



Water Quality: Elders' Voices

ELDERS' MEMORIES AND PERSPECTIVES ON ACCESS TO HEALTHY
WATER IN THE INUVIALUIT SETTLEMENT REGION





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*"They call it Imiqtavik, 'a place where you get water'. 'Imiq is water.
The water is in the beginning in our language."*

- Mary K. Okheena, Ulukhaktok



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Danny C. Gordon, Lee John Meyook, and Judy Selamio from Aklavik; Bertha Joe, Gerry Kisoun, and Meltzer Sydney from Inuvik; Gilbert Ruben, Mary Ruben-Bennett, George Krengnektak and Andy Thrasher from Paulatuk; Joey Carpenter, John Keogak, and John Lucas Sr. from Sachs Harbour; Sandy Adam, Abraham Klengenberg, and Peter Nogasak from Tuktoyaktuk; and Helen Kitekudlak, Mary Kudlak, Agnes Kuptana, and Mary K. Okheena from Ulukhaktok.

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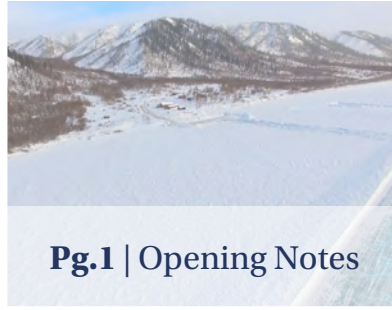
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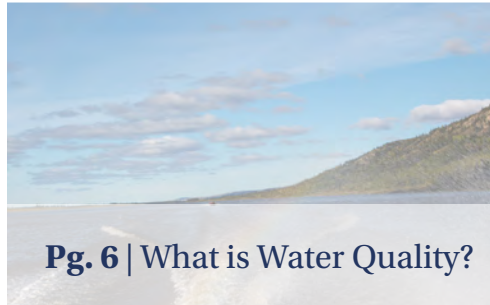
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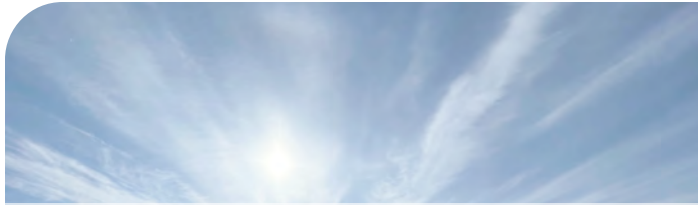
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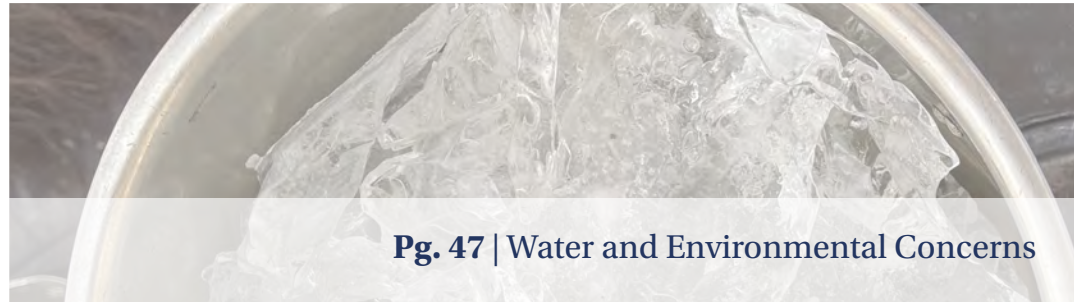
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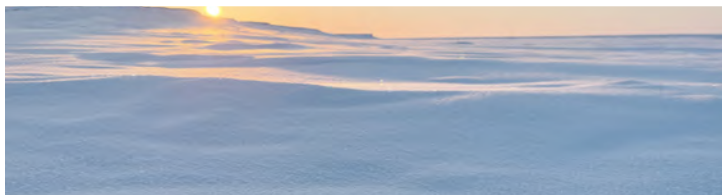
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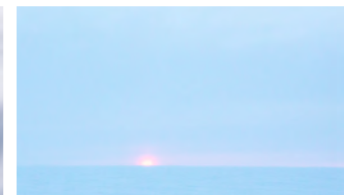
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Andy Thrasher

Opening Notes

The Inuvialuit Settlement Region (ISR) has been home (Nunatsiaq – Beautiful Land) to the Inuvialuit people since time immemorial. Signed in 1984 by the Inuvialuit and Government of Canada, the Inuvialuit Final Agreement (IFA) is the first comprehensive land claim agreement signed north of the 60th parallel. The IFA affirms Inuvialuit rights to govern the ISR through stewardship and conservation practices determined by Inuvialuit to preserve Nunatsiaq in the ISR.

The Inuvialuit Regional Corporation (IRC) was established by the IFA, implementing mandates that represent the rights and interests of Inuvialuit. In this role, IRC establishes and manages programs to monitor and protect the environment and Inuvialuit beneficiaries. The basic principles of the IFA, as expressed by the Inuvialuit and recognized by Canada, are to:

1. preserve Inuvialuit cultural identity and values within a changing northern society,
2. enable Inuvialuit to be equal and meaningful participants in the northern and national economy and society, and
3. protect and preserve the Arctic wildlife, environment, and biological productivity.

Inuvialuit communities and Elder Knowledge experts have raised concerns about water quality (“good water”) on the land and in the communities. To support communities and address water quality concerns, IRC began studying water health, accessibility, and availability through various research programs, starting in 2022. The Elders’ stories shared in this book are based on interviews that were held during the summer of 2023 and are part of the larger IRC Water Quality programming. These Elder interviewees were representatives selected by their Community Corporations to share Local Inuvialuit Elder Knowledge, oral history, and Inuvialuit Community Knowledge. The focus for these interviews is to shed light on how Elders understand their access to healthy water, historically and in the present day, and to identify any changes they have observed on the landscape that may be impacting that access.

Through their stories, the Elders share information and knowledge about water and waterways across the ISR, gained from lived experience and teachings from their parents and grandparents. Their accounts cover a period from approximately the 1940s to the present day. They describe a way of life their parents and grandparents followed – a time when Inuvialuit lived most of the year on the land, moving seasonally from one camp to another, travelling and harvesting for geese, muskox, whales, caribou, seals, fish, and other animals.

“The elders back then travel the land a lot more than we do because they had to live on the land, move around all this country.” - Andy Thrasher



Canada Lambert Conformal Conic Projection, NAD 1983



During the fur trade boom in the 1920s – 1950s, many Inuvialuit made a living from trapping muskrats in the Mackenzie Delta or white (Arctic) fox along the coast. When fur prices dropped after the 1950s, the construction of DEW Line sites¹, the introduction of reindeer herding at Reindeer Station east of the Mackenzie Delta, and later the oil boom of the 1960s and 1970s offered opportunities for waged employment.

In the 1950s and 1960s, encouraged by the federal government, Inuvialuit moved into permanent settlements where government services were available. However, the connection to the land remains strong, and the Elders' stories refer to spending time at their bush, fish, or whaling camps on Banks Island, Victoria Island, or the Beaufort Delta region. The seasons still form an important backdrop to the way of life. People harvest geese and muskox in the spring and caribou in the fall and winter. In the summer, berry picking, fishing, and whaling take place.

Throughout the interviews, the Elders raised concerns about changes they are witnessing on the land, ice, and sea. Climate change and the warming temperatures that come with it are resulting in later fall freeze-ups and earlier spring break-ups, thinning and diminishing sea ice, thawing permafrost, eroding shorelines, dropping water levels, and other observed changes, that are making travel, harvesting, and fishing more challenging. In some cases, places where good water could be found are not as easy to access or are disappearing. The Elders' reports and memories are invaluable because they can give us a picture of any changes they have seen to the land and water over time.

“They used to pass their knowledge down, to be aware of certain areas where there was currents and that on the ice, where they shouldn’t be travelling at certain times. All these were passed down [be]cause they used to travel in these regions and they knew. Even some of the lakes, [like] which lakes melt faster than the others...and which rivers flow earlier than [other] rivers. So they knew all [this] knowledge to pass down to the younger generation so that they can be aware.

All these things that happened through the years, they start remembering, and they pass it down.” - Mary K. Okheena

1. In 1954, at the height of the Cold War, the Canadian and American governments agreed to jointly build a line of manned radar stations across the Arctic from Alaska to Greenland. The Distant Early Warning (DEW) Line was designed to detect enemy bomber aircraft coming over the Arctic in the event of an attack from the USSR.

2. Reindeer Station was created in 1932 to house a herd of reindeer purchased by the Government of Canada. Some Inuvialuit were employed as herders and lived in the community with their families.



George Krengnektak

Land and Waterscapes of the Inuvialuit Settlement Region (ISR)

“[Our elders] knew these areas and they knew what they consisted of,”
- Helen Kitekudlak

The lands and waters in the Inuvialuit Settlement Region (ISR) are of great cultural and traditional value to the Inuvialuit. Located mostly above the treeline, the ISR includes the Beaufort Sea region, the Mackenzie River Delta, the northern portion of the Yukon (“Yukon North Slope”), and the northwest portion of the Northwest Territories.

There are four coastal communities and two inland communities in the ISR. Tuktoyaktuk, Paulatuk, Ulukhaktok and Sachs Harbour border the Beaufort Sea, while Aklavik and Inuvik are in the Mackenzie River Delta. There is a vast network of rivers, streams, and lakes across the entire region, colouring the map blue. The Mackenzie Delta, the second-largest Arctic delta in the circumpolar North, is a maze of intertwining channels, islands, lakes, and ponds.

It is a waterscape that supports an abundance of wildlife. Muskox, polar bear, bowhead and beluga whales, bearded and ringed seals, caribou, Arctic fox, and Arctic char are found on the coast. The wetlands and woodlands of the Delta support muskrats, mink, moose, geese, ducks, swans, and several fish species, including whitefish, inconnu, lake trout, cisco and burbot. And it is a landscape that has sustained Inuvialuit livelihood, culture, and well-being for generations.

George Krengnektak: *Birds singing, loon hollering, squirrels chatting, every time I lay down on the ground looking at the stars just before dark. All those little animals just like sing for me. Loons making noises. I just love to hear those. All those things. That's the part of my life.*

Gerry Kisoun: *Right now, we'd be coming back from the whaling camps to get fresh water in the lakes, do the fishing, make dry fish, pick up berries on the land because aqpiqs are getting ripe...September they go to the main community and get supplies for winter...and go to their main camp again in the Delta, start fishing for the dogs for the winter...and then when the ice forms, my father said, and when that ice was two to four feet thick, he'd run six fishnet...and gather maybe 3000 fish... and that [was] part of the food for the dogs for the winter.*

What is Water Quality?

“We always knew it was important to have good clean water.”

- Joey Carpenter

In the most fundamental sense, water quality means access to safe, healthy water for drinking, as well as access to water for other purposes including household purposes. Good quality water, according to the participants, was water that tasted good, was fresh, and had a clear appearance. They often distinguished between water they preferred and chose for their drinking water, and water they could use for washing, cleaning, and doing laundry. Access to clean drinking water, either at home or out on the land, and availability of water sources, are also important aspects of water quality. How close or how far away are water sources and can they be reached safely? Are there many freshwater sources available?

On another scale, water quality is also about the health of the waterways across the ISR and whether they can support the fish and wildlife Inuvialuit have depended on. Water and its frozen forms (ice and snow) play an important role in Inuvialuit cultural traditions and way of life, for example, acting as travel corridors to harvesting areas, traplines, and seasonal camps. The Elders talked about all these facets of water quality.

“Some of the lakes, we go fishing, and [they] are so clear you could see way out, 50, 50 feet out. You can see the rocks, the fish really clear, the clearest water I have ever seen.” - Andy Thrasher

John Keogak said that good water is *“Clean, fresh, ice water from the land and the sea.”*

For **Mary K. Okheena**, good water is *“Glacier water, ice water, rivers flowing, and clear water.”*

Helen Kitekudlak described good water as *“Pure, clean, clear, ice, [and] snow.”* She added that water that was not good or was polluted was *“muddy”, “not clear”* and had *“lots of bugs in it”* or *“garbage”*.

Abraham Klengenber said that *“as long as there’s no silt or no smell in the water”*, the water is good to drink.



Joey Carpenter



Lee John Meyook

Finding Fresh Water on the Land

“I remember in the summertime...at times, depending on where one is, you had to look for water. We were always looking for water- my older brothers and sisters and I. We’re always looking out in a boat looking for ...fresh water, and we won’t always find streams that are coming off from the mountains or from the hills so lakes, snow piles along the coast.” - Lee John Meyook

“It was really good water them days,” Sandy Adam remembered. There was “good clean water anywhere you go,” Meltzer Sydney said. The Elders consistently stated that water was always clean and abundant wherever they travelled on the land, and in most cases, still is today. In those days, people did not talk about the condition of the water, according to Mary Ruben-Bennett. The water was good and there were no concerns. Bertha Joe recalled growing up, “we didn’t have to go very far for water because our water was so good then. Even in the river, we used to have that for water because there’s no chemicals, no anything around.”

Andy Thrasher described some of the characteristics of a lake with good quality drinking water:

That lake over there used to be the water lake. There was no dump, no nothing around. And it’s a fairly good-sized lake with three or four species of fish in it. And it runs into the ocean when it rains...

All of the lakes are connected together, and they all run out in the end to the ocean. I got to say we’ve got some of the best water in the North. I’ve never seen bad water here.

Mary K. Okheena identified “flowing rivers” as important sources of water. *“I never really see them get water from the lake, just from the ones that flow.”*

People chose camp sites near water when possible:

Helen Kitekudelak: *We still try to camp like our ancestors or, you know our elders, where there’s access to water. They always have the areas where they know they can stop where there’s a river or a place to get water to do their cooking and drinking and cleaning.”*

John Keogak: *They usually camp where there’s a lake or stream or river.*

Water that flowed down from hills and mountains was especially valued because it was cool, fresh, and clear.

Mary Ruben-Bennett: *Look for clear water, creeks that flow down.*

Lee John Meyook: *Mackenzie Delta, we were always beside the river. So the river was always our water source, be it ice, be it snow, be it water. And from down at the coast, it would be snow or running water from the mountains, like a stream that's coming down from the mountains where we get the fresh water.*

Helen Kitekudlak: *The melt water comes from a lot of the hills and cliffs and that, go to the lakes, and the lakes usually have... little streams and rivers that continue to go to the lower lakes and then all to the way down to the ocean. And so you still have that pureness of that good water from the lakes.*

Agnes Kuptana: *If you hear the little streams coming, and it's coming off the snow, you know high up, then that's safe. Because it's coming up off the big snow up there. Because it's already been running for a while, take off all that dirt.*

Danny C. Gordon: *Our water flows from Fort McPherson, what is called the Peel River where McPherson is. And it came out of the mountain.*

Judy Selamio: *Our creek is clean from mountain dew water. Creeks from mountains always clear water.*

Lee John Meyook spoke of travelling to smaller rivers where there is “fresh running water from the mountains.” He also identified natural springs or “any water that's coming out of the ground” as places people would seek out for their drinking water.

The Elders said while the water on the land was pure, it could have debris in it that they would filter out before drinking it.

Bertha Joe said, “You watch when you get water because..there's always floating stuff in it, but long ago, it never affected anybody.”

Agnes Kuptana described a clever way of filtering water by lining a creek bed with stones:

Our grandparents, our parents, always tell us that only after the second good rain, that's when you can dig a place where you can have a place to scoop water from for your drinking after a good rain. They used to dig in the rain and put thin rocks all around it..and place it all up so there is no mud and it's all rocks.



Judy Selamio

Observation had shown people that it would take two good rainfalls to flush out the creeks in the springtime, removing the mosses, lichens, leaves, buds, and other debris that had fallen into the water. **Mary Ruben-Bennett** described a similar natural screening process: *“You look for clean water, even in the summer when it rains, you get water between the rocks. When it rains, [places] fill up with water and then the rivers go through it, and then when it’s all settled, the top of it is good.”*



On the coast

In coastal areas, there were specific challenges because of the proximity of the ocean water in the Beaufort Sea and its bays. People looked for water that was not salty. In some cases, they had to travel further inland to find fresh water or wait for the right conditions to access it. **Lee John Meyook** said that there were *“just certain places on the coast that you are able to get water.”*

Helen Kitekudlak: *...sometimes the ocean water laps into the river. So if you want to get it from this area which looks good, but the ocean laps salt water there, you have to go further upstream to see if it’s not gonna be salty.*

John Lucas Sr.: *We go way in the river. Way up there’s fresh water coming down from the lakes. But if you go so far, there’s salt water. But if you pass a certain part of the river, the mouth of the river, you go further up, there’s fresh water coming down.*

Gerry Kisoun: *When we’re down on the coast hunting the beluga whales, we go inland and find those lakes again...It takes 45 minutes or so just to go to the water source by boat.*

Joey Carpenter: *In the summer when there was no ice in the harbour they would go by boat “a little ways up the river where the water is fresh, fill up a 45-gallon barrel, bring it back, put it on the beach and haul it up the hills...It’s a lot of work.”*

Mary Ruben-Bennett spoke about the importance of timing in getting fresh water in a particular location.

We used to camp in a place called Fish Camp. We walked quite a way from our tent to a stream that would go down into the lake and we had to wait for the tide to go down. I can’t remember, but there was a certain time that you would get water.



Mary Ruben-Bennett

In this case, the stream was likely close to the ocean and affected by the incoming tides. When the tide came in, the salt water travelled upstream into the freshwater stream. By waiting for the tide to recede, they were able to have access to fresh water for drinking.

Salt water could still be used though, **Bertha Joe** said, for laundry. But when the community would travel to Kivalliq Bay for harvesting, he would go “*way up by the lakes*” to get their drinking water “*because you know that’s not going to be salty. That’s good water.*”

Permafrost water

It was interesting to learn about another resourceful way to collect drinking water. **Mary K. Okheena** described how water from permafrost was used in the past if there were “*no rivers to get water from*”.

Long ago, we used to get permafrost water. You know, they used to get holes on the side of the hills, mounds. Those were permafrost melts. They used to get water from there.

Even today, Mary will drink permafrost melt water.

Yeah, once in a while, when we go out on the land. I like the taste. It’s so fresh. When we are out on the land and we are going down the side of a slope, and you see a river flowing down [with] no lake or anything, but it’s coming down from the side of the hill, I just love to take a drink from those. It’s so fresh.



In the Mackenzie River Delta

The Mackenzie Delta is covered in lakes, ponds, and low-lying islands composed of river sediment. Fresh water is abundant in the Delta but at certain times of year, the volume of water in the Mackenzie River increases dramatically. In spring and summer when snowmelt and ice break-up happen, the Mackenzie River fills with silt—fine bits of rock and mineral particles that become sediment and settle at the bottom of the river. During this time of year, a lot of silt flows in the river and it takes on a murky appearance. **Gerry Kisoun** talked about how the silt load in the river water changes during the year and about using water from the Mackenzie River:

Usually in the flood season in May and June [it] brings all the silt down from the rivers south of us and all that silt travels in the water and the water is very brown all summer long. And late in the fall when the power of the river settles down, then the water, the silt starts to settle. And then the water again becomes clear and freshwater once more. So, by the time September comes, middle of September, we're taking water right out of the river without even filtering it. And that's our water. That's how we've been ever since I was a kid growing up in the Delta.

In summer, though, there was a lot of silt in the river. He remembers when he was a young child living with his family in a tent along the riverbank in front of present-day Inuvik. At that time, there were no water delivery services or any roads, only trails.

I used to go and get water with a couple of buckets ...and my mother would wash out one or two buckets and put a dish cloth over that...and that [water] would filter through that dish cloth and most of the silt would come out of it, and then clean it off and then whatever else might have gone into that water, let it settle to the bottom.

"The river is all good water. It's just that you have to strain it. But if you go to the camps and you go out in the Delta, you go to the lakes and you look for lakes that are a bit on the clear side.

Water for washing can be taken right from the river.

Danny C. Gordon described getting water from the river in summer before the water plant came in. When they took ice from the river in the springtime, they would take it home and let it sit for a few days until the mud settled to the bottom and the water became clear.

The river silt wasn't a big concern for Danny because the mud is a natural occurrence in the Mackenzie River and is not contaminating the waters. "Water was always good in Aklavik," Danny said. "Mud has no taste. It's just colour. I don't think it [is] damaging to humans."

People also accessed fresh water from the numerous lakes in the Delta. **Gerry Kisoun** described travelling to lakes by navigating through the maze of intertwining channels:

The lakes give us a lot of fresh water too. If you travelled across the Delta in a boat and if you happen to make a wrong turn, if you started running into clear water, you're heading for the lakes. If you stay in the mud, or in the silt, you're in the main channel. Yeah, just [a] thing that we learned as kids growing up here.

There's lots of lakes in the Delta where you go into the creek. You might go to another lake or plateau clear, and then you go into another creek. You got some more lakes. Then you go from that creek to maybe one more and you might get into maybe the third set of lakes back there. Clear, crystal clear water.

He described a camp 12 kilometres down the Mackenzie River's East Channel where they take water from the lake. His description of the water there speaks to how water from the land is valued for its benefits to health and well-being.

The lake water is beautiful water. Beautiful water, fresh water. Sometimes we say...we can get all our Vitamin B12 out of that water, the water we get out of that lake right now. Some of the best water in the world. It got some grass growing underneath it. All that helps. I think it's a natural filter and we use that water. We don't use the filter or anything. We just put it in our cup. Yeah, makes some of the best tea...So to me, it tastes like good water that I've had as a kid growing up here.

When asked if all the lakes in the Delta were clear, Gerry replied that “most of the lakes were clear as long as they didn't have a creek coming in from the main river system.” This could happen in the springtime during break-up, if there is an ice jam on the Mackenzie River that could cause it to back up into a lake.

On the land, where **Danny C. Gordon** has his bush camp, 30 miles out from Aklavik, Danny noted there are:

lots of good lakes, lots of good drinking water. And there's always a lot of snow. Snow couldn't make much water, but it's clean and it's pretty well pure. No mud.

Before break-up, they would fill up three 45-gallon drums with water from the area. “Now we have a lot of plastic tanks,” he said. “We fill them up before mud comes around for break-up, so we have clean water all summer.”

Sandy Adam told how they used to walk a long way from their whaling camp to pack drinking water from a lake, but they appreciated the fresh, clean water.



Danny C. Gordon

Places to Avoid When Collecting Water on the Land

Water that did not flow or that was not connected to other bodies of water was considered undesirable for drinking, according to the Elders. **Joey Carpenter** mentioned that *“ponds and water holes are not good water. You gotta have a lake or a relatively big lake.”* **Gilbert Ruben** said people avoided small ponds, in particular: *“We just call them ‘those little dead lakes’. And they got that grassy taste... Nobody bothers [with] them.”* Ponds are small areas of fresh water, but unlike rivers, creeks, or streams, they do not have moving water. Because they are shallow, they often have plants growing on the bottom. **Judy Selamio** described water from ponds as having *“too much bugs and [a] different taste. It tastes like moss.”* She said that it was important to *“look at the colour of the water...If it’s yellow or green, my grandparents wouldn’t drink that kind of water. Like slimy.”*

The Elders also talked about ‘dead lakes’. **Gilbert Ruben** told how Rat Lake is no longer connected and he does not drink from it because *“it’s kind of dead.”* **Abraham Klengenberg** said, *“The water is no good in some places. When it’s dead water. When there’s no life in the water and it smells. I don’t know what you call that gas that comes off the moss. You can even smell it...If there’s no flies or no bugs, they call it a dead lake.”* Their descriptions match up with what is referred to as open and closed lakes. An open lake drains into a river or other outlet that eventually drains into the ocean. Water in an open lake constantly flows out and because the same water does not remain in an open lake for any length of time, the water is fresh. In a closed lake, on the other hand, waters do not drain into the ocean but evaporate or drain into the ground. That kind of water can have a salty taste.

There were times when available water sources were not ideal, and people adapted to the water that was at hand. **Helen Kitekudlak** described how her family had to be resourceful when her father was out for long periods on the land.

Before he would go hunting or go out on his trapline with his dog team, he would make sure there was a big pile of ice to melt for water because sometimes he would be gone for a month. If they ran out, they would gather fine, clean snow to use for their water. If he was away during the summer, he would...always make sure their barrels were full of water. If they ran out, they would use water from a small body of water nearby. There’s an area back here, which is like a little puddle like, about this big, and it’s kind of deep, but it’s like groundwater and sort of...brownish colour. And we’d use that.

Helen noted that if water sources are limited to ponds, then the water should be boiled. **Judy Selamio** said that when her elders took water from smaller lakes, they would screen the water. *“Some places taste like willow and some taste like grass. All depends on where the lakes and rivers are.”*



Gilbert Ruben

Using Freshwater Ice for Drinking Water

“You could drink the whole island. We don’t think about water when we’re travelling because it’s just right there, you know?” – John Lucas Sr.

“With the Elders, you can see that it’s always a blessing to get some ice from somewhere...so pure, that clear ice.” – Meltzer Sydney

“Ice is the preferred water to drink.” – Joey Carpenter

Freshwater ice is ice formed from lakes and rivers. **John Keogak** prefers ice over flowing water for drinking because *“it’s more pure-like than water,”* a sentiment that was often expressed in the interviews. Ice water and snow water are highly valued for their coldness, clarity, and fresh taste. **Mary Kudlak** described how her elders got water from the rivers in summer, and ice from the lakes in winter or snow melted over the *qulliq*, a traditional stone oil lamp fueled by seal oil or blubber.

John Lucas Sr. described the lakes they got their water from: *“They’re all freshwater lakes, so even if you camp beside a lake, you can get ice. Nothing salty. The salt starts at the beach here, not on the land.”* **Sandy Adam** talked about getting ice from the lakes every winter, bringing it back with a dog team and storing it outside. **Joey Carpenter** told a similar story:

There might be some creeks or something that the ocean is going into that could be a little salty. Anywhere. Even in the water lake, in the early fall, when the ice is about that thick, you go up there and cut big blocks and bring it down with [the] dog team. Sled load of ice going downhill.

Meltzer Sydney remembered when they lived at Reindeer Station and would cut up ice from the river in late fall and store it in an icehouse for drinking water during the summer months. At home, they would have a hole in the ice and pack water just close to the river and use ice blocks for water in the summer.



Sandy Adam



Gilbert Ruben commented that they would usually get ice from the lakes and “*when they get it, we just let it melt and let it settle down... [to filter out] mostly these little sand pebbles.*” Occasionally, they would get ice out of the ocean “*in the summertime when there’s the icebergs, just to have quick tea.*” Inuvialuit long ago must have observed that even though icebergs are floating in salt water, the ice has no salt and when it was melted, they would get drinkable fresh water. In fact, icebergs are made of compressed snow, which is frozen fresh water.

Candle ice is another form of ice that has been used as a source of drinking water. It only forms when the sun warms ice enough that it starts to break down due to air or water trapped between ice crystals. As the ice begins to melt, it breaks easily into candle-shaped columns. **Joey Carpenter** says that people go out even today to collect candle ice. “*It’s not solid. It’s broken up. People are going up there right now and getting that ice and bringing it home and melting it. Some people store it away too in the freezers or whatever.*”

Agnes Kuptana also spoke about collecting candle ice and how it can be a convenient source of fresh water in certain conditions: “*If a north wind comes and we have two big lakes here, the north wind comes in [and] all that candle ice comes to the shore.*”

Mary Ruben-Bennett recalled that when they moved to Paulatuk in 1965, there was no water truck delivery, so most people relied on ice. They would chisel through the ice and then scoop the water into barrels where people could fill their pots.

Helen Kitekudlak remembers how water was collected when she was a Youth and her family lived at King’s Bay. Before they went out trapping and harvesting, the men would cut up blocks of ice when the ice got thick enough in the fall. They would line the ice blocks up near the shore and one of the family’s daily chores was “*taking and chopping up that block of ice what we could carry, put it onto the sleds, [and] pull it back*”, sometimes with the help of their house dog. They would fill up a 45-gallon barrel beside the blubber stove and pile the rest of the ice outside on a raft.

When he was growing up, **John Lucas Sr.** shared how they would get ice from the lake and store it in the stove's hot water container. He talked about hauling ice for his mother before he went trapping. He would *"make small pieces so she can lift it up and put it inside the barrel inside the house to melt."*

Danny C. Gordon talked about when his family first came to Aklavik, there was no water treatment plant, so they cut blocks of ice from the river for drinking water and stored them in an ice house. It could hold up to 200 to 300 blocks of ice, and sawdust from the sawmill was used to help insulate it. *"That kept them pretty well all summer."* The sawdust had to be washed off before using the ice. Danny noted that people today still prefer ice for drinking and making tea.

Estuaries—where fresh and salt water meet—present another potential source of water for those familiar with these areas. The Husky Lake watershed empties into an arm of the Beaufort Sea and its waters are rich in nutrients from the mixing of fresh water and salt water. **Gerry Kisoun** talked about getting ice when they go fishing at Husky Lake in the spring.

When you chisel that hole into the ice or you drill a hole into the ice, that top layer is always quite fresh. Get a little bit too far down into the water and the salt will show up.

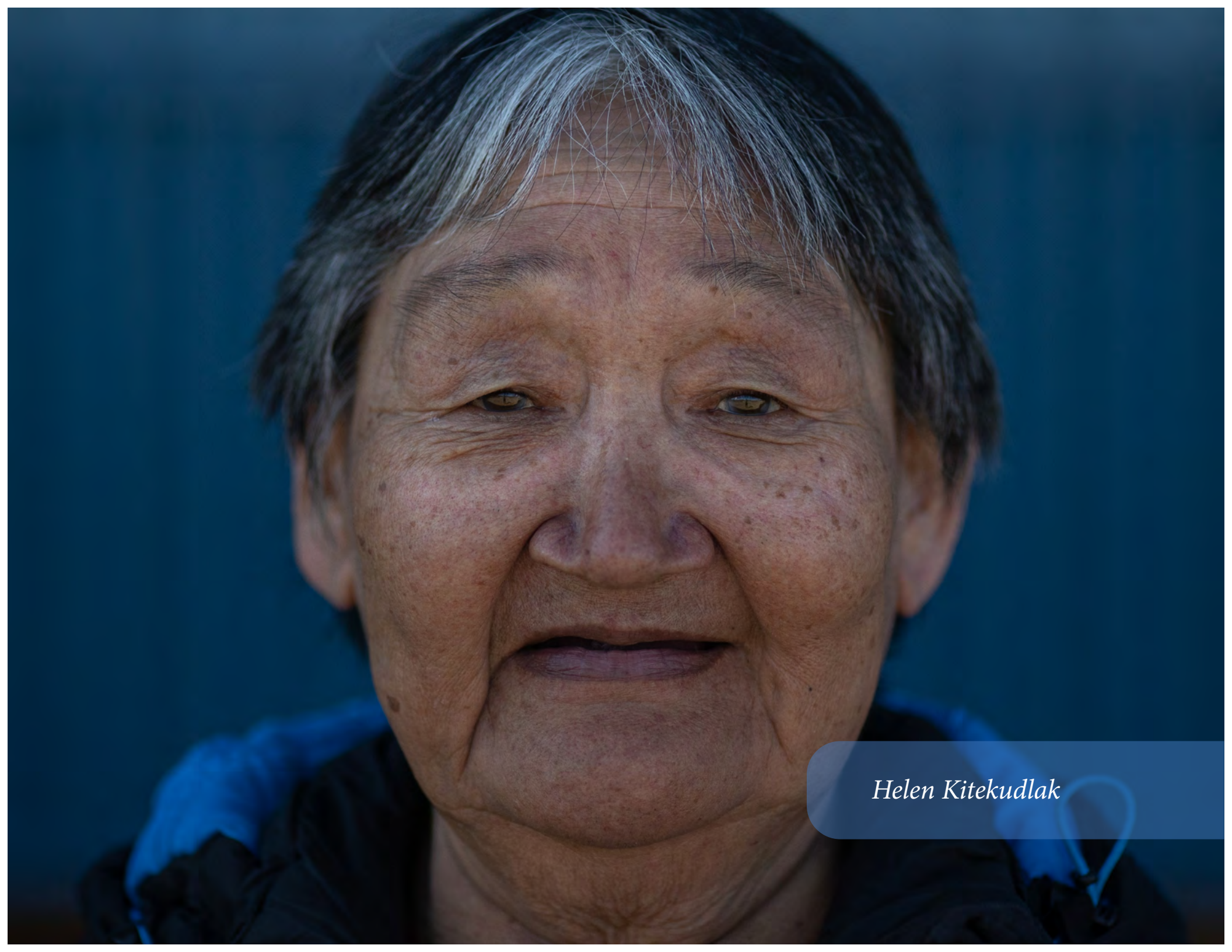
The Elders told how ice is still used and preferred by many today for drinking water. **Mary Kudlak** recalled,

We get water from a water lake all year round. But our tradition, we still use ice water. We get ice and melt it and have it for water, or snow right now.

She described how she collects ice with her grandchildren, nieces, and nephews, and fills up pails of ice for the whole summer until the ice returns in the fall. She stores the ice in coolers and last year, the ice lasted until September 8th.

At his cabin on Middle Lake, **John Keogak** from Sachs Harbour uses ice. He tells his grandchildren *"to get the clean ice, not with any dirt or gravel or things like that"*:

We usually just look for the soft snow...that's on the ice this time of year. Or the ice. It starts changing to snow, softening up. So, we could just scrape it off instead of trying to break it with something. A lot of the ice we get in the camp is when we are drilling holes to make fish holes to jiggle. All that ice is there so we just put it in a bucket.



Helen Kitekudlak

Using Sea Ice for Drinking Water

Ice and snow have immense cultural value for Inuvialuit. Sea ice has been essential for survival, providing a platform for travel and harvesting, as well as a birthing, resting, and harvesting place for wildlife. Inuvialuit have depended upon for their livelihood. But sea ice has also provided an invaluable source of drinking water on the coast. Sea ice is frozen sea water that floats on the ocean surface. The Elders describe how they have been able to take advantage of the ability of frozen sea water to desalinate, resulting in clean, fresh drinking water. When sea ice is collected, under the force of gravity, the salt will naturally drain from the ice. **Sandy Adam** described when and how they would get fresh drinking water from sea ice:

Only time you could use that is when it's springtime. You put the ice on top of the banks and let all the saltwater go down and the ice stays behind and it's fresh. Even out here, if it's candle ice, you put it on the ground, let the salt go out and you put it inside and it's fresh water.

Joey Carpenter described the time when his family would use sea ice:

Only when the ice piles up, like rough ice, when it's not subjected to all the water, and then what salt is in there, eventually it just drains down and creates a big chunk of ice. There's a big pile in there that's fresh water. Even the ice you chop off and melt it, of course. Now, in the summer there's no more ice.

Helen Kitekudlak talked about how they would collect sea ice for water when they were out camping:

And every spring and summer, we haul big barrels where we always chopped up sea ice into them and use that for water. Because the ice would always be around to get it by boat or when it drifted ashore, we brought it ashore, then drain the salt water.

She described how to drain the ice and test it for drinking:

If there's ice around, we usually put the ice on the land and leave it dripping. You know, you get the ice off the ocean, and you leave it dripping through the day. And then when you know that the salt in it drips down a bit, you taste it from the bottom. [If] there's no saltiness, then you chop it up and put it into [the] bucket.

Mary Kudlak recalled using freshwater that pooled on sea ice growing up:

As a young child, when it's melting like this, you get clean water from on top of the ice out there when the snow melted. You test it before if it's salty or not and then when it's fresh, you make tea or coffee.

Although the ocean is salty, the sea ice on top is fresher, especially on older, multi-year ice. As the ice forms, the freezing process expels salt into the water, and the ice can be fresh enough to drink when melt ponds pool on its surface.³

Similarly, **Lee John Meyook** said, “You’re able to get fresh water throughout the summer from the ice that’s floating back and forth in the ocean.” He described how the top surfaces of the ice are not salty: “It’s fresh water, like fresh snow water.” He would carry buckets out onto the ice and get fresh water. However, in recent years, it is getting more difficult to access this ice because break-up is happening earlier and taking the ice further out.

John Keogak also explained that sea ice pushed up on the land “usually stays until about mid-July before it melts away. But then you always have ice floating around,” and you could go out with a boat and “bring a pail and fill it up with snow and ice”. That sea ice is good for coffee, John said. It was also easier to collect it from the shore than walking up to the lake and hauling water with pails as they had to do when they first moved to the community.

If there's any ice pushed up on the beach, after a while it drains all the salt, and the ice is pure. They'd use that because it's a lot easier than carrying the water from the lake. They say if you find ice with just a little salt, that's the best for coffee. That's what the elders used to like, just a little salty. Good for coffee. We use it when we are out on the land. We use a lot of ice. That's where we go in the summertime. There's no lakes or anything. There's just gravel and all saltwater, so we camp where there's ice and do that. Just where there's a long spit, gravel spit, about three miles we go there because there's no bugs and it's cool. Nice and cool. The weather gets hot up here. Terrible.

Even though there is water delivery in his home community of Sachs Harbour now, they still go out and get ice in the ocean.

Gilbert Ruben remarked that ice collected from the sea also makes good tea:

It's nice and clear, clean. When you get it on a tap when you start boiling it, you can see the rim on your pot, kind of white, and with the ice, it's nice and clear, clean.

3. National Snow and Ice Data Centre (<https://nsidc.org/learn/parts-cryosphere/sea-ice/why-sea-ice-matters>)



Mary Kudlak



Abraham Klengenberg spoke about using sea ice when he went with his dad on the trapline: *“We used to use multi-year ice on the coast. There used to be a lot of it.”*

When asked how they got the salt out of the ice, Abraham explained,

My dad knew which part of the ice to get. It was sometimes way out. Sometimes the multi-year ice is about 20-30 feet high. We would get nice clear river ice that doesn't have salt.

Using Rainwater

Meltzer Sydney from Tuktoyaktuk described how they would collect rainwater running off the eavestroughs on the house into a 45-gallon drum:

That's where you get your good rainwater. There is no pollution or anything in the rainwater in them days. It was clear. Rainwater, even for washing clothes makes a lot of difference. It's clean.

When the barrel was full, they would just empty it and fill another barrel: *“That way you have lots of water.”*



Meltzer Sydney

Using Snow for Drinking Water

Sugar snow

Snow is composed of frozen water crystals. The Elders referred to crystal snow or sugar snow as snow that is usually found near the bottom of the snowpack. This type of snow forms snow crystals or facets that look like large grains of sugar. It has a clean appearance and is light. Snow has been a convenient source of water and easier to carry than hauling water.

Meltzer Sydney: *It's just like little small pebbles. It's not that fine snow you see at the top. It's at the bottom and looks like little ice cubes. You can tell as soon as you reach it. It's not packed. That's where you get most of your water from. If you get it from the top and you get a pail and fill it right up, you don't get much. But when you get sugar snow, you can fill a pot, and it'll fill a whole pail.*

Joey Carpenter shared how they collected sugar snow across the Harbour in the 1960s:

We always knew that's safe drinking water and sometimes in the late spring where there's no more snow but there's snow on that bank, you know, when the sun hits it, it's just like sugar, little crystals, ice crystals when you look really close. You put them in bags or boxes or whatever containers, we put it in the icehouse, put them big bags of crystal snow, sugar snow we called it because it looked like sugar. And take that in the summer, like we take a bag.

Gerry Kisoun described a particular combination of weather and snowfall that can create ideal conditions for sugar snow formation:

In the fall, you get that fresh snow..and then maybe in October, November sometime we get a touch of rain in there and that turns solid and then all winter all the snow piled up on the sort of solid stuff. By the time February, March...comes along, you break through all that solid stuff, it's all just like sugar, like sugar you put in your tea. Same thing. It's crystallized and that's some of the best tea water too. You can't beat that.

Agnes Kuptana said that in the fall just after freeze-up and with the early snow on the ice, the ice and snow make very good water.

If it really snows, day and night, and there's lots of snow, we scooped that snow off into plastic bags before dust comes. If there's no wind, then it stays there and it's nice and clean and white. We melted it into drinking water.



Agnes Kuptana

Mary Ruben-Bennett remembered how people would use sugar snow or crystal snow when they were out camping. **Judy Selamio** told how they used snow water last July when they were char fishing and caribou harvesting on Herschel Island. **Agnes Kuptana** described how they collect sugar snow in the spring:

We've been collecting ice into a big container outside and collecting sugar snow, which is the bottom layer, take all the dirt off and collect all that sugar snow and put it into buckets...That's our drinking water all summer.

John Lucas Sr. talked about how snow was used when travelling on the land:

We would melt our own snow. We don't use ice when we travel. Most of the time we use sugar snow...There's snow all over. That's what we sort of used for tea and coffee, that sort of thing.

Out on the land, they would brush off the top layer of snow, and rather than carrying buckets, they would scoop up the snow with whatever they had with them, such as a tea or coffee pot. *"Anywhere you go, it's good. It's not disturbed or anything. Nothing gets to it."*

You could drink the whole island. We don't think about water when we're travelling because it's just right there, you know?

When collecting snow to melt for drinking water, **Gerry Kisoun** mentioned staying away from the willows to avoid getting leaves and moss in the snow. Rabbits also live among the willows, he said, so *"we watch for the rabbit poop too."* He added, *"You always got to clean a little bit of water once in a while. But it's still workable and still drinkable. It's healthy."*

The Elders' stories demonstrate intimate knowledge of the characteristics of snow in different weather conditions over the seasons. Freshly fallen snow is composed of loose, fresh ice crystals and is less dense than snow that has stayed on the ground for a while.

John Lucas Sr. describes how they would use this compacted snow, which has been compressed by layers of snow over time. They would look for snow around the camp *"in the clearest spot where there's hard snow"* to melt for water.

It's a lot more compact than sugar snow is. You get a container full of sugar snow, it's gonna have a little bit of water. You get a compact one, the one that was drifting and that sort of thing, it gets hard. That's what we use. There's more water in it.



Using Snow for Household Purposes

Snow was readily available and accessible for many uses, including for washing and doing laundry. **Joey Carpenter** shared how they used snow and ice when he was growing up:

To wash clothes and dishes, we melt snow, just to wash dishes and clothes. But the ice, we always fetch ice for the water to drink.

Helen Kitekudlak tells how in winter, snow was gathered and used at home. Her story shows how valuable a resource water is:

For laundry we often went to an area where we know there was clean snow, fill up...a big square basin and put that on the stove and that would melt...On Saturday mornings we do that. All of us kids would have a really good wash, a change of clothes. With that same water that we washed up in, all the dirty clothes would go in there, put back up on the stove, got heated up especially in the winter because you can't really, you know, melt water lots and that, then it got put back down and you do the scrubbing and rinsing and then you hang them to dry...And then the same water would go wash the areas of the house that needed a good scrub down, especially the floor, and then it would finally get thrown out.

Community Municipal Water Supply

As told in the Elders' stories, when water was first delivered in the communities, water was pumped into a tank from a nearby water source such as a lake and delivered to households by truck. It appears that the trucked water was not treated with chlorine at the time. **Helen Kitekudlak** remembers a tractor with a big tank of water that would fill up the 45-gallon barrels in the houses. They had one barrel inside the house, and one outside. After that, water was delivered by a water truck. **Danny C. Gordon** remembers when they piped water from Pump Lake in the summer in the 1940s to 1960s. *"Everybody had a pipe coming into their home with a fire house or a garden hose"*, and water was stored inside the house in 45-gallon drums. He added that the *"water has dropped so much for silt"* and that Pump Lake has since dried up.

Gerry Kisoun described how there was trucked water delivery in Inuvik (then called "East Three") when his family moved there from their trapline in the Mackenzie Delta in 1956. *"Our water supply was brought in by a water truck and they pumped water into a 45-gallon water barrel."* In winter, though, when he was 12 years old, he used to go out with his dog team to haul ice because *"it cost one or two dollars to fill up that water tank."* It was cheaper for him to go out with the dog team because his father was trying to make a living with a one-income family. He would *"go to the river down here and find the cracks in the river and find that ice and bring it home."*

Eventually water treatment plants were introduced in the communities, and source water was filtered and treated to remove impurities.⁴ Today, municipal governments in the ISR communities administer water and sanitation services with the support of the Government of the Northwest Territories (GNWT).

Freshwater sources in the ISR communities include:

- Running tap water that has been treated at a water plant and chlorinated. Water is distributed to individual houses and other buildings in the community using trucks, or in the case of Inuvik, through a utilidor, a piped water distribution system.
- Treated running tap water filtered with Brita filter or boiled
- Bottled water purchased at store
- Lake or river ice, snow, and/or water from preferred water source on the land. The Elders said that they continue to collect water from the land as a preferred alternative or supplemental source of drinking water to the water provided in town by their municipal government.

4. Water treatment in the Northwest Territories has evolved from simple truck-fill water stations with chlorine disinfection, to having filtration in its water treatment plants. Chlorine is added to drinking water in the NWT to kill any microorganisms that can cause disease. Filtration can remove dirt, metals and other substances that could impact health.



Tap water ⁵

During the interviews, it was apparent that water quality is of the highest importance to community members. Their observations and knowledge of water on the land provide an excellent vantage point from which they can assess the water available to them in their communities.

The availability of tap water brought convenience, as well as changes to the way of life for Inuvialuit. **Gerry Kisoun** remembers moving into a 512 house in Inuvik after living in a tent along the riverbank for a few years and then in a tent frame while the town was being developed. He describes how at first, they had trucked water delivery and a honey bucket.

The thing about the 512s is that we had an indoor outhouse. That was really, really good. We didn't have to go outside to the outhouse in the middle of winter, yeah, like we did when we lived in a tent...That outhouse was a honey bucket. And then we had a...45-gallon water barrel...They cleaned them out the best they could and that was our water supply. Our water supply was brought in by a water truck and they pumped water into it.

When the utilidor came in, it brought indoor plumbing and made labour-intensive tasks like hauling water easier.

You always got to empty the honey bucket, and we just put the honey bucket beside our 45-gallon burn barrel. That's what we had and when that utilidor came in, wow, huh? You could flush that toilet...When the utilidor came in, that was another huge change in our lifestyle...At least we don't have to haul water anymore with water buckets.

Mary Ruben-Bennett also said that people were “well, happy you know. It's running water. You don't have to go out and get it, yeah.”

However, even though getting water from the tap is convenient, the Elders often expressed their reservations about drinking it. The source for Sachs Harbour's municipal water supply is Water Lake (sometimes referred to as MOT⁶ Lake), but **John Lucas Sr.** uses the water only for washing dishes and laundry:

For the last 45 years, I never drink water from the [MOT] lake. There's contaminants. There was a Department of Transport station here, you know, weather station. They had a garage right on top of the lake. From there, it goes right down into the lake. You don't have to haul water anymore with water buckets.

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John also referred to the “*dust and that goes down to the bottom when there's no more wind*” in the wintertime.

When asked if there was talk of moving the water lake after the accident, John said, “*We had a plan of moving it to a lake further north, like maybe just about two miles out...They took a look at and said it cost too much.*”

Mary Kudlak is concerned that the water quality in her community's water lake will go down because fishing is no longer permitted in the lake.

Because the fish grown too much together in the lakes [be]cause our water lake is not that big. It's gonna get no more good for drinking water.

Mary described a similar situation in Cambridge Bay where they haven't fished in their fish lake for 10 years. “*It get[s] like more critters like and get salty, [you can] taste the difference.*”



5. At present, source water for Aklavik is the Peel Channel (Mackenzie River); the Mackenzie River and 3 Mile Lake / Hidden Lake for Inuvik; the New Water Lake for Paulatuk; DOT Lake for Sachs Harbour; Kudlak Lake for Tuktoyaktuk; and RCAF Lake for Ulukhaktok.

6. MOT refers to the Ministry of Transportation. They operate a weather station in Sachs Harbour.

7. John Lucas Sr. refers to an accident on September 22, 1989, when a plane encountered fog and crashed into MOT Lake on its final approach. All five occupants were killed.

Tap water, chlorine, and Brita filters

Peter Nogasak was able to give good background information on how the water plant system and water treatment works. Peter worked for the Hamlet of Tuktoyaktuk first as a maintenance person and then as foreman until he retired in 2011. In that time, he received training and certification in Yellowknife. *“We helped design the water plant to see what we wanted [and] what should be needed to make it easier to work with chlorine added.”*

The lake that people used to haul water from in pails dried up, so the new water source is further out. Municipal and Community Affairs (MACA)- Government of Northwest Territories, and the Hamlet determined where the best water source would be:

We did a lot of water tests through MACA with the Hamlet to see where is our best sources for water. We sampled lakes on this side and they were too shallow for use, but where we are now, we have a lake after lake with creeks going through.

Where we get water from is three miles out. We run a pipeline going out and a few years back, we had a MACA engineer come in. We'd do water tests out on the lake where we pump water from a different level at different times to make sure everything's good.

Peter described how the new water plant has a large reservoir and the water is pumped from there into a water tank. *“They would get divers to look at the liner to see if it needs to be drained and cleaned. Everything looks good so far.”*

He spoke about adding chlorine to the water to disinfect it and kill bacteria, viruses, and other microorganisms that can be harmful to our health:

The thing about using chlorine, you're going to be really careful you don't put too much or too little. That's what we all push with [the] water plant because our own selves, we don't want chlorine. We never grew up with the chlorine. We did cut ice, melt the ice, and drink water, the same with snow.



Gilbert Ruben from Paulatuk was the plant operator for the water plant in his community:

Even though the water is nice and clear, the only reason we put chlorine in there was because of the little insects or whatever was in there. Sometime we'd accidentally put a little too much in, but then we reduce it down later on.

Danny C. Gordon remembers when they first started using chlorine in Aklavik. “People did complain that they were putting too much and that’s all you tasted when you make coffee.” He said that the chlorine level today is controlled in the modern water treatment plant. “They take sampling two, three times a day just to make sure that level is right for people to drink.” The level is adjusted if there’s too much chlorine and that’s all people taste. “Mind you,” he said, “that’s what kills all that bacteria and germs, you know, with chlorination. Makes it right for drinking.”

Danny referred to occasional mechanical issues with the water plant, but they were fixed right away:

Once in a while on the intake, the pipe would break and didn’t happen very often and mud coming into the plant and they clear that right away. So, it’s really, really good.

Abraham Klengenberg commented,

Water that we get through our tap is all free and filtered. It’s not the best water alright, but it’s drinkable. It’s acceptable. They do their best to try to keep our water running good.





Abraham Klengenberg

Mary K. Okheena also recognizes that the water treatment plant in her community is well maintained:

It's been kept up well, maintained well for all these years. The only time it broke, not too long ago, they got it fixed right away.

For communities that have trucked water delivery, each building has an individual tank to store drinking water. These tanks need to be cleaned at least once a year because dirt, algae, and bacteria will build up in the tank over time. When that happens, the chlorine in the water will not be enough to keep the water clean and safe for drinking. **Joey Carpenter** had a concern that some of the household water tanks were difficult to access so they could be cleaned out on a regular basis:

Bring the water here, that's the first step. The manufacturers and Housing Corp, when they install water tanks, should make it accessible so that we can go in there twice a year and clean it out. I had one of those stand-up water tanks. I used to clean it twice a year. A lot of grime, dirt, everything.

Even though there is an understanding that chlorine is added to the water to help keep drinking water safe from bacteria that can cause disease, there is a dislike for the taste of chlorine and in some cases, a distrust --particularly among the Elders. When asked whether the younger generation minded the taste of chlorine as much or whether they still prefer ice, **Gilbert Ruben** said,

They don't mind the tap water. Maybe down the road, they'll do the same like we're doing when they get older, I guess.

Gilbert guessed that about half the community uses tap water and the others use tap water but like to get ice too “because it's a lot fresher and then you don't taste the chlorine.”

In most cases, the Elders used tap water for cooking and laundry but not for drinking, or they filtered the tap water through a Brita filter to lessen the taste of chlorine.

Sandy Allen: *That one is really powerful. Really awful. You could taste all the chemicals in it. If you put your cup in it, you could taste it right away. Awful.*

Mary Ruben-Bennett said that tap water was drinkable but that a lot of people buy the Brita filters and filter the water that comes from the tap. She uses a Brita filter when she is in Inuvik as well.



Gerry Kisoun

Bertha Joe from Inuvik boils the tap water if she uses it for drinking water because she dislikes the chlorine, or she buys water from the Northern Store.

Mary K. Okheena teaches her children and grandchildren not to drink anything out of the tap, but just to use Brita water or ice water:

I don't trust it being on its own. I have to make sure it's purified. Especially if it's been in a tank for so long.

Lee John Meyook still gets ice from the river because he doesn't like the delivered municipal water:

It's got too much chlorine in it. After you drink this water from the coast like fresh water without any additives, chemicals in there, then you taste the one that's here.

Agnes Kuptana said people generally use Brita jugs “because they put too much chlorine in and it's not drinkable.” She doesn't drink the water because “you can really taste it” and it affects her stomach. “If they can afford the Brita jugs, then they will buy it and use them until somebody brings them snow or ice.”

Bottled water purchased at the store

While the taste of chlorine is generally disliked by many residents, it is also recognized that it is necessary to keep the drinking water safe and it is free of charge. There are costs involved in purchasing and maintaining a Brita filter or in purchasing bottled water.

Gerry Kisoun commented on how the bottled water tastes different than fresh water but recognized that it is acceptable for drinking:

Whatever they make in that distilled water, that water system you buy from the stores and that, they got a different flavour too... at least it's drinkable water, that's the main thing.

Abraham Klengenberg prefers to get his water on the land rather than paying for it:

I got a cabin across the harbour where I do my fishing when I'm off work just across the bay. Go to the water lake with a boat and get fresh water. I get water from out of town. I kind of don't believe in having to buy water. It's hard to accept the fact that we have so much fresh water at this lake. It never spoils.



Ice, Snow, and Fresh Water from the Land for Tea

Even though he appreciates the convenience of a piped water distribution system, Gerry Kisoun also appreciates the value of getting out on the land and getting your own fresh water:

I still enjoy being out on the land in the middle of winter and chiseling an ice hole in the ice or even when you're just making that ice, all that chunks of ice that you're taking out, that's all water too. You put it into the bucket, and it'll turn into water, fresh water. You can't beat that fresh water.

Even today, ice water is preferred over tap water for tea. **Helen Kitekudlak** describes the taste of tap water as “way different” and says that “the Elders will still go to the lakes to get a bucket of water for their tea”:

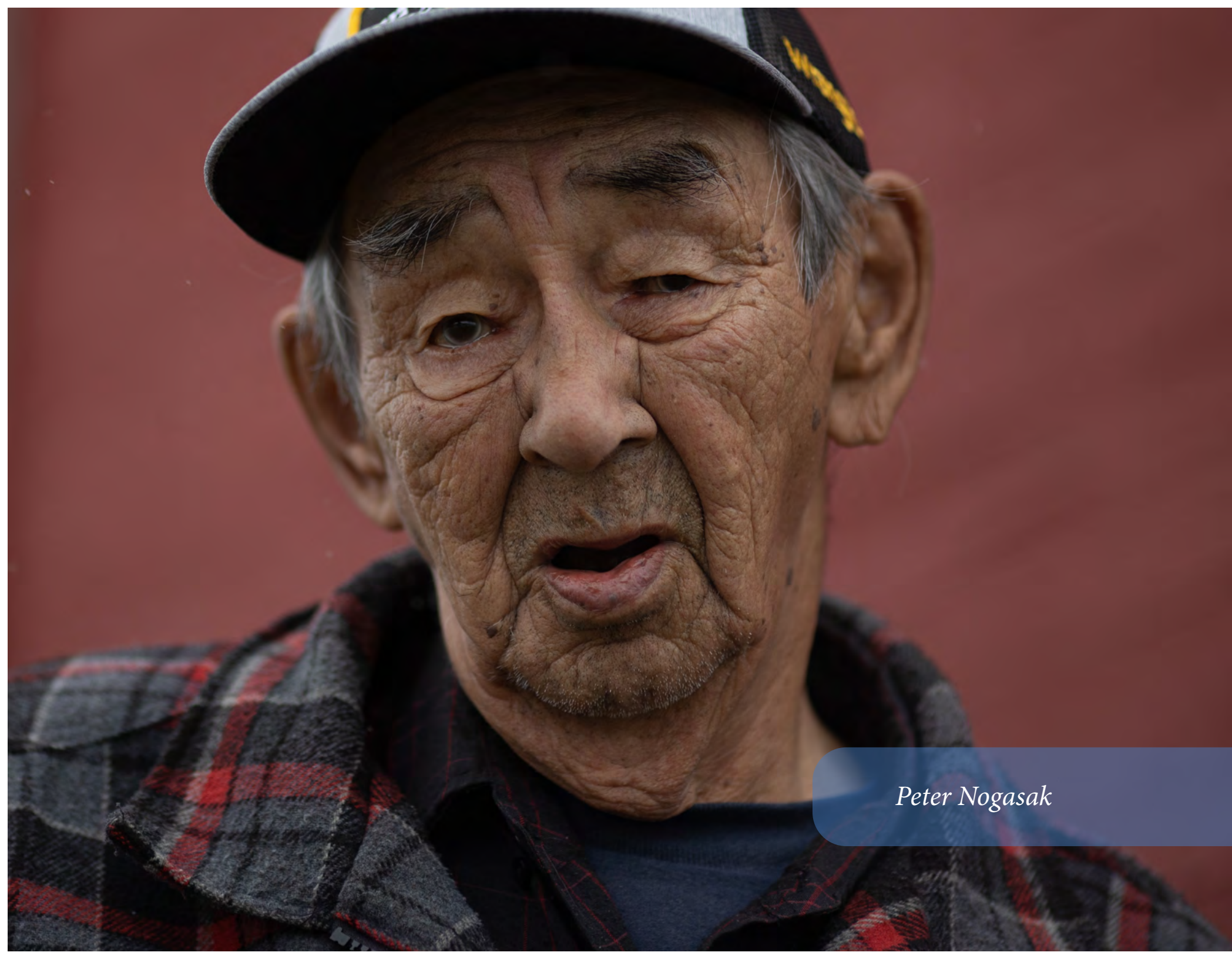
Mary Kudlak: *When you make tea from the tap water, it's dark water, and when you make tea from ice and snow water, it's clear, like bright.*

Helen Kitekudlak: *When we use our tap water or any other water, the tea is really dark. But when we use ice water, it just stays clear.*

Mary Ruben-Bennett: *That's the best type of water for coffee, yeah, you taste the difference, so it's good because they get the Youth to bring ice for the Elders.*

Gilbert Ruben: *It's nice and clear, clean. When you get it on a tap, when you start boiling it you can see the rim on your pot, kind of white, and with the ice, it's just nice and clear, clean...You see the difference and the taste is different. Nice and fresh for sure.*

Joey Carpenter: *The tap water is a little murky compared to ice water. You get a glass of tap water. You wouldn't think it's murky. You put a glass of ice water next to it, and you can tell the difference...But we've been drinking this tap water and nobody gets sick.*



Peter Nogasak

Water and Environmental Concerns

Pollution is the introduction of harmful materials into the environment.

“We keep an eye on it, not through studies, what [we] just experience from travelling here and there.” --Peter Nogasak, Tuktoyaktuk

Dumps, sewage lagoons, plastics, and other concerns about risks to water in the Communities

Sandy Adam is concerned about how the DEW Line used to have a garbage dump near his home community of Tuktoyaktuk:

They used to burn it. But they dump everything, even oil, fuel, anything that, you know when they first came in they didn't know nothing about pollution in them days, so that part might be contaminated yet...And they had no place to put garbage...they had one closer to Arctic Point right in the ocean. And then they moved it back.

He spoke about not getting water “close to the dump area where all the companies put their garbage.”

Mary Kudlak had concerns about garbage in the dump in her community of Ulukhaktok being “blown away to the river”.

They don't burn garbage anymore at the dump. Only way it's gonna stop [is] if they moved the dump further out and build it better and burn whatever it could burn.

Mary Ruben-Bennett related that there was a concern in her community of Paulatuk when they had a dump near the water lake.

“They thought it might be seeping into our water lake. That's why they moved it to...a different spot.”

Mary thought there was too much garbage in town, more so than in the past because there is more plastic packaging and more plastic products. She remembers when the dump was not fenced, and debris blew into the water. Today the Paulatuk dump is partially fenced. The fence is on the lake side and prevents some debris from blowing out into the water.

Gilbert Ruben had a similar story about the wind and garbage at the dump in his community of Paulatuk and how the fencing has improved the situation:

Some of the garbage from the south wind, they fly and hit the lake in summer or winter...Before they put the fence up there, there was garbage flying all over in the ocean, on the land. After the fence was put up, you could still see some not as much as before.

Andy Thrasher, also from Paulatuk, described how frequent winds in the area compounded the problems with the local dump:

There was no way to contain it. No fencing at the time, and a lot of that plastic went on the land from winds. Every time it blows, it's terrible. Any direction that you can see. And all that paper and plastic stuff are blown into the ocean. They haven't figured out how to contain in all that garbage. We have such strong winds here.



Lee John Meyook from Aklavik commented that garbage is a concern in the community but that there is a spring cleanup each year to pick up garbage that has accumulated over the winter “or else the spring flood will take it down the river.”

Judy Selamio also from Aklavik is concerned about the quantity of garbage around the community:

“There’s so much garbage flying all over..Even from the airport down to the dump you could see the garbage...And it’s all that cans and garbage that gets into the ditch water and gets slimy and green.”

Meltzer Sydney sees garbage on the highway and in his home community Inuvik. “Anywhere you look there’s garbage. Growing up, you’d never see that.” He said that they used to burn garbage in town and at whale camp.

The move to replace single-use plastic bags with reusable bags in the Northwest Territories has helped reduce the quantity of plastics and litter in the communities. **Mary K. Okheena** from Ulukhaktok said that the garbage in town is not as bad as before. *“When they took the plastic bags, plus recycling when it started, those stuff really work.”* Agnes Kuptana, also from Ulukhaktok, agrees that the discouraged use of plastic bags has been beneficial, because before reusable bags were introduced, *“that plastic flies all over [on our] lands, in our water, and sinks and we try and clean those out. And if you see them on...fishing nets along the shoreline, you take them in and throw them in the garbage to try to keep our land clean and our fish.”*

Peter Nogasak had a concern about any possible risk to a fish-bearing creek close to where the new dump is in Tuktoyaktuk:

There’s water in the area where they’re supposed to dump, but I pushed that to the Hamlet that they have to watch that water and you don’t overflow into the creek. That’s a fish-bearing creek...and it goes way up where the fish go up for the winter in the fall time. The creek comes right to the harbour...it could seep down.



Sewage lagoons⁸ are generally located on the outskirts of communities. For example, Ulukhaktok’s sewage lagoon drains naturally into a wetland and ultimately into the Beaufort Sea, approximately 2.4 km away. It is 3.4 km north of the community and 3 km northwest of the water supply.⁹

8. Sewage lagoons are large ponds into which sewage and wastewater (‘effluent’) from sewage systems flow. In the sewage lagoons in the ISR, sewage treatment is accomplished naturally in the lagoon itself and the downstream wetlands or waterways. Sewage and effluent are broken down by germs in the pond, aided by sun and wind. They provide light, warmth, and oxygen to the water. This is necessary for bacteria and algae to grow in the water and to break down the sewage. Wind helps to evaporate the water and bring oxygen in.

9. Hamlet of Ulukhaktok, NT Sewage Treatment Facility Operation and Maintenance Manual
https://www.inuwwb.ca/sites/default/files/documents/2015-12-23_sewage_om_manual_-_draft.pdf

Agnes Kuptana is concerned that the sewage lagoon in her community of Ulukhaktok is too close.

In the springtime whenever that little river goes, you can see, and you can smell that. That's not healthy for the community.

Peter Nogasak expressed concern that more frequent and intense storm surges could create conditions for uncontrolled release of sewage into Tuktoyaktuk's harbour:

[The sewage lagoon] is tested and drained once a year and that goes into our ocean...It's not close to the water, but if we ever get high water, flooding water, that will push the sewage into the harbour.

He is also concerned that the fuel tanks could leak and get into the water table and said that it was important to take precautions:

Making sure they don't leak. As soon as it leaks, you contact the Environmental Officer at ENR. You contact them and check to see how much contaminants [have] gone through the soil. Then you gotta clean it all up. We stop only when the engineer says okay and it's good. There's a lot of old dump sites in town that I know I'll mention to the Hamlet.

Joey Carpenter from Sachs Harbour raised several concerns related to substances possibly getting into Water Lake, the community's water supply. He is concerned that asbestos may have gotten into the nearby water lake when the MOT buildings that were built in the 1950s were taken down. *"That asbestos doesn't go away. It doesn't dissipate."*

Another concern has to do with the dusty road beside Water Lake that the sewage trucks use. *"So dust goes into that lake,"* he said. *"I don't know what they can do about that."* Joey mentioned that there is another lake about two miles out that is very clean and might be a better source for their water. There is also concern that the road to the dump goes right past Water Lake and that small particles from the garbage truck will get into the drinking water.

When they haul garbage bags from garbage from town, those little particles fly off in the water from the garbage truck too... It's too close to the lake, that road.

This could be a concern in the spring when the ice is melting on Water Lake and all the dust from the road gets into the drinking water making it "not too clean" a couple of times a year.



In the winter there is ice over the water lake and there's no water disturbance, so nothing gets churned up...When the ice goes out and the lake is wind[y], all that ice, when it's forming in the fall time, little thin ice and trucks go by, dust and from the land, it collects on the ice. When that ice is melting, all that dirt in there it goes into the water. So only [a] couple of times of the year the water is not too clean.

Joey also referred to the accident when a plane crashed into the lake “*when the ice was thin*” and that “*some of the older people, when they drink water, I guess, sometimes they think about it. So that's a form of pollution.*”

Pollution on the land: plastics, debris, and garbage

“I know our elders, they know the areas, the place names, and the places where they would camp in the winter, in the summer or in the spring, any time of the year. They knew those areas and they knew what they consisted of. I'll tell you this one story. Long ago, when we lived across there, there was your natural garbage, which was waste from the animals, which was rarely a waste, because if you had the meat ...and guts and stuff like that, that didn't go to waste either. It went to the dogs...They had an area where they had their houses, like a pit with rocks around it. Very rarely did it get full, because we didn't have that much garbage...And if they thought it was getting a little bit too much, they'd burn it. And then very rarely, [be]cause they didn't have, they didn't need that much. And we didn't grew up with that much.” -Helen Kitekudlak, Ulukhaktok

Helen Kitekudlak's story tells us that the nature of waste has changed as our modern throwaway society has created the conditions for generating more garbage. Along with the waged economy and 9-5 pm jobs, consumerism has increased as many community members live a more 'southern' way of life and spend less time on the land. Traditional life on the land had its own natural recycling practices with any leftover waste from harvesting or fishing being given to sled dogs or left for wildlife to eat. Food was never discarded and there was very little other waste. **Mary K. Okheena** shared information on traditional practices for disposing of natural waste on the land:

If ..you caught an animal and you skin it out there, then you leave it. The carcass—the other animals will eat it. That's kind of like a gift [to] let the other animals survive. That's the way I see it. A lot of times, I always fillet maybe one or two or three [fish], just to leave something.

She encouraged people today to follow the same traditional practices and values:

It's always the same thing we do when we travel out on the land. Always pick up your garbage. Always pick up what you went out with. Pick them up from the land and bring them back. Never leave it out there.

Currently, there are limited recycling facilities in the ISR, and there is a need for better waste management and improved garbage disposal systems and infrastructure.

Pollution was not a word that **Agnes Kuptana** grew up with:

Back then we never had to worry about getting water from anywhere because there was no pollution. Everything was so clean. Like today, it's different. You never know what kind of pollution there is on the ground. What camps did they leave when the river goes, what runs down and you see colours.

Sandy Adam commented that there is less garbage on the land than when the oil companies were there. “*Them days they used to have paper bags, then plastic came out. Seismic used to be bad. They used to leave their wires... and cables on the ground...And then they just used to leave their garbage. Even dig a hole and throw it [in].*”

All the oil companies came and took all their garbage away, most of it anyways, out on the land. They used to have a big gas plant, a gas storage up near Anderson River. And they took all that out, all the barrels and all that. What [a] time, the 70s, huh? They really start cleaning up.

Gerry Kisoun has also always seen garbage from industry, likely from garbage dumps “*that sort of broke open*”.

When asked if there was more plastic garbage in town or out on the land, **Sandy Adam** from Tuktoyaktuk said that most of the garbage was in town and that there was no plastic debris out of town because people make sure they bring everything back. **Lee John Meyook** said that *“you see garbage here and there, but most people put it into bags and take it back to town or they have a burn barrel down at the coast”* at Shingle Point. **John Keogak** told how the young generation in his community of Sachs Harbour is learning good stewardship on the land:

Kids learn early on from an early age that they don't just throw garbage around. Anything they take out they bring back or dispose of it properly. They're pretty good on keeping the land clean. Even at an early age, the little ones they're being taught pretty well. So they won't have a messy place to go. We teach them that.

Mary Kudlak talked about the importance of keeping water clean and that Elders told them not to leave anything on the lake.

Because fish could swallow them, even cigarette butts, shotgun shells, empty shells and lots of other things, plastics. This is our land, was used by our ancestors. Let us leave it for our next generation clean and how it was.

Some of the Elders have noticed this kind of waste out on the land. **Helen Kitekudlak** described debris left behind at the more common camping areas. *“They have their own little garbage dumps”* and there are *“a lot of quads and skidoos, old ones that are left in those camping areas, you know, they're just there, just sitting there.... You know, it really takes the beauty out of those main camping areas.”* She is concerned about the debris left on the land that can affect the water, such as the at Mashuyaq, a camping area a few miles away from the community:

You know, they shoot ducks, and I think they just leave all their shotgun shells all over the place. You know..takes the beauty, all that. You know, they often think about people shooting on the ice and all those shots sinking to the bottom of the ocean... I think there's some people, but very few people when they do go, you know, shoot ducks and that will pick up theirs that are there in their hunting area and put them in a bag and bring them back.

Bertha Joe is concerned about the debris on the land and in the water and how that will build up over time. *“There's so much stuff all over that people don't realize what's going in the water.”*

Helen Kitekudlak described another kind of pollution on the natural landscape, an increase in the number of permanent structures on the land, which has created visual clutter and is detracting from the pristine appearance of the land:

There's more cabins than any time in our life since all over the place, especially at Fish Lake and some of the caribou hunting [areas]. Mashuyaq is one of the more prominent ones where...it used to be a place just full of tents and then they'd leave it with the rocks that make the tent areas. Now it's just full of cabins and whatever they there so the beauty of it and the naturalness of it has just, to me, disintegrated.

She also told a story about a trip she took with her husband and their families to visit the place where her husband was born, 70 miles west of Ulukhaktok. There, they encountered broken and scattered debris.

He said his sister's buried there and all she had was a little wooden cross. He found a nice stone so he put her name on it and I think her birth date and her death date on it. And he wanted to go home and visit and put the stone on her grave. It's the only grave there. And he was looking around and seeing all the changes in the area. And the two garbage cans that they had cut in half...They were rotting. They were broken. ...Windows were broken and everything. And he was looking at them and thought, who did this? Why did they bring them here to, you know, the beauty of the tent area is all full of garbage of those cabins that they put there and never did nothing with.

Mary K. Okheena has seen plastic on the land but closer to town, and described its visual impact vividly:

You know plastics don't degrade like the other stuff. So those ones, you can see. And they show really clearly because our land is just only white and brown and black.

Abraham Klengenber has noticed plastic debris on the land: “lots in the harbour along the beach on the land”. He is not concerned about any harm to the water though. “I know it's wrong, but nothing drastic.” However, he does say that it is not “nice” to see debris on the land.

Gerry Kisoun has noticed a lot of leftover garbage out in the Mackenzie Delta along the riverbanks, especially on weekends.

I was looking at it last night, coming home, and I see tires and so on and that might turn into a nice little cleanup project. Because it's good to try to keep your land and that as clean as possible. I mean somebody's got to do it. Otherwise, the future's not gonna look too bright for them and maybe for their families for their children in the future.



John Lucas Sr.

Perhaps the most poignant and compelling reason for managing plastic pollution better and taking care of the land is found in a story that **John Lucas Sr.** told.¹⁰ He discovered plastic in the stomach contents of a polar bear he had harvested, 120 miles from his community of Sachs Harbour.

The only thing that's in the stomach is plastic piece of plastic. They can't digest it. To me, 120 miles, that's a long ways, and the polar bear has plastic inside the stomach? A lot of garbage flies around in the wintertime when it's windy, and that sort of thing [and] ends up in the ocean. It's kind of sad in a way that animals are consuming what people are throwing. The animals are trying to survive and starting to consume more stuff that humans throw away. ...For me, it's getting worse and worse for the animals to try and survive.

Environmental contamination concerns across ISR communities

Contaminants are chemicals that enter the environment often because of human activities. A wide range of chemicals can contaminate water, land, or air, impacting the environment and health of people and wildlife. Air pollution is not a concern for **Joey Carpenter**: “We are so isolated in the Western Arctic. There's not enough consistent winds from other countries that can bring any pollution here.”

However, **Mary Kudlak** expressed concern about debris left behind on the land from industrial and exploration activity and the risk it could pose to water:

When people that works up land looking for minerals and when they leave garbage and whatever, empty barrels and they could rust in, in the years to come. They drain to the ground and make the water get polluted and even your garbage...the land look after you when you look after it good, [it] would provide you with food like animals. That was passed on to us from our ancestors, our parents, grandparents.



10. It cannot be said for certain what the source of this plastic pollution was. This far was from the community, it is possible that it could be the result of long-range transport in fish from outside the ISR that the polar bear came across and ate. It is also possible that it could be debris from the community or some other land area that travelled out on ocean currents.



Andy Thrasher also raised a concern about potential risk to water, in this case from mineral exploration:

I've never had big worries about pollution here because there was never any oil companies or any other companies that go by that left things on the land. The only time I worry about it is when the diamond company was here. We try to keep them away from lakes that we drink [from]. We make sure that they do what we want.

Gerry Kisoun says that sometimes he worries about arsenic coming out of the Great Slave Lake system “and if it ever fails, we won’t be talking about good water anymore I don’t think. Mostly will be all gone. Pretty dangerous stuff.”¹¹

John Lucas Sr. talked about contaminants from the weather station garage in his community of Sachs Harbour:

That’s where they did all their maintenance...There’s a lot of oil going on the ground. The place was built in 1952 and through the 50s, 60s, and 70s, you don’t know what goes in the river. I mean it’s going downhill, right? Ever since they had that accident, even before that, you can see a speck of oil on top [of] the water. The permafrost is so deep from the ground...Once that leaks through the ground and into the ice, it’s gonna trickle somewhere, you know, down and down. And this one was down to water lake.

Danny C. Gordon from Aklavik expressed concern that contaminants like mercury could be in the river:

*I suppose there’s contaminate like mercury in the water and stuff like that. I’m sure that’s coming down the river because our rivers go all the way up to Alberta where they come from..other than that, I think we’re pretty good in the North.*¹²

11. Gerry Kisoun is referring to the Giant Mine Remediation Project. Giant Mine was a gold mine operating outside of Yellowknife from 1948 until 2004. To extract gold from the ore, a roasting process was used. This process created arsenic trioxide dust, a highly toxic substance. The project involves storage of 237,000 tonnes of the arsenic trioxide waste underground, as well as other measures to minimize the release of contaminants from the site to the surrounding environment.

https://publications.gc.ca/collections/collection_2014/aadnc-aandc/R74-18-2007-eng.pdf

12. Danny C. Gordon speaks about mercury as a potential contaminant. Mercury is a naturally occurring element in the air, water, and soil. It is released into the environment from the weathering of rocks and other processes, and because of human activities through industrial waste disposal. Once released into the environment, it can be transformed into a biologically toxic form, methylmercury, that is easily absorbed into the food chain. Though some studies have been done around mercury in the Mackenzie River Basin, the subject is still understudied and poorly understood, and further research is needed.

Changes on the Land Observed by Coastal Communities

“They use a lot of landmarks back then when they travel. And nowadays, that’s changing.” - Mary Ruben-Bennett

Peter Nogasak identified the environmental issues that concern him most:

The biggest thing is global warming and erosion going on. I’m not paying so much attention to debris or anything on the land.

Peter told how his grandfather used to tell him stories of how the rivers and landscape are changing. In some cases, the rivers are filling up with sand making it harder to get through with a boat:

On the sandspit, you could walk to the point on down there. That’s all gone. At the mouth of the river, there was never any islands there. Now there’s islands and the boat, the tugboat is slowly getting hard to come through. Narrow, the channel got narrow and shallow. I know they talked about dragging it once, but nobody got the money for dredging.

Mary Ruben-Bennet told how her Elders noticed changes on the land, likely caused by erosion along the shores:

I know when we ...go out camping, they notice the changes in the land. You know, where the water is covering up some areas.

I remember when we’re travelling to the river, we were able, you know, the men were able to navigate. We have a sandbar that stretches quite a ways, and they would wait for high tide to navigate instead of going all around that sandbar. They would navigate a way to make a shorter cut. But that over the years has changed a lot...because you know, the sandbar once you reach it...you’re able to walk on the sand...because out here it’s deep, eh? But when you reach that place, a sandbar, you’re able to just go out there and walk on water.

Abraham Klengenberg has also seen a buildup of sand and the resulting low water levels that impede travel:

Sometimes we can’t go where we used to hunt along the coast on account of the sand blocking the place where you go into. It gets really shallow. You have to go the long way around.



He also commented that erosion is changing the fresh water sources, and sand is getting into the ice. You can still get ice from eroded shores, he said, but you must filter it to get the silt and sand out.

Peter Nogasak has observed flooding in other places, and in this story, he shows how that has affected harvesting. Changes to the landscape can also mean changes in wildlife habitat, and in this case, the disappearance of a feeding and resting area for geese:

I know there is a lot of fish in that area. [If] there's seagulls sitting in a creek, oh, there's going to be fish coming in. The whole place is flooded right to the Pingo. [There] is no more mud flat for geese [to] go and wander around in the mud.

He noted that changes on the land are not as noticeable in the winter when the land is covered in snow but that they can be seen in spring or summer. However, changes in ice texture, thickness and other characteristics are readily observed in the snow season. Peter described changes in ice thickness and hardness on Husky Lake:

In my days ice in Husky Lake [was] six to seven feet. Now, one day, three to four feet. People think it's hard, you know. Once you get candle ice, it's not hard anymore.

Peter also shared his observation that the air doesn't smell as salty as it used to, an observation that was confirmed by a researcher:

When I was growing up right from here, you drive out and you smell the taste of salt in August. And you had engineers doing the shoreline studies on current and sediment...and I talked to the lady doing the water tests, can you give me a read on the water from when you first started to now? When she first started, she said [the ocean] was 20% salt and now it is 2% salt.

The lack of multi-year ice¹³ results in more fresh water coming in and the ocean losing salt¹⁴:

Because we don't have any multi-year ice out there no more, we're getting the river water, growing up out there, cracks open in the spring. We watch if the water turns brown, river water [is] coming so we head home.

Peter said that people are not taking ice out of the harbour anymore.

That's been stopped for quite a while, but when I was younger out there hunting whales, we take water right out of the river. Clear. A little bit muddy but clear. Now we don't even do that anymore. We take water from here in jugs when we are heading out. Even to go inland to go hunting we don't melt snow anymore. We are hauling jugs of water.

Peter shared more observations about declining multi-year ice and his concern that the ice is leaving earlier, it seems, each year:

It's been gone for how many years now, must be close to 10 years. Big ships can go through now, ice breakers. We used to hunt whales between the first and second week in August. There was still ice out there. Now you don't see it on the third week in June... nothing. And we used to come back for a week in June. Now we go home the first week in June.

Joey Carpenter has noticed there are fewer big ice piles along the shore and sea ice break-up is beginning earlier than in the past:

Before 1990, summertime, the pack of ice flows all summer. Depending on the wind, it blows back and forth. Some days, it's clear and the ice comes in. Since the early 90s when the ice go, you don't see ice until freeze up...[now], two weeks early, there's no ice left. It used to be mid-July, end of July there's no ice left.

13. Multi-year ice is ice that has lasted more than at least one winter, having survived each summer melt season. It is much thicker than younger ice, typically 2 to 4 metres thick.

14. The salt concentration of the ocean changes as more fresh water from melting sea ice enters the ocean system.

Helen Kitekudlak talked about how finding drinking water is harder now that “*the ice is not staying anymore through the summer.*”

I said to him [my husband] where the heck are we going to get water? He said there's a freshwater pond one mile up. And our kids had never had to do that. Every day, they took every single container. They walked up there, fill them up, bring them back. From there, they really learned how precious water was because we had to boil it. It wasn't a lake. It was a freshwater pond. And you don't know what lives in it even though you know it's clear. But being afraid of maybe the little bugs that might be in it, we had to boil [that] water before using and cool them off if they want to make juice of something. And so to them, they realized how precious water was in different areas or in an area you camp where there's no access to it. And so in that way, they really got to appreciate the water they get just from anywhere, which they often took granted for.

John Lucas Sr. said that “*the land is changing very, very rapidly... a lot of lakes that we used to go get water from when we were out on the land, it's all drained.*”

John also talked about erosion along the ocean shoreline.

You know if there's no ice and it gets windy, it [the coastline] gets eroded. But if there's ice around, it kind of slows it down.

A thick layer of sea ice absorbs the power of big waves and prevents them from crashing into the shore. But with the loss of sea ice, waves, wind, and ocean currents can wear away the coastline, resulting in rapid coastal erosion.

John said that the waves are washing into the banks causing the sand to go out into the ocean. The incoming water is creating tunnels into the banks, and the small lakes nearby are draining into the ocean through these tunnels. When you go along the shoreline, you can hear the water trickling into the ocean.

When we travel in the summertime for hunting, on the ocean, when you stop you can hear water trickling from small ponds and that sort of thing, down to the ocean. In some places when you look at the hill, there's sand coming down, and you look under, it's way, way under. It gets so, you know, far in. The weight of the land cracks and it kind of fall into the deep.

...It's always coming down, it's eroding. Small pieces breaking off. Then it gets so far deep under where you can crawl [as] far as you want, but it gets so heavy that the weight that it's holding, it's falling. There's no hard ground around here, too much sand, that's what's really wearing it off. The waves come in and take some sand out and keep doing that and get further in. The tunnel of the waves is getting further in under the ground, and it gets so heavy where it goes and falls down into the ocean.

Changes on the Land Observed by Mackenzie Delta Communities

“In 1987 I went hunting from Tuk to Hendrickson to Kugmallit Bay. It’s like 45 kilometres from there to here on the ice with snow machine. On the 13th of June, we hunt geese, ducks, probably swans too. I don’t know where we got any but we also pick eggs from Egg Island. Egg Island has gone now. A lot of our islands, they show up and they disappear. They show up and they disappear. We used to gather seagull eggs. Beautiful, beautiful food.” – Gerry Kisoun, Inuvik

Lee John Meyook identified the erosion that is taking place in the Mackenzie Delta and changing the face of the landscape:

A lot of erosion [in the Mackenzie Delta] happens where you get the water going downstream, and you get blocked lakes being exposed, rivers going by.

He was also concerned that they are not getting as much snow as they did years ago: “When I was growing up, the side of the road would always have [a] good six, eight, ten feet of snow...Nowadays you don’t see that happening.” He has seen the “river system...sort of drying up like when you go travelling to the coast”. Water levels are dropping and channels that they used to be able to go through are now just mud flats.

The water level is dropping, dropping, dropping and the channels we used to go through are having big mud bars right in the middle of the channel that we used to travel through and logs that are just, you know, out there, so you stick to the bigger rivers like the Peel River where we’re able to stay in the deep water.

Meltzer Sydney heard about changes on the land from his dad.

All these lakes that used to be deep, creeks used to be running, and now they’re all dried up. And he could see it coming, the first changes to the creek.

Judy Selamio noted that travel routes they used in the past are being altered because waterways are drying up:

I went down to the coast the other time. You can’t even go down by the mainland. You have to go out by the ocean. So shallow. No more water. No more water.

Bertha Joe talked about how the water levels in the river channels are dropping:

The water is getting so low in there and you can see..at the bottom of the channel...all kinds of grass growing up on the bottom of it. It's been how many, two, three years now I seen this. It's getting hard to go into the channels even because the water's getting evaporating and the channel is getting narrow and all the grass is growing from underneath the water. What are we going to have left? Water's just evaporating.

Bertha has also observed low water levels at Whitefish.

And when they used to go whaling in the summer time... You have a big lake there, and a little island right there, all along from across there, tents..all them by the beach. Full. And have all their boats inside. You think you see that today? The water's too low. How? How are going to get in?

Gerry Kisoun said that his father noticed the erosion that was happening even then:

Even in my dad's time, the Mackenzie Delta is I think must be 80% mud, 85% mud. Because we see so much erosion happening, especially today. And the water is warming. That's what I found in the last number of years.



Climate Change Concerns Across ISR Communities

“I was a little girl about three, four, and [my taatak] told me, he let me go right in front of his chair...talked to me and he told me you got to be careful...when the world start getting old, it’s going to be totally different, so watch.” - Bertha Joe, Inuvik



Climate change and the rising temperatures that go with it are affecting the land and water in many ways, and as a result, impacting Inuvialuit way of life. The ISR has experienced significant warming trends, thawing permafrost, and eroding river and lake banks and ocean coastlines. Warmer fall weather leads to ice forming later than usual, which means ice is not as thick or strong. In recent years, freeze-up tends to happen in early November instead of mid-October. Snow melt and break-up in spring now occur as early as late June or early July, instead of mid- or late July.

Erosion can happen when permafrost thaws. Permafrost consists of soil, gravel, and sand, usually bound together by ice. When temperatures rise, that ice can melt, and soil and sediment are easily washed away without the ice holding them together.¹⁵ The sand and silt that was held firm before might now cause a shoreline or bank to collapse, or wash sediment into a stream or river. Where the water was once clear, it can become silty.

While climate change is complex and its various causes and effects are difficult to untangle and require more research, the Elders’ reports are invaluable because they provide first-hand observations on the land. **Agnes Kuptana** described how things are different today:

We’re living like we’re already in middle of July and it’s only middle of June. Back then in July, you would have seen people still dog teaming...scooping up ice that has been piled up and dropped down, no more salt water, or take the sugar snow if they’re travelling.

15. <https://education.nationalgeographic.org/resource/permafrost/>

Gerry Kisoun told this story, showing how water temperature has been warming.

Fast forward to 2007, 2010. I took a family from Inuvik to the mouth of the river, East Channel, to go swimming on the 14th of June. So at that time I had a thermometer in the boat that I was using that day. And when we got close to the Beaufort Sea to Kugmallit Bay, the water was reading 65 degrees Fahrenheit on the 14th of June, not long after the ice went out. The water in many swimming pools is what? 70 degrees Fahrenheit to 75...So I told them that story about coming from Tuk on the 13th of June, going to Kugmallit and hunting geese for a couple of days, going home on the 15th of June on the ice right in front here. And here you are 27 years later, swimming in what they wanted to call the Arctic Ocean. Yeah, no more ice...It was 30 years before that I used to drive right into Tuk with a snow machine in the middle of June. We don't do that now... We've seen a lot of change.

Bertha Joe commented on how much earlier the berries are ripening. In July, the appiks (cloudberry) were out already, and the blueberries, blackberries and cranberries also ripened early. She said, “I couldn't get over the cranberries already. Some of them are just huge already. Like why? It's for the rain, the rain too, maybe under the ground too...” She talked about picking berries at Whitefish this summer. “In July there were out already. Very early. The warmness of the, you know, warm.” In her comments, Bertha suggests that increased temperatures and precipitation might have contributed to an earlier growing season for berries. Increased precipitation is another consequence of our changing climate, as average temperatures rise, and more water evaporates into the atmosphere.

Many of the changes the Elders are seeing affect the water: in some cases, channels and rivers are becoming shallower, the water is becoming warmer, sandbars are increasing in size and number, mudslides or landslides are becoming more prevalent, and smaller creeks and lakes are drying out, in many cases due to increased evaporation because of warmer temperatures.

Judy Selamio is concerned that these changes will adversely affect their livelihood. “No more rivers to go into the creeks, no more water.”

Mary K. Okheena described changes she has noticed:

I have seen it. Even our climate has changed from the pollution...Our weather isn't the same, springs are getting so much earlier than what they were. Our birds are migrating earlier than what their timeline used to be for migrating north. The melting of the ice is a lot faster than what it was.



Mary K. Okheena

The area covered by sea ice is shrinking, with less old and thick ice, and more young and thin ice. The multi-year ice is being replaced by seasonal ice, which melts and re-forms each year and is more fragile and breaks up easier. Earlier snow melts and changing ice dynamics are reducing access to traditional water sources. **Lee John Meyook** recalls:

Years ago, the Arctic Ocean moves...It goes out but it usually just goes in and out with the current up until the 1980s, and then [you] would get the break up happening...it takes the ice out and goes far way far out. In the past, [you] could go out on a big ice pan and able to get fresh water throughout the summer.

Judy Selamio told how her grandparents predicted these changes:

I knew a lot of this is gonna happened because my grandparents talk[ed] about it [in] 1971. They talk about all the changes in the world. They say there's gonna be lots of fires, lots of flooding, lots of hunger. You can see all that today...No animals down the road, no fish, no caribou, nothing because it's not well taken care of due to fires and flooding and erosions. They're gonna move on different ways, different places, you're gonna see, you start seeing strange animals now. You can see them now. What they were talking about 1971, you could see today.

There are concerns about how climate change is affecting wildlife. **Peter Nogasak** said that people in his community of Tuktoyaktuk are concerned especially about harvesting:

Our harvesting has changed quite a bit –fish, geese, and caribou. That's all to do with climate change and the flooding that goes on all over the place...Most of us this time of year, we should have been fishing. Two weeks now, nobody's getting anything. We used to fish almost to freeze up...not anymore, change too much.

He has noticed that there seems to a shift in the fish species they have fished in the past:

For a number of years, the first thing we notice is we are not getting any herring like we used to. Starting to get like there's no more whitefish now. Nobody's catching whitefish for the last two weeks...parents and elders used to go out and help each other, [they had] five boats and they fill them right up. Now we[re] lucky to get a handful. Not everybody, two, three guys.

Judy Selamio has sometimes observed signs of disease in beavers:

Sometimes you could have a sick beaver, because I do a lot of analyzing on it...A couple of young boys get me couple of beavers [in] springtime so I could skin [and] eat it...You really have to watch for their liver and heart and kidneys. Sometimes they have...TB. They have little white dots and sure enough, that beaver had TB.

She added that “all animals get sick [due] to water change.” Judy has also seen changes in fish.

Fish is getting softer. Mushy. It's getting hard to make dry fish due to warm water under the ocean or anywhere...I went down to Herschel...harvest char from down there. Even the char is getting soft. The water's getting warm. You never ever did see jackfish and coney in the ocean. That's what you see in the ocean now.

Climate change is creating fluctuating, often unpredictable and sometimes unsafe, environmental conditions.



Peter Nogasak spoke about how people in the old days would talk about their trips on the land and what they noticed, and today people are starting to share their observations again.

Going back to the old days for people talk[ing] about their trip out and what they notice and that's the way it's starting to get now...Because weather change, ice conditions change...And with global warming, we're pushing it...because weather change, ice conditions change.



End Notes

Elders have noticed that there are changes in the landscape they and their ancestors have travelled and lived on for generations. Familiar landscapes are shifting and transforming as a result of climate change (and possible pollution), and in many cases, affecting the waters that have sustained Inuvialuit way of life on the land. The Elders' stories speak of ingenuity, resourcefulness and patience, and an intimate knowledge of their environment gained through lived experience. The skills needed to find good water on the land have been passed down to the Elders whose voices are heard here in this book, and to the Elders who preceded them. Their descriptions of the abundance of pure, fresh water in their homeland –the water, land, and ice of the Inuvialuit Settlement Region--show how rich this resource is. Their attachment to drinking water that comes from ice, snow, and waters on the land speak to the importance of continuing to gather water from traditional sources for wellness and cultural connection. The changes they are witnessing to land and water are reminders that this precious resource is increasingly under threat from pollution and climate change. The messages they share encourage Inuvialuit to use and protect their natural environment sustainably and responsibly so that wildlife and people continue to thrive. Finally, their knowledge of what constitutes good water can guide and inspire Inuvialuit today to ensure that available water in their communities is of the highest quality.

Peter Nogasak: *Keep the water streams clean. Make sure nothing gets spilled in the water. Especially our drinking water... We need to protect our watershed. It's a big watershed and it goes way, way, up.*

Mary Kudlak: *The land look after you when you look after it good, [it] would provide you with food like animals.*

Gerry Kisoun: *I think you do your part in keeping our land and waters clean, and I think that will help sustain you and your families in the future.*

Because if [we] don't take care of it we don't take care of it as well, where are we gonna go? What are we gonna do? Who are we going to depend on? We have to do it ourselves. Nobody is going to take care of the land and water for us. We have to take care of that environment. It's called environmental stewardship.

The Elders that we spoke to here may be the last generation to know the Beaufort Sea and these lakes, rivers and streams in exactly the same way they and their Elders before them did. Their voices—and the voices of their Elders –are resonant and present.

Judy Selamio: *"We are very strong in our language and could pass on that knowledge while we're still here... Try to get more on the land activities with Youth, maybe five Youth, five elders, and bring them to a camp where there's like lots of little lakes and study waters down there... You could study a lot of water down there, from [the] Delta and the ocean."*

Agnes Kuptana: *"Today when you go to some areas where they [our ancestors] have been hunting, or you see some caches where they have been, you see when you go to them sometimes, you feel this warmth just hits you from head to toe, right through to the top. They're still with us."*



