

## **Appendix B: Interviewees Reference**

### ***Residents of Iqaluit***

<b>Participant (in alphabetical order)</b>	<b>Date of Interview</b>	
Boas, Henry	March	2002
Joamie, Mosesee	February	2002
Joamie, Sytukie	March	2002
Koomarjuk, Jimmy	March	2002
Kownirq, Simeonie	March	2002
Mike, Elaiya	March	2002
Nowdlak, Johnny	March	2002
Peter, Jacopoosie	March	2002
Qaumariaq, Sammy	March	2002
Tiglik, Mosesee	March	2002

### ***Residents of Pangnirtung, Nunavut***

<b>Participant (in alphabetical order)</b>	<b>Date of Interview</b>	
Evic, Levi	March	2002
Keenainak ,Abraham.	October	2002
Maniapik, Joanasie	October	2002
Nauyk, Salomonie	October	2002
Novaqilk, Mosesee	March	2002
Qarpik, Jaypeetee	March	2002
Qaqqasiq, Apak	November	2002
Qaqqasiq, Leah	November	2002
Qijuarjuk, Mosesee	October	2002
Uniuqsaagaq, Ipeelee	March	2002

## **Climate Change Interview in Pangnirtung – March 21<sup>st</sup>, 2002**

**Levi Evic**

### **Project Description and Reasons for the study**

The reasons for the study and the project were related to the participants, including the information contained in the consent form. It was outlined that the government wanted to get a baseline with Inuit Qaujimajatuqangit on the climate. The reasons for the study, from the government perspective, were also pointed out and what this information could and might be used for, in the future.

**POB:** I was born at Illungayut in 1947.

*Has the weather changed since you were a child?*

Yes, I will not be able to recollect all details, but I will try to answer based on what I remember. When I was a child, I recall that the weather was an important issue and I recall what type of weather it was because we were either always outside playing or hunting and these are the experiences that I use to gauge the changes.

*From your recollections, what about when you became a youth?*

When I was a youth, I was led to understand that the climate has its patterns and although I was not taught every little nuance of the weather, I was taught enough but I cannot identify all the signs Inuit used. I was taught about the weather and I have been around long enough to see what happens with the weather when you are out on the land.

*Do you recall what the weather was like predominantly in the years when you became independent? Did the ice leave early, was the weather bad all the time or what was your main recollection of those periods that you are alluding to?*

The weather is always different and there are areas of bad weather and good weather, and when I became independent, the areas that I had heard about I was careful around and all of the knowledge that had been passed down from my brother and father, I was careful to apply them, especially as I found out that they were true and I have tried to implement the lessons that I was taught.

This includes reviewing the clouds and the horizon, checking carefully for signs of impending bad weather. If any signs led to this, then I would postpone my trip. Or if I were out and in a storm I would look for signs that indicated a shift in the weather to the good. Those were the types of signs that I always tried to pay attention to when I became independent.

*What about the changes to the weather, let us say over the last ten years to date as compared to your childhood. Has it changed at all?*

In terms of the weather, as I stated earlier I noted my recollections, if you look at the climate in terms of what is happening and what traditionally would happen, and compare that to what today's weather, then you can see the changes that are occurring. The weather has changed, to cite an example, the fact that we are getting the cold weather later into the end of the calendar year, this is what is noticeable about the differences between the past climate and today. I do not know every little detail or change that has occurred, but overall the cumulative effects are noticeable. It is not the same anymore and it has changed.

*When did you notice the change in the climate? Can you elaborate as to the approximate timeline of the change in the climate?*

I cannot state whether this will continue or not, but I can only state that the climate has changed. It has never been the same from year to year, but there are levels and limits as noted in oral history and as per my experience. I can only state that it may return or it may keep warming.

This issue is complex and we are talking about a short-term matter, at least in terms of oral history. But, this is still a small blip in Inuit history although it is the most marked in terms of the climate change.

*What did your father talk about, in terms of climate and change? Did he talk about the changes that he had noticed? What about effects on traditional practices?*

Yes, my father used to talk about the weather and in relation to the first question, from my youth to my young manhood, my father kept including me in the hunts and he would outline the changes that were about to happen in the weather patterns and I would be told that this was about to happen.

As well, in the recent past, my father kept observing that the climate was changing. I have heard observations to date regarding the changing climate from the elders.

Mostly the hunting practices have been affected especially today with the long period of cool weather, which is not quite cold enough to freeze the saltwater. As well, this cool weather has hampered some of the traditional timing harvesting practices, due to the long fall season.

In the past, they would already have been travelling to the area they wished to exploit. But these days, it is still open water when that time arrives. The open water season has really lengthened and this has affected a lot of Inuit and myself, personally. Although you want to go hunting, the ice that has formed is not thick enough to travel upon and it is

impossible to go outside of Pangnirtung without hitting an impassable spot. Perhaps it will not continue or it will, but in any event this long open water season has affected Inuit harvesting practices. As well, the wind in the fall is incessant and it has affected Inuit as well, especially when it starts blowing. It storms more often these days.

*What have you observed in relation to the changes in temperature, is it a lot hotter or colder than in the past? Is it the same or has its behaviour changed too?*

The temperature is different now. When the time comes for the frigid cold to arrive, it seems to want to just linger in the distance. It should already be winter, if this were the old climate but it just continues to remain stuck at the transitional point. It is just like fall although in the past, it would have been deep winter.

The temperature when it is warming, when spring is starting, the temperature even when it does not get hot, as compared to before, when it started to get warm and the ice got warm, then it started to melt. The ice has melted quite fast and this has been quite noticeable, even when the temperature was not that high.

Our ice used to reach certain months in the past, but due to the warming trend, the ice has started to melt a lot earlier. Not only is the ice not forming until Christmas, now it is melting just when the Inuit calendar identifies spring as finally starting to spring. It seems like it is melting earlier, I am not sure if it will remain that way or if it will revert back to normal.

In terms of hot periods or cold snaps, I can only recall that in the past it was warm, but not to the degree we experience now. What I can recall about a hot period was last spring; the one that just finished was really hot. It was hot, and it has been a few years before it started to get the hottest on record.

Even the water was tepid, as if it has been warmed over a fire. It did not even feel cold, and this is where I noticed that it was hotter than usual. As well, in respect to the cold, I have started to notice that compared to the last three winters, that the winters were not as severe as if it did not want to freeze anything.

Now in contrast to those winters, it has now been quite cold for several days at a time and it seems to have reverted back to normal with freezing temperatures and so cold that any open water seems to be hot. As well, it causes the snowmobiles to freeze just like the past, as compared to the warmth of the last three winters.

It has been noticeable that this winter has been quite cold compared to the last three that we have experienced. That is what I can comment on according to my knowledge, but I cannot predict what else this winter will bring as it turns to spring as it is quite unpredictable now. I cannot say that it will be like last year or years past.

*What about in terms of impending snowstorms, what types of signs did you look for then?*

*In terms of the weather patterns, have you noticed any changes in the climate?*

The signs have changed slightly, not completely foreign, but according to my experience and oral history, I can only say that the signs these days are more rapid, as if it is in a hurry and it catches you unprepared, because the storm seems to follow the sign right away. This is what I have noticed as well.

The storms are hard to count and I cannot really comment on whether there are more storms or not, but all the summers are not the same, some years it is more stormy with rain, and other years it is drier and that is what I can say about the storms.

In respect to the snowfall, it is noticeable that there is less snowfall occurring than in the past. If I were to cite an example, the sea ice here used to have more snow cover and these days, it has hardly any snow cover. I am not sure what is causing this, and I cannot identify the reason, but I do know that there is less snow, although I cannot state that there are less or more snowstorms.

*What about in terms of the wind, has the prevailing wind changed its direction or have the winds all changed?*

The wind seems to be less consistent in its origin and can now blow from anywhere. It has winds that are shiftier and the wind comes from anywhere now. The wind seems to have no prevailing direction as it comes and goes.

*What about the changes in terms of seasons, hereabouts we generally have five seasons; Upinngaksaq, Upinngaq, Auyaq, Ukiaksaq and Ukiuq, what have you noticed in these last few years?*

Yes, the seasons within the last few years have been changing and it is quite noticeable and today, the open water season has really increased big time. It has really lengthened in the last few years. The ice season is now very short and it has lost approximately two months.

The seasons that have changed the most are the spring, with the earlier ice melt; I do not know if this is just an anomaly or if it is now the normal state of the climate. The fact as well is the ice has started to melt even before we consider it springtime. That is how different it is now.

Or else the ice has not formed properly and it has remained thin all the way to early spring and it cannot withstand the sun and it disappears earlier. That is what has become really noticeable in the last few years.

*What effects on lake ice have you noticed in that time? Can you elaborate on the differences in timing, characteristics or other noticeable changes?*

Yes, the ice melt is something I have not really noted, but in terms of the ice formation of the freshwater lakes, due to the fact that the cold does not really stay, but only lingers in the highest areas. This has been the norm for the last few years and the lakes, which would already have had an ice covering, are still open into November.

The ice is also different and it has been noticeable that the ice is a lot thinner than before perhaps this is due to the lack of cold temperatures, they are only following the climate and now they do not have thick ice. This is what we have observed.

The ice has changed slightly, but the ice behaves differently depending on the temperature and when it is really cold, and when it is warmer, the ice will follow. When the temperature is warmer, then the ice seems less frozen and when it is colder, then the ice seems a lot more brittle. That is what I know.

*In terms of the sea-ice, let us move into the changes in the marine areas and the ice formation that you may have noticed in the last ten years?*

The ice is also a lot later than before, in the past it would have been already fairly thick, but these days it is still open water and I do not know if this will continue or if it will not.

The last few years have been the same with the ice forming later than usual. The ice as well has been noticeable in its thickness or lack thereof. It is noticeable in that the ice tends to melt faster and ice that used to become “*tuvvak*” rarely reaches three feet and the ice now deteriorates extremely fast these days.

*What about the floe-edge, what the Inuit have noticed in this area and the location?*

The last few years the floe-edge has not gone to its usual position and it has been fairly close to the fiord and although once in a while it extends the landfast ice, the ice gets sheared off fairly quickly and it has not reached its traditional limit for a long time. It has not reached that traditional limit for about five years and it is always quite close to the land and it soon shears off close to the land. The ice breaks up faster and is not navigable soon after spring. These days the floe-edge and its characteristics have been different and I hope that this is not the normal limit now.

*What about the terrain, in terms of permafrost and the like, have you noticed any areas that are experiencing slumps or other melting phenomenon?*

Yes, in terms of the areas, it is noticeable that the permafrost is melting to a deeper level. Even if you are not looking for these signs, it is noticeable that the land is sagging, especially the areas that have glaciers.

The areas around them are really melting and the land is changing due to the glaciers and permafrost melting. These are changes caused by first the melt and the freeze and that is how the land starts to change its characteristics in that manner. I have not experienced

everything but I do know some of these things.

In terms of wetlands, I am not so sure whether there have been any changes in this area, as I have not really paid attention to them. I cannot state whether the wetlands are decreasing or increasing, as I have not really made observations of them.

*What about the snow? Have you noticed any changes in the snow, as you know we live in areas of cliffs and there are quite a few areas where we can get landslides and so on. Have you noticed any changes in the occurrence of landslides or avalanches?*

The areas are not the same in their propensity to produce avalanches or landslides, but this phenomenon is contingent on the snow conditions. If the conditions are right, then the avalanches are a common occurrence, if not, then they hardly occur. That is what I know about these things.

We do live in a land with depth and if the snow conditions are favourable, then the avalanches would occur with more frequency, but with the lack of snow that we are experiencing, then these areas are not as prone to avalanches.

*What about the snow characteristics? Let us say that if we had to build a shelter, then we have to either dig or build an igloo, we would need snow of a certain type. Has this changed as compare to that past?*

Perhaps if we had good snow and favourable winds, then the snow would be good for igloo building. The areas with those conditions still have good snow, but there is less snow and this has an affect on the conditio ns that are prevalent in the area. If the conditions are not favourable such as this year, then the areas where we tend to build igloos have little snow and we cannot build them. That is the case this year.

*What about the changes that affect your travel plans or routes during the year?*

In terms of the problems with the travel routes, the lack of snow is noticeable but in terms of the weather, it controls the amount of snow that we get and that is all that I can comment on.

*What about wildlife? Have you noticed species being affected by the change in the climate? Are these affecting your harvesting practices?*

I have not really seen animals that are unusual, however in terms of animals we do not usually see in the winter, I have seen some examples of birds that are still hanging around in the middle of winter. That is what I have noticed that there are birds that are still in the north during the coldest time of the year. Other than that I have not noticed anything out of the ordinary.

*What about the fish, are their runs or their health affected by climate change? Have you seen any new types of fish or noticed anything out of the ordinary?*

In terms of climate change and its affects on fish, I really have not noted anything. I have been fishing most of the time, but I have not had reason to suspect the arrival of new species.

*What about the issue of new species of insects, have you seen other examples of new species?*

Not really. I have not really paid attention to them. But the black flies and houseflies are now ever increasing and even in areas, which are really clean outside of Pangnirtung, you can still see them. Before, in the past, once you got out of the community you hardly ever saw flies, especially when I was a young man. These days, the flies are everywhere and this is something that we are noticing these days.

*Have you seen any evidence of stress from the fish, in terms of skin growths or what not that you may have noticed that is attributable to climate change?*

I have not really noticed any changes in the fish that is directly related to climate change that is all that I can say about that.

*What about the species of vegetation in this area, have you seen new species that are growing in this area? Have things changed that you are aware of?*

In terms of vegetation, and especially new species, I have not really seen any new species of plants that I am not familiar with.

In terms of changes to our existing vegetation, they are also very susceptible to changes in the climate and they are dependent on the conditions, such as sunlight, warmth and rain. They tend to grow better with those types of conditions, but I have noticed that they grow better when the conditions are better for them.

I know that they are cyclic in their bounty, some years there are less berries, other years there is a bumper crop. In respect to our harvesting of the berries, it is variable every year. Perhaps we have had changes, but as I said our oral history states that berries are cyclic and do not grow every year.

*What about water quality or quantity in this area, either through the taste or the colour? What about the water from our community? What about the growth of weeds or other vegetation in the lakes?*

Some of the water that we drink from the lakes, it is now possible to see especially when the spring melt is oncoming, either through the snow when it is wet, or when the lake is melting, there are more things floating in the water, I am not sure what they are but they look like floating scum or something that is filmy on the top of the water that does not look like it came from the land itself. That is what I have noticed; there is always a film

of something on top of the water these days.

The water is what it is, I cannot state that it is better one way or the other at this time, but as I stated earlier, there is something that is gathering on top of the water and this makes the water less tempting to drink. That is the only thing that I have noticed, that is floating almost as if it was thrown into the water and it is collecting on the top.

The water in the community is still seemingly the same, although the creek is different. The creeks are always better water than the stagnant waters as they are generally moving and that is all that I can state. The water still looks clear and clean as far as the rivers and creeks are concerned, I do not think there are that many changes in our local drinking water.

As far as the growth of algae or other vegetation, I really cannot say as I have not really observed them over the years.

*What about the tides, have they changed or has there been differences in the areas that are covered by the tides?*

The tides we have now, especially as we are from an area that experiences big tides, at neap tides, we are now experiencing some changes in these tides today. The tide at this time seems different as if there is something slightly askew. The tides have changed slightly in this area.

*What about areas of tundra fires that you have seen that are not seemingly caused by humans, but by natural causes?*

I have not seen any cases of tundra fires that were not started by a human. In terms of fires self-starting in this area, I have yet to experience such a thing.

*Let us see if we can move to health and the effects of the climate on human health such as sunburns, snow blindness and so on. Have you noticed any changes in the health of the Inuit?*

I have not really noticed what changes have been affecting Inuit in terms of climate change, but in terms of respiratory problems, the air seems to be different, either when it is starting to warm up or cool down this has an effect on our bodies, perhaps through bodily functions or the like, but that is something I have noticed.

In terms of the sun intensity, the sunrays are a lot stronger nowadays. To use an example, for our hands or faces, the intensity of the sun is quite a lot stronger but it is hard to describe other than that it is a lot hotter and it is causing more problems for our skins. It is causing sunburns today and that is what I have noticed.

*What about snow blindness and so on, has there been an increase, decrease or is it still*

*the same?*

In personal terms, I have not really noticed but I cannot state either way that sun blindness has increased, decreased or remained static. I can only state that there seems to be less, perhaps due to better protection.

In the past, I really used to get snow blind as a child and every spring it was one of my spring rituals. Today I do not get snow blind to that degree, perhaps due to the fact that we now have superior eye protection these days that is all that I can say.

*Has the climate change caused other effects on human health such as in regards to the occurrence of colds or not?*

In terms of colds, I really cannot state the colds have increased due to climate change, but the colds may have a better chance with the warmer temperatures and it may be a factor. It seems that there are more colds occurring these days.

The sunrays are a lot hotter. Although all Inuit are different in their ability to withstand the sun, it is noticeable that there are more Inuit who are starting to experience problems.

The sun is a lot stronger in its intensity and this is noticeable.

It is something that is noticeable that more Inuit are hiding from direct sunlight when it is overhead. I myself do not like to expose any skin these days because it is a lot hotter on the skin.

*Do you have any other comments to make in regards to this study?*

Yes, I do not have a lot of comments in regards to climate change and I have tried to answer the questions as best as I could, but there are things that I have experienced and that is what I have tried to relay to you.

I can say a few more things, perhaps as a summary of the changes to the climate, but our climate has changed, there seems to be more of a requirement to watch its every move.

As well, the wind is more unpredictable and is stronger, especially in the open water season. This is more evident and another thing that is conspicuous is through the movement of the weather now has a starting point that seems to be slightly off to the side, especially when we are experiencing a neap tide or when it is fading. They seem to be off time and they seem to be a couple of days late.

As well, there is *putunivik* and *pitunnirusiq*, those are the neap tides both the beginning and the ending. Sometimes when it is time for *pitunnirusiq*, it does not seem to stop and it seems to continue until the next neap tide. That is what I have noticed in terms of its change.

*Personal message to the lead consultant from the interviewee, please disregard.*

## **Climate Change Interview in Pangnirtung – March 16th, 2002**

### **Jaypeetee Qarpik**

#### **Project Description and Reasons for the study**

The reasons for the study and the project were related to the participants, including the information contained in the consent form. It was outlined that the government wanted to get a baseline with Inuit Qaujimagatungangit on the climate. The reasons for the study, from the government perspective, were also pointed out and what this information could and might be used for, in the future.

**POB:** I was born at Pangnirtung in 1949, September 16th, when it was sunny. I was born here at the hospital.

*Has the weather changed since you were a child?*

The weather in the past, when I was still a child, I recall growing up outside of Pangnirtung. I noticed one year in particular, during the winter it was quite cold, just like it is today. It seemed that back then, it would have more ice fog. At least when I started to recall the weather, even when it was really clear, it would be really cold and ice fog was in the air.

We used to play outside at night and it would be cold and clear. I recall that the moon would shine and that we would be out playing for hours. Maybe it was due to the fact that we were having fun that I was not always cognizant of the weather we experienced.

*From your recollections, what about when you became a youth?*

From the time I was a child up to when I was a youth, during the early spring and spring seasons, we were out and it seemed that spring used to be very long, with the sun shining for hours at a time, that may have been due to the fact that I was a child.

When it was spring, when the ice first started to get melt-water pools, there would be two distinct stages. First there would be the first stage when the water first formed into pools, the ice would be very thick still and it would not be at all dangerous to travel upon. Then the water found a route down into the saltwater and drained.

Then the ice, with the weight of the water sloughed off, rose up and then it started to melt again, then during this second stage, the ice would start to get dangerous with big holes in the pools. This is what I recall when I was included in the spring hunts. As well, the spring was quite long, due to the fact that the ice would stay until late into July. That is what I recall.

*Do you recall what the weather was like predominantly in the years when you became*

*independent? Did the ice leave early, was the weather bad all the time or what was your main recollection of those periods that you are alluding to?*

I recall prior to coming to Pangnirtung, which was in 1964, that I was still not quite independent, although I would go hunting when I could borrow equipment. It was only when our family moved here, that I started to go hunting and became more independent. We were not quite adults, but we were young men becoming able to hunt by ourselves. We would be out hunting and back then, the ice used to freeze fairly uniformly. The ice did not start melting right away, it would go in stages in the melt and not all at once like today. The temperatures would hover around the freezing point and it did not go soaring upwards like it does now.

I have noticed this aspect of the change during the summer, when the wind starts to blow, it can now blow for days at a time. There seems to be no clear edge to the present day weather patterns. The area where we make our camp, used to have nothing but calm water for days at a time with nary a ripple in the water, at least during the middle of summer.

The last few years, it seems that the wind has changed its approach and will come in any season and can blow for days, and the lapse between the wind is a lot shorter now.

### **Indicators / Impacts**

*What about the changes to the weather, let us say over the last ten years to date as compared to your childhood. Has it changed at all?*

It has changed. When we were young men, it was a different lifestyle. The climate these days is nothing like what we grew up with. The climate is changing and to cite an example, I was taught by my father to recognize certain signs that were applicable to our area in terms of upcoming weather.

When I would go out at night, I had been taught to observe the skies. In the mornings, it was the clouds I had to observe to ascertain the upcoming weather. He would ask for the observation and make a prediction as to what type of weather it would become the next day. He would say so, and in these last days he would state that it would be so, but it changed and without any signs whatsoever, the weather would change all of a sudden. In the old days, the signs that he taught me as they were passed down unto him, no longer have any bearing on the upcoming weather. The reasons are that the weather is nowhere near what it used to be. The ice is different and it seems as if the ice does not want to appear. Sometimes, even before the spring has arrived, the ice is already melting and soon after that, the ice leaves the fiord.

As well, the ice breaks up way earlier than usual. These are part of the changes and further, in the summer the differences are drastic. In the past, even the gentle showers of spring would be part of the charm of the scenery. It was quite refreshing especially with

the moist smell of the tundra. These days it does not behave in that manner anymore. It has really changed, at least the areas that I visit and camp in.

*What have you observed in relation to the changes in temperature, is it a lot hotter or colder than in the past? Is it the same or has its behaviour changed too?*

It used to be quite cold here in the past. Today, the cold is still quite cold when it drops that low, but the changes are evident, both in terms of the temperature and the moisture content. It is quite cold but it hardly forms any ice fog. I have not really noticed that it is very different in terms of cold, but the cold seems to have lost its bite and when it gets warm, it really gets warm with the sun beaming hotter than ever.

The area where I go to camp, it used to be warm in the summer but these days it is even warmer. It is even hot now, and even the tidal zone gets hot. Usually, right after the water goes out the exposed area does not warm up right away. Now it gets warm quite soon shortly after the water has drained away. This is due to the warmer temperatures. Those are the changes I have noticed.

*In terms of the weather patterns, have you noticed any changes in the climate? What have you seen in terms of the signs prior to bad weather?*

Back then in the past, when the bad weather was incoming, mind you we lived in an area that generally had bad weather. It had worse weather than the community here, that area where we lived back in the past. These days, although all of the signs are there, the weather does not become bad and the weather stays relatively calm.

Now when the weather when it does get bad remains bad for quite a while. It seems to behave in that manner now. Today, it stays fairly calm for a long period and then when it does get stormy, it remains stormy for quite a while, sometimes for a whole month. Well, at least two weeks in any event.

I am using that as an example of how long the weather will fluctuate nowadays. It never used to act that way. Now, you really have to watch the weather these days due to the fact that it has changed.

*In respect to the changes in the weather, and the signs that accompany them, have you noticed what changes occurred and what kind of weather they are accompanied by?*

Well, the weather has changed and the way I have been taught about the weather is that when the sun becomes especially hot and it beams down on you insistently then it will be followed by a bout of rainy weather. Or it will rain or snow, that the rainy weather will follow shortly thereafter and that the clouds will be quite far off and they will look as if they are wavy. They are bringing the rainy weather.

Back then even though it was hot, it was not like, we call it “*aqqatittiniq*” when the

weather is like that, when the sun is especially strong and it gets hot. Nowadays it stays like that, with the sun beaming that hot and intensely for days at a time and there is no sign of bad weather. That is what is confusing to us.

*What about in terms of impending snowstorms, what types of signs did you look for then?*

We would look for a small wind that was kind of strong, with some strength, and then when it dies down, then usually the snow would follow that type of weather pattern.

Nowadays, it may be the same, but these used to be followed by heavy snowfall. I have noticed that these days that there is hardly the snowfall that we used to experience.

In the old days, we used to experience really deep snow prior to the snowmobile making headway into the Inuit modes of transportation. Now we hardly ever get deep snow anymore, especially without the dogs that had the hard time. Now, it will start to clear when night is arriving, then it would stay the same until we woke up.

That is how the weather behaved in our homeland, where we used to have a lot more snow and hardly any wind. It used to have a lot of snow then. These days the snow seems hard packed everywhere with no powder snow anywhere.

*What about in terms of the wind, has the prevailing wind changed its direction or have the winds all changed?*

The changes that I know of is that the wind is not carved in stone, it shifts occasionally. But, now it seems shiftier than before and it seems as if it has no affinity with any direction. It goes from one direction to the other in a matter of minutes, especially in nonwinter seasons.

This phenomenon tends to be more pronounced in the summer, with winds going every which way. In the old days, this shift in the wind meant that there would be good weather for a while. Now it never does that anymore. It never ceases nowadays and I do not know what is causing it to behave in this manner.

*What about the changes in terms of seasons, hereabouts we generally have five seasons; Upinngaksaq, Upinngaq, Auyaq, Ukiaksaq and Ukiuq, what have you noticed in these last few years?*

I have really noticed that the spring, we used to refer to it as spring when there was still ice on the fiord. With the time of year being the same, it would be just becoming spring in the old days, but now the ice is gone all of a sudden, so it becomes auyaq, the time of no ice.

This is due to the ice melting. The spring has shrunk, the auyaq is really long now and then it has also invaded the traditional ukiaksaq period and remains auyaq into fall. It

remains at ukiaksaq for two months, as it cannot get quite cold enough to freeze the top layer. That is what has changed as well.

The winter is seemingly just a shadow of its former self. It is quite short now and the dark period is when we had ice to travel on, at least starting from November we would be travelling by dog team on the ice. Nowadays, it is right up to December and even right up to Christmas that Inuit are still out boating in the fiord. That is how much it has changed since my youth. You can now boat during the twelve days of Christmas; it was unheard of in the old days.

*You have noticed the changes are occurring over the last ten years, what effects on lake ice have you noticed in that time? Can you elaborate on the differences in timing, characteristics or other noticeable changes?*

One lake I visit quite regularly, “Iqalugjuat” it is a place that I have fished over many years. That was the main fishing lake we had when we were growing up and when we moved into Pangnirtung, back then the lake ice used to be really thick. It still gets quite thick these days, but it no longer approaches the same depth of thickness that it used to attain. It is noticeably thinner; in the old days it was so thick that we needed to have long poles. It seemed that when the ice first started to form, it would snow endlessly for days, and this snow would accumulate and sink into the lake freezing as the weather got colder and that is why it was thicker then.

Most lakes tend to have water seepage in the middle layer when there is an inordinate amount of snow on the ice. That is how it would ice up and become quite solid back then. These days it hardly snows so this has an effect on the thickness as well.

In terms of the quality of the ice, I have not really noticed. But in the old days, we used to have difficulty keeping the fishing hole open due to the cold weather. They may still be like that I do not know. I do not know if the consistent freezing of the top layer is still as fast as it once was. I am sure that it is less because the lakes now are not as thick.

I know that they are thinner, especially if you compare the months to what it traditionally would have been. Perhaps if we look at the month and state this is how thick the ice should be, and then look at how thick it is and compare them. I know that the freezing is later on and they develop their thickness later on.

They are open longer and the creeks and rivers also have currents still running between the ice layers deep into the winter months prior to it becoming safe to travel on. It does not show on the top, this when they should be completely frozen over at that time of year.

This is due to the fact that the cold temperatures are coming later into the year.

*In terms of the sea-ice, let us move into the changes in the marine areas and the ice formation that you may have noticed in the last ten years?*

It is definitely affected as the sea ice forms later and later every year now. It is vastly different in its timing compared to the past. It is also late and it does not get thick for quite a number of weeks as opposed to it getting thicker by the hour as in the past.

Today, although it has been not that many, it has become more marked, perhaps due to the temperature shifts. The change is noticeable because even in areas where there is no current to speak of, the ice is still quite thin for a while. I think that the sea is warmer.

*What about the floe-edge, what the Inuit have noticed in this area and the location?*

This is something that I cannot answer with absolute conviction, but it is something I have spoken about with my elders. I wanted to know where it had been traditionally, not only from my father but also from others about where it traditionally was.

It would be close once in a while and in other years it would be further down into the sound, but the floe-edge is always shifting from year to year. But we used to get female seals, but we hardly seem to get them anymore. I cannot really state what reason has caused it but the ice is also different.

The ice, even when it is quite thick and seemingly solid and land fast, sometimes shears off in great blocks. It never used to do that, with that type of volume anyways and it was usually areas of thin ice. That is what is different.

*In terms of your travel, such as through lakes, rivers, plains and the sea ice, have the changes affected your ability to travel in certain routes due to the changing conditions?*

Yes, the lakes are affected as well today and they have changed immensely. In the past, when we went fishing we would see the ice melt water pools with large holes and the ice would still be traversable. These days once the ice is melting, you cannot use it within hours, due to the changing conditions.

In the old days, the snow would become quite hard, due to the cold temperatures at night and we could travel faster at night and you were less likely to fall through. Now the snow does not even freeze very much and it soon melts within a few hours of the night. This may be due to the fact that we do not have the amount of snow we used to get traditionally.

The lakes would have been used, but they are not visited or used until much later in the season when the route has finally become usable. But this is due to the cold losing its bite and the snowfall becoming scarcer. That is what I think.

*What about the snow? Have you noticed any changes in the snow, as you know we live in areas of cliffs and there are quite a few areas where we can get landslides and so on. Have you noticed any changes in the occurrence of landslides or avalanches?*

The fact that we have not had the usual amount of snows means that there are less avalanches, but back then when we had deep snow, perhaps four or five years ago. When we had lots of snow then, when the temperature warmed all of a sudden, then we have a lot of avalanches.

This is what happens now these days, when the temperature rises rapidly, and then you tend to get landslides and avalanches. Some are so violent; it is like the bursting of a dam. You would think that only rivers blow their ice dams, but the areas without water can now flow like water.

Yes, this is definitely a result of the warming trend because the snow definitely blew, just like a river does when it starts running. It is noticeable that the snow blew away from the area from the inside.

*What about the snow conditions? Do we get more snow today or less snow?*

These days we hardly ever get the soft snow that is a result of lots of snowfall, but little wind. Most of the snow we get now is wind packed. The snow never used to be like that, at least not all over the place, there were different areas with different snow. The snow does not stick around for long anymore. This is due to the sun being hotter and stronger.

*What about the snow characteristics? Let us say that if we had to build a shelter, then we have to either dig or build an igloo, we would need snow of a certain type. Has this changed as compare to that past?*

In the past, there used to be different types of igloos; those that were built to last only a day or two, others that were meant to withstand a storm and were more robust and compact, others that were meant to last the winter.

These days due to the fact that we hardly get any snow and the fact that the snow is rather hard, some of the snow is not good for trying to make good igloos. There are too many inconsistencies in the layers and it would be difficult to try to build an igloo now. It would be probably easier to build a snow cave to last the storm.

*What about the changes that affect your travel plans or routes during the year?*

The changes are that the snow is now different, due to the warmer temperatures in the fall; the snow tends to have real ice as its base. It is real ice at the bottom, probably due to the warming trends and it will make it harder for the animals that depend on this vegetation.

If it becomes ice covered, like it does when it kind of melts in the warm fall and then refreezes in a cold snap, it is really hard for animals to break through the cover. The lower elevations are affected more so than the higher plateaus.

The sea ice is different as well, in some ways it still forms and is still useable, but the wind these days, unlike the old days when it seemed quite flat, makes the ice rough and this causes the snow to form huge snowdrifts in all directions, mainly from the south.

In the old days, we used to have good snow that was a result of a single storm and was nice and compacted, but it was like a belly in one direction. Now these are rare as the wind plays with the snowdrifts now.

*What about the water levels in the lakes, rivers and so on, has it changed? Have the tides changed over time or are there other changes you are aware of?*

In summer, the lakes tend to have low water levels due to the warmer temperatures. That is the way it has always been. But the lakes are definitely lower than the previous levels, as well, the high water mark that is usually reached as spring slowly melts the snow, when it first melts, the lake usually has a high water mark.

However, they seem to be something that was attained in the past long ago, since the present high water marks are nowhere near the traditional high water marks. I think that this is due to the fact that the snow melts instantly and it does not have a chance to linger in the lake prior to discharging.

Now you can see that the spring melt is a lot faster and the rivers blow their channel open and start to run really fast discharging the spring melt waters. When it does not rain as much as in the past, then the lakes are not replenished and they tend to have a lot lower levels with the creeks becoming mere trickles. As well, as the land is melting, so is the middle layer, the permafrost. It is also melting in some areas because they seem to be swallowing up some of the water.

*What about wildlife? Have you noticed species being affected by the change in the climate? Are these affecting your harvesting practices?*

Not really. Well, I have seen these new specimens of marine mammals. At one time, at least twice, there was a herd of small seals; they were seals that we had not seen previously in the fall. We had not seen them before, but if they have been seen in the past I have not been told.

At least not in those numbers, and for a while, we had lots of them for a while. As well, the other seals we are seeing now, they are younger specimens. Further we have started seeing these small flying things, I mean that they seem to live a lot longer, these flying insects. I cannot recall seeing them and that is what I have noticed. There are some species that are not usually seen that are migrating here, due to the warming climate.

*What about the fish, are their runs or their health affected by climate change? Have you seen any new types of fish or noticed anything out of the ordinary?*

In terms of fish, the Inuit here have grown up in an area that is always full of fish. I have grown up in fishing areas most of my life and fish have been a major part of my life and I know them quite well. I recall that the fish used to be quite large, fat and healthy looking.

There are still specimens like that, but overall the size is a bit smaller than before. The majority of the fish are no longer that large. The fish are a bit smaller, but even though the fishing pressure is on and according to oral history, they would lay more eggs to compensate.

These days, the laws of the southerners seems to be the other way around, that if we pressure the fish too much, they will start to be depleted. That is not what Inuit believe. The sea run char remain in the sea for summer, they run down in June or July and return in late August. Most of them go for that period and other fish remain longer in the oceans.

The fish that migrate up larger rivers tend to stay out longer, due to more water volume, at least that is what I have learned. There used to be some fish that would kind of stay in one spot for a while, as if waiting for you. Nowadays, it seems as if all the fish are immediately migrating into the lakes.

*What about the issue of new species of birds, have you seen other examples of new species?*

Yes. We see them occasionally, but these birds are increasing at an enormous rate. The Canada geese that we used to see very rarely are now quite numerous and have increased to the point where you encounter them everywhere. As well, the species that are increasing are the scavenger birds and the ducks are decreasing at least in the area where we camp.

*What about the issue of new species of insects, have you seen other examples of new species?*

Only those insects that look like long flies, those are the only ones that I have noticed. They come from the resupply sealift wood. They are the ones that we see now, especially when it is really hot. We never used to see those long insects that kind of look like flies.

They seem to try to run into people, but they are not blackflies. Those are the only insects that I have noticed. But I have noticed that when the temperature rises, so do the insects. Some of them are showing up for the first time.

*Have you seen any evidence of stress from the fish, in terms of skin growths or what not*

*that you may have noticed that is attributable to climate change?*

I have seen some of the skin; they all have different types, depending on their home area. But some of them, the flesh is what I have noticed most of all. The flesh used to be, we have been fishing in these lakes for ages, it used to be quite firm.

That is what I know as a result of eating those same fish for years, I do not know if it was the flesh or the climate, but flesh is a lot whiter than before. That area up there has fish with really red flesh.

The fish that look really healthy are now displaying flesh that is whitish and although they look really healthy, the flesh is not red. In that regard I have noticed the colour, the taste seems relatively unchanged, but the colouration of their flesh has changed.

The skin used to be different in the old days as well, probably due to over-population; it would have scratches on it. These days, they would think that the fish was dying or something.

*What about the species of vegetation in this area, have you seen new species that are growing in this area? Have things changed that you are aware of?*

Not really. In terms of vegetation, these days they are growing quite well, but the land is drying up and the plants that require that type of wetland are having a hard time growing. In terms of new vegetation or other species, I have not really noticed any new species of vegetation in and around this area at the present time.

But I have noticed that the plants are not getting enough water and are drying out due to the loss of groundwater. This may be due to the heat of the sun or evaporation. That is what I have noticed about the vegetation around here.

In terms of the vegetation and its effects on the animals, there are some repercussions for that fact that some of the vegetation is drying off. The vegetation that is not growing affects the caribou and this is reflected in their fat layers or lack thereof. When the temperature is too hot, then this has an effect on the ground.

Some areas of wetlands have dried up due to the warming trend. It is full of vegetation but they are not all growing. They do not grow as well due to the higher temperature and the lack of rainy weather. They dry out.

*What about water quality or quantity in this area, either through the taste or the colour? What about the water from our community? What about the growth of weeds or other vegetation in the lakes?*

Only the small creeks or brooks, at least that I have noticed. The real rivers do not seem to have changed at all. But these small creeks that run through some of the land are now

full of minerals, they turn completely black when you use it for tea. It seems that they turn darker now than before. It is like soot, it seems to have pervaded the whole region. That is all that I have noticed in terms of water quality.

In terms of the water from the community, the water has changed and when we first started to get water delivered, I did not like the smell of the water. It was really smelly, but now I am attuned to its smell and it does not bother me anymore. The water is still drinkable so I have not really noticed any changes to the water quality in the community.

In terms of growth in the lakes, the bottom seems to have a lot more algae than it used to have. It's not like real algae, but it covers the rocks nonetheless. They look similar and the lakes, especially the smaller ones that are now full of this growth, we collect drinking water from them during our travels. They should be researching this to make sure that it is not dangerous.

The people who collect drinking water from them should check the water carefully. When there is a period of rainy weather, then the water is replenished. When we have no bad weather for a while, some of the lakes are dry that we used for drinking water before. *What about the tides, have they changed or has there been differences in the areas that are covered by the tides?*

Yes, the only thing I really noticed is that the tide seems to be continually experiencing neap tides, I do not know if that was the case. What I mean is, that when the neap tides arrive, they are far stronger and it goes further in.

But in terms of the regular tide, it does not go out as far as it used to. We also know that during the summer, around September, that is what we call real summer, that is when all the vegetation has finished growing and they start preparing for the fall.

The tide that used to accompany this seasonal change was very clear and marked. Now it cannot even reach the area where it used to reach long time ago. I do not know whether it is due to the changes in the tide or the land, but the tide seems to have lost its upward power, but it goes down lower in other places as if experiencing a neap tide. The current as well is quite strong in the tidal pattern.

*What about areas of tundra fires that you have seen that are not seemingly caused by humans, but by natural causes?*

I have not really seen areas that have burned, but I have seen areas that seem to have melted from the bottom up and it slid down, here I am talking about whole slabs of soil that have slid down the hillsides. The permafrost has melted and the vegetation slid down when it lost its footing. I have seen large areas like that which are experiencing these changes due to the warming climate.

*Let us see if we can move to health and the effects of the climate on human health such as*

*sunburns, snow blindness and so on. Have you noticed any changes in the health of the Inuit?*

Yes, in terms of the climate and its effects on the body. The air has taken on a different quality, in terms of dryness. The air is a lot dryer now in the spring and summer. This has an effect on the body, the air is really dry and in the middle of the day, when the temperature rises, the difference is noticeable.

The temperature has become a lot hotter and the air has become a lot dryer. Even the land is dry and I think that the air is affected by this dryness of the land. As well, it seems overly bright. It only used to hot enough to get a suntan during the spring, now you can get a suntan at any time. Now it reaches into fall, where you can still get a tan. That has changed in that regard.

The sun is a lot hotter and due to this extra strong sunray, it is drying out the land and it seems that you cannot do anything due to the heat. Even when you are travelling, it is still warm when the sun is shining. You can feel the heat emanating from the land. That is all that I have noticed.

*What about snow blindness and so on, has there been an increase?*

I have always had a problem with snow-blind sickness. I used to get really bad cases, and when I would get it, I could not open my eyes at all, that is how bad it got. These days, I still get snow-blind not to that degree as it is slightly different now.

*It is different in that it affects you and it is far more painful now. I would get sick for two days, but by the second day I would be able to open my eyes. It is harder on the eyes now.*

These days I can only feel the pain and I am able to open my eyes, unlike in the past when I could not open them until the second day, that is how different it is in terms of the effects of snow blindness. Now it is a lot drier and it is different now. It is worse and more painful.

*Has the climate change caused other effects on human health such as in regards to the occurrence of colds or not?*

Only in terms of personal experience, I tend to get colds myself. Sometimes, I get colds that are different in terms of length, I do not know if it is related to the change in the climate but we never used to have colds that last that long. Some strains seem to last the entire winter.

I do not know if it has an effect on our food. As you know, with the changing seasons, Inuit exhibit different symptoms such as suntans in the spring, in the winter, we lose the tans and it seems to have more fat. Our skin seems to adapt to the seasons as well. In terms of suntans, I stated earlier that I had noticed that the strength of the sun allows it

to cause suntans all spring and summer long now. It never used to do that. Once the snow melted, the Inuit would lose their tan.

Yes, in terms of respiratory problems, it has changed in the springtime especially. The air outside becomes quite humid and hot and it is difficult for Inuit to breathe as we are not used to the hot temperatures. That causes the Inuit to flee to the tents as the air within the houses is so hot that you cannot even sit without sweating.

It would be a lot more difficult for those Inuit who have respiratory illness to live through these changes. That is what I think.

*Do you have any other comments to make in regards to this study?*

I do not have a lot to say, but in terms of climate change, I am worried about our wildlife because new species will follow the warming trend. When this area becomes as warm as the south, then the wildlife will change as well and we have to plan for this eventuality.

Perhaps in the future, we may have to look at recording this knowledge, for it will seem as if it were nothing but a fairytale if it is not recorded now. For example our stories about certain species may no longer be relevant in the future. These days, we have these birds in the winter.

In the winter, we never used to have these little sparrows that now over-winter these days.

We would get them earlier than usual every so often, just not all winter. That is how much it has changed with the climate. We will have to look at the effects of global warming on the large animals such as polar bears and other species that will be affected by the changing climate. They are the ones in peril.

## **Climate Change Interview in Pangnirtung – March 14th, 2002**

### **Ipeelee Uniuqsaagaq**

#### **Project Description and Reasons for the study**

The reasons for the study and the project were related to the participants, including the information contained in the consent form. It was outlined that the government wanted to get a baseline with Inuit Qaujimajatuqangit on the climate. The reasons for the study, from the government perspective, were also pointed out and what this information could and might be used for, in the future.

**POB:** I was born at Qikiqtan in 1932, June 26th.

#### **Has the weather changed since you were a child?**

I may not recollect every little detail about the weather, but I will try. Back then when I was a child, the weather seemingly was always calm, at least to my eyes. We used to live in that area overland on the other side. This was at Padlei where I started to recall my youth and the area where we lived in.

In the spring, it seemed as if nary a wind would appear during that season. Although it would blow occasionally, it was not as strong as Pangnirtung. The wind was not funnelled into the fiord and this is part of my recollection. This was when both of my parents were still alive that we used to live in that area. Unfortunately I cannot detail everything about the climate, but what little I recall, I will share with you.

I cannot recall how many years we actually spent at Padlei, we lived overland of the other fiord to the south here, it was also at the head of a fiord. It was enroute to Padlei that is what I recall. We lived there for several years, and when the ice had become thicker, then we would move towards Padlei, when the fiords are “*killuaqtaqtut*”, when they are traversable to the real hunting area, the floe edge.

My father used to want to go the floe-edge and we used to go hunting there. He wanted to go where the resources of the sea were more plentiful. We would stay there for days at a time.

*From your recollections, what about when you became a youth?*

Yes, after we lived there for several years we lost our mother up there, then we moved to this other fiord and I was left behind and looked after by another family member, my angutiksaruluk (my adoptive/step father), “Uniuqsaagaq”. When we started to live in that area that was the first time that I experienced really strong winds.

Sometimes it was not possible to go outside for the fear of being blown away to the ends of the ice that is how strong the winds were. This is what I recall and some episodes are

really scenic in my recollection. It has changed according to my observations, I am by no means an academic, but I have noticed some changes.

When the wind did blow, it would blow quite strongly but not violently, but it would die sooner as well. Nowadays, the north and the south seemingly are fighting for control, when one dies down the other takes its place, especially in the fall. It is not so noticeable in the spring.

*Do you recall what the weather was like predominantly in the years when you became independent? Did the ice leave early, was the weather bad all the time or what was your main recollection of those periods that you are alluding to?*

Nowadays, the weather is quite different according to my observations, as I said I am no academic professor, but the wind seems to spring out of nowhere and when the clouds start to change, it is immediate and the wind springs up right away, even during the spring.

However, you pay attention to the weather especially when you want to go places, at least this is what I was taught in the days when we had only dog teams. We had to continuously monitor the weather and prepare for what we were going to face as we had no speedier way to either go around or straight through the storms.

With the dog teams, it was different and you had to be aware of your surroundings at all times. You had to ensure that you were aware of the signs of the impending weather, and especially my maternal uncle Etuangat, who was always concerned about the weather and the fact that Inuit of today paid no attention to the signs of the upcoming weather.

He tried to teach that to young Inuit. I am not very knowledgeable about this, but my elders have taught me some things about weather and the signs that are there.

*What about the changes to the weather, let us say over the last ten years to date as compared to your childhood. Has it changed at all?*

In terms of huge changes in the climate, I cannot tell you, but the things that I have noticed are subtle and are signs of more ominous changes yet to come. The melting of the snow is a lot more pronounced with the weather and the wind springing up out of nowhere. They appear out of nowhere, now.

We grew up with the wind, so we always watched the horizon and the clouds so as to know what the upcoming weather would be like. These days it is even more important to watch the clouds to see what is going on.

The southerly winds are more pronounced in their signs and even before it comes, you can see the cloud cover moving in. It goes up against the northern horizon and you can tell that the southerly wind will blow, not right away, but sooner or later, it will blow.

**Indicators / Impacts**

*When did you notice the change in the climate? Can you elaborate as to the approximate timeline of the change in the climate?*

I cannot say this is the day exactly where I started to notice, but these days, the last few years especially have been poignant. Personally, in my opinion, it is when the Inuit were all in the communities that the problems started to arise. We used to live separately but now we are all bunched into communities.

The climate started to change when this happened, I cannot decipher why it started, but the issue here has been that the changes started to accelerate. Now it is getting hotter here in the north, it is not due to my being knowledgeable, but these are things that I have noticed.

*What did your father talk about, in terms of climate and change? Did he talk about the changes that he had noticed?*

Yes, my real father, I do not recall if they spoke about the climate, or even my mother. I heard more things from my mother, but since I grew up in a different family due to losing my mother, I did not have an opportunity to talk with them.

But my angutiksaq, he was always observing the weather and the signs that identified the changes that would happen in the weather, including the wind or storms. He would identify the clouds for me and tell me about the signs of impending change.

He would teach me these things, and although I am not very learned, he taught me a lot about the weather and the signs that I had to watch out for if I was not to run into trouble with the weather.

*What about the signs of bad weather approaching, did you learn about these changes and what did they signify?*

Back then the weather was something my adoptive father kept trying to teach me about and he would let us know about the approaching weather, due to the fact that we lived in a land of heavy winds. He kept us apprised of the situation and when we were at the head of a fiord, even though it was clear, he told us to start preparing for a southerly. That is what he tried to teach us so that we could be prepared.

Even before the wind approached the land itself would start to shimmer and shake and you could feel the vibrations of the storm a couple of hours prior to the storm. This was one of the signs of impending weather that he tried to teach me. He made sure that we were always observant of the subtle signs.

*What have you observed in relation to the changes in temperature, is it a lot hotter or colder than in the past? Is it the same or has its behaviour changed too?*

The changes that I have observed are that in the fall, around November it starts to get colder now, it seems to get cold all of a sudden but then by January the cold seems to lose its vigour. The really cold period of deep winter is shorter now.

It seems that by March, the cold weather has been sapped of its strength. Due to this rise in temperature, the ice no longer has the opportunity to get thicker during the days of the lengthening day. The ice breaks up earlier due to its thinner depth and if it would have been thicker, then the ice would not have melted as early as it does. That is what I think.

I have not kept records of the variations in the temperature, but I can say that it will be cold for basically two and a half months, and the third month has lost its cold weather. It has been like that for a while, before it would have still been really cold in March and the ice would have had a chance to get thicker.

It does not seem to get as cold as it used to get and these days, it is only January and February that are the cold months. That is what we have noticed. Now, as opposed to the old days, this month will no longer experience the cold weather of winter. It just starts to get warmer now.

*What about in terms of impending snowstorms, what types of signs did you look for then? In terms of the weather patterns, have you noticed any changes in the climate?*

The changes are in relation to the signs. When the good weather lasts for a few days, once you start to see clouds created, then the weather is preparing to change into a different state, that is what we used to look out for. When the signs appear, then the bad weather needs to get out before the weather will get back to normal.

In terms of the impending snowstorms, the signs are generally the same, but due to the differences in each weather system, I could not say it will be thus, but I would rather not speak to something I have no conviction about.

*What about in terms of the wind, has the prevailing wind changed its direction or have the winds all changed?*

What I have seen is that, although I cannot explain every little detail, I can state that having grown up in that area overland of here, where the prevailing wind was mainly from the north in the winter.

But in the springtime, although the wind was still from the north, it was not as strong and rare. During this time of year, most of the fiords and inlets tend to have winds that are blowing into the fiord. This is melting the land and also bringing in warmth. In the fall, the fiords reverse their winds and the majority of the wind generated is blowing out the fiord towards the mouth. That is what I have learned. I am not sure if I have answered the question properly.

In terms of the shiftiness of the wind, yes it is noticeable. But in terms of the cycles, it seems to be few and far in between now. In the fall, the wind is quite strong as the cold weather is moving in. The wind is usually shiftier then, in that season. When you are traversing the gullies and low areas, they have differences in temperature and they tend to generate wind.

This is especially when it is trying to freeze the seas, it tends to blow on the water, as if to make it colder. In terms of ice formation, with those winds, the ice used to form earlier. These days the ice does not form, even with all of the signs pointing towards an early ice covered year.

*What about the changes in terms of seasons, hereabouts we generally have five seasons; Upinngaktsaaq, Upinngaq, Auyaaq, Ukiaktsaaq and Ukiuq, what have you noticed in these last few years?*

As I stated earlier, I have observed these changes in the year's cycle. In this month that we are using now, it hardly ever snows anymore, at least compared to before. This month was called, "qanniruut" because it was preparing the seal dens for the seal pups, it would start snowing and that is why it was called by that name. That is what I can say about early spring.

In terms of spring, it used to be colder longer and the fact that the climate is changing is noticeable as it is warmer and the spring arrives with a force, accelerating the melting process and causing the ice to deteriorate faster. That is what I can say about spring. It is getting a lot warmer now that the spring arrives earlier than before.

With respect to summer, if you were hard up especially without a boat, it would be a long summer as it is so long now. To use the past as an example, we lived overland at the head of a fiord and we hardly had any boats, mainly qayaqs. We had to walk places and every once in a while; my stepfather and I would walk to the community to buy goods.

I imagine that the trip would take a lot longer now, especially with the later formation of the ice. That is what I can say. The fall is also a lot longer than before especially now, it starts to get cold and then stops at a certain level.

The winter seems a lot shorter now. In terms of the ice, that is what made it ukiuq. Now the winter ice is forming later and melting earlier. This process seems to be accelerating as well. The ice melts faster, and I am no professor but these are the things that I notice based on what I know.

*You have noticed the changes are occurring over the last ten years, what effects on lake ice have you noticed in that time? Can you elaborate on the differences in timing, characteristics or other noticeable changes?*

Even though it gets cold, it does not get sudden cold snaps anymore. This affects the lakes especially the fishing lakes that are utilized by the people here. Apparently it takes them longer to reach a safe thickness before the nets can be set safely, without danger to the harvesters.

Today, apparently only in February did they start to thicken. That is what I heard, as I no longer am active and I am not allowed to go out hunting due to my lungs. I am only passing along what information that is passed onto me by the hunters that do the activities. The lake ice will continue to thicken until the middle of next month.

The ice does not form as early as before. The area where we grew up, it was called the land of shadows as the sun hardly ever reached it and the lakes would freeze early. Once fall came, then the ice would form, as the sun no longer warmed it. I have not heard whether anyone has visited my homeland in a while. I have heard about Avatartuuq and Iqalukjuaq being visited for subsistence fishing.

The ice is still frozen but the edge that is buttressing the shore is not as hard as it used to be. It is still hard, but it does not seem to freeze as hard.

*In terms of the sea-ice, let us move into the changes in the marine areas and the ice formation that you may have noticed in the last ten years?*

The ice used to form a lot earlier. When we lived in outpost camps, the Inuit would start travelling once the sea ice had formed prior to December, then the Inuit in the camps would start to filter into the community to restock their supplies. These days the ice finally starts to form when January is close.

Due to this later forming of the ice has already affected the two outpost camps that we have in the vicinity. It delayed their trip into Pangnirtung and Laipa and Philipoosie had to wait until the route to Pangnirtung became traversable. It was only in February, at the beginning that they were able to come into the community due to the ice not freezing until then.

*What about the floe-edge, what the Inuit have noticed in this area and the location?*

The floe-edge is these days, although it will still occasionally freeze over the sound, always quite close to the community. It has not been far, but at least twice since I have been here. It used to be that it would have been quite far by now, now to date, it has not gone far, and the Inuit in Tuapat have reported that the ice sheared off and the floe-edge is now at a different area.

This is due to the wind, but it is obvious that the ice does not form as well or as early as it once did. “Nunniulauqsimajuniiq&unilu”. The floe-edge is a lot closer than previous years and it does not have the attachment to the land as it once did as I was told that the ice kept shearing off continuously.

It apparently was not freezing all the way to the bottom as it usually does and this caused the ice to remain weakly bonded to the land. I no longer hunt, but I hear these things.

*In terms of your travel, such as through lakes, rivers, plains and the sea ice, have the changes affected your ability to travel in certain routes due to the changing conditions?*

There are two areas where I have seen this phenomenon, up at “kangiqturuluk” at a glacier where we used to travel over to reach another area. The glacier has retreated to a point where it is not negotiable through this pass via snowmobile.

I have seen this and as well, the glacier at Tuvvaqjuaq has melted to the point where it does not figure in the travel plans of Inuit anymore. These days it is not used as it cannot be used as a short cut anymore, due to the glacier retreating and disappearing. I saw the changes start to happen, but at last report, it is apparently completely impassable.

*What about the wetlands around these areas? Have the wetlands changed or are they stable?*

In terms of wetlands, the flat areas are usually wet, due to the plains absorbing water, if you look at sloping areas, due to the slight slope, the water has drained from them and they are quite dry now. The melting of the permafrost is apparently deeper as these areas are sloped inwards.

This is partially known to us, but not to the degree. I know about some of our oral history, but not all of it.

*What about the snow? Have you noticed any changes in the snow, as you know we live in areas of cliffs and there are quite a few areas where we can get landslides and so on. Have you noticed any changes?*

Yes, but I was not quite finished with the previous question. As well, within one of the passes to Broughton Island, these lakes at one time were separate lakes with a glacier in the middle. It has melted as well and although some of the melt water ran down the other side, a lot of it melted into the area and it became one lake.

This area, which used to be above water and was traversable at Pisuk, has now become impassable due to the melting of the glaciers. Further, the snow changed its springtime characteristics, both due to the warmer temperatures and the melting of the snow earlier caused it to slide.

This is what I noticed; you now have to be more cognizant of these types of dangers. This is especially important if there are going to be tourists who are hiking and utilizing these areas of danger. There could be landslides or avalanches that could occur with more frequency these days.

*What about the snow, we know that because we live in the Arctic, that we will get snow, but have you noticed any changes in the amount of snowfall we get in a year?*

Yes, today we do not go by dog team and it seems to spite us in that it never has any more deep soft snow that was the worst of all for dogs. This is something I have noticed especially.

When we had dogs, it seemed that every winter there would be periods of deep snow which limited travel, especially when you had more than one day's travel to conduct.

These days with snowmobiles, it is easy to go more than one day's journey to areas with game. It really has not gotten any periods of deep snow within the last twenty years or so and I have heard that areas that are used have no instances of deep powdery snow.

*What about the snow characteristics? Let us say that if we had to build a shelter, then we have to either dig or build an igloo, we would need snow of a certain type. Has this changed as compare to that past?*

Okay, in the last few years I have not made an igloo and as I stated earlier, I do not go hunting anymore. But I do know that when it looks like it is going to blow, I was always told that I should not look for snow that is at the bottom of cliffs or areas that are sheltered from the blow.

Nowadays, the snow and especially the snow from the north and south are not the same but I no longer know as much since the winds arrive with little warning. I am not sure if I can answer this question properly.

*What about the changes that affect your travel plans or routes during the year?*

When spring has arrived and the snow is starting to melt, then it becomes a burden to travel on. The lake ice starts to get dangerous when the ice is softer, the ice can crystallize into long narrow crystals with no stability. They are called "illaujat". A lake can become illaujaliktuq, in other words, unnavigable.

Nowadays, with no dog teams, the edge when it starts to get melt water on it, you have to be careful. With dog teams, as long as the dogs could get across, then it was no problem to cross. With a snowmobile, it may be harder to cross as the water starts to melt into the ice. This makes it dangerous.

When the snow is starting to melt alongside a lake, some parts that do not look deep can be deceiving and you can sink into them and the qamotik and machine can get stuck big time. With dogs, you can always move to another place to pull it out. If your machine is stuck, then you are stuck.

The snow on the sea ice, when it is wet, at least on a dog team, was not as sticky to the

sled runners and there was no water gathering underneath the snow banks like the situation above, but the snow on a lake can hide water on the ice that has gathered from the hills above. This can get really dangerous.

In terms of the marine ice, the melt water pools can get quite deep but they are not as dangerous as the freshwater ice. It is possible to still traverse on the ice.

*What about the water levels in the lakes, rivers and so on, has it changed? Have the tides changed over time or are there other changes you are aware of?*

I have not really noticed big changes probably because I am sedentary now. This month, I did notice the last neap tide was quite stronger than usual and I even heard that a boat that was on the land was pulled out and left on the “*qainnguq*”. This may have been due to the ice underneath that forced the water further and floated the boat away and left it on the edge of the sea ice.

*What about wildlife? Have you noticed species being affected by the change in the climate? Are these affecting your harvesting practices?*

In terms of wildlife I cannot speak to many sightings, but I can say that there are some changes that are apparent over time. The skins seem to be burned by the sun, they look like scabs but seem more sunburnt than anything else. I have noticed that.

I have noticed that they retain their winter fur further into the spring and that they do not like to bask too long in the hot sun. It is too hot for them now, and in terms of the effects of the sun, it is affecting the seal’s fur and they do not seem to moult completely as a result of the hotter sun.

If they were spending time at the ice basking, then their pelts would have the time to finish moulting. This is not the case and it seems to be affecting them in that way, at least according to my way of thinking.

There is one species that I have seen and heard about. These are small “*tikaarullik*” type mammals that are quite small and they were around this area for a while. A hunter reported finding a carcass and that is how we found out that it was something we had not seen before. Otherwise, I really have not seen any new species.

*What about the fish, are their runs or their health affected by climate change? Have you seen any new types of fish or noticed anything out of the ordinary?*

I have not really noticed, but the fish that are anadromous, especially the fish from Avataaqtuuq are not the same as the fish from Iqalukjuak. The looks are not the same and

I have noticed, I believe it was two years ago that there were fish of a different lake intermingled with the fish from the lake.

I am not sure how it got there and why, but some of the lakes that are full of fish, if the lake is polluted or tainted, the fish do not like to stay around and I have heard that fish will leave a lake and not return. This is according to the oral history. But I know that Inuit were catching healthy fish at the other lake, so I thought they might have been just visiting. That is probably not the case, but I have noticed some of these things.

*What about the issue of new species of birds, have you seen other examples of new species?*

I really have not noticed new species, but this area hardly ever used to get murre, especially the waters off Pangnirtung, at least in the past and we did not get Canada geese but today, we have more murre and Canada geese in our areas.

There were only two types of birds in Pangnirtung that were caught a long time ago. Now there are other species and I do not know when, but the Canada geese have continued to make inroads into this area.

*What about the issue of new species of insects, have you seen other examples of new species?*

I have not really noticed new insects. But I have noticed these new insects that appeared, most likely from the construction materials, these little beetle like insects. I have seen them; some of the houses have them and it looks like they came with the materials brought into the community for construction.

They look like beetles, minguqs, small ones, but they are smaller than them. I have seen them as well. They look like they came from the material because they do not have wings, which is why I suspect that they have not flown into the community.

*Have you seen any evidence of stress from the fish, in terms of skin growths or what not that you may have noticed that is attributable to climate change?*

I am not sure why they were there, but I do not think that it was related to climate. I have heard that the fish have an unerring smell that directs them back to their lake. Somehow, either due to the low water levels or the change in the smell or taste, these fish followed the other fish as they migrated back to their lake.

I really could not determine the exact cause for this particular case and I am not sure what caused those fish to migrate up another river and into another lake, so I can only tell you what I have seen and what I suspect.

*What about the species of vegetation in this area, have you seen new species that are growing in this area? Have things changed that you are aware of?*

I have not really seen any new plants, but there was one that I saw which intrigued me

and I even took it home, it was near the fish plant building, it was a long stemmed plant, like grass with some sort of woody stem. That is the only one that I did not recognize.

I have seen some plants start growing in the mud spurned up by vehicles, this summer I noticed that they really grew fast and covered that whole area quite fast. The plants, what are they, “*paunnaq*” they were growing the fastest at least near our place.

That area was even reddish due to all of the growth that was occurring in that area. That is what I have noticed. The willows near our house were growing the most last summer and the plants that had not grown much were growing really well. I suspect that they will continue their accelerated growth once the snow cover is gone.

In terms of effects on animals, they may be affected especially if they are growing that fast and that well. The animals will have more food and may increase, and as I stated earlier the vegetation was growing well and they would have quite a bit of food.

The caribou will not stick around, at least according to our oral history. The land here is now full of their food, but once they have eaten the lichen, then they will leave. Our elders used to say that these old trails, while they were still around, prior to the vegetation covering the trails, the caribou will be back using them again.

This was proven true last year. The caribou were using their old trails again before they had all grown in. They will stick around only so long as there is food to keep them here, once the lichen is gone, so are they.

The plants that we know, such as heather, most likely due to the increased warmth are staying productive way past their traditional growing periods and they seem to be growing quite fast. That is what I have noticed.

*What about water quality or quantity in this area, either through the taste or the colour? What about the water from our community? What about the growth of weeds or other vegetation in the lakes?*

I know that when the snow first melts, the rivers are running quite briskly, but once the snows are largely gone, generally around the beginning of August, the water levels start dropping. It is only with rain and stormy weather that the water gets replenished. This has an effect on the water levels locally, but overall, I have not really seen much difference myself.

Not really, I have not noticed any change. The area towards Netsilik Lake, the rivers seem to be different from the ones here and the water turns black when you drink tea with it. That is all that I have noticed, but this is known historically in any event.

No, I have not noted any changes, other than the additives that are added to the water. In terms of the algae and other water vegetation, I have not even thought to look for any

changes.

*What about the tides, have they changed or has there been differences in the areas that are covered by the tides?*

Not really here in Pangnirtung, but towards Broughton Island the area does not have a very large tide and I have noticed that the tide there seems to be increasing, perhaps due to the tilt of the earth. I suspect that this is a result of the axis shifting because areas that did not get submerged in the past or exposed are now commonly submerged or exposed.

*What about areas of tundra fires that you have seen that are not seemingly caused by humans, but by natural causes?*

I have not seen any incidences of tundra fires anywhere in this area.

*Let us see if we can move to health and the effects of the climate on human health such as sunburns, snow blindness and so on. Have you noticed any changes in the health of the Inuit?*

Only in terms of the strength of the sunrays, it is starting to affect Inuit on the skin, it is causing itchiness and sunburns. This is what I seem to have noticed in relation to the climate and its effects on humans.

*What about snow blindness and so on, has there been an increase?*

Not really. I have in my whole life, only once gotten snow blind. I really have no experience with this phenomenon.

*Has the climate change caused other effects on human health such as in regards to the occurrence of colds or not?*

In some ways, but it is more to do with all of the Inuit and other people who are shuttling between communities that has caused colds to occur with more frequency and even when it starts to die out, a new strain goes around and you end up having a cold most of the winter.

It does not seem to really be caused by climate change, but it has more to do with the pollutants in the air and things that are burnt. I tend to easily get irritated lungs if there is any kind of smoke. That is all that I can report.

*Do you have any other comments to make in regards to this study?*

Not really. But the climate is changing and I do not think that it will stop for anyone. I cannot state what has caused it exactly or whether it will stop, but it will get warmer and it is probable that something major will happen in the near future. I am not a wise man, so

I cannot state what will happen, but I try to imagine the changes that may happen when the sun gets hotter almost the same as the south.

Further, the differences between cold air and warm air will cause further problems and may affect Inuit. I have thought about this issue from time to time, but I have no real solutions. I really do not have much to say, and I do not want to assume to know something that I do not and if I say anything it will only be based on my ignorance.

## **Climate Change Interview in Pangnirtung – March 8th, 2002**

### **Mosesee Novaqilk**

#### **Project Description and Reasons for the study**

The reasons for the study and the project were related to the participants, including the information contained in the consent form. It was outlined that the government wanted to get a baseline with Inuit Qaujimajatuqangit on the climate. The reasons for the study, from the government perspective, were also pointed out and what this information could and might be used for, in the future.

**POB:** I was born at June 17, 1945 at Illutalik. I grew up there as well.

*Has the weather changed since you were a child?*

I will start from early spring, in my youth when I started recalling events for the first time as a child, the early spring as I recall was a lot longer. It remained in that state for two months or more. Back then, the snow never melted immediately as it does these days. The snow would start to soften and slowly start to get mushy. Then during the evening, it would freeze the top layer “*qiqsuqaq*”, allowing Inuit to travel easily over the frozen layer up to the early morning, when the morning sun would then hit it and start to soften it again. This does not happen anymore these days and this is one aspect of early spring that I have noticed changing.

In respect to the spring, around July, it would start around late June and July was the real spring. This was what I recollect as being touted as the spring “*upinngaaq*” by my family. This was real spring and I recall that this period of the year was especially sunny, with the sun starting to beam directly down and melting everything.

I recall this period or season as being the warmest, due to the sun shining directly. It was nothing compared to today and the temperatures that are reached nowadays. That is how I recollect spring at any rate.

In respect to the summer, I cannot recall with great detail, but I do recall that the weather in the spring seemed to flush out the land, then when the weather cleared, it cleared for a long way and you could see the sky with absolutely no wisps of smoke or anything.

Nowadays, there seems to be some sort of haze on the horizon.

Even when the weather seems to have cleaned itself out, there is still a haze in the air and it never approaches that type of clarity in the sky anymore. Perhaps it has something to do with my eyes as well, or something to do with the pollution.

The rain is called the cleanser and it would sure cleanse the whole of the land, prior to fall. That is what I recall that the land would be very clean and these little lakes would be the only ones that were dirty. At that time, it was the water meant for dogs as we still had a lot of dogs back then.

The fall was the season that the cold started to come. Back then it felt as if it was slow coming around, but in retrospect, it was quite rapid compared to the falls we experience these days. The fact is that I am an adult now and the fall we used to have was quite short.

Nowadays we have a fall that stretches from September to November, and sometimes December. In the old days fall started in September and ended in October. That is when the ice would freeze. Nowadays it starts in September, and October and November are the fall months.

In the past, it would start to freeze up around October and by November everything was pretty well iced up and we could start travelling then. This is how much fall has changed in regards to fall.

In regards to winter, back then it seemed that the cold months were primarily the end of November, December, January, February were the really cold months. These days the cold weather has started to arrive only in January and February. The cold only lasts that long now and January is when the ice finally forms enough for travel, at least the sound, and our “*ikiq*”.

Outside of Pangnirtung, that area used to get iced up a lot earlier as I recall. This is how different it is now. In respect to the chill, this still has not really changed, but the start of the cold weather has changed. If you use clothes as examples, we used to start wearing our winter clothing earlier.

Nowadays, we are still using fall clothing late into the year, because it does not seem as cold anymore even with the chill still around. That is how different winter has become and to use myself as an example, I have been out and about the months that I am talking about and I know that I still have relatively the same amount of cold tolerance, but the weather is not as crisp and it does not affect me as much anymore and this is what I notice.

*What about the changes to the weather, let us say over the last ten years to date as compared to your childhood. Has it changed at all?*

Nowadays, with the climate that we are experiencing and as I have heard it reported by my elders and older relatives, according to the oral history and my experiences to date, the climate is changing and it is all over the news. I am one of those who have noted the changes from the time we were youngsters to the climate of today.

The wind seems more prevalent these days and it crops up anywhere. I used to hear as a

child that the climate would eventually change. Further that our land would start to become warmer and less cold. I never really used to put much stock on the oral history, because I presumed it was only sayings. These days I recognize that much has changed compared to what the climate was like in my childhood as compared to today's climate.

The weather is completely different now. The winter is a lot shorter in terms of timing and months. The changes are quite obvious and the way spring arrives now, with a rush and the way the snow has melted off the land so quickly, including all of the ice on the water, these are all changes that are different from the past.

Back then; the ice would last until July. We would still be using dogsleds. Nowadays we are still using the "qainguq" to travel, but a lot of the areas no longer have ice at that time, even the fiords. That is how different it is these days. Even though we are not scientists, the differences in the climate are obvious when you compare the climate from then to the climate of today.

The resources within the environment, especially the animals are the most affected and we are starting to see the results. There are changes as well. I have noticed that the animals are not getting as fat as before, especially the marine mammals and I think this is in response to the warming of the climate, including the waters.

That is how it seems nowadays, and it seems that due to the warmer weather, they do not seem to be as fixated with getting enough blubber to last the winter. That is how I have noticed, especially via the animals that I catch to feed my family, especially the seals have changed. I am not sure what has affected them, whether it is their food or not, I do not know.

*When did you notice the change in the climate? Can you elaborate as to the approximate timeline of the change in the climate?*

Only around the time that, around the year 1975 and before, I do not recall anything different nor did I hear of anything different in respect to the weather from the other Inuit living in the area. I recall that about the changes to the weather as happening gradually after that year.

*What did your father talk about, in terms of climate and change? Did he talk about the changes that he had noticed?*

I kept hearing about the references to the climate when I first started to recall and unfortunately I did not focus on learning this part of the oral history as much. However, I recall that there were predictions about what was going to start changing and now as I experience these changes, I believe the sayings that were told about lakes, and other indicators such as plants and birds that can be used as indicators of the change. My parents used to talk about it, and I regret that I did not pay much attention. But, those sayings are now true and they were not just sayings. It was true, and my parents

apparently were kept apprised of what would happen in our day as children and while they were alive, it did not change to the extent that it has now, but it was starting to change slowly for them.

It changed a bit, but now both of them are no longer with us and I have no one to ask now about the oral history that my parents used to talk about. The saying that they used to say is true, about the climate changing and now I believe it.

*In terms of climate change and your lifestyle, has this change affected your practices of our forefathers?*

In terms of real change in my own lifestyle, none really that significant resulting from climate change. But in terms of the warmer temperature, it is harder on the skin and the face. Even with the sun partially blocked, the sun is hot on the face. That is how strong the sun is now.

In the past, it was only when it was absolutely clear would the sun get hot. These days every spring, the sun is a lot hotter than before and more people are getting sunburns on the face, not only myself but other people as well. Inuit are using the suntan lotions especially these days. I recall in the old days, there was no need to throw on any type of lotion or protection and we tanned naturally. There were no incidences of sunburns back then.

I think about the changing climate and whether I am affected as well, in terms of my desire to be out and about, to collect enough resources and my endurance “*qitutsiqaniq*” seems affected and I get tired all the time. As you are aware, when you do not have enough sleep, your body and mind tends to crave sleep.

But even when you have had the proper amount of sleep, to be slightly tired “*qitutsiqarujunirmit*”, it seems to remain with me, this tiredness. Perhaps I am not the only one affected by the changing climate, it may have an effect on the physiology of the Inuit. At least I wonder about that.

*What have you observed in relation to the changes in temperature, is it a lot hotter or colder than in the past? Is it the same or has its behaviour changed too?*

The temperature fluctuation is noticeable on some days, not only in the spring, but in the summer as well, the things outside when you touch them, they are as warm as the objects inside a household. That was never the case before; the objects are a lot warmer to the touch these days.

As well, in terms of the body effects, when you are not wearing a lot of clothing, you used to get a cool breeze from the air that would cool you down, cool air but these days, the coolness of the air seems to have abated. That is what I notice, probably due to the warming of the climate.

The summer observations I have made, I have just alluded to, in terms of the fall, and I have noticed how the water now interacts with the land. Our salt water used to get a waxy film “*kiglirusiq*”, it used to get an edge of ice right along the edge of the water, even before the ice was getting ready to freeze. The edges would start to gradually enlarge and this was due to the water-cooling, although the temperature was not that cold yet.

We still get some of the edging of the ice on the high and low water mark, but in terms of the comparison between the past and these days, it is minimal and even before it appears, the ice has started to ice over. That is how the fall has been acting these last few years in respect to our marine areas. That is what I have noticed.

The changes in temperatures I cannot really state as to the year, but I recall one year in 1995, I recall that year that the ice melted earlier than usual, although the temperatures were still not too warm. That is what I recall about the temperature changes.

*What about in terms of impending storms, what types of signs did you look for then?  
In terms of the weather patterns, have you noticed any changes in the climate?*

When it is going to rain, they do not seem to have changed so much, but I have noticed that the weather used to take its time in preparing to brew up a storm, but these days it seems to be rushing. This was when it would be getting ready for a rainy day and the animals would start preparing for the bad weather.

The Inuit also used the animals to gauge the changing barometer and they would know that bad weather was coming. It could be either the birds or the caribou or seal, but they are all sensitive to the weather. “*itsuggunnarmata*” That is like the body has a lot, that is even when the weather is really nice, then that means that it would change soon. The animals were used in the old days.

These days, even without these signs, the weather changes all of a sudden, without the weather preparing a warning. The wind picks up, the storm starts and once it starts to go, then it proceeds right away these days. It is not as ambivalent as in the past.

In terms of snow, the moon was used as a gauge of snow activity, when the moon has a circle, moon dogs, then and the elders used to say that a snowstorm was upcoming. Either that or it would be windy. It was mainly for snow, but it was also know for the wind.

As well, the sea was used as an indicator as to when it would snow. Prior to the snow coming, even before the edging of the watermarks, if there was a cover of thin ice, either at the shore or close by, then it will snow. Not right away, but the clouds colour or darkness was used for signs of impending snowstorms.

These days even without the snow, we get these snow type clouds that are coming out of the area everyday without any snow. That is how much the clouds have changed as well. That is what I have noticed.

*What about in terms of the wind, has the prevailing wind changed its direction or have the winds all changed?*

We have been taught about the four winds since we were young, particularly the north, south, west and east. In the old days I heard it called “*akiaqsiut*”. When there was going to be a windy day or storm, then the signs that were used, for example a northerly, if I was at the floe-edge and the wind, even if it was not from the south, the ice would be crammed against the shore. That the ice would start to pressure ridge past the edge and when it was going to blow a northerly, then these signs were used along with the animals. They tend to face the wind that is going to blow and they were used in the old days.

When it is going to blow a southerly, the clouds and it is like the turning inside out of the weather, the clouds are different and it is like a large single cloud with smooth surface and it looks as if it is one cloud. This was used to identify that there was to be soon a southerly arriving soon. But these days, even with northerly identifying clouds, it now blows a southerly wind.

In terms of the other directions, the northerly wind is generally behind the clouds, these small clouds that are like mist or fog, that are generally underneath the clouds, which are not really part of the cloud, they would form then pass and then they would form again and then these are the signs of a northerly wind.

Small clouds form, disappear, others form and then the tops of the highest mountains start to get misty foggy type of cloud, then there will be a wind from the north, but these days, even without these little fog type clouds on the mountains, and the clouds have not formed intermittently, the northerly wind starts to blow, sometimes for days at a time.

That is what I have noticed now. The westerly wind is something that I really have no clues about other than the fact that this wind is generally called the snow bearing winds. In the early spring, at least anyways, this used to be the soft snow wind, which would bring the powder snow. As well, the northwesterly wind is called the snow making wind as well. It still is a snow bearing wind.

In the summer, when you start to get westerly winds, then the winds take a while to finish blowing from that direction. When there is no wind from the direction, but the clouds are moving from a westerly direction, this is a good sign. As well, during this season the easterly wind is also good especially with the higher altitude winds. As long as there is no wind with it.

It is not like “*anisarniq*” the wind the pushes out. The easterly is different and the *anisarniq* wind is more for the fiords. But when the easterly is blowing, it can produce strong winds, but the production of strong winds seem to be few and far between compared to what we used to experience. It does not seem to storm as much from that direction anymore. Sometimes it is a month between blows from this direction.

*What about the changes in terms of seasons, hereabouts we generally have five seasons; Upinngaksaag, Upinngaag, Auyaq, Ukiaksaag and Ukiuq, what have you noticed in these last few years?*

The seasons are changed; especially these seasons. Perhaps to use the water as an example, the summer season is a lot longer than it ever used to be, at least from my recollection. The time of open water from the fall to the ice freezing over seemed to always have its timeliness, but these last few years, the fall has become different.

The ice starts to melt even before the traditional time for it and the ice formation dates are no longer relevant as they are more than a month behind the usual time. In terms of Inuit who have grown up in this area all know that the ice does not form at its usual time anymore.

The summer, both in terms of temperature, which is slightly higher and the length is a lot longer, and it has extended the fall season here as well. The summer is quite a bit longer, although it is not that much warmer than before. The climate seems to be a wimp now, in terms of the cold. This affects not just the ice timing, but also its deterioration. That is what I think.

*You have noticed the changes are occurring over the last ten years, what effects on lake ice have you noticed in that time? Can you elaborate on the differences in timing, characteristics or other noticeable changes?*

The lakes and their rivers are not one of my favourite places and I am sorry that this is the case, but the rivers are affected in that they are usually at lower levels. To cite an example to fish lakes, the fish that run to the seas, the rivers used to be deeper than before and the rivers had to be crossed only at specific points and these days, some of those rivers are crossable in places where it used to be too deep.

The rivers are now quite a bit lower than they used to be and that is what I have noticed, but in terms of lower waters, it is noticeable but not that blatant. The freezing of the lakes I have noticed and I am told sometimes that the lakes are no longer getting as thick as before.

Some of these lakes would get quite thick, especially the lakes where Inuit went fishing, sometimes even before the water level was reached, an Inuk would not be visible due to the depth of the ice that he was working. That is how thick they used to be. Nowadays, there are no lakes that reach that depth of ice anymore, with one exception in the lake at Kangiq&uruluk, it gets the thickest due to its proximity to a glacier.

The other lakes do not even get that thick anymore and even prior to the water level being broached, the ice when there is little snow can be really thick. Nowadays, even though there is hardly any snow cover, the ice does not reach its traditional thickness anymore. That is what I have noticed in terms of the ice thickness in our lakes.

In respect to the characteristics of the ice, they are different. The ice still gets really frozen, but if you look at the length, in terms of months, they have lost time. If the cold stays longer, it gets thicker. These days the lakes do not remain frozen for as long and they are melting a lot faster. It is also noticeable that the ice is different in the way that it chips off the ice pick.

Even when it is still very frozen, it does not get brittle enough for pieces to go flying, when you were trying to remove slough from the area, it used to be a harder time as the wastage was of finer grains and these days, it is easier to use a dip net to get the slush off the waterhole. I cannot really ascertain that it is a lot warmer, but the fact that the ice is different is noticeable.

*In terms of the sea-ice, let us move into the changes in the marine areas and the ice formation that you may have noticed in the last ten years?*

Compared to the previous climate, the ice does not form anywhere near where it used to freeze over. For example, areas with heavy currents are the last to freeze over due to the current; it is kind of like that, with the water no longer freezing over. It seems that the currents have not really changed, but something has, perhaps the water temperature.

This may be due to the warmer temperatures, but at any rate, the timing of the ice is at least two months behind now, compared to the past. That is what I have noticed and in terms of the spring melt; the ice would occasionally melt earlier than usual. But these last few years, every year the ice melts earlier and earlier.

Even areas with little current are not freezing over and they have non-recurring polynias all over the place now. This used to only occur at the areas where there were really strong currents. These areas are called “*aukaturliit*” as they tend to melt from the bottom up and they would always be the first areas to start melting.

These areas would be the first to start melting and deteriorating; these were known areas of strong currents. These days, even in place where we have no known polynias, there are occurrences now happening all over the area. Near Pangnirtung, we are starting to get polynas where there never used to be one. That is how thin the ice is nowadays.

The ice is quite a bit thinner than my own recollections. The ice still gets fairly thick as we still get cold weather. These days, though, even with the cold weather now, the months that used to be called the icing months are now quite a bit shorter. This year, it has hardly snowed and if this was the past, then it would be called “*sikkuriksijuq*”, that meant that it was getting really thick.

Nowadays, even with this scenario, in April there are polynas that are occurring already. That never used to be the case before. This is while the ice is still fairly thick, even though we have not actually measured the ice; we generally note the areas that would

have been ice covered are not the same anymore.

*What about the floe-edge, what the Inuit have noticed in this area and the location?*

This fiord is quite a big one, Pangnirtung Fiord and ever since I have started to recollect matters, this fiord opens up to Cumberland Sound; we call it “*ikiq*” as well. When the sound ices up, it was called “*nuttuq*” and it used to occur more frequently between the complete icing over of the sound. That is when it is called “*nunniraqtat*”.

This winter we have had a fairly cold winter and the north wind has been blowing bringing in the cold air, in the past, if we were to look at the icing period it would have completely iced over the sound, it would be “*nunniq*”. It is still not at that stage.

Even during the winter, even with the cold temperatures, the climate has changed in ways that I have observed are lengthening the period between the freezing over of the sound. Our sound used to completely ice over every once in a while, but it has not occurred for years.

When I was a child growing up to my youth, the sound froze over at least every few years. It is definitely not icing over as much as it once did. The period has grown between the times that the sound would freeze over.

*What about the permafrost, have you noticed any changes? As Inuit we do not use it as much as in the past, due to technology, what have you observed in relation to landslides?*

Not really. The areas that are prone to landslides and avalanches are generally like that all the time and that is why they were avoided. But these days it is sometimes possible to witness a slide that occurred in an area not known for its slides.

I think that this may have to do with the permafrost melting and I have heard that the hunters are seeing areas that are experiencing landslides that never used to have them. As well, on more than one occasion, I have witnessed the occurrence, not every year, but on occasion the areas that do not usually experience slides are experiencing them now. I am sure that it is connected to the issue of climate change.

*What about the snow? What about the snow conditions? Do we get more snow today or less snow?*

In terms of my own knowledge, it used to get a lot more snow, especially early spring when we would get powder snow, at least that is what I recall and this is another aspect of the climate that has changed from the past. They even used to build a “*talluk*” when the snow became deep, “*maujaligaimmat*”.

This was to help you walk around when there is too much snow, that is why they would build a talluk and this was usually an annual occurrence, although it would occasionally

not happen. The snow has not become soft and deep in the early spring for many years now and that is what I have noticed.

*What about the snow characteristics? Let us say that if we had to build a shelter, then we have to either dig or build an igloo, we would need snow of a certain type. Has this changed as compare to that past?*

Yes, if you are checking for it. I have not personally checked the snow characteristics, but I have noticed that the characteristics are different especially when you want to make an igloo. The snow looks exactly the same on the top, at least the look of the snow, but the changes are obvious and it is as if the snow is more ethereal and I mean that it does not get as dense and able to withstand the wind. Now the snow seems porous and the wind blows right through.

It is called “*sullujaaq*”; it was called poorly frozen snow that had not frozen properly. The snow is usually in that state now. There are still patches of good snow around. Another thing that I have noticed is that the sound of footsteps on the snow has changed in its pitch and tone. It used to have more echoes in the past, but these days it is duller, as if it is not as frozen as before.

*What about the changes that affect your travel plans or routes during the year?*

In terms of travel problems, I have not really noticed changes in the lakes, as I do not use them as a major route when I am travelling. I can only state that due to the warmer temperatures, the ice is not as densely cracked as it usually is.

The cracks are usually all over the place. I think this is an indicator of higher temperatures during the winter months, but the ice used to be all cracked, even when it was really thick. The ice is not as exerted in different directions I suppose, due to the less than normal warmer temperatures.

In terms of problems with the sea-ice, it still gets thick, but in areas where it has hardly any snow, “*apputaittuq*” the ice does not get as frozen and as thick as before. When you are riding on it, the salt content and the slipperiness have changed. When it is colder, the ice is slipperier and when it is warmer, the sled tends to stick to the ice.

*What about the water levels in the lakes, rivers and so on, has it changed? Have the tides changed over time or are there other changes you are aware of?*

The lakes seem to have not really changed, at least the larger ones, but the smaller lakes now are affected in that they are now overburdened with water initially during the first snowmelt. I think that this is due to the snow melting almost all at once, in the past, the snow used to melt very slowly, not at the speed it does now and there used to be snow patches all summer long.

There used to be “*aniuvaq*” into September as well. That is what I recall. The areas that used to have these snow patches no longer contain them these days and they seem only to have the name of “*aniuvalik*” only with no snow.

But in terms of the lake water levels, the edges that are used by the caribou, the muddy edges, these have not really changed, so I cannot really answer that question properly.

*What about wildlife? Have you noticed species being affected by the change in the climate? What about the fish, are their runs or their health affected by climate change?*

In respect to the fish, I have not really noticed any changes. In terms of effects, I have not really noticed anything but that is more likely due to my not being an avid fisherman. There are more adept and avid fishermen who can attest to the changes occurring in our fish populations.

*What about the issue of new species of birds, have you seen other examples of new species?*

In terms of birds, there are some new species around, especially when you look at the smaller birds. There are now these small birds that we have not seen before, especially noticeable are those birds that those of us Inuit who have gone to the south have seen and now see in the north. They are different and we have now seen examples of these migrants in our lands.

Our birds as well have changed as well. They seem to be rushing more and more, as if they are in a big hurry. I do not know the reason why, but the young birds are growing faster. I cannot figure out why they seem to have accelerated their growth, but it used to be due to the cold that would be nipping on their heels.

That is why they seem faster, because the weather has become more lenient and there is still quite a bit more food available prior to their migration. That is what I have noticed and accordingly I have commented on these changes in relation to birds.

*What about the issue of new species of insects, have you seen other examples of new species?*

There are some species that are arriving that have not been seen before and they do not even have a name for them. The insects that we know, such as the “*qalirualit*”, they all have names, at least the species that we are accustomed to all have their names.

There are now reports of insects that Inuit have no names for and they have to describe them. The flying insects are still not that affected, but the black flies, the ones called “*milugiaq*”, there are these insects that kind of look like them, but they are not the same. These are the only ones that I have noticed in respect to insects.

*What about the species of vegetation in this area, have you seen new species that are growing in this area? Have things changed that you are aware of?*

In respect to plants, I cannot make too many comments, as I have not really noticed changes. But, in terms of the plants we have had for years, such as heather or other flammable plants, they seem to be more lush.

The berries are more subject to the lengthier fall, and they tend to be frozen earlier. Perhaps this is opposite, because our plants have not adapted to long summers, they are still following the ancient timing sequences. They are adapted to only grow the months that we had summer in the past. It used to be that with the frost, the plants would start to change in colouration and everything seemed to be in harmony.

Nowadays, the plants are starting to change into their colouration at the time it would traditionally have started to cool even when the temperatures are still warm. That is what I have noticed and as well, these “*tittaak*” as they are called, these bright plants are not growing as much as before, perhaps due to the increase in the wind. I miss those little plants, the “*tittaraat*” in the summer. I believe that they are also called “*pualunguaq*”, the little white plants; the seeds that are blown from them are called “*tittaaq*”. This included the cotton and some of the other blowing seeds that I have missed these days.

I have noticed that the grass that grows around here is quite a bit longer than my recollection about their lengths from my youth. Perhaps this is due to the fact that I did not live in Pangnirtung for a long time. They seem to be longer stemmed nowadays. As well, the blue little plants that are found near wetlands, I forgot their name, but they are growing more around the community.

They are affected by the climate changing and that is why the vegetation is changing ever so slightly. That is why I have missed some of the plants of my youth. This can only be due to the changing climate that we are experiencing these changes. No person could affect the climate in that way.

The animals that depend on the vegetation do not all depend on the same types and that is why it is hard to say what has changed and how this is affecting the animals. I cannot really state that it has affected them, but what I have noticed is that the caribou, even though there is quite a bit of food, they are not as prone to getting tallow on their backs anymore.

The tallow is different along with the taste and smell of the meat compared to the past. Perhaps the vegetation is changing and we are the only ones not noticing the changing smell of the vegetation.

They are only exhibiting the smell of what they eat, and the smell used to be more pungent, “*tijjariktuq*” it was called. I have not smelled a nice caribou smell in a long time

like that. The smell used to be more pointed, but now they are different in that way.

*What about water quality or quantity in this area, either through the taste or the colour? What about the water from our community? What about the growth of weeds or other vegetation in the lakes?*

Not really. The lake water does not seem to have changed that much, but every summer I am always walking in uninhabited areas, especially where there are caribou. I have noticed that the lakes, perhaps due to the sudden melting of the snow overnight, tend to have more sediment in the water.

Some of the lakes are still full of sediment and silt, but there are more of them now. Some lakes, with no source of water also have silty water that is always cloudy and not clear. But the lakes that did not have sediment previously are starting to get sediment, this is noticeable when you look down upon these lakes.

The whitish area that clouds the water keeping you from viewing the bottom is called “*isutaq*” and more lakes are exhibiting this trait. That is what I have noticed. In respect to the quality, I really cannot state, although I have noticed some subtle changes. It is still very clean water, especially the running waters, but the small creeks and brooks are a lot more infested with small bugs in the water and as well, the small ponds and lakes are now cloudy and when you get water from them, it is noticeable.

We have certain lakes that we use for drinking water, but we are starting to only collect water from moving water as these ponds and small lakes have more bugs in the water.

Even the small ponds are getting more infested, that is what I have noticed. In respect to the local drinking water, the water when you drink it, it is not as heavy as it used to be. It is lighter, perhaps due to the fact that there are additives added to the water.

It could also be a result of the climate change, but when you drink the water, it used to be crisper, at least to my taste. It seemed more filling due to its crispness but these days, the water that I drink does not seem to have the same fulfilling feeling that I used to have when I took a drink of water.

In regards to the algae, I have not really noticed any changes in the growth rates of water vegetation. But I have noticed that there is more algae in the small lakes. It does not really seem like algae, but it is slippery and causes the rocks to get slippery.

Nowadays, the rocks that were not slippery even when wet, are getting quite slippery. It is like a coating on the rocks. Places that would not seem to have any slippery rocks now have this growth on them. This is part of what causes me to wonder about the changes that are happening.

*What about the tides, have they changed or has there been differences in the areas that*

*are covered by the tides?*

The tides do not seem to have changed, as far as my experience goes. But, in terms of subtle changes, the monthly calendar where it states that the neap tide and the new moon are to arrive, they are slightly off from what the calendar says, especially the neap tide. The two tides, “*pittuniq*” and “*pittunivik*” have other words, such as “*pittunailaaq*” and “*pittunirusiq*”.

These are the neap tide processes, but this summer, the tides were different to some of us, in that the highest tide not only came but it repeated itself. It would have been the “*pittunirusiq*”, but it is just like the “*pitunivik*”, the highest neap tide. If I had been paying attention, perhaps I could have noted it earlier but this is something that other Inuit have noticed as well.

*What about areas of tundra fires that you have seen that are not seemingly caused by humans, but by natural causes?*

I really have not seen any areas that have been burned. We keep stating that it is warmer than before, but when I was a child in the 1950’s, when I was out walking with my parents, we saw a large tundra fire, these plants called “*urjut*” had been smoldering, but they are slightly different, with more density.

This looked like it was started naturally and I have not noted any other incidents. However, the plants, even when they are not singed, you can tell that they have been stressed, as if something was pressing down on them. This may be the hotter temperature we experience nowadays.

*Let us see if we can move to health and the effects of the climate on human health such as sunburns, snow blindness and so on. Have you noticed any changes in the health of the Inuit?*

I really have not noticed any changes, but it is similar to a previous question. My body seems to be reflecting the mood of the land and when I get up in the morning after a good night’s sleep, when I would go outside, there was something in the air that caused you to wake up fully.

Nowadays, the air seems to be different, it is hard to explain, but it seems to have something to do with the pollution, something that we cannot really see, but that our bodies are feeling, especially in the morning.

*Has the climate change caused other effects on human health such as in regards to the occurrence of colds or not?*

In terms of changes to the occurrences of snow blindness and sunburns, it is noticeable that the sun is stronger in its intensity. These are not real burns, but they are a result of

drying out of the skin. It starts to peel more. Before, we would only get a suntan.

Nowadays, some people start to burn and peel. There are more problems now with the skin cracking and peeling. That is what I have noticed.

In the winter, I have noticed that there are less breaks between the colds that linger in the community prior to another strain arriving. Compared to the past, when it was a lot colder, perhaps we did not have the pollution back then and this could be exacerbating the problem.

Nowadays, there is nary a break in the colds before another strain is making the rounds in the community. In the past, it was the usual fact that we would get a cold at the beginning of the year and then no more colds for the rest of the year. Now, there are more strains and the climate could have an effect.

*What about snow blindness and so on, has there been an increase?*

Not really, I do not hear of many cases of snow blindness anymore perhaps due to the fact that everybody wears sunglasses now for their protection. It used to be, that every spring, someone would get snow blind. This was a yearly occurrence, everyone who spent a lot of time outdoors. As well, that month that was called the month of snow blindness, it used to appear around the time that the ice was losing its snow.

Then with all of the light bouncing off the ice and glare snow, then you would get snow blind. I cannot ascertain why the period does not affect Inuit as much as before. Perhaps it is due to the ice not surviving for long anymore. As well, the melt water pools have rings of dirt around their edges, these were called the snow blind rings. There are less of these now, but there is more gunk, not dirt. That is what I can say.

Not really. I have not really noticed any changes to the human health in terms of climate change and unfortunately I cannot really speak to this issue as I have no real knowledge of it. I have heard that the air is not as crisp or fresh as it once was, especially by the elders.

As well, when you are hiking and you are tired and breathing hard, the air seems a little bit different. Being outdoors is a lot better than indoors especially if you are tired and breathing hard. Nowadays, with that kind of windedness, it is harder to breathe now and it seems more acidic to the nose and it is sharper. I cannot state what it is that has changed, as all I can say is that it has changed.

*Do you have any other comments to make in regards to this study?*

I really do not have a lot of other comments to make, but our ocean, especially the sea bed facing the shore has become less clear. It used to be clearer and you could see the bottom from a long ways away.

Nowadays, it is harder to see the bottom. In the old days when we lost a seal due to sinking, we could still look for it, if it was not too deep and we would try to hook the seal.

The clarity of the water was a lot better. Even in those places now, the water is harder to peer through. You can make out the bottom but it is not as clear as it once was.

There seems to be nothing added in the water, and as well, when it is really calm, our water has a seeming slick covering the water on the horizon. We never used to have that kind of covering on top of the water. Further, the seaweed seems to be collecting this oily substance from the water. I think that is has come from the air, the pollution that is raining down.

In the old days, the seaweed did not have any type of substances on them, but these days the seaweed is now slippery as if it has an oily layer on it. That is what I have noticed about the change in the marine waters.

Our snow that we use for drinking water in the winter has changed as well. We use it for water when we are out hunting, and as it melts, it seems to have substances included within the snow now. It is as if there is something else in the snow, because in the old days, as it started to melt, it would start to become clear. It is obvious because you can now see the rings at the water line of the pot, this is a yellowish substance that we find on the level of the water of the pot.

## **Climate Change Interview in Pangnirtung – October, 2002**

### **Abraham Keenainak**

My name is Abraham Keenainak and I was born on April 4, 1941.

I was born in Saunirturarjuk, a place where we camp before relocating to Pangnirtung. I was quite young when we moved to Nunataaq. I grew up from quite young to my adulthood.

I grew up spending most of my time hunting with my father and others and they used to say that climate was changing. I too have seen the climate changing.

The changes I've seen on ice are that before 1962 the ice conditions were good those years. The ice condition changed after 1962. As a hunter, I started noticing that ice was starting to form very late. Around 1960 the ice used to form early. When it had formed the ice conditions were good those days, but after 1960's even though the ice has formed, it was still not good to use. Those days the ice used to form completely during January. The ice at that time is completely formed as we can go just about everywhere to hunt/camp. The other changes I've seen on the ice condition is that during April, the ice seems like it would be good to use but it usually started breaking earlier. There was even a time when it was May the ice wasn't useable. It wasn't like that before. We even used to come to Pangnirtung with our dog teams in June those years but these days it's impossible. We even have started boating around May. That's how it had change since before, with the paths we used when we go hunting/camping.

Since I grew up spending most of time hunting, the other changes I've seen is how the snow forms on the land. The meltdowns are usually early. The paths we use on the land are these days impossible to use due to early melting of the snow on the lands. Those days the paths were useable for quite a while but these days it's not like that because the snow melts earlier. Being a hunter, who travels and uses the land, sometimes the land isn't useable even though we'd still like to use it. The ice breaks early and the snow melts early during spring on the land. The paths we used to use these days aren't useable because of the early melting of the snow.

The changes I've seen on sea waters is that Pangnirtung gets low tide, and the low tide usually goes quite far. When it does, it has pads of waters throughout the low tide, these pads never got warmed but these days they do get warm. I've noticed them this summer. Like for example, when we have just cut up an animal, we'd wash our hands from the water, the water isn't cold, it's more like lukewarm water, even salt water on the pads of low tide. I have seen these changes especially during the summer season. It wasn't like that before. The salt water used to be colder. These days it's warmer.

When the water was colder, there used to be more seals. Even though there still are seals around our region, there aren't that many anymore. I thought the seals have moved to an

area/region where the waters are colder. Some skins of seals are different during fall while some don't. Maybe due to lack of snow during fall, there skins are more like dried.

The weather climate has got warmer especially during the summer. The weather sometimes changes quickly, like, say the weather is good, the temperature gets warmer even though it looks like it won't due to the reflection of the sun. It wasn't like that before but the sun's reflection is warmer.

My parents used to tell me about this condition they used to get for three days. These days this condition comes any time it wasn't like that before. They used to say if we had bad weather for three days, good weather would come afterwards. These days even if we have bad weather for three days, good weather comes but changes quite often. Weather predictions are useful to predict but these days the predicting is different because of the changes.

These days we don't get much snow as we used to get. Those days with our dog teams, the snow was more especially in spring. Pangnirtung region hasn't had that kind of snow in a long time.

Even though we still get blizzards, the snow formation is different. The way snow forms from the North and South directions are different. The formation from the North direction is more like the conditions we get from the South. The North directed winds were good to use, it's not like that anymore maybe because of the changes of wind directed changing. That's what I have seen in the changes of wind directions. Because of this Pangnirtung doesn't get most blizzards. Pangnirtung used to get strong winds before. We still get strong winds but they aren't that strong anymore. We used to get more north directed winds but today the wind usually comes from the south direction. That's how it had change as I have noticed them before.

There haven't been many changes on the formation of ice on lakes. The lakes we go for fishing hasn't really change. Not like the conditions of sea water ice. The taste on lakes is like still the same, very good to drink.

Probably due to warmer climate the ice on sea water seems to get softer quicker before spring season. Those spring seasons after most snow on ice have melted, the color used to be in bluish color, these days it's whiter and softer.

The changes I've seen on plants are that those days there used to be lots of Aniugaaqs almost throughout the summer, these days there were hardly any. There aren't many more due to warmer temperature on the frost. Even some glaciers have melted. There are some glaciers that aren't there anymore because they have melted due to warmer climate. Glaciers are melting.

There are some paths we use that aren't the same anymore probably due to climate change or warmer climate. Like for example some areas where rivers never flowed are

flowing causing it to flood the sand, which causes more rocks on the surface on the land. This has cause some changes on our paths, there seems to be more rocks on the land, but not on all of the land.

The other changes I've seen are the sand that has formed due to the flowing of the rivers. There are areas where sand is different than the one we had before. The way rivers flood hasn't really change.

The changes I've seen on animals are that the outer layer skins of fish. They have marks that are predictable on how they have them.

There are birds that have started to come which aren't usually in our region. Once in awhile we see birds that aren't seen in our region.

There haven't been many changes on plants that I've seen that grow in our region. The animals that eat plants have also changed due to lack of rain. The fat on caribou are thinner this summer, because their condition is just like the weather. It's probably because the plants they eat aren't moisturized because of the dry land. The berries we had this year were plentiful. They never grew that much before around Pangnirtung area. This summer berries and kigutanginnaqs were plentiful.

I have not seen or heard of a person getting sick from eating any kind of country food.

## **Climate Change Interview in Pangnirtung – October, 2002**

### **Joanasie Manniapik**

My name is Joanasie Manniapik and I was born January 31, 1936 at Imiggak, close to an outpost camp from Pangnirtung.

I grew up at the same place where I was born, right until I reached my adulthood. We moved to Pangnirtung around 1936. I had TB during 1963. I was sent out, came back and has lived in Pangnirtung ever since. I have been here ever since then. While I was recovering from my TB, my dogs had all died. When I had recovered I came back and start living in Pangnirtung.

The first time I noticed that climate was changing was when I was still young. I noticed that the land was forming snow faster than forming ice. The weather used to be colder, much colder even before the ice has formed. I kept noticing the changes until I reached my adulthood. The ice used to form earlier those days. Even though the weather these days are still cold, it's not colder than before. I think that especially Pangnirtung ice forms very late compares to the other communities.

My parents didn't really tell me about the climate changing but my father used to tell me to be prepared, especially predicting weather. According to his beliefs he used to tell me that every time I get up in the mornings, I had to go outside and take a look at the weather. He used to predict weather pretty well. The way to predict weather these days differs to the older times. The kind of weather these days are like the weather is calm one moment and than next it's different. The weather conditions used to be better those days. Sometimes I think that it's probably due to our world changed by the climate.

The way for me to do things has changed especially during the winter. The paths we used to use before, we can't use them anymore. There is this one path that used to have lots of snow, both on the ice and the land. The area is now covered mostly by sand. It has changed. There has also been changes on the things that I do by, for example, there had been times when we had to wait a period of time, sometimes longer to catch animals due to the changes on the paths from the effects of climate change. Especially in Pangnirtung that our ice doesn't form until its very late. We have noticed that some areas that we used to use as paths are no longer useable. I think it's due to the warmer climate. The ice on sea waters seems to break earlier too compares to those years. The ice forms different these days because of the warmer temperatures. Pangnirtung's region used to form ice that was good. Today it hardly forms well. Not like before. The area where I was raised, the ice there doesn't breakup sooner than here in Pangnirtung. The temperature these days aren't cold as before. It used to be so cold that sometimes we couldn't even see our dogs from the sleds because it was so cold that it was like foggy. Also the temperature when the ice has formed seems to have changed. Those days when we had good weather during the spring, it used to be warm. These days it's not. I remember one time I was a young boy. The weather was absolutely beautiful and warm.

The kind of temperature we have compares to those years are different. These days we get nice warm weathers once the ice have all melted. These days it's like summer season arrives, gets warm and than becomes cold. But right now it's supposed to get colder because it's a fall season, it's like it's getting warmer now even though it shouldn't be. All seasons' looks like all have been affected due to climate change.

There haven't been many changes on the rain but sometimes there is. There have been times when we didn't get rain for a while but starts raining continuously. It looks like the rain has change compares to those years. These days the rain seems to rain for longer period of time, those days it used to rain for shorter period of time. This used to cause the plants to grow very healthy in a short period of time. We don't get this kind of weather anymore. There are areas in the land that has dried up due to lack of rain. It wasn't like that before.

The snows we get during the winter have changed. Back in those days the kind of snow we used to get most of the time was the fluffy soft snow. It was sometimes too soft that our sleds used to get stuck. These days due to lack of snowing during winter, we don't get those soft snow on the ice/land. It's due to the lack of snowing.

The blizzard conditions during winter haven't really changed. But at some points it has. We don't get many blizzards during spring either. Probably due to lack of snow, we don't get many blizzards as before. It has looks like affected all seasons.

Lightning strikes before in our region use to strike more those days. These days we hardly see lightnings struck. It used to strike mostly during spring seasons back then but these days I haven't notice or heard one striking. It may probably be that I am in Pangnirtung and there are other sources making noises in the community.

The wind conditions we get these days are very different that the conditions we used to get before. Those days if we had a bad weather and the winds' direction changes and good weather developed afterwards. Today in a bad weather, the wind changed its direction, clears up and doesn't clear up even though the looks of the sky would get better weather. The conditions we get these days are different than before. It looks like we get more winds these days too. There used to be times when the weather used to be so nice that the water used to be very calm. We used to get those kinds of weather sometimes for three days straight in those years. These days it usually goes up to two days but not longer, even during the spring season. It is probably due to the winds we get these days. These days when we go boating we have to be more prepared and have to watch our boats when using them. These days the winds tend to appear more unexpectedly. We have to bring more equipment that could be used for emergency purposes. Most people bring these kinds of equipments but there are still some people who don't.

There have also been changes on how people get worried when hunters don't arrived on time. Those days when a hunter didn't get back on time, we knew right away that they had caught something and had something to do. These days if a hunter is like couple hours late, we get worried. It's probably the same in other communities. Those days we

used to travel even on blizzard conditions because our dogs knew where our camps were. If a hunter is late, people start phoning others making them worried. These days probably due to our equipments like skidoos or boats that they tend to break and people knows they do. That'll make them worried easily these days. It is probably due to the winds or blizzard conditions.

The way rivers flow these days are quite different that before. They used to flow clearly but today it's still clear but different. It wasn't like that before. It's not that clear anymore. It's still good to drink though.

The thickness on our lakes those days are thinner than the conditions we had before. Those days it used to be thick during winter. We still get thick ice on lakes bit not like the thickness we had before. Back than there was even a time that the ice was so thick that another person was needed to pick up a person chopping ice. These days it does take time to chop but not deeper than before. We used to use drills in those times it used to be thick. Today we still use drills and it's still thick but not like the thickness we used to get. Just like other communities, the ice that has lots of snow more likely to be thin. Also some rivers that used to flow well before are now not flowing probably due to lack of rain. This summer I really did noticed the change because there were times when I saw fish trying to go up the lakes using its river; they couldn't due to lack of rivers flowing. If we were in those days, they would have made it to the lakes with no trouble. Probably due to lack of rains these days that some rivers don't flow as much as they did before.

The ice conditions on sea water have changed. Those days if I were to chop the ice, there would be pieces flying everywhere. Lakes' ice is like that. That's how frozen it used to get. Today, if I were to chop the ice, it's different now, like it's not completely frozen. These days the ice seems to be softer.

We used to use dogs' lines to sometimes predict weather. If the line was melting than we knew the weather was improving. We used to use them to predict weather in those years but today since I mostly rely on using the skidoos more often, I also tend to use the skidoos to predict weather. If the machine is warm than I know that the weather would improve.

The ice formation these days are different than the ones formed before. Even though the weather is cold, it doesn't form very well. The ice seems to be wet these days. Those times it wasn't the same.

The floe edge in Pangnirtung has not really change. But these days they are closer to Pangnirtung probably due to the ice moves more and tends to break easier. The path we used to use has changed. There are areas where we use to have no trouble using that aren't useable today. Those days the ice on floe edge use to start breaking up during spring season, but nowadays it doesn't.

The paths I've been using have dramatically changed. If I were to travel back than I would have not much trouble because of lots of snow. I would also not cross/use the dangerous ice conditions on the ice thickness. I think that since the weather is slowly crumbling. The paths we used to use those days have mostly changed.

The birds used to arrive late those times. These days they seem to arrive early. Even though we get early meltdowns, they still arrive late. There are also birds that have been seen that weren't here before. Loons have started arriving in large numbers they weren't here before. Pangnirtung didn't have that many loons before.

The plants that grow here haven't really changed. If we had hardly any berries this year, than next year there would be plenty. Probably due to warmer climates, the berries seem to grow faster and healthier. There haven't been many changes on plants. The plants that grow close to the ocean these days seems to start growing more often compares to those days.

The animals that eat plants have also been affected by the climate change. There seems to be no harmful effects on birds but caribous these days are more sick probably due to lack of plants that caribou eat. Those days I didn't hear or saw a caribou sick. These days we see lots of dead caribous that died from natural reasons. There have been many reported dead caribous.

I have heard that a person got sick from eating seagull. They are usually the first to start producing eggs; people were hospitalized from eating their eggs. There was also a person getting sick due to eating loons' stomach.

## **Climate Change Interview in Pangnirtung – October, 2002**

### **Moses Qijuaqjuk**

My name is Moses Qijuaqjuk and I was born in Nunataaq, the place where I was born. Since I grew up there, I've been going back and forth to that region because the land is beautiful.

I grew up at Nunataaq the area has changed. The water in those years used to be calm most of the season but these days it's more liked windy. I think it was around 1950's that people were relocating and that dogs were killed that we moved here to Pangnirtung even though I'd never really went here.

I grew up knowing my grandfather, Keenainak and sis son. He used to tell us that the climate was changing. He used to tell us to predict weather because it will continue to change.

Since I go to the region where I was raised, I have noticed changes on the climate. Like I said earlier, the climate used to be colder but these days it was mostly windy. The snow condition was kind a difficult those days because of lots of soft snow on the ice. There used to be lots of soft snow, it was difficult for our dog teams to use. There was even a time when people had to make paths for the dogs to use because the snow was too soft. These days there is hardly snow anymore. And those days the ice had lots of pads but these days there aren't that many any more due to not much snow on the ice. That's how much it has changed. It also gets strong winds that are so strong it gets dangerous these days.

Those days when we used to go by dog teams, I used to have a camp further north, since than that I have notice the climate has been changing. The path I usually use by skidoo even at windy weather, I use the tracks on the snow to go back and for the. Some area has lots of soft snow, so I usually use the path. The weather condition isn't good for a while. We can predict when it will get windy. Even if it's snowing or windy I try to keep on tracks on the snow when I travel through that area. The path had soft snow, so we always went through the same tracks in order to use the path. We even had to group our dogs tighter in order to try not to use the softer part of the tracks because we'd get stuck. That's what I used to do. We had to use the same tracks those days. And some ice used to be covered with snow even if the ice was thin. These days we see this more often. The ice condition are considered dangerous where areas before they weren't. The ice breaks sometimes even during spring. It is probably due to the seawaters changed condition. It's not from the current movement. The ice is different these days due to softer ice. Those days the ice used to be harder. These days there is like another layer on the ice. We have to watch where we go because some of the ice could be thin and dangerous to use.

The changes for me doing things on the land have change. The climate is changing. The things we used to do those days compares to today is different. That's how it is these days.

The temperature these days have also changed. Those days it used to be a lot colder. The weather used to be colder that we used to notice that just by using our breath. We breathe out, the air used to froze quicker due to colder climate. Even the air froze when we pee has looked like changed. It doesn't freeze quicker these days due to climate change. It is warmer these days. The wipe we use was an example to notice the climate changing. If it was frozen and started melting, we knew it was getting warmer. These days it's not like that, it is not that cold anymore. The climate has really changed.

There are also changes on the weather. Pangnirtung during spring/summer is sometimes very hot. Even if we had warm weather for a while colder climate comes thereafter. The condition seems to change quicker these days. If we had a good weather but the wind direction changes, the temperature gets colder. That's how it is today, pretty much different than before. The winds' direction changes from every direction these days.

The snow we get these days is like, the snow falls and starts forming snow on the ground but than it melts and doesn't formed. The area where I live used to get lots of snow; these days it's not the same. When it had stated snowing, it sups quickly. That's how it is these days. The way we predict weather using the clouds has also change.

The blizzard conditions have not really changed but even if we get blizzard the temperature is not cold. Those days when we had blizzards it used to be colder, frost used to froze quicker. Sometimes blizzards are strong.

The wind condition has also change. We never had bad weather for more than three days before. These we have bad weather for more than three days sometimes. The north directed winds are like longer these days. When my father had passed away, my stepfather used to tell me that the wind would never last up to three days. The condition would change and improve on the third day. These days it can go more than three days. One time there was this windy day, it was quite strong even humans would probably get flowed by the wind because it was strong. The winds these days seems like they come from every direction.

The place where I grew up had history of lightening striking before. The way rainfall seems to have change. These days the rain is like different compares to before. If we see an area that is really heavily raining we sometimes used to get scared thinking lightening would strike. Predicting conditions in that region is reliable. Say I predict an actual condition for next years condition, sometimes these predictions becomes true.

The wind seems to rely on both the sun and the moon. The sunrises while the moon goes lower where areas the moonrises while the sun goes lower. The winds direction seems to

change quicker these days. The weather doesn't stay calm for a longer period of time. The main directed winds we get are north directed and south directed winds. These days if we get winds from the north, the direction changes easily. If we had north directed winds and if it was strong that was considered dangerous to use because of the strong winds from the north. The wind those days were like; it came from this direction but changed not directly but curvedly. These days it's not like that anymore.

The meltdowns on the ice on lakes seems to melt earlier these days compares to those days. At my camp, there is a river that flows year round and I did notice that every year the way it freezes wasn't the same anymore. The ground wasn't even frozen that I even saw little fishes. This was during the winter season. The lake is kind a far, upper section of the river is completely frozen but lower section isn't. The ice condition on lakes is like the same as sea waters ice. The thickness on the ice of lakes hasn't really changed. If the ice had lots of snow the ice the ice would be thicker, but if the snow was soft than the ice would be thinner. It is still the same. The snow that formed by the winds on lakes are usually thicker, while the ice that had formed with many winds they are usually thinner.

The taste of the water is different only in Pangnirtung. But if we go outside Pangnirtung the water is fresher. There haven't really been any changes of the taste on water. The water outside Pangnirtung area is different, fresher and tastier.

The ice on sea water forms very late these days. When it looked like the ice has started forming, it doesn't form right away. Every since I remember, the ice forms very late these days. When the ice has started forming, it usually melts again. But after it had melted the next formation is usually good. If it had snow on the early formation it will more likely to melt because the ice is thin. That's how the ice is in the area where I live. That's how it is these days.

The ice conditions are different these days. The thickness of the ice seems to be thinner these days. Even the people who go Turbot fishing have notice these changes. The ice is pretty much softer these days. The ice is like softer these days but before it used to be harder. The ice conditions aren't the same anymore.

The area where I live, the ice condition is good, lots of snow. But those days the path used to be easy to use as a routine but these days we have to use the area close to the beach because the conditions gets dangerous. These areas weren't dangerous before. There is this island close to my camp that I can use as an example. The path is usually good to use in winter seasons but these days it's kind a impossible to use. The point of the island's ice condition used to be useable but these days the ice condition is usually thin, even during winter season. If you don't know the area, it is considered dangerous because you don't know the area.

The floe edge these days are pretty much closer to our land. Before it looks like it used to be further away.

The frost on the land has also change due to climate change. The frost is usually melted making it warm. It is still frozen but not like before. The frost isn't the same anymore. When I traveled by skidoo I used to ride following snow that was formed by the wind; these forms are covered by snow they are now formed differently. We used to say that the caribou or any animals caught during the colder seasons, the meat used to get colder quite quickly but now it's like that.

The sand on beaches have changed, due to the pressure from the currents, it's washing away the sand. In an area close to my camp some areas are completely washed away. They too have changed due to climate change.

For the paths I used on the land, there haven't been many changes. Big rocks that I can recognize are like more noticeable these days. The conditions of the paths we used haven't really changed.

The paths that people used haven't really changed. Since they have been used for a long period of time, they'd become trails. Just like the way caribous make trails. The trails that were used by our ancestors, they are still used. The reason why they are still noticeable is that people still used them. There are trails that go a long way. These paths are mainly used since people try using the same paths to make traveling easier. I've been going on daytrips during summers so k know the main trail that is used, I could actually see the path even though I'm not using it.

The insects in our camp seems like they haven't change much. There are lots of insects in that area. There are flies that are in different appearances. There haven't really been many changes on flies or bugs.

Last year we saw birds that aren't usually located here. There are also birds that come here that never did. They look familiar to sea gulls, but more aggressive. They never were located here before. The usual small birds that were always here are still here. But smaller birds have also been located while the birds that have always been here are disappearing. There seems to be like fewer birds in our camp area. There are now birds that stay up here and don't migrate. Last winter there were even some under our camp's home. Birds these days are actually seen even during winter. There are also changes on the skin of fishes. There have also been changes on how some fish taste. It's not the same as before, but not on all of them.

The changes I've seen with my wife on plants is that they have seems to grow bigger these days. Since the plants rely on the weather, if we had good weather most of the season than they would grow well, but if we had bad weather most of the season that they would not grow well. If the ground melts early than berries would be plentiful, but if the ground melts late, there won't be plenty. That's how it is these days, but those years there were lots of berries. I've noticed this from the place where I was raised, the way the plants grow have changed due to the warmer atmosphere on the ground. And there are plants that aren't here anymore. The areas that were good area for berry picking

aren't good anymore especially in our area. The other side of our camp had plenty this year because there won't any last year.

There haven't been many changes on animals that eat plants in our area, but on the other side, there were reports on animals found dead. In this region there are plenty of plants that are healthy but probably the other side gets more winds, there plants aren't that healthy. These animals died of natural causes not by other mammals, even though there are lots of reported wolves in our region. Since I am a hunter I have really not noticed many changes on animals appearances compares to those years.

I haven't seen or heard a person getting sick from eating country food. But I have noticed that caribous' ligaments, they seem to be bad these days. And also some appearances have changed on their lungs. There are tissues growing in their lungs that didn't seem to grow before.

## **Climate Change Interview in Pangnirtung – October, 2002**

### **Solomonie Nauyk**

My name is Solomonie and I was born in Usualuk on August 30, 1950.

I grew up in a camp called Qipisak, on the bay of the other side at Pangnirtung. I spent most of my childhood and adulthood there but moved here to Pangnirtung, when dogs were killed. They took us here by an airplane. This was probably around 1973. It was the same time students were sent to residential schools to Kuujuaraluk.

The time when I first noticing that our climate was changing was when I was an adult. Those days the weather conditions used to be looks like calmer and during winter, there used to be more snow. Those years the weather used to be calmer. Up to now there seems to be more winds in our region. Probably due to climate changing there isn't much snow as before. I've noticed these changes. Also the plants that grew well before doesn't grew well these days because of the ground. There are plants that grow pretty well but there are also plants that grow in two years. The way berries and qungulik grow are unhealthy than before. Since the berries grow just about every second year, they were plentiful this summer. The plants that grow on the ground are like they are dying just about every year. The areas where people used to lived produce lots of plants. I went to the place where I used to live in my younger days, the area we used to camp have plants growing in healthy figures. Those areas were used to store country food.

My parents didn't really tell me about the changes on the climate but I have seen them changing myself.

The way for me doing things have also change, like predicting weather or the little snow that falls, which is noticeable when traveling or walking, have also seems to change. I have not aged meat in a long time so I can't tell you exactly how the ground has been affected by the climate change.

The climate change has seems to change the temperature these days compares to those day it has got warmer. Pangnirtung in the winter used to be so cold that it used to look like it was foggy, due to cold climate. These days it doesn't get that cold as it did before. Those days' mornings were so cold that it used to get foggy even in the winter, but when afternoon came, it used to clear up. Those days the temperature used to be colder. I have seen that the temperature these days in the summer are a lot warmer. The sun's reflection seems to get brighter these days and looks like its getting warmer also. And our spring/summer seasons seem to arrive too early compares to those days. The warmer climate those days used to arrive on time but these days it comes early. Due to warmer climates these days, the snow and the ice seem to melt early, it didn't in those years.

I have not seen many changes on the way rainfalls. Snow and rain falls, making the ground wet.

We used to stay in igloos most of the winters those days, these days we mostly stay in tents. I tend to stay in igloos instead of tents. But during winter the tents gets cold due to not enough insulation. These days the snow seems to be much harder. Back than it used to be sorter. When we make igloos these days, the snow is much harder that before. One time I had to make an igloo with very soft snow, I had to step on it to make it harder. That igloo I built with soft snow, it was no good.

These days' compares to those years, we get more blizzards nowadays. These kinds of blizzards we get are very strong. We get these strong winds not only in Pangnirtung. Our blizzard conditions are usually bad, not only here but other regions too.

The land when traveling in winter, their seems to be more rocks on the surfaces, especially since I am not originally from here, I have to be precautious when traveling.

The way lightning strike seems to have no changes. Not too long ago, I saw one striking.

The changes I've seen on the conditions of the winds compares to those days have also seems to changed. The direction of the winds these days' looks like they come from any directions, which change a lot. That's how it is these days, the winds' directions comes from any directions. The way winds change its directions have seems to effect mostly during the summer seasons. For example, say I go boating on a calm day; suddenly wind starts flowing from another direction and the weather changes quickly.

I have not really seen the changes on the thickness of the lakes' ice.

The taste on the water these days seems to have change, because these days we get like two different ways river flows. One is from the lake while the other kind is very small river that started flowing probably because of the winds or from the effects of the meltdowns of the snow on the ground.

The sea water these days tends to have early breakdowns of the ice compares to those days. It's probably that currents in our region come from any region and from the warmer climate the ice tends to breakup early. Since the ice seems to be softer when formed these days, I think it's due to lots of currents coming in from any directions, and warm reflection from the sun, that ice seems to break early. There are lots of currents in our area.

The ice thickness on sea water these days seems to be much thinner than before. The thickness on lakes and ice used to be much thicker. Nowadays, the ice is thinner, I know because I go turbot fishing.

The floe edge those days used to be further. Today the floe edge is closer to our community. These days we have to travel not far to reach the floe edge but those days we had to travel further distance.

I have not really noticed the changes on the way ground forms when the snow melts.

Some small lakes we used to have are no longer lakes, mostly dried up. Some lakes either if it has fish or not, seems to be less these days where those days it used to be more.

The way rocks show on the surface seems to be more, due to floods on lakes. There are rocks that are easy to move because of the pressure it had when the rivers had flood.

The way snow forms these days is a lot lesser than before. We used to get lots of snow, but nowadays we get less. The snow on the ground melts quicker these days. Those days the snow didn't melt that quick like today. It is probably due to not enough snow on the ground. It used to be good for our sleds, when the snow was good for longer period of time. These days it is still good but only for a shorter period of time.

The paths I usually uses, I still use them and have not seem many changes. But, the ice is rougher to use these days. Back than it used to be good. It is probably from the winds and the currents on the water. The rougher part of the ice is from lots of movements by the currents or by the wind. It's probably that since it bangs to the other section of the ice, that it breaks easier.

These days I tend to eat fish that is boiled because I have heard that toxins/chemicals have been spilled to our oceans by sources that worked at Mines or Oil Companies. These spills have really affected our animals in our regions. There seems to be changes on the skins of fishes. There are also seals that are very skinny. The seals probably migrated somewhere at some point of the season because sometimes when we go hunting, there's hardly any seals. There are birds that are now seen here that never used to come. The birds population compares to those and these days seems to have not really change.

Also the insects have not much changed. But, there are these kinds of bees that produce no sound; there seems to be more these days. These bees are probably the kind of bees that were produced through the skins of caribous.

The plants that grow in our region haven't really changed.

The animals that eat plants these days are skinnier, especially caribous. Same thing to ptarmigans, they are skinnier now. Maybe most animals that eat plants these days are skinnier. The berries that grow in our region haven't much changed.

I have not heard or seen a person getting sick from eating country food.