate change as a good or bad thing for the community? Why?
9. If the region was to undergo a significant change in climate, what do you see as the consequences for the tourism industry in Churchill?
10. What do you think will be the effects of climate change on local wildlife and habitats? Are changes already taking place? Explain.
11. In your opinion, how well is the community prepared to deal with potential changes in climate? What solutions could the community employ to adapt to potential changes in climate? Explain.
12. Do you see tourism development as a viable means of promoting future economic stability for the community?

Thank you very much for your time in completing this interview!

Appendix#2

Participant Consent Form

Project title: Adapting to Climate Change In Churchill: Perspectives of Local Residents

Researcher: Mike Chotka

Supervisor: Dr. Thibault Martin (204) 286-9187

I am a student researcher from the University of Winnipeg conducting research for my honours paper. The purpose of this research is to examine how citizens of Churchill Manitoba perceive climate change, as global warming is a threat not only to local habitat and wildlife, but also threatens the economy and livelihood of the town as well. Potential solutions, or adaptations, that the community will have to employ in the wake of climate change, envisioned by local residents, will also be examined.

You will be asked to answer **20** questions regarding your views on climate change. The interview will take about 20 minutes. Your responses will be used to provide information regarding the research focus. Your name will not be used in the study and your participation will remain confidential unless you request otherwise. Your participation in the study is very much appreciated and it is useful for you to know that you can quit the interview at anytime for any reason, even if the interview is not complete.

Declaration: I understand that anonymity and confidentiality will be maintained unless I specify below. I understand that I can withdraw from the study at any time, for any reason, and that I will not be penalized. I understand that my responses will be tape-recorded and my responses may be directly quoted in the research. I understand I have the choice to not be tape-recorded but have notes taken if I so desire. I understand that I will not be subject to any emotional harm or deception. Feedback as to the results of this study can be made available to me at any time following the studies completion via Thibault Martin @ (204) 786-9187.

I wish to remain anonymous **1. Yes 2. No**

I have read the above and understand the nature of this study and agree to participate. I also understand that I have the **right to refuse to participate** and that **my right to withdraw from participation at any time during the study will be respected**. If you have any questions or concerns please contact the Sociology Research and Ethics chair Michael Weinrath @ (204) 786-9403, or the Chair of the Senate Committee on Ethics and Human Research and Scholarship Laura Sokal @786-9915.

Signature of participant

Date

Signature of Researcher

Date