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Public Opinion Research on Extreme Temperatures and Alerting Programs in Northern Canada

Final Report

Prepared for Environment and Climate Change Canada

Supplier name: Earnscliffe Strategy Group
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Ce rapport est aussi disponible en français.

Canada

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September 2021

This public opinion research report presents the results of a series of one-on-one interviews conducted by Earnscliffe Strategy Group on behalf of Environment and Climate Change Canada. The research was conducted from June to August 2021.

Cette publication est aussi disponible en français sous le titre : Recherche sur l'opinion publique concernant les températures extrêmes et les programmes d'avertissement dans le Nord canadien – Rapport final

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Earnscliffe Strategy Group Inc. (Earnscliffe)
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I hereby certify as a Representative of Earnscliffe Strategy Group that the final deliverables fully comply with the Government of Canada political neutrality requirements outlined in the Communications Policy of the Government of Canada and Procedures for Planning and Contracting Public Opinion Research. Specifically, the deliverables do not include information on electoral voting intentions, political party preferences, standings with the electorate or ratings of the performance of a political party or its leaders.

Signed:  Date: September 10, 2021

Doug Anderson
Principal, Earnscliffe

Executive Summary

Earnscliffe Strategy Group is pleased to present the following report to Environment and Climate Change Canada (ECCC) summarizing the results of the qualitative research on extreme temperatures and alerting programs in northern Canada.

Environment and Climate Change Canada's (ECCC) mandate is to protect the safety and security of Canadians and their property. Public weather alerts are the main avenue for this action. The Meteorological Service of Canada (MSC) has recently established, in partnership with Health Canada (HC) and the provinces and territories, a world-class Heat Warning and Information System across the majority of Canada. This system provides health-based Heat Warning criteria and services through advance notifications to public health partners supporting their Heat Alert Response Systems (HARS).

The MSC does not currently have a regionally appropriate service in Nunavut, Northern Quebec (Nunavik), and the High Arctic of the Northwest Territories and Yukon to protect Northern Canadians during extreme heat events. The MSC has heard anecdotally from Service Meteorologists that there are heat concerns at temperatures lower than one would expect within the Northern Canadian population, in particular the high arctic. However, the current population size and health data limitations in Northern Canada have prevented Health Canada from completing a thorough and informative heat-health analysis for the development of Heat Warning thresholds, nor is there international research to support this action. At the same time, climate change has increased the prevalence of extreme heat events in the North. Consequently, the determination of health-based Heat Warning criteria and thresholds is a priority to protect the population.

In order to develop an appropriate Heat Warning Program and effective messaging system for the North, further investigation into Northern Canadians' perceptions, needs, and current understanding of extreme temperature and their associated warning systems were required.

In addition to helping ECCC better understand Northern Canadians' opinions and needs related to extreme heat, the department also aims to use this research to better understand how the existing extreme cold warning program in the North is used and how the warnings influence decision-making for Northern Canadians. As Nunavut, Northern Quebec, and the High Arctic have the most extreme cold temperatures in Canada, this research will help improve the existing Extreme Cold Warning Program to better suit the needs of Canadians in the North.

The total contract value of the project was $69,371.43 including HST.

To meet ECCC's objectives for this project, Earnscliffe conducted a wave of qualitative research. The research entailed a total of 52 one-on-one interviews conducted by phone from June 11 to August 12, 2021. The target audiences included Indigenous and non-Indigenous members of the general population living in Canada's North (outside Yellowknife and Whitehorse, where existing criteria for heat warning systems are not appropriate), Indigenous Elders living in Canada's North and public health and emergency management officials. In total, we conducted 35 interviews with the general population, 4 with Elders, 8 with health officials and 5 with emergency management officials. The interviews were approximately 40 minutes in length and participants received an honorarium of $200.

It is important to note that qualitative research is a form of scientific, social, policy, and public opinion research. Qualitative research is not designed to help a group reach a consensus or to make decisions, but rather to elicit the full range of ideas, attitudes, experiences, and opinions of a selected sample of participants on a defined topic. Because of the small numbers involved, the participants cannot be expected to be thoroughly representative in a statistical sense of the larger population from which they are drawn and findings cannot reliably be generalized beyond their number. As such, results are directional only.

The key findings from the research are presented below.

Key Findings

Weather and Climate Change

- Participants clearly distinguished between weather (current conditions) and climate change (the changes in weather observed over time, attributed to human activity).

- While most are concerned about climate change, intensity varied. Some are very concerned, and cited dramatic changes they have observed including:
    - Warmer temperatures in the winter and summer;
    - Thawing permafrost causing their homes to sink;
    - Unreliability of ice roads and ice thickness, which pose supply chain and safety issues for hunting and fishing;
    - Changes to animal and insect species in their area; and,
    - Frequency of forest fires and impact of forest fire smoke on air quality and health.

- Those who were less concerned about climate change explained that they were enjoying the warmer weather and opportunity to do more outside. A few also felt concern about climate change was overblown and perhaps part of a historic warming period.

Extreme Temperatures

- A common attitude held by almost all participants was that they find extremely cold weather easier to handle than extreme heat. Participants explained that they expect the weather to be reliably cold during the winter. They are used to preparing for the cold and the infrastructure in their communities was built to help them live in these conditions.
    - In contrast, extreme heat occurs less predictably. Many felt it may be happening more often and is more difficult to manage. Their bodies are not accustomed to the heat and their houses were not built to help them stay cool (e.g., they retain heat and do not have air conditioning).

- Asked what they view as extreme cold requiring them to take precautions, participants mentioned a range of anywhere between -30 to -50 degrees Celsius. Participants acknowledged that at temperatures in that range, they would need to dress more warmly and reconsider travel (in case of vehicle breakdown) or carry more clothes/blankets in

their vehicle. Some noted that they do not go outside when it gets extremely cold, while a few said they usually continue with most of their normal activities.
    - One weather condition that was sometimes mentioned as arriving with extreme cold was ice fog. Those mentioning it clearly see it as a condition that may impact either their own plans (because of poor visibility) or life in the community (because flights in and out are disrupted).

- The hot temperatures at which participants feel uncomfortable ranged from the low 20s to 30s. Answers seemed to vary by region – those in Nunavut more often mentioned temperatures in the low to mid 20s, while those in Yukon seemed to mention temperatures in the 30s more often.
    - Many noted that they have trouble keeping their house cool because none of their homes have air conditioning and were built to retain heat. Some also mentioned feeling more lethargic or getting a headache in the heat.
    - Some would keep their existing plans, while taking precautions such as carrying more water, wearing sunscreen, etc. However, others said they would try to stay inside and avoid going out or seek out a place to cool off or swim.
    - Some would appreciate an extreme heat warning, but the group who did was divided on when they would like to receive them – about half felt a day in advance would be sufficient, while others wanted a few more days to prepare, cool their house down, etc.

- While hot temperatures can be an inconvenience, participants seemed more concerned about the impacts of weather events that can accompany hot weather rather than the temperature itself. Participants, particularly those in Yukon, often spoke about forest fire smoke as part of what they consider weather, because it is triggered by heat and thunder/lightning storms.

- Shorter winters and abrupt changes in weather conditions and temperatures in the fall and spring emerged as perhaps even greater concerns than extreme cold or extreme heat. Several participants noted that ice is not reliably frozen for as long and is not as thick as it was in the past. This means they don't always know if it is safe to go out on the ice to hunt/fish and use ice roads.

- Health officials indicated a number of public health-related concerns that did not arise as frequently among the other participants:
    - They noted that vulnerable populations such as those experiencing homelessness or Elders and the elderly are more affected by extreme weather, whether it be directly due to the conditions or due to the isolation that can occur when others are unable to visit them.
    - Those who go "out on the land" were also a segment of the population these respondents mentioned as being of concern, given the impacts of climate change on ice conditions and the ability to move about and access traditional sources of food (e.g., hunting, fishing).

Sources of Weather Information

- Most use ECCC's weather resources in some capacity, either through the website or the WeatherCAN app. Other sources often mentioned include the iPhone weather app, Windy, Weather Network app, and firesmoke.ca (health officials specifically).
    - Several participants also explained that the weather is a very common topic of conversation among family and friends in the North.

- Most access weather reports using their smartphone or computer. A few rely on radio and TV.
    - They are most often looking for temperature, wind (particularly for wind chill and to determine if the wind is strong enough to cause significant waves on rivers and lakes), chance of precipitation, and storm warnings. All of the above have some bearing on how they plan their activities.

- Participants feel the weather forecast is often inaccurate, but do not blame ECCC or other providers for errors. Many believe it is simply too difficult to predict weather in the North because it can vary dramatically based on precise location and can change rapidly.

- Participants felt that ECCC's weather information quality is not bad, but that it does often miss the mark. A few examples include either not notifying them of storms or predicting a storm that never materializes.
    - Asked what ECCC and other weather providers could do differently, participants mentioned major weather event accuracy, placing weather stations in more locations, more frequent updates, including citizens in reporting in small communities (including consulting elders), winter road conditions, reporting the weather in Indigenous languages, and marine forecasting.

Introduction

Earnscliffe Strategy Group is pleased to present the following report to Environment and Climate Change Canada (ECCC) summarizing the results of the qualitative research on extreme temperatures and alerting programs in northern Canada.

Environment and Climate Change Canada's (ECCC) mandate is to protect the safety and security of Canadians and their property. Public weather alerts are the main avenue for this action. The Meteorological Service of Canada (MSC) has recently established, in partnership with Health Canada (HC) and the provinces and territories, a world-class Heat Warning and Information System across the majority of Canada. This system provides health-based Heat Warning criteria and services through advance notifications to public health partners supporting their Heat Alert Response Systems (HARS).

The MSC does not currently have a regionally appropriate service in Nunavut, Northern Quebec (Nunavik), and the High Arctic of the Northwest Territories and Yukon to protect Northern Canadians during extreme heat events. The MSC has heard anecdotally from Service Meteorologists that there are heat concerns at temperatures lower than one would expect within the Northern Canadian population, in particular the high arctic. However, the current population size and health data limitations in Northern Canada have prevented Health Canada from completing a thorough and informative heat-health analysis for the development of Heat Warning thresholds, nor is there international research to support this action. At the same time, climate change has increased the prevalence of extreme heat events in the North. Consequently, the determination of health-based Heat Warning criteria and thresholds is a priority to protect the population.

In order to develop an appropriate Heat Warning Program and effective messaging system for the North, further investigation into Northern Canadians' perceptions, needs, and current understanding of extreme temperature and their associated warning systems were required.

In addition to helping ECCC better understand Northern Canadians' opinions and needs related to extreme heat, the department also aims to use this research to better understand how the existing extreme cold warning program in the North is used and how the warnings influence decision-making for Northern Canadians. As Nunavut, Northern Quebec, and the High Arctic have the most extreme cold temperatures in Canada, this research will help improve the existing Extreme Cold Warning Program to better suit the needs of Canadians in the North.

The specific objectives of the research were to address the following information needs:

- The current needs and concerns of Northern Canadians and stakeholders in relation to Extreme Temperatures Warning Systems.
- What resources Canadians in the North readily have available and use in relation to extreme temperature warnings and messaging systems
- Do Canadians in the North require further support and resources related to extreme temperature warnings and messaging systems?
- How do Northern Canadians perceive the appropriateness of extreme temperature warning criteria/thresholds?

- How do Northern Canadians perceive the appropriateness of alerting, messaging, and actions related to extreme cold/heat-health?
- How Canadians in the North would want to integrate climate change concerns related to warming, extreme temperatures, and dramatic annual temperature swings to help protect their personal safety and security and the environment in which they live?

To meet ECCC's objectives for this project, Earnscliffe conducted a wave of qualitative research. The research entailed a total of 52 one-on-one interviews conducted by phone from June 11 to August 12, 2021. The target audiences included Indigenous and non-Indigenous members of the general population living in Canada's North (outside Yellowknife and Whitehorse, where existing criteria for heat warning systems are not appropriate), Indigenous Elders living in Canada's North and public health and emergency management officials. In total, we conducted 35 interviews with the general population, 4 with Elders, 8 with health officials and 5 with emergency management officials. The interviews were approximately 40 minutes in length. General population participants and Indigenous Elders received an honorarium of $200.

The table below shows the number of interviews by audience:

Table 1. Number of interviews by target audience

Target Audience	**Number of Interviews**
General population, non-Indigenous	22
General population, Indigenous	13
Elders	4
Health Officials	8
Emergency Management Officials	5

Appended to this report are the screener, invitations letters and interview guide.

It is important to note that qualitative research is a form of scientific, social, policy, and public opinion research. Qualitative research is not designed to help a group reach a consensus or to make decisions, but rather to elicit the full range of ideas, attitudes, experiences, and opinions of a selected sample of participants on a defined topic. Because of the small numbers involved, the participants cannot be expected to be thoroughly representative in a statistical sense of the larger population from which they are drawn, and findings cannot reliably be generalized beyond their number.

Detailed Findings

The following report is divided into three sections. The first deals with participants' views about weather and climate change broadly. The second examines attitudes about extreme temperatures and weather, and how both impact daily life in the North. Finally, the report concludes with a section detailing participants' sources of weather information, impressions of current weather forecasters and suggestions for improvement. Unless otherwise noted, findings in this report are common across all audiences; only noteworthy differences are mentioned.

Weather and Climate Change

Participants clearly distinguished between weather and climate change. They viewed weather as the current conditions, including the temperature, precipitation, wind, etc. Almost all agreed that climate change, in contrast, is the change in weather conditions over time. Many noted that climate change is a product of human activity.

While almost all were concerned about climate change, the intensity of participants' concern varied. Most noted that temperatures have risen in both winter and summer and that the dependable weather patterns in the North have been disrupted. Many referenced dramatic changes to the frequency of weather events such as forest fires, and the impact of forest fire smoke on health. Those who lived near or relied on rivers to get around or to fish noted an increase in flooding.

Participants connected the changing weather patterns to changes in the species of animals around them. Several have observed new species (e.g. mosquitos and other insects, fish) around where they live and noted that they now see fewer of others that were once plentiful (e.g. caribou). A few participants mentioned that in their view, the changing conditions that affect hunting and ice thickness mean that traditional Inuit knowledge of the land does not always hold true.

Finally, many agreed that climate change is having a dramatic impact on infrastructure in their community. The thawing of the permafrost is causing homes and buildings to sink, they reported. Ice roads are not safe for as long as they once were, affecting supply chains to communities.

Those who were less concerned about climate change explained that they were enjoying the warmer weather and opportunity to do more outside. A few also felt concern about climate change was overblown and that it is perhaps part of a historic warming period.

Extreme Weather

Extreme Cold

Asked what they view as extreme cold requiring them to take precautions, participants mentioned a range of anywhere between -30 to -50. Particularly for the participants who grew up in the North, the cold does not prevent them from going outside. Participants acknowledged that the cold could impact how they go about their daily activities, but that it is relatively easy to prepare and plan for. Rather than drastically impacting their day-to-day life and activities, it is a part of it. As two participants explained, they plan for cold weather:

> *"So you know, everyone understands there's going to be cold snaps like that. And everybody's usually prepared already…I feel like everybody here knows to be prepared, and has the ability to be prepared for that kind of extreme on the bottom." -Non-Indigenous participant, Yukon*

> *"But people are used to, they know how to dress, even little kids. They know how to dress, how to be careful. And they're very attentive to the regulations that they've been taught about wearing proper footwear, pants, neck warmers, toques, mitts, and even the kids know the order to put it on." -Non-Indigenous participant, Nunavut*

Communities and families have strategies for dealing with the cold. Some noted that they do not go outside when it gets extremely cold, while others said they usually continue with most of their normal activities, sending their kids to school and going to work, but with precautions. For example, during periods of extreme cold, participants explained that they would need to dress more warmly and reconsider travel (in case of vehicle breakdown) or carry more clothes/blankets in their vehicle. They pay attention to detect any signs of frostbite when outside. One participant said that even at -45, they would still go out on the land to hunt but prepare by wearing bear or caribou skin clothing to keep warm and waterproof boots.

Several participants noted that windchill can impact safety outdoors during cold weather. It is riskier to be outside when it is cold and windy. Some participants explained that there is a greater risk of dying from exposure when the winds are strong. Others pointed out that vehicles are more prone to failure below a certain threshold. Consequently, they pay close attention to windchill warnings when examining weather information.

One other weather condition that was sometimes mentioned as arriving with extreme cold was ice fog. Those who mentioned it clearly saw it as a condition that may impact either their own plans (because of poor visibility) or life in the community (because flights in and out are disrupted).

Extreme Heat

A common attitude held by almost all participants was that, for the reasons outlined above, they find extremely cold weather easier to handle than extreme heat. They are used to preparing for the cold and the infrastructure in their communities was built to help them live comfortably in those conditions. In contrast, extreme heat occurs less predictably. Many felt it may be happening more often and is more difficult to manage.

The hot temperatures at which participants feel uncomfortable range from the low 20s to 30s. Answers seemed to vary by region. Those in Nunavut more often mentioned temperatures in the low to mid 20s, while those in Yukon seemed to mention temperatures in the 30s more often.

Participants explained that their bodies are not accustomed to the heat and their houses were not built to help them stay cool (e.g., they retain heat and do not have air conditioning). Many participants, included the individual quoted below, expressed concerns for the health of people in their community when temperatures reach the mid 20s to 30s:

> *"For us, 28 above is extreme. 25 is warming but 28 to 35 is extreme. I know last year we had 35 above, that's extreme. So people don't have air conditioning units in houses. Last year, we had to use one in our house, just to keep…the impact is immense during the day. Dehydration, if that's the case, heatstroke. It's the fact that if you can't have adequate rest during the night…for a longer period of like, two or three days, that had a huge impact to the health, wellness [of the] community especially. And [that] really compromised people in our community. They're going to be heavily impacted, and remote emergencies, heatstroke or whatever." -Elder, Northwest Territories*

Echoing the participant quoted above, when participants experience temperatures they find uncomfortably hot, many noted that they have trouble keeping their house cool because none of their homes have air conditioning and were built to retain heat. A few also mentioned aspects such as difficulty sleeping that can affect energy level and mood. Some noted that they feel more lethargic or get a headache.

During periods of extreme heat, some would keep their existing plans, while taking precautions such as carrying more water, wearing sunscreen, dressing lightly, etc. However, others said they would try to stay inside and avoid going out or seek out a place to cool off or swim. A few participants who work outdoors said that they try to begin working earlier when it is hot out or work at night and sleep during the day. One participant mentioned that when it is hot outside, they move activities, including smoking meat, inside their home, because the sun is too intense for them to work outdoors.

When prompted, some said they would appreciate an extreme heat warning. Some felt a day in advance would be sufficient, while others wanted a few more days to prepare, cool their house down, or adjust their plans for a trip out on the land if needed. Of note, emergency management officials preferred several days' warning to help them spread the word to affected communities, particularly ahead of a weekend when people plan trips. A few participants felt a warning about heat was unlikely to be able to help them in any way beyond setting expectations. For them, it might be nice to have, but is not necessary.

Indigenous and non-Indigenous participants alike held a range of views regarding the appropriateness of and need for extreme heat warnings. Several participants, in both audiences, did not think there was much they could do to prepare for extreme heat and consequently felt they did not need a warning. Some individuals in each group expressed that they would like several days' warning of extreme heat in order to prepare for trips out on the land or recreational outdoor activities and trips. Though most of the reasons for wanting a heat warning were similar between the two groups, one Indigenous participant articulated that a warning would be important for Elders, which none of the non-Indigenous participants mentioned.

While hot temperatures can be an inconvenience, participants seemed more concerned about the impacts of weather events that can accompany hot weather rather than the temperature itself. Participants, particularly those in Yukon, often spoke about forest fire smoke as part of what they consider weather, because it is triggered by heat and thunder/lightning storms. Some indicated feeling that thunderstorms were either occurring in increasing frequency or intensity or even new to their area. They know forest fire smoke impacts health, including making it difficult to breathe and causing headaches. A few had experienced highway closures due to active forest fires that had impacted their travel plans.

Changing Weather Patterns

Shorter, warmer winters and abrupt changes in weather conditions and temperatures in the fall and spring emerged as perhaps even greater concerns than extreme cold or extreme heat. Many who grew up in the North explained that winters are no longer as cold as they used to be:

> *"When I was a kid up here, minus 40 was common. I mean, it was an everyday thing. When it got to minus 20, we would take our jackets off and say, my God, it's hot. Last year, we might have touched 40 once. We had a very warm winter last year, most of the time in the 20s and early 30s on the Celsius scale, and I believe I plugged my truck in once, all winter." -Non-Indigenous participant, Nunavut*

Though not all could recall an instance when temperatures exceeded 0 degrees Celsius in the winter, most noted that warmer winter temperatures are having a negative impact on life in the North. Several participants explained that warmer winters mean that the ice is not reliably frozen for as long as it was in the past, nor perhaps as thick as in the past. This means they don't always know if it is safe to go out on the ice to hunt/fish and use ice roads. The latter also impacts the supply of food and essentials in some communities, as the following participants highlighted:

> *"The whole thing about the ice roads that people depend on [them], you know. So you don't have to fly all your goods in, you can truck them in. That's a lot cheaper. But now that that window is a lot shorter than it was, I guess the big companies are having similar issues like to the mine sites to get their supplies in as well. They're finding it more challenging." -Non-Indigenous participant, Northwest Territories*

> *"The sea ice. It melts sooner and takes longer to freeze in the fall. Places that used to be safe to travel are less safe or safe for less periods of time. People are falling through the ice and very experienced hunters…we're losing people because the ice is changing and it's hard to read." -Inuit participant, Nunavut*

> *"We rely on snowmobiles to get out on the land during the wintertime and that's, normally you can count on an 8-month period and that's in decline because we have to wait in the fall for snow, and in spring time especially on the land and on lakes it melts very fast, we can't travel for as long as we used to on the land." -Inuit participant, Nunavut*

In addition to changes to the freeze/thaw cycle, a few participants noted that they are experiencing abrupt changes in weather more often than previously. One participant, who had recently experienced a hailstorm in their community, highlighted the changing trends:

> *We don't traditionally see hail in June, you know, you get the occasional frost or snow just because it's so far north, but you have to hailstorms within 10 days is pretty, pretty not normal for this part of the world. So I can see kind of just changes in since I've been living here, you know, we get more frequent thunderstorms, where they're more reminiscent of like an Ontario thunderstorm where it's, you know, very loud, lots of lightning, heavy, heavy rains. It's just not something that I've ever really experienced up here in the north in the Yukon. -Non-Indigenous participant, Yukon*

According to them, thunderstorms are increasing in frequency and severity, along with high winds. Some participants explained that their community has experienced more flooding as well.

Extreme Weather & Public Health

Public health officials offered, as might be expected, more detailed responses when asked about the impacts of extreme heat on communities in the North. They indicated a number of public health-related concerns that did not arise as frequently among the other participants. They explained that those experiencing homelessness, low-income individuals or Elders and the elderly can be more affected by extreme weather. The outsized effects on these populations can be directly due to the conditions; seniors are more vulnerable to respiratory complications stemming from smoke and are more susceptible to heat stroke, for example. Public health officials also noted the danger posed by the isolation that can occur when others are unable to visit seniors due to either very cold or very warm weather.

Individuals with a lower income or who are experiencing homelessness are at a greater risk than the rest of the population during winter and summer. Officials noted that they do not always have access to housing that is either warm or cool enough, depending on the season. Being exposed to the elements outside, particularly in the winter, is also a dangerous risk for the homeless population.

Those who go "out on the land" were also a segment of the population these participants mentioned as being of concern, given the impacts of climate change on ice conditions and the ability to move about and access traditional sources of food (e.g., hunting, fishing).

One of the public health officials we spoke to said that they try to amplify ECCC's extreme heat warnings. They advise people to take precautions such as staying hydrated, ensuring pets and children are not left in vehicles, cooling themselves down with a wet towel and, for the elderly or frail individuals, discussing their medications with their doctor if they believe they are more prone to heat-related illness.

Weather Information in the North

Sources of Weather Information

Most participants said that they use ECCC's weather resources in some capacity, either through the website or the WeatherCAN app. A few also mentioned looking up ECCC's marine forecast. It should be noted that almost all referred to "Environment Canada" rather than Environment and Climate Change Canada and a few asked for clarification over whether they are one and the same.

Aside from ECCC, participants mentioned getting weather information from the iPhone weather app, CBC, the Weather Network app, and Windy.com. Health officials also mentioned firesmoke.ca. Weather is also a frequent topic of discussion between friends and family, both in person and within community-based social media groups. As one non-Indigenous participant in Nunavut said, "forecasting a blizzard here is a full-time pastime."

The Internet and mobile phones are where most get their weather. Some rely on radio or TV. Indeed, when asked whether there are any existing sources of weather information which they discount or ignore, several mentioned TV. The TV broadcasts they see are not particularly focused on the North, let alone on their local community, so the information is largely irrelevant to their circumstances but may be of interest for knowing how the weather is where family or friends are living.

Participants reported checking the weather daily, if not more frequently. The information they look for in a forecast is, first and foremost, temperature. However, wind is also quite important. As noted earlier, wind chill can have a significant impact on how they prepare for the day. Wind can also be relevant for planning trips on rivers and lakes (to determine if the wind is strong enough to cause significant waves). Participants also look for the chance of precipitation and storm warnings. All of the above have some bearing on what they choose to wear and how they plan their daily their activities. For example, if the temperature is forecasted to exceed a threshold they find uncomfortably hot, they may choose to pause any outdoor work. A few participants explained that they rely on the weather forecast to help them plan trips on the land. In addition to temperature and wind, they also look at the tide forecast. A few mentioned also seeking out the sunrise and sunset times, as well as historic trends, but more out of personal interest than anything else.

Quality of Weather Information

Participants felt that the weather forecast is often inaccurate. One participant in Nunavut explained, "Literally, it will call for on the weather site, you know, a good chance of precipitation but it's pouring rain. They'll say 'it's fine, it's only -35' but it's -50." Some also noted that the weather events being warned about in special weather statements don't always materialize.

However, participants did not blame ECCC or other providers for errors. Many believe it is simply too difficult to predict weather in the North because it can vary dramatically and can change rapidly. They use the forecast as a guideline, but do not trust it implicitly.

As one public health official noted, weather can vary dramatically within just a few square kilometres:

> *It would be interesting to see if there could be readings done at different locations like in Dawson. We're aware that out at the airport where the weather station is, tends to be, it's in a different valley. It's very, very close to where I live, it's only a 15–20-minute drive, but we know that there is a difference in temperature in town than there is out of the airport. Might be because the river is close to us here and we are also in a different valley, but it would be interesting to have different points of information like at the airport it's this and in town it's like that." -Public health official, Yukon*

They explained that most know that there is a discrepancy between the reported forecast and the conditions in town, but that it could be useful to have more reporting stations in their community.

Participants felt that ECCC's weather information quality is not bad and of the sources available to them it is among the most reliable. A few noted that ECCC's weather forecasting includes all the information they need – temperature, long range forecast, wind warnings, forest fire maps, etc. Though ECCC's information is among the best resources that they have, participants say it does miss the mark fairly regularly. A few examples include either not notifying them of storms or predicting a storm that never materializes or is not as intense as predicted.

Asked what ECCC and other weather providers could do differently, participants often mentioned major weather event accuracy. Some also felt it would improve the accuracy of the forecasts to place weather stations in more locations. Several participants requested more frequent updates. A few explained that it

could be helpful to ECCC if they included citizens in reporting in small communities, including consulting Elders, and if they reported the weather in Indigenous languages. Providing updates or video footage of road conditions was also mentioned by a few participants as something that would help them plan their travel more safely. Finally, one Elder felt that ECCC could do more to communicate information about ice thickness with communities who rely on it for transportation and fishing.

When prompted, many participants felt that a forecast specifically for hunting and fishing could be useful. They suggested that such a service should include marine forecasting, information about how fast rivers are running and the tides, all of which would help those travelling on water to assess the safety of their excursion. One participant suggested providing a forecast specifically for the area where bison hunting take place in Yukon. However, not all felt a special forecast for hunting and fishing is necessary and claimed that they already get enough information from existing sources.

Finally, public health and emergency management officials had a few unique ideas that would help support their own work. One suggested making ECCC weather reports available via weather radio warning system. They thought that ECCC may be working towards this already, but supported the expansion of such a project. They pointed out that it is crucial to reach people who are no longer in an area with cell service. They felt this could be accomplished by making ECCC weather warnings available on SPOT satellite messenger or Garmin's inReach, a two-way messaging device that many hunters carry.

Another public health official asked for surveillance data on the health impacts of extreme heat, so they could ensure they were describing the effects accurately to the population. While some do try to educate the public about the risks of extreme heat and how to cope, most would welcome more resources from ECCC that could be easily disseminated to the population to support their efforts. One mentioned that more information about the risk of sunburn would be helpful in particular.

One of the emergency management officials spoke about the need for greater coordination between ECCC, search and rescue, emergency management and the territorial government. In the past, when they had high levels of smoke in their area, they had difficulty obtaining the local smoke level numbers and consequently were unsure when to tell the elderly to evacuate. In a similar vein, another said they had received a heat warning from ECCC last summer, but were unsure how to communicate about it to the public. Two emergency management officials said that they felt ECCC should do more on social media to spread the weather warnings; Facebook, Twitter and Instagram were mentioned unaided.

Conclusions

The findings of the research suggest that many of those living in the North are preoccupied by climate change and its impact on weather and daily life. For most, the weather events and trends they have experienced in more recent years are linked to climate change. Almost all participants found the warmer temperatures, early thawing/late freezing, and changes to the natural landscape concerning.

One of the objectives of this research project was to gather information to inform extreme temperature warning criteria. Participants explained that in cold weather, they become uncomfortable or have to take precautions when the temperature reaches anywhere between -30 and -50 Celsius. For warm weather, the threshold is somewhere between the mid to low 20s and 30s. Their ability to cope with weather on either end of the spectrum varies. The interviewees explained clearly that they are prepared for cold weather. They expect it to be reliably cold in the winter and have already adjusted their routines and come up with solutions to cope with it. They acknowledged the danger posed by extreme cold but felt well equipped to meet the challenge. In contrast, participants seemed less prepared for warm weather, but also did not perceive that the risks are as significant as those posed by extreme cold. Participants adjust as well as they can to hot weather, but their options are more limited. Many noted that most buildings lack air conditioning, and it can be difficult to cool off. Health officials in particular warned of heat stroke, dehydration and sunburn. Not all general population participants felt that the extreme heat has a significant impact on their health, but those who did mentioned that the heat makes them more tired and lethargic and can lead to dehydration.

Asked whether they would find an extreme heat warning useful, some saw value in it, but were split over how much advance notice they would need to prepare. Part of the group felt a day would be sufficient, while others wanted a few days' warning so that they could cool down their home. Those who did not feel they needed a heat warning did not think it would be likely to help them, other than by setting expectations.

As outlined in this report, hot temperatures can be an inconvenience, but participants were more concerned about the impacts of weather events that warmer temperatures bring about rather than the temperature itself. For example, participants, particularly those in Yukon, often brought up forest fires and forest fire smoke, which they know can dramatically impact health and safety. Relatedly, shorter winters and the unpredictability of ice freezing and thawing has huge consequences for transportation, logistics, supplies to local communities and hunting, according to participants.

Participants rely on weather forecasting, most often ECCC's, but feel the information they receive is not always accurate. They did not blame ECCC or other sources for this, because they acknowledged that weather is difficult to predict in the North. However, they did offer many suggestions to improve the information they currently receive, including more accurate reporting on major events (e.g., blizzards, thunderstorms) and placing weather stations in more locations around their community. Other suggestions included reporting on road conditions and ice thickness, as well as marine forecasting for those who go out on the water to fish and providing the forecast in Indigenous languages.

Appendix A: Interview Methodology Report

Methodology

The target audiences for this research were individuals living in Nunavut, Northern Quebec (Nunavik), and the High Arctic of the Northwest Territories and Yukon, both Indigenous and non-Indigenous, Elders, public health officials and emergency management officials. Interviewees from the general population and Elders were given an honorarium of $200. The interviews were conducted between June 11 and August 12, 2021 and averaged 40 minutes in length. All interviews were conducted in English and by telephone. The tables below break down the participants by target population and territory.

Table 2. Number of interviews by target audience

Target Audience	Number of Interviews
General population, non-Indigenous	22
General population, Indigenous	13
Elders	4
Health Officials	8
Emergency Management Officials	5

Table 3. Number of interviews by territory

Territory	Number of Interviews
Nunavut	17
Northwest Territories	21
Yukon	14

Recruitment

For general population recruitment, our data collection partner, Leger, created a list of phone numbers of residents of the Territories, excluding Yellowknife and Whitehorse. General population participants were initially recruited by Leger using the screening questionnaire in Appendix C. Upon completing the preliminary recruitment, they were contacted directly by one of Earnscliffe's schedulers to set a time for their interview, using the letter included in Appendix D. We made an effort to ensure that the final sample included a good mix of participants by territory and set quotas to ensure we included at least 10 Indigenous participants in the research. We also monitored where each participant lived to ensure that the locations were further north than Yellowknife and Whitehorse, where existing criteria for heat warning systems are not appropriate.

Health and emergency management officials were recruited from a list developed by ECCC and Earnscliffe, using the letters in Appendix D.

The Elders were scheduled using an approach referred to as snowball sampling. This is a technique commonly used when the researcher is unable to access a list of appropriate participants or members of the target audience are difficult to identify. We used the connections of one research participant to Elders in far North communities to come up with a list of Elders to whom we could reach out.

Moderation

Three moderators were used over the course of the research project. Each moderator took notes and summarized their interviews and met periodically to provide the other with a debrief on the groups, including the key findings.

A note about interpreting qualitative research results

It is important to note that qualitative research is a form of scientific, social, policy, and public opinion research. Qualitative research is not designed to help a group reach a consensus or to make decisions, but rather to elicit the full range of ideas, attitudes, experiences and opinions of a selected sample of participants on a defined topic. Because of the small numbers involved the participants cannot be expected to be thoroughly representative in a statistical sense of the larger population from which they are drawn and findings cannot reliably be generalized beyond their number.

Glossary of terms

The following is a glossary of terms used throughout the report. These phrases are used when groups of participants share a specific point of view. Unless otherwise stated, it should not be taken to mean that the rest of participants disagreed with the point; rather others either did not comment or did not have a strong opinion on the question.

Table 4. Glossary of qualitative terms

Generalization	Interpretation
Few	Few is used when less than 10% of participants have responded with similar answers.
Several	Several is used when fewer than 20% of the participants responded with similar answers.
Some	Some is used when more than 20% but significantly fewer than 50% of participants with similar answers.
Many	Many is used when nearly 50% of participants responded with similar answers.
Majority/Plurality	Majority or plurality are used when more than 50% but fewer than 75% of the participants responded with similar answers.
Most	Most is used when more than 75% of the participants responded with similar answers.
Vast majority	Vast majority is used when nearly all participants responded with similar answers, but several had differing views.
Unanimous/Almost all	Unanimous or almost all are used when all participants gave similar answers or when the vast majority of participants gave similar answers and the remaining few declined to comment on the issue in question.

Appendix B: Interview Guide

Thank you for agreeing to take part in this research project on behalf of Environment and Climate Change Canada (ECCC). ECCC currently does not have research specific to extreme temperatures, nor impact-and-health based warning systems in the North. The research will be instrumental in helping ECCC define appropriate thresholds and providing information that is effective and that resonates with those living in Canada's North.

Before we begin the interview, I would like to acknowledge that I am joining this conversation from the traditional and unceded territory of the Algonquin Anishinaabeg people.

I also want to remind you that:

- We encourage you to be as open and honest as possible.
- As researchers, we are here to learn and try our best to understand your needs through your experiences.
- Please be assured that all of your responses will be kept confidential. Your input will be combined with responses from other study participants and compiled into a report that will provide feedback to ECCC.
- With your approval, we would like to record the interview for reporting purposes as it is difficult to take notes and lead the conversation at the same time.
- With your approval, we would also like to share a transcript of the interview; again, any personal identifiable information would be removed beforehand.
  - Do you approve of us sharing a transcript of the interview with ECCC?
- The interview will last approximately 30 to 40 minutes and will cover a range of topics including:
  - Experience with extreme weather in the North
  - Trusted sources of weather information
  - Overall familiarity and impressions of ECCC's services
- Given the focus of our conversation today, I would like to start by asking you how you define weather and how you define climate change? What are the difference between those two terms?
- How worried are you about climate change? What are you most worried about?
  - *[IF NECESSARY:]* What are you most worried about specifically relating to [FOR OFFICIALS] the North [FOR GENPOP AND INDIGENOUS] your region/community/area?

Extreme Weather in the North

- How would you describe what extreme weather conditions mean in the North to someone who isn't from [FOR OFFICIALS] the North [FOR GENPOP AND INDIGENOUS] your region/community/area? *[NOTE FOR INTERVIEWER: do not spend too much time discussing weather events other than extreme tempertatures]*
  - *[IF EXTREME HEAT:]* What about extreme weather conditions relating to hot weather?
- Whether in the summer, the winter or both, when do you get uncomfortable or impacted by extreme temperatures?

  EXTREME COLD

  - In other words, when do you feel too cold or when is it so cold you or others need to take precautions or behave differently? What temperature is that?

- What other weather conditions might also come with or be caused by extreme cold?
- What impacts do periods of extreme cold weather have on health or safety?
- How do you respond to extreme cold? How do you adjust your activities in these conditions?
- Tell me about a time when temperatures reached or exceeded 0C in winter, what impact did that have on you and your activities?
- *[FOR INDIGENOUS ELDERS IF NECESSARY:]* Tell me about a time when you experienced extreme cold.

EXTREME HEAT

- And, how about when it comes to hot weather? When do you feel too hot or when is it so hot you or others need to take precautions or behave differently? What temperature is that?
- What other weather conditions might also come with or be caused by extreme heat?
- What impacts do periods of extreme hot weather have on you? *(PROBE AS NEEDED: health, safety, livelihood with probes to food scarcity, travel, mental health, hunting/gathering)*
- How do you respond to extreme heat? How do you adjust your activities in these conditions? Why?
  - How far in advance do you need warnings about extreme heat?
- *[FOR INDIGENOUS ELDERS IF NECESSARY:]* Tell me about a time when you experienced extreme heat.

- Do you have a temperature or are there specific weather conditions that would make you change your plans and behaviour, for example a trip out on the land or ice?

Weather Information Consumption

- Can you describe for me when or how you typically get weather information? How do you typically use this information?
  - Do you know who or what is the source of the information?
- When you are looking at the weather forecast, what information are you looking at/for?
- How do you typically use this information? What impacts does knowing the weather forecast have on you, your plans, your thinking or your behaviour?
- Do you trust the weather information you typically get? Why or why not?
- What do they (the organizations you get weather from) do well? What could they do better? Do you feel like the information you get is always sufficient or is it lacking in any way (sometimes or usually)?
- What time of the week do you typically seek out weather information?
- Are there other sources of weather information that are available to you, but which you discount, ignore or don't typically access? What are the reasons you choose to ignore these sources?
- *[IF NECESSARY]:* Where do you get this information? *[NOTE TO INTERVIEWER: PROBE FOR SPECIFIC SOURCES, NOT JUST TYPE OF SOURCE]*
  - Social media (where?)
  - Radio
  - Weather app (which one?)
  - Website/Internet (where?)
  - Post office
  - Indigenous/Inuit Elders
  - *[FOR PUBLIC HEALTH OFFICIALS]* Nurse's station
  - At work/from colleagues
  - Other (please specify)
- Is there anything else you look for beyond the temperature? How do you use this information?

ECCC Weather Information Service Awareness, Familiarity & Impressions

- How familiar are you with ECCC's weather information services? Would you say you are very familiar, somewhat familiar, not that familiar or not at all familiar?
  - IF ANY FAMILIARITY: How is it you are familiar with ECCC's weather information services?
  - IF ANY FAMILIARITY: How often do you seek or hear about ECCC's weather information – either directly from ECCC or indirectly like through news media or some source relaying the information?
- Overall, what is your impression of ECCC's weather information? Would you say excellent, good, fair, or poor? Could you explain your response?
- To the best of your knowledge, is ECCC providing weather services that meet the needs of [FOR OFFICIALS] northern Canadians [FOR GENPOP AND INDIGENOUS] people in your region/community/area?
  - What, if anything, are they doing well?
  - What, if anything, should they change? What could they do better?
- What weather information do you need that you are not getting now? Please be specific. How would you use that information?
- How could ECCC improve their service to those living and working in [FOR OFFICIALS] Canada's North [FOR GENPOP AND INDIGENOUS] your region/community/area?
  - Could they make improvements to the frequency of updates?
  - What about the channels they use to communicate updates?
  - What about the information they provide?
  - What if they included lifestyle differences (i.e., specialized for hunting, fishing, etc.)? Could that be helpful? Why or why not?
    - What kind of information could they provide that would be helpful from a lifestyle perspective?

SPECIFIC PROBES FOR PUBLIC HEALTH OFFICIALS

- Earlier I asked how worried you were about the impacts of climate change and extreme temperatures. What have you noticed in terms of the health impacts of climate change and extreme temperatures?
  - Are there health impacts that are physical and others that are mental? Please describe each if there are these different types of impacts.
- Who are your most vulnerable populations? What have you noticed/detected about the impact of extreme temperature – both extreme cold and extreme heat?
  - What information do you need to meet their needs in cases of extreme cold and in cases of extreme heat?
  - Do you need a tool to educate these populations? What would be helpful? Please be specific.
- Generally, what weather information or tools do you need/want? Please be specific. How will you use that information?
- What tools would help you get an alert out about extreme weather? Please be specific.

SPECIFIC PROBES FOR EMERGENCY MANAGEMENT

- What are the biggest challenges you face in terms of emergency management during extreme weather conditions?
  - What, if anything, are you doing well?
  - What, if anything, could you do better?

  - Are there ways that different, better or more specific weather information can help you during extreme weather conditions? Are they different for extreme cold and extreme heat? If so, what do you most need in each case?
- Which extreme weather event poses the greatest risk to [FOR OFFICIALS] northern Canadians [FOR GENPOP AND INDIGENOUS] people in your community/region/area?
  - *[IF NOT MENTIONED]* What about wildfire smoke?
    - What specific challenges does this pose?
    - What information should be communicated to [FOR OFFICIALS] northern Canadians [FOR GENPOP AND INDIGENOUS] people in your community/region/area related to wildfire smoke? Please be specific. Why?
      - Probe if needed: heat, air quality
- Generally, what weather information or tools do you need/want? Please be specific. Why?
  - What priority would you place on temperature? Why?
  - What are the specific challenges you face where temperatures are concerned? Why?
- What tools do you need to do your work? Please be specific. Why?
- How close does emergency management work with public health?
- Is there anything, any information and/or tools, that ECCC could provide to facilitate these interactions/relations?

SPECIFIC PROBES FOR INDIGENOUS ELDERS

[NOTE TO INTERVIEWER: IF INTERVIEWEE IS INUIT, REFERENCE "INUIT" RATHER THAN "INDIGENOUS"]

- We've talked a bit about some extreme weather experiences that you have experienced or heard about. Are there ways that extreme weather affect Indigenous/Inuit people living in the North in ways that non-Indigenous/non-Inuit people in the North or people living in the south might not understand?
- Are there things that you think ECCC should learn or know about that would help them better understand about extreme temperature – hot or cold – in your community and region?
- If ECCC wants to better help people living in the North and your community deal with extreme weather, what are the things they should be focusing on?
- *[IF NOT MENTIONED]* What about wildfire smoke? Is this something that you have noticed occurring (more than in the past)?
  - Does wildfire smoke pose any challenges to people in your community?
  - Does wildfire smoke seem like something that ECCC should be providing warnings about? Why/Why not?

Conclusion

This wraps up all of the formal questions I had for you today.

- Before we conclude, do you have any final thoughts and/or advice you would like to pass along?

I really appreciate you taking the time to speak with me today. Your input will be very helpful to Environment and Climate Change Canada as they try to better understand the extreme weather and climate change needs of those living in Canada's North.

Appendix C: Recruitment Screeners

Indigenous Participant Recruitment Screener

Hello, my name is _____ and I'm calling on behalf of Earnscliffe, a national public opinion research firm. Would you prefer to continue in English or French? / Préférez-vous continuer en anglais ou en français?
We are preparing to conduct a series of one-on-one interviews on behalf of Environment and Climate Change Canada about extreme temperatures in Northern Canada. ECCC is mandated to provide timely weather forecasts and alerts to Canadians in order for them to protect themselves, their families, and the environment in which they live. Through this mandate and research, ECCC's goal is to determine how best to modernize service for Canadians in Northern Canada. ECCC hopes to do this by applying what is learned from you during these interviews to deliver weather information as needed directly to Northern Canadians and their communities.

We are looking for people who would be willing to participate. Participants will receive an honorarium for their participation. May I continue?

Yes CONTINUE
No THANK AND TERMINATE

We are reaching out today to ask you to participate in a discussion to share your views on extreme temperatures. Participation is voluntary. We are interested in hearing your opinions; no attempt will be made to sell you anything or change your point of view. The format is a one-on-one interview, lasting between 30 to 40 minutes, with a research professional. The interviews will take place over the phone. All opinions expressed will remain anonymous and views will be grouped together to ensure no particular individual can be identified. Participants will receive an honorarium of $200 for their participation. But before we invite you to attend, we need to ask you a few questions to ensure that we get a good mix and variety of people. May I ask you a few questions?

INTERVIEWER NOTE: If a participant asks for information on this research project they can be told: Earnscliffe Strategy Group is located at 46 Elgin Street, Suite 400, Ottawa, ON K1P 5K6. Doug Anderson, Principal, is leading this project and can be reached at [613.563.4455].

If a participant asks for information on the Government of Canada sponsor, they can be told: Representatives from Environment and Climate Change Canada, Mike Howe, Manager, Health and Air Quality Forecast Service, and Melissa MacDonald, HAQ Program Meteorologist, can be reached at 902-448-2695.

Yes CONTINUE
No THANK AND TERMINATE

READ TO ALL: "This call may be monitored or audio taped for quality control and evaluation purposes.
ADDITIONAL CLARIFICATION IF NEEDED:

- To ensure that I (the interviewer) am reading the questions correctly and collecting your answers accurately;

- To assess my (the interviewer) work for performance evaluation;
- To ensure that the questionnaire is accurate/correct (i.e. evaluation of programming and methodology – we're asking the right questions to meet our clients' research requirements)
- If the call is recorded, it is only for the purposes of playback to the interviewer for a performance evaluation immediately after the interview is conducted or it can be used by the Project Manager/client to evaluate the questionnaire if they are unavailable at the time of the interview – all audio tapes are destroyed after the evaluation.

S1. Do you or any member of your household work for or at…

	Yes	No
A marketing research firm	1	2
A magazine or newspaper, online or print	1	2
A radio or television station	1	2
A public relations company	1	2
An advertising agency or graphic design firm	1	2
An online media company or as a blog writer	1	2

IF "YES" TO ANY OF THE ABOVE, THANK AND TERMINATE.

S2. Which territory/province do you reside in?

Nunavut	1
Northwest Territories	2
Yukon	3
Quebec (Nunavik)	4
None of the above	THANK AND TERMINATE

S3. What is the name of the city, town or community in which you reside? [RECORD] IF WHITEHORSE, YELLOWKNIFE, OR QUEBEC OUTSIDE NUNAVIK, THANK & TERMINATE

TARGET: Kugluktuk, Ulukhaktok, Sachs Harbour, Grise Fiord, Kinngait, Arviat, Arctic Bay

S4. Are you:

First Nations	1	
Métis	2	
Inuk (Inuit)	3	
None of the above	4	[THANK AND TERMINATE]
Prefer not to say	9	[THANK AND TERMINATE]

S5. Do you identify as:
AIM FOR GOOD MIX

A man	1	
A woman	2	
Gender diverse	3	
Prefer not to say	9	[THANK AND TERMINATE]

S6. Could you please tell me which of the following age categories you fall into? Are you... *AIM FOR GOOD MIX*

<18	1	THANK AND TERMINATE
18-34	2	
35-54	3	
55-64	4	
65-74	5	
75+	6	

S7. Do you have a respiratory or cardiovascular illness or disease?

Yes	1
No	2
Don't know/Prefer not to say	9

S8. Do you work outdoors?

Yes	1
No	2
Don't know/Prefer not to say	9

S9. Do you have children under the age of 18 living at home with you?

Yes	1
No	2
Don't know/Prefer not to say	9

S10. Have you participated in an in-depth interview or focus group before? A focus group brings together a few people in order to know their opinion about a given subject.

Yes	1	CONTINUE
No	2	SKIP TO S14
DK/NR	9	THANK AND TERMINATE

S11. When was the last time you attended a focus group or participated in an in-depth interview?

If within the last 6 months	1	THANK AND TERMINATE
If not within the last 6 months	2	CONTINUE
DK/NR	9	THANK AND TERMINATE

S12. How many of these sessions have you attended in the last five years?

If 4 or less	1	CONTINUE
If 5 or more	2	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

S12. And what was/were the main topic(s) of discussion in those groups?

IF RELATED TO EXTREME TEMPERATURES, THANK AND TERMINATE

S14. Participants in interviews are asked to voice their opinions and thoughts. How comfortable are you in voicing your opinions in front of others? Are you… (READ LIST)

Very comfortable	1	CONTINUE
Somewhat comfortable	2	CONTINUE
Not very comfortable	3	THANK AND TERMINATE
Not at all comfortable	4	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

S15. Based on your responses, it looks like you have the profile we are looking for. I would like to invite you to participate in a one-on-one interview. The interview will take place via telephone call and it will last between 30 and 40 minutes. Participants will receive an honourarium of $200 as a thank-you for their time.

Would you be willing to participate?

Yes	1	RECRUIT
No	2	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

PRIVACY QUESTIONS

Now I have a few questions that relate to privacy, your personal information and the research process. We will need your consent on a few issues that enable us to conduct our research. As I run through these questions, please feel free to ask me any questions you would like clarified.

P1) First, we will be providing the interviewer with a list of respondents' first names and profiles (screener responses) so that they can ensure they are speaking to the right person. Do we have your permission to do this? I assure you it will be kept strictly anonymous.

Yes	1	GO TO P2
No	2	GO TO P1A

P1A) We need to provide the interviewer with the names and background of the people participating in an interview because only the individuals invited are allowed and the interviewer must have this information for verification purposes. Please be assured that this information will be kept strictly anonymous.

Now that I've explained this, do I have your permission to provide your name and profile with the interviewer?

Yes	1	GO TO P2
No	2	THANK & TERMINATE

P2) An audio recording of the interview may be produced for research purposes. It will be used by the research professional to assist in preparing a report on the research findings and will be destroyed once the report is completed.

Do you agree to be audio recorded for research purposes only?

Yes	1	THANK & GO TO P3
No	2	GO TO P2A

P2A) It is necessary for the research process for us to audio record the session as the researcher needs this material to complete the report.

Now that I've explained this, do I have your permission for audio recording?

Yes	1	THANK & GO TO P3
No	2	THANK & TERMINATE

P3) Employees from ECCC and/or the Government of Canada may listen to the interviews (via recording).

Do you agree to allow Government of Canada employees to listen to the recording?

Yes	1	THANK & GO TO INVITATION
No	2	GO TO P3A

P3a) It is standard qualitative procedure to invite clients, in this case, Government of Canada employees, to observe the research or listen to interviews after they have occurred. They will do so only to hear your opinions first hand although they may take their own notes and confer with the interviewer on occasion.

Do you agree to allow Government of Canada employees to listen to the recording?

Yes	1	THANK & GO TO INVITATION
No	2	THANK & TERMINATE

INVITATION:
Wonderful, you qualify to participate in one of our interviews.

Can I please confirm your contact information so that one of Earnscliffe's schedulers can follow-up with you to confirm the date and time of your interview?

First name
Last Name
email
Daytime phone number
Evening phone number

If the respondent refuses to give his/her first or last name or phone number please assure them that this information will be kept strictly confidential in accordance with the privacy law and that it is used strictly to contact them to confirm their attendance and to inform them of any changes to the discussion group. If they still refuse THANK & TERMINATE.

Non-Indigenous Participant Recruitment Screener

SUMMARY

- 25 one-on-one interviews with residents of Nunavut, Nunavik and the high Arctic locations of Yukon and the North-West Territories.
- At least half should be with Indigenous individuals
- 30-40 minute interview
- $200 incentive

Hello, my name is _____ and I'm calling on behalf of Earnscliffe, a national public opinion research firm. Would you prefer to continue in English or French? / Préférez-vous continuer en anglais ou en français?
We are preparing to conduct a series of one-on-one interviews on behalf of Environment and Climate Change Canada about extreme temperatures in Northern Canada. ECCC is mandated to provide timely weather forecasts and alerts to Canadians in order for them to protect themselves, their families, and the environment in which they live. Through this mandate and research, ECCC's goal is to determine how best to modernize service for Canadians in Northern Canada. ECCC hopes to do this by applying what is learned from you during these interviews to deliver weather information as needed directly to Northern Canadians and their communities.

We are looking for people who would be willing to participate. Participants will receive an honorarium for their participation. May I continue?

Yes	CONTINUE
No	THANK AND TERMINATE

We are reaching out today to ask you to participate in a discussion to share your views on extreme temperatures. Participation is voluntary. We are interested in hearing your opinions; no attempt will be

made to sell you anything or change your point of view. The format is a one-on-one interview, lasting between 30 to 40 minutes, with a research professional. The interviews will take place over the phone. All opinions expressed will remain anonymous and views will be grouped together to ensure no particular individual can be identified. Participants will receive an honorarium of $200 for their participation. But before we invite you to attend, we need to ask you a few questions to ensure that we get a good mix and variety of people. May I ask you a few questions?

INTERVIEWER NOTE: If a participant asks for information on this research project they can be told: Earnscliffe Strategy Group is located at 46 Elgin Street, Suite 400, Ottawa, ON K1P 5K6. Doug Anderson, Principal, is leading this project and can be reached at [613.563.4455].

If a participant asks for information on the Government of Canada sponsor, they can be told: Representatives from Environment and Climate Change Canada, Mike Howe, Manager, Health and Air Quality Forecast Service, and Melissa MacDonald, HAQ Program Meteorologist, can be reached at 902-448-2695.

Yes CONTINUE
No THANK AND TERMINATE

READ TO ALL: "This call may be monitored or audio taped for quality control and evaluation purposes. ADDITIONAL CLARIFICATION IF NEEDED:

- To ensure that I (the interviewer) am reading the questions correctly and collecting your answers accurately;
- To assess my (the interviewer) work for performance evaluation;
- To ensure that the questionnaire is accurate/correct (i.e. evaluation of programming and methodology – we're asking the right questions to meet our clients' research requirements)
- If the call is recorded, it is only for the purposes of playback to the interviewer for a performance evaluation immediately after the interview is conducted or it can be used by the Project Manager/client to evaluate the questionnaire if they are unavailable at the time of the interview – all audio tapes are destroyed after the evaluation.

S1. Do you or any member of your household work for or at…

	Yes	No
A marketing research firm	1	2
A magazine or newspaper, online or print	1	2
A radio or television station	1	2
A public relations company	1	2
An advertising agency or graphic design firm	1	2
An online media company or as a blog writer	1	2

IF "YES" TO ANY OF THE ABOVE, THANK AND TERMINATE.

S2. Which territory/province do you reside in?

Nunavut	1	
Northwest Territories	2	
Yukon	3	
Quebec (Nunavik)	4	
None of the above	THANK AND TERMINATE	

S3. What is the name of the city, town or community in which you reside? [RECORD] IF WHITEHORSE, YELLOWKNIFE, OR QUEBEC OUTSIDE NUNAVIK THANK & TERMINATE

S4. Are you:
ENSURE AT LEAST HALF OF INTERVIEWS ARE WITH INDIGENOUS INDIVIDUALS

First Nations	1	
Métis	2	
Inuk (Inuit)	3	
None of the above	4	
Prefer not to say	9	[THANK AND TERMINATE]

S5. Do you identify as:
AIM FOR GOOD MIX

A man	1	
A woman	2	
Gender diverse	3	
Prefer not to say	9	[THANK AND TERMINATE]

S6. Could you please tell me which of the following age categories you fall into? Are you... *AIM FOR GOOD MIX*

<18	1	THANK AND TERMINATE
18-34	2	
35-54	3	
55-64	4	
65-74	5	
75+	6	

S7. Do you have a respiratory or cardiovascular illness or disease?

Yes	1
No	2
Don't know/Prefer not to say	9

S8. Do you work outdoors?

Yes	1
No	2
Don't know/Prefer not to say	9

S9. Do you have children under the age of 18 living at home with you?

Yes	1
No	2
Don't know/Prefer not to say	9

S10. Have you participated in an in-depth interview or focus group before? A focus group brings together a few people in order to know their opinion about a given subject.

Yes	1	CONTINUE
No	2	SKIP TO S14
DK/NR	9	THANK AND TERMINATE

S11. When was the last time you attended a focus group or participated in an in-depth interview?

If within the last 6 months	1	THANK AND TERMINATE
If not within the last 6 months	2	CONTINUE
DK/NR	9	THANK AND TERMINATE

S12. How many of these sessions have you attended in the last five years?

If 4 or less	1	CONTINUE
If 5 or more	2	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

S12. And what was/were the main topic(s) of discussion in those groups?

IF RELATED TO EXTREME TEMPERATURES, THANK AND TERMINATE

S14. Participants in interviews are asked to voice their opinions and thoughts. How comfortable are you in voicing your opinions in front of others? Are you… (READ LIST)

Very comfortable	1	CONTINUE
Somewhat comfortable	2	CONTINUE
Not very comfortable	3	THANK AND TERMINATE
Not at all comfortable	4	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

S15. Based on your responses, it looks like you have the profile we are looking for. I would like to invite you to participate in a one-on-one interview. The interview will take place via telephone call and it will last between 30 and 40 minutes. Participants will receive an honourarium of $200 as a thank-you for their time.

Would you be willing to participate?

Yes	1	RECRUIT
No	2	THANK AND TERMINATE
DK/NR	9	THANK AND TERMINATE

PRIVACY QUESTIONS

Now I have a few questions that relate to privacy, your personal information and the research process. We will need your consent on a few issues that enable us to conduct our research. As I run through these questions, please feel free to ask me any questions you would like clarified.

P1) First, we will be providing the interviewer with a list of respondents' first names and profiles (screener responses) so that they can ensure they are speaking to the right person. Do we have your permission to do this? I assure you it will be kept strictly anonymous.

Yes	1	GO TO P2
No	2	GO TO P1A

P1A) We need to provide the interviewer with the names and background of the people participating in an interview because only the individuals invited are allowed and the interviewer must have this information for verification purposes. Please be assured that this information will be kept strictly anonymous.

Now that I've explained this, do I have your permission to provide your name and profile with the interviewer?

Yes	1	GO TO P2
No	2	THANK & TERMINATE

P2) An audio recording of the interview may be produced for research purposes. It will be used by the research professional to assist in preparing a report on the research findings and will be destroyed once the report is completed.

Do you agree to be audio recorded for research purposes only?

Yes	1	THANK & GO TO P3
No	2	GO TO P2A

P2A) It is necessary for the research process for us to audio record the session as the researcher needs this material to complete the report.

Now that I've explained this, do I have your permission for audio recording?

Yes	1	THANK & GO TO P3
No	2	THANK & TERMINATE

P3) Employees from ECCC and/or the Government of Canada may listen to the interviews (via recording).

Do you agree to allow Government of Canada employees to listen to the recording?

Yes	1	THANK & GO TO INVITATION
No	2	GO TO P3A

P3a) It is standard qualitative procedure to invite clients, in this case, Government of Canada employees, to observe the research or listen to interviews after they have occurred. They will do so only to hear your opinions first hand although they may take their own notes and confer with the interviewer on occasion.

Do you agree to allow Government of Canada employees to listen to the recording?

Yes	1	THANK & GO TO INVITATION
No	2	THANK & TERMINATE

INVITATION:
Wonderful, you qualify to participate in one of our interviews.

Can I please confirm your contact information so that one of Earnscliffe's schedulers can follow-up with you to confirm the date and time of your interview?

First name
Last Name
email
Daytime phone number
Evening phone number

If the respondent refuses to give his/her first or last name or phone number please assure them that this information will be kept strictly confidential in accordance with the privacy law and that it is used strictly to contact them to confirm their attendance and to inform them of any changes to the discussion group. If they still refuse THANK & TERMINATE.

Appendix D: Recruitment Letters

INSERT DATE

First Name Last Name
Email address

Dear [INSERT FIRST NAME]

We are contacting you today on behalf of Environment and Climate Change Canada (ECCC) to request your participation in a study about the impact of extreme temperatures and health-based warning systems in Northern Canada.

ECCC is aiming to better understand how Canadians in Northern Canada perceive extreme temperature warnings, heat and cold, and their needs and concerns as they relate to extreme temperatures. ECCC is also looking to develop Heat Warning criteria and update Extreme Cold Warning criteria for Northern Canada.

Gathering feedback from members of the public, health and emergency management officials, and Indigenous elders in Northern Canada is a critical component of the research. ECCC would like to request your participation in this study.

Over the next few weeks, we will be conducting a number of one-on-one interviews with members of the general public, as well as emergency management and health officials and Indigenous elders in Northern Canada.

The interview would be conducted by telephone, either in English or French depending on your preference, and will take approximately 30 to 40 minutes of your time on a date and at a time convenient to you. As is customary with this type of research, results will be anonymous and reported on an aggregate basis only; no individuals will be identified in any reporting for this research.

Thank you very much for considering this request. Your input is key to our research and we hope you'll take time to share your thoughts with us. If you require any further information, please do not hesitate to contact me directly.

Sincerely,

Doug Anderson
Principal

INSERT DATE

First Name Last Name
Email address

Dear [INSERT FIRST NAME]

Environment and Climate Change Canada (ECCC), has enlisted Earnscliffe Strategy Group to conduct a series of interviews with members of the general public, health and emergency management officials, and Indigenous elders in Northern Canada. The purpose of these interviews is to help the ECCC better understand how Canadians in Northern Canada perceive extreme temperature warnings, heat and cold, and their needs and concerns as they relate to extreme temperatures. ECCC is also looking to develop Heat Warning criteria and update Extreme Cold Warning criteria for Northern Canada.

We are writing this letter to respectfully request your participation in this research initiative. While we know that your time is precious, we hope that you will find the 30 to 40 minutes required to offer your perspective.

ECCC is mandated to provide timely weather forecasts and alerts to Canadians in order for them to protect themselves, their families, and the environment in which they live. Through this mandate and research, ECCC's goal is to determine how best to modernize service for Canadians in Northern Canada. We hope to do this by applying what is learned from you during these interviews to deliver weather information as needed directly to Northern Canadians and their communities.

We want to assure you that responses of individual participants will remain anonymous and will be reported on an aggregate basis only. In other words, no individuals will be identified in any reporting for this research.

Thank you very much for considering this request. We hope that you will find time to share your thoughts with Earnscliffe. A representative from the firm will be in touch with you shortly to arrange for a mutually convenient time.

Sincerely,

Melissa MacDonald
HAQ Program Meteorologist
melissa.macdonald@canada.ca
902-448-2695

Mike Howe
Manager, Health and Air Quality Forecast Service
mike.howe@canada.ca