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RECEIVED 28 August 2025

REVISED 13 November 2025

ACCEPTED 28 November 2025

PUBLISHED 02 February 2026

CITATION

Ireland M, Norwegian G, Hardisty M, Latta A,
Gyapay J, Sioui M, Pludwinski B, Sanguéz A,
Falconer A and Bell M (2026) Reviving
connections: Dene wellbeing and climate
adaptation in Tthets'éhk'edélj.
Front. Clim. 7:1694811.
doi: 10.3389/fclim.2025.1694811

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Reviving connections: Dene wellbeing and climate adaptation in Tthets'éhk'edélj

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This article is a composite of nested stories about one Dene community's efforts to respond to change. It situates adaptation to climate change as the most recent in a longer history of social, economic, and cultural adjustments in response to the effects of colonization experienced by Tthets'éhk'edélj First Nation. As we delve into historical accounts of community collaboration in the money economy, the adoption of agricultural crops for food security, and a home-grown response to residential schools, self-determination and resilience emerge as consistent threads. These are both reinforced and put into question as we cross into a contemporary story about the community's responses to climate change across the past two decades, which is intertwined with the acceleration of social and economic change amidst the ongoing impacts of intergenerational trauma. The article concludes its overall story arc by describing the multi-year research partnership and writing collaboration for the article itself, which took shape even as flooding and fire threatened Tthets'éhk'edélj's existence. That final story is part methodological reflection and part deeper exploration of the community's struggles to revive Dene knowledge and ways of being by restoring connections with the land—even as the land is being rapidly transformed. Story as a mode of reconnection and reconnection as a form of climate adaptation put Indigenous understandings of health and wellness into focus as fundamental ingredients. Our reflections on the experiences of Tthets'éhk'edélj First Nation intersect with and contribute to the rising tide of voices and stories articulating Indigenous pathways toward alternate futures.

KEYWORDS

climate change adaptation, indigenous health and wellness, colonialism, resilience, self-determination, story, economic development, residential schools

Dene peoples and a changing climate in the Dehcho

Indigenous Peoples in northern regions face some of the most dramatic effects of climate change, both due to the accelerated pace of change in higher latitudes (Rantanen et al., 2022) and to the close integration of Indigenous lifeways with the biophysical environment (Hicke et al., 2022). This is the story of one community's experiences of change and their efforts to adapt in ways that uphold and renew relationships with the lands and waters that have provided sustenance, home, and identity since time immemorial. That community is Tthets'éhk'edélj (Pronounced THETS-EH-KAY-DAY-LEE) a Dene First

Nation located in the boreal region of Canada's Northwest Territories. For four of the authors of this article, including the three lead authors, Tłtsh'édél First Nation is home.

Tłtsh'édél First Nation lies along the Dehcho (Mackenzie River), a little over 200 kilometers northwest of where it starts its journey northward to the Arctic Ocean from Tucho (Great Slave Lake) (see Figure 1). Tłtsh'édél First Nation shares its name with the river that flows into the Dehcho beside the settlement, known in English as Jean Marie River. That river's headwaters stretch up to a lake known as Tłtsh'édél, and Tłtsh'édél denotes that the waters flow from that origin. There are just over 160 registered members of Tłtsh'édél First Nation (Registered Population, 2025), though only 60–70 reside in the community (Statistics Canada, 2023).

This region, itself named Dehcho after the river that runs through it, has seen many of the impacts associated with climate change: thawing permafrost, unprecedented drought, declines in wildlife, and repeated flood and fire evacuations. While these changes bring immense challenges, Dene traditional stories tell of a long history of change—stories that carry the memories of ice sheets, as well as long extinct animals and other beings.

Like other Indigenous Peoples, Dene understand wellbeing in holistic terms, centered on reciprocal relationships and responsibility to care for land and water. For several decades, knowledge holders in Tłtsh'édél have been observing and discussing the differences they see and feel in their environment. They haven't needed scientists' validation to know that things are changing, but they have been clear about the value of collaborating with researchers and others to increase the community's ability to understand and respond to change. This article, which is one of those collaborations, delves into stories of climate change awareness and action in Tłtsh'édél. The aim is both to gift those stories back to the community and to share them with others as part of Indigenous Peoples' wider contributions to knowledge and action in response to our planet's uncertain climate future.

Orienting our stories

Evolving with the land: self-determination, resilience, and the power of story

The stories we share here are of both struggle and hope, and situate climate change within a longer history of Indigenous adaptation to both environmental change and the impacts of colonialism. Drawing from a Western perspective we can characterize the stories with terms like “resilience” and “adaptation,” but these words do not find easy translation into the Dene language. From a Dene perspective, the stories are about drawing on cultural and spiritual teachings about being a capable person in relation to others, and about collectively *evolving with the land* in adjustment to new circumstances, seeking the wellbeing of both Dene and other beings.

The impulse to tell these stories emerged from our research collaboration to support the development of a climate change adaptation strategy for Tłtsh'édél First Nation. We asked community members to approach the challenge of climate change in light of their history of adaptation to social, cultural, economic, and political change. Many participants spoke proudly about that

history of resilience and we saw the opportunity to bring that historical narrative to the surface and give it sharper definition.

Following Kimmerer (2013), we assert that reconstructing these stories about Tłtsh'édél's history of adaptation is itself a form of action in response to change. She writes that “Stories are among our most potent tools for restoring the land as well as our relationship to land” (341). Stories remind us to attend to the land with all our senses, shaping our mindset by helping us perceive our interconnections more clearly. In Dene tradition—as in many other Indigenous traditions—Ndeh, or the land, is seen as the first teacher and stories are understood to come from her, like our Mother sharing lessons. Through our experiences, the stories come to be held not only in our minds but also in our bones. Together, story and experience teach us respect for Ndeh, along with a knowledge that Ndeh will take care of us as a nurturing mother cares for a child. Finally, stories also carry us through time, weaving the connections from one generation to the next. In this way, documenting the stories of Tłtsh'édél's past resilience in the face of colonization and climate change provides a basis for present and future generations to reflect and respond to the stories in their own ways, tapping into their Dene identities and knowledge to revive and reinvent their connections with Ndeh.

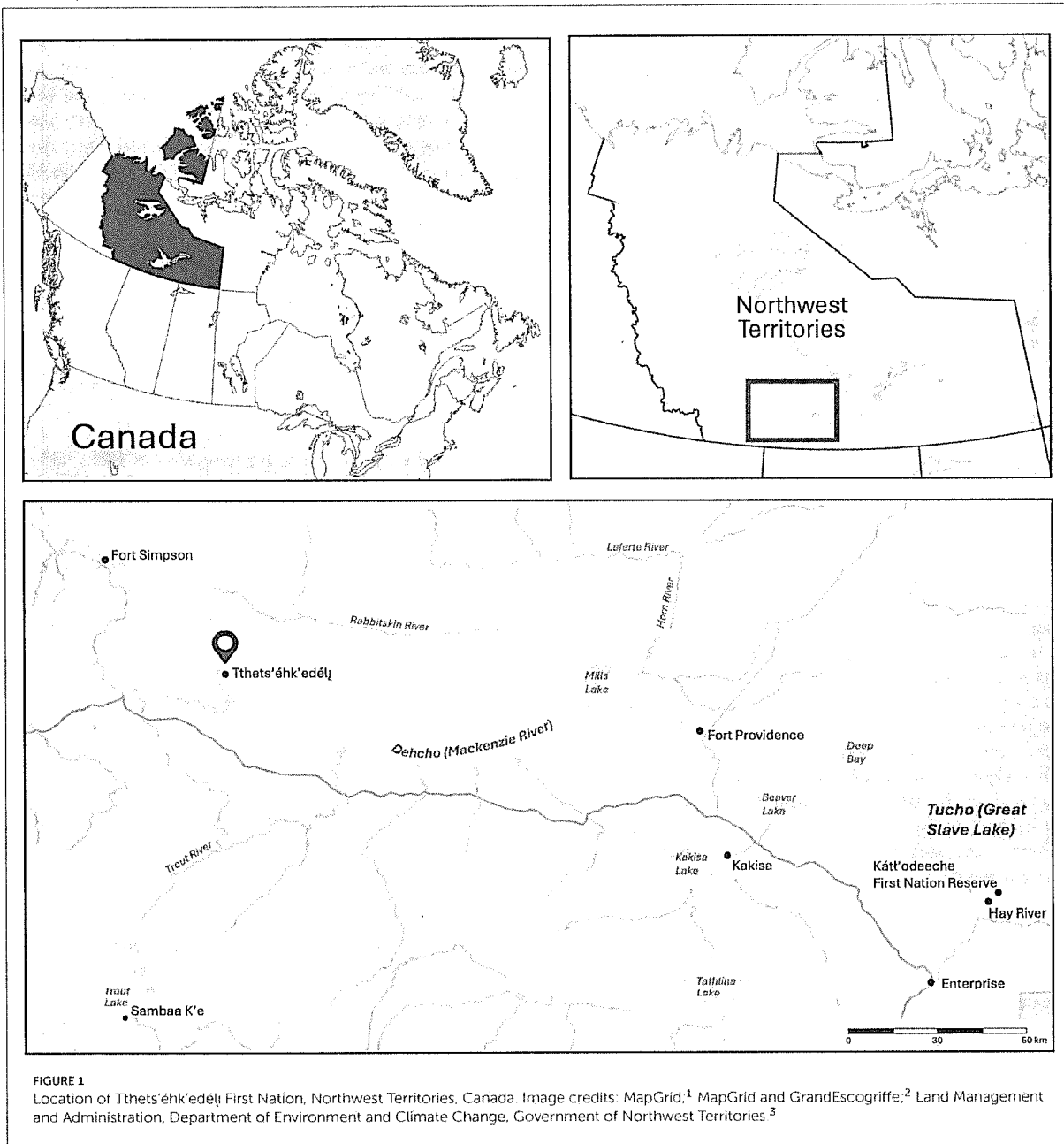
Our approach to climate change adaptation in Tłtsh'édél connects with and builds upon other work documented in the scholarly literature, but we have chosen to defer discussion of those connections until the “lessons and reflections” at the end of the article. This aligns with Dene approaches to knowledge sharing, which start with a holistic big picture before turning to explanations, reflection, and discussion. Our research collaboration is also one of the stories we tell, so we describe our methods when we come to that story.

We foreground our voices as Dene lead authors in this article. This is our community and we will narrate the stories from our own perspectives. Where we have depended on fellow community members or other sources to confirm or clarify dates and other details, we acknowledge those sources. Where there are no such acknowledgments, the details of the stories reflect consensus arising from discussion of our own recollections. Needless to say, the non-Dene members of the team are not part of the “we” that is voiced in our stories. They have walked with us, listened with care, and helped to transform our oral histories and reflections into written narrative.

Putting things in writing, especially when dates are attached, can lend an undesired certainty to the “facts” of an account. The details of our stories were sometimes recalled distinctly by different knowledge holders and other sources. Our purpose is not to establish a definitive historical record, but rather to paint a faithful overall picture of our community's past experiences adapting to change.

The Dehcho Dene homeland and colonial history

Before sharing our stories, there is more to know about the wider history of our region. The Dehcho (which translates as “Big River”) and its tributary waterways have served as ribbons of connection for extended Dene family territories of seasonal travel



and livelihood since time immemorial. Today, those family groups are clustered in nine permanent settlements. Tthets'ėhk'edėł is

“Jean Marie River” on settler maps and on many documents and web resources referring to the community. Recovering our traditional place names is a long process.

Prior to the colonial period, we were sustained by what the land provided. Our territory was rich with moose and caribou,

1 NWT location map by MapGrid, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=98179352>.

2 Dehcho location inset adapted from MapGrid and GrandEscogriffe, CC BY-SA 4.0, https://commons.wikimedia.org/wiki/File:Northwest_Territories_adm_location_map.png.

3 Dehcho Region base map adapted from GNWT ATLAS, <https://www.maps.geomatics.gov.nt.ca/HTML5Viewer/index.347.html?viewer=ATLAS> (Accessed March 31, 2025).

smaller animals like beaver and martin; several kinds of ducks and geese; many species of fish, berries, roots and medicinal plants; and also the sturdy wood of spruce, pine, and birch. From these gifts offered by the land, we crafted everything: tools, clothing, sleds, food, shelter, artistic and ceremonial materials. Our traditional economy was circular and reciprocal, with caring for the land as its foundation and sharing as its core principle.

In the late 1700s, opportunities to trade furs with non-Indigenous newcomers started to change the Dene economy, and the Hudson's Bay Company established Fort Simpson as a permanent trade post in 1822. The fur trade introduced Western tools, clothing, and other goods, but allowed our Dene People to continue living primarily off the land as they had for generations. It was the arrival of missionaries in the mid 1800s that announced bigger changes to come, and the first residential school opened in Fort Providence in 1867.

In 1921, the Dehcho Dene joined other Dene nations across the region in signing Treaty 11, the final of the numbered treaties that the Government of Canada used to open up the interior of the continent for settlement and eventual resource extraction. The treaty paved the way for more newcomers, including the permanent presence of the Royal Canadian Mounted Police (RCMP) and game officers—enforcers of laws that infringed on Dene autonomy, threatened traditional harvesting systems, and pushed family groups into permanent settlements.

It was a time of rapid and often difficult change. Major disease outbreaks, such as influenza, took many lives. Meanwhile, fluctuating fur prices and the start of resource extraction projects brought a rising wage economy during the mid 20th century. Then, in the 1960s, residential school attendance was made mandatory, with a major intergenerational impact across the Dehcho region. Thousands of children were robbed of their childhood, language, and culture. All these factors led to adaptations in Dene social, economic, and land relationships, many of which we explore further in the stories of T̄h̄ets'ėhk'edėl̄j̄ adaptation.

Despite the efforts of colonial authorities to regulate our hunting and trapping, end our migratory lifeways, extract our natural resources, and stamp out our identity, Dene and other First Peoples across the Mackenzie region have proven resilient. Widespread resistance to a pipeline proposal in the 1970s led to a landmark public inquiry and helped set the stage for land claim negotiations (Berger, 1977). Today, the Dehcho Dene continue to negotiate with the governments of Canada and the Northwest Territories to achieve implementation of our constitutionally recognized territorial and self-government rights. Meanwhile, the revival of land stewardship practices in a modern format, combining Dene knowledge with Western Science, has led to Indigenous Guardians programming and the creation of a Dene-led Protected Area, Edėhzhíe.

Significant aspects of our traditional economy and cultural skills continue to be practiced today and we are always making efforts to ensure that knowledge of these ways are passed to younger generations. Dene laws continue to provide the basis for living well, guiding relationships among kin and between generations. This history of change and resilience has set the stage for new kinds of adaptation in response to a changing climate, such as collaboration with university researchers to understand and respond to changes in our land, water and food system; or in the creation of new

protected areas, where we play a central role in environmental monitoring and stewardship; and through collaboration within our community and with government and other organizations to prepare for and respond to emergencies like wildfires and floods. In the following section, we take a closer look at the Dene history of adaptation as we experienced it in T̄h̄ets'ėhk'edėl̄j̄. Our account largely focuses on the second half of the 20th century, blending from there into our contemporary responses to the impacts of climate change.

T̄h̄ets'ėhk'edėl̄j̄: our stories, in three parts

Part 1: 20th century adaptation to colonial change

Our families began establishing themselves in T̄h̄ets'ėhk'edėl̄j̄ in 1915. Responding to pressure from Canadian authorities to form a permanent settlement, they chose this location because it had long been used for summer gatherings. It was favored for the fishing opportunities and the ability to travel up and down the waters of the Dehcho to meet other families in similar summer camps. The first families in the community are linked to three sisters: Sophie, Cecile, and Marguerite Betzah, who married Egaondi Ekali, Joseph Sanguéz, and Baptiste Norwegian (later remarried to Charles Sanguéz), respectively.

Our Elders report that the earliest houses were of logs or hand-cut timber, roofed with spruce bark and mud.⁴ By the 1940s, further experience of construction had been gained through contact with *móla* (White people, or outsiders) and the community began building sturdy log houses with tin roofs. By the 1960s, they were building multi-storied log houses and other buildings,⁵ the last of which were still standing until their 2024 demolition due to 2021 flood damage.

House building and many other skills were learned from visiting and working on construction in settlements like Fort Simpson and Fort Providence. Charles Sanguéz is particularly remembered for bringing some of this early knowledge back to the community. These and other skills were also learned through contact with individual outsiders. A trapper, remembered by the community as “McNeil,” had cabins in our territory and lived in the community off-and-on for several years in the early 1900s. He is credited with teaching Louie Norwegian and several other early leaders in our parents' generation to speak English and even to read.

Norwegian went on to become chief from the late 1930s to his death in 1977. He was also one of the first Dene in the Dehcho to purchase an outboard motor and a snowmobile, seeing the advantages of new technology in adapting the traditional economy with changing times. During his leadership, the community worked together extensively. As the Dene reciprocity and sharing economy met the Western cash economy, our families often pooled resources for capital purchases to undertake collective economic activities. Income from these new activities filled a gap in our economy, as

⁴ Billy Norwegian, August 7, 2024.

⁵ Billy Norwegian, August 7, 2024. Ernest Hardisty, August 8, 2024.



FIGURE 2
The community's river tugboat, 1952 ©NWT Archives/June Helm fonds/N-2003-037: 0309

restrictions on wildlife harvesting impacted trapping income and access to traditional foods.

For generations, we have governed ourselves according to Dene laws, which most importantly call us into relationships of sharing, mutual aid, love, and respect.⁶ Leaders in Tthets'ėhk'edėł made decisions based on principles of reciprocity, community dialogue, and consensus. Men led decision processes, meeting inside one of the bigger homes during winter or outside in the shade during summer. While women might have seemed to be more "behind the scenes" of domestic life, they were often the ones who brought issues forward for discussion. If the chief came home to find the community women gathered in his home, it was likely they were there to bring a concern forward based on their own deliberations.

Although Louie Norwegian was chief for roughly 40 years, leadership of different initiatives would also be taken up by other men in the community. A comparison can be drawn between traditional governance in Tthets'ėhk'edėł and the formation of geese in flight: periodic swapping of spots in the formation shared the load of being out in front, and everyone worked together in a coordinated fashion. In particular, the men knew each other's

strengths and would lead activities or tasks based on their skills and knowledge.

The transition to the band council governance system, mandated by Canada's Indian Act, started when Chief Louie Norwegian became sub-chief to Łiidlii Kue First Nation (LKFN) in the 1960s. However, our community was not satisfied with being an add-on to another community's government. In 1992, Tthets'ėhk'edėł separated from LKFN and became an independent band. It was within our own band government that our women became more visible in community leadership, both on Council and as chief. Yvonne Norwegian, daughter-in-law of Louis Norwegian, was the first woman to lead the community, elected in 1992.

The structure of the band council system is different from how we as Dene have traditionally governed ourselves. Nevertheless, it has allowed us to continue like geese in flight, swapping the burden of leadership among different members of the community. We try to maintain the spirit of collaboration and inclusive decision making by holding workshops and gatherings to shape our direction on important issues. This has become more difficult with time, as Tthets'ėhk'edėł First Nation members relocate for education and work. It is also true that the intergenerational impacts of trauma can fracture community relationships and undermine the unity we need to move forward in responding to climate change and other challenges. The stories we share in the following pages give us an opportunity to celebrate and revive that spirit of working together and sharing the burden.

⁶ Dene laws are derived from the experiences of our ancestors and their knowledge of the land, and are closely related to the principles and values that guide our governance systems (Dehcho First Nations, no date a)



FIGURE 3
The community's first sawmill, being operated by Louie Norwegian, late 1950s. NWT Archives/Sacred Heart Parish (Fort Simpson) fonds/N-1992-255-0243.

Working together: the river tugboat

Our People had always relied on the rivers as transportation routes, traveling in bark canoes for summer fishing and gatherings, and by dog team in winter for hunting and trapping. After the arrival of *móla*, motorized boats became more important. In 1948, the men of the community pooled their trapping income, which along with a small loan from the federal department of Indian Affairs allowed them to purchase a river tugboat from the Mission in Fort Smith (see Figure 2). James Sanguéz and Louie Norwegian were taught to operate the boat by Phillip Lafferty, a Dene from Fort Providence. The community rebuilt it in 1951, and it operated until 1986.⁷ The boat opened a range of new possibilities, including annual fishing expeditions to Tucho. Gabe Sanguéz, who became a third operator, reported that they netted as many as 20 thousand fish per year, some sold in Fort Simpson but most portioned out to the community (500 per family) or given away.⁸

The boat was also used for work installing navigation buoys on the river. Gabe Sanguéz recounted how during one of these trips, two horses were purchased from the Catholic Mission in

Fort Providence.⁹ The horses were used to start logging trees from further inland, and hand-cut timbers were used to build a barge. After this, the community started selling firewood to the Hudson Bay Company, RCMP, and hospital in Fort Simpson.

Dene entrepreneurship: the sawmill

In 1956, the purchase of a second-hand sawmill and a D2 Cat (bulldozer) led to increased harvest of firewood and greatly enhanced the production of lumber (see Figure 3). The mill was operational by 1958 and by fall 1959 had been used to produce the logs and lumber for the construction of five new houses.¹⁰ The community also constructed barges, which they loaded with pre-cut logs for house construction, with several of the men transporting them downriver to Wrigley, Norman Wells, and Inuvik.¹¹ In 1964, a new mill was purchased and some community members who worked on the mill trained to be certified in lumber grading. This led to sales of lumber in Wrigley, Fort Simpson, and Hay River.¹² In 1972, with the encouragement and involvement of a former teacher

⁷ Boat details from Gabe Sanguéz, and also an unattributed account, in *The History of Jean Marie River*; detail about funds for the purchase from Richard Sanguéz, personal communication, February 11, 2025.

⁸ Gabe Sanguéz, as in recorded in *The History of Jean Marie River*.

⁹ Billy Norwegian and Margaret Ireland, August 8, 2024. Gabe Sanguéz, as recorded in *The History of Jean Marie River*.

¹⁰ As in recorded in *The History of Jean Marie River*.

¹¹ Stan Sanguéz, December 17, 2021; Billy Norwegian, August 8, 2024.



FIGURE 4
Tending one of the community potato patches, 1962. ©NWT Archives/June Helm fonds/N-2003-037: 0221.

in the community, a new mill was purchased in an effort to expand production, and was placed further north on Twelve Mile Island, near the Liard River.¹³ The mill faced problems not long after that, including financial troubles and damage from a fire. One of the Elders who worked on the mill also commented on the younger generation's lack of interest in carrying on the work.¹⁴ The mill shut down in the early 1980s.

Ttsets'éhk'edél, community garden: adapting for food security

Alongside these economic activities, the community was adapting its food system to meet the new realities, adopting

gardening alongside traditional foods. Billy Norwegian, born in 1937 to Louie and Bella Norwegian (née Hope), remembers from his childhood that there were two potato gardens surrounded by a high log fence to keep the dogs and other animals out (see Figure 4). Then, in the 1950s, he remembers operating the D2 Cat during the establishment of another larger community garden and by 1960 there were three areas under cultivation, with additional crops, including carrots, cabbage, turnips, and tomatoes.¹⁵ The harvest was stored in a root cellar that was dug into the permafrost. The community also raised chickens and geese. Reflecting on the community's success with growing food, we credit it to good leadership, wide community involvement, and teamwork.

A flood in 1963 washed away much of the topsoil from the main garden area, and subsequent harvests were significantly reduced.¹⁶ By that time, participation in upkeep had also declined,

¹² Earnest Hardisty, August 8, 2024; and as in recorded in *The History of Jean Marie River*.

¹³ Father H. Posset (1974), included in *The History of Jean Marie River* [No original bibliographic record].

¹⁴ Earnest Hardisty, August 8, 2024.

¹⁵ Billy Norwegian, August 8, 2024, crops as recalled by Billy and as in recorded in *The History of Jean Marie River*; and Father H. Posset (1974), included in *The History of Jean Marie River* [No original bibliographic record].

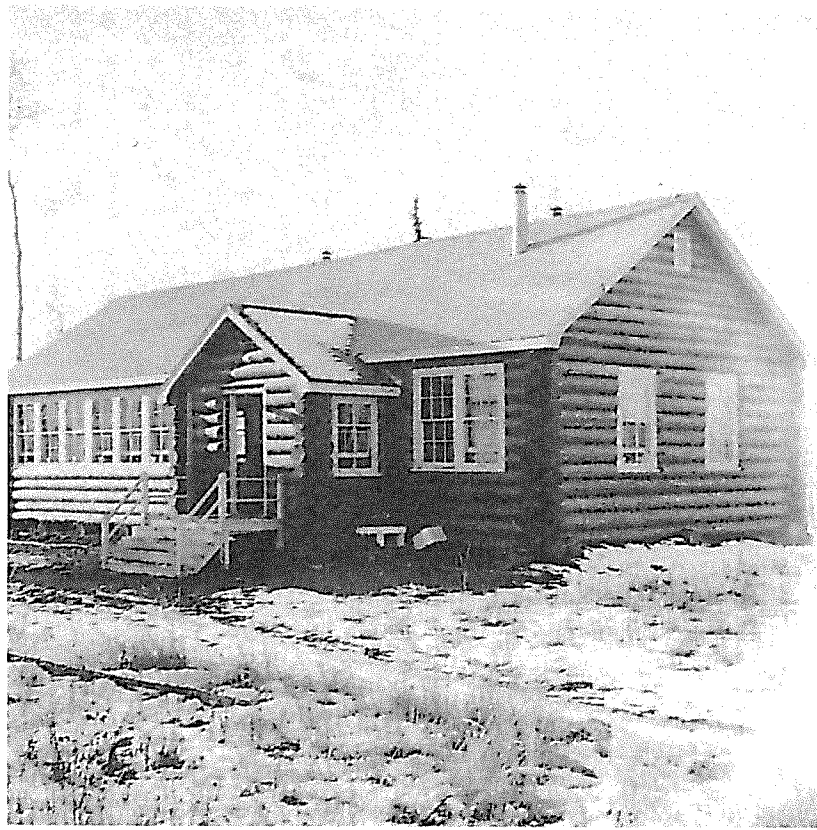


FIGURE 5
The Louie Norwegian School, 1955. © NWT Archives/Government of the Northwest Territories Buildings photo collection/N-2002-036.0074

as more people gained paid employment outside the community. However, the community continued to collaborate in efforts to provide food security. The brief operation of a Hudson Bay store in the mid 1960s was unsuccessful, so the community built a co-operative community store, which operated from 1972 to 1993, sharing a building with the band office.¹⁷ An all-season road to the community was completed in the mid 1990s, reducing the community's reliance on harvested and community-grown foods through year-round vehicle access to stores in Fort Simpson and Hay River.

The Louie Norwegian school: responding to residential schools

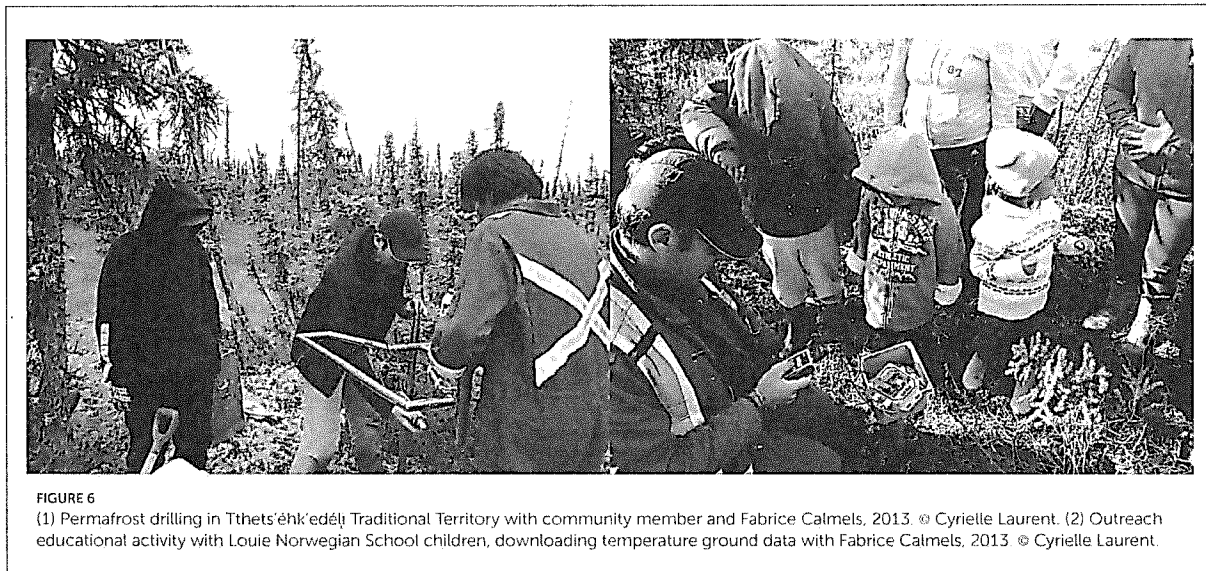
In the 1940s, communities in the Dehcho experienced increasing pressure from religious and Canadian authorities to send their children to residential schools that were intended to assimilate our children into Euro-Canadian culture. The mission boat traveled

down the Dehcho each fall, stopping at communities to remove children from their families to attend the Sacred Heart Residential School in Fort Providence. Ttsets'ehk'edélj families avoided the boat by heading into the bush around the time it would normally come. This worked until the school authorities made a surprise raid, catching the community unaware and rounding up the children to be sent away.

As the story has been told to us, the weeping of the mothers echoed through the community, empty of its children, propelling Chief Norwegian and other community leaders to take action. Chief Norwegian advocated to the federal government to have a school in the community. An anthropology graduate student served as the first teacher in 1951, and community members supported correspondence education for several years after that. A log schoolhouse was completed in 1953, and the Jean Marie River Federal Day School opened for Ttsets'ehk'edélj children from kindergarten to grade 6 in 1955 (see Figure 5). Grades 7–9 had to be taken at the Lapointe Hall residential school in Fort Simpson. Students attended residential schools in either Fort Smith or Yellowknife to complete up to grade 12.

¹⁶ Billy Norwegian, August 8, 2024.

¹⁷ As in recorded in *The History of Jean Marie River*.



Part 2: Ttsets'ėhk'edėł in a changing climate

Our lead author, Margaret Ireland, remembers her father and other Elders discussing changes on the land when she was still a teenager in the 1970s, but it would be 30 years before “climate change” became a familiar term in Ttsets'ėhk'edėł. After more than two decades living outside the community for education, work, and building a family, Margaret moved back in 2000. In 2004 she agreed to lead the community's Traditional Knowledge study as part of the environmental review process for the Mackenzie Valley Pipeline. She discovered that our Elders and Harvesters were concerned not only about the pipeline, but also about other ongoing environmental changes. Trees were leaning over, riverbanks were slumping, new species were showing up, and the distribution and physical characteristics of animals and fish were changing.

Margaret revived an Elders Council and with their direction sought funding and partnerships with scientists to provide additional information that would help us understand why and how the environment was changing. With Margaret's leadership and the support of chiefs like Stanley Sanguet and Gladys Norwegian, our community undertook numerous climate-related studies and planning processes over the following 15 years.

Health and wellness became a central topic in Ttsets'ėhk'edėł First Nation's climate change work during these years. Working with a consultant, the community completed a major report in 2011 to document climate change impacts on health and wellness (Jean Marie River First Nation PACTeam Canada Inc., 2011). This was an opportunity for community members to share what they were observing and experiencing, consider our vulnerabilities, and have our first major discussions about adaptation. The report tackled impacts in the areas of food security, safety of drinking water, cultural continuity, community sustainability, on-the-land travel safety, risks from extreme weather, and the wider health of plants

and animals. This holistic set of considerations framing health and wellness in relation to the health of the land showed up again in our Ripple Effect Community Health Plan (Ireland and Ireland, 2017). There, we set priorities to strengthen participation in traditional food harvesting, restart community garden activities, and invest in renewable energies.

This health and wellness work was paired with scientific and Traditional Knowledge research into the way thawing permafrost was changing the landscape and in turn affecting wildlife, with implications for our food security. A partnership between 2012 and 2019 with researchers at Yukon College (now Yukon University) allowed us to map permafrost degradation and conduct a related food security vulnerability assessment. Traditional Knowledge was used alongside Western Science in these studies, including a report documenting Elder and harvester knowledge to understand changes in boreal caribou habitat (Ireland et al., 2018). As directed by our Elders, youth were directly involved in the work, gaining experience in the field alongside the Yukon College researchers (see Figure 6). The 2020 synthesis report put Ttsets'ėhk'edėł First Nation in the forefront of efforts to understand the threats of climate change to traditional food systems in the Dehcho (Ireland et al., 2020).

During this time, Ttsets'ėhk'edėł First Nation was also busy with regional activities that are directly related to our capacity to respond to climate change risks and vulnerabilities. For example, in 2019, a major initiative led by Dehcho First Nations¹⁸ brought Elders, youth, and others together to share in documenting *Nahendhodhe—Our way of life* (Dehcho First Nations, no date b). Several Ttsets'ėhk'edėł Elders and language experts were central to this project, which produced a series of videos explaining Dene laws in our language, Dene Zhatie.

¹⁸ Dehcho First Nations is the regional governance organization for First Nations governments and Métis locals in the Dehcho. <https://dehcho.org/>.

The community also became involved in conservation and environmental monitoring. This included the creation of the Edézhíe Indigenous Protected Area through a 2018 Dehcho First Nations leadership resolution and a 2022 designation as a National Wildlife Area (Edézhíe Management Board, no date). T̄h̄ets'ėhk'edėł̄ participates in the protected area's management board and in monitoring activities through the Edézhíe Guardians program. Meanwhile, our participation in water monitoring through the wider Dehcho K'ėhodi (Caring for the Dehcho) Guardians program became key to other collaborations with university researchers to help understand and manage the risks from climate-driven increases in mercury levels in fish (Laird et al., 2018; Swanson et al., 2023).

Together, these interconnected efforts point to a continued spirit of resilience in T̄h̄ets'ėhk'edėł̄. As our parents' generation did, we remain ready to try new things and build new partnerships that will help us continue evolving with the changes happening around us. In the final phase of our story, we dig deeper into our most recent efforts to build relationships that can enhance our capacity to evolve with the changes occurring to the land, our Mother, Ndėh.

Part 3: collaboration for climate change adaptation

The difficult work of adaptation

Much was achieved across 15 years of climate change work in T̄h̄ets'ėhk'edėł̄, but it was never easy. Levels of community engagement varied, reflecting competing demands on peoples' time but also ongoing struggles in the community with trauma-related dependence on alcohol and drugs.¹⁹ At times our capacity was hindered by turnover in leadership, management, and staff—all while demands on our time and energy were increasing for land claim negotiations, protected area establishment, and managing the impacts of flood and wildfire.

In every area that we worked to build our resilience we were met with challenges. We worked to continue our traditional sharing economy, with moose meat and fish regularly shared out to Elders and others. However, many of our best harvesters were now Elders themselves and many of those who would have become our next generation of harvesters moved away for study and employment. Meanwhile, a shortage of housing meant there were few options for those young people who did want to stay. We also worked to reduce our own contributions to global warming, but here too the challenges were numerous. Two solar installations met with initial success, but one was later taken down due to technical issues we lacked the capacity to address. A community garden was reestablished, but participation was low and the greenhouse was damaged by flooding in 2021 and a heavy snow load the following

¹⁹ Our struggles with alcohol and drugs are like those in Indigenous communities across Canada, and reflect the intergenerational trauma from residential school and other impacts of colonialism on Indigenous culture and ways of life. The North America-wide toxic drug crisis has hit especially hard in the North. In 2024, the Dene National Assembly declared a state of emergency to draw attention to the issue (Blake, 2024)

year. We installed permafrost monitoring stations but then lacked funding and personnel to ensure they were regularly visited for data collection and upkeep.

Capacity challenges were accompanied by growing concern among our Elders as their knowledge of the land sometimes failed to provide explanations and responses to the changes they saw. In the past, we would respond to shifting abundance of fish, wildlife, and berries by giving parts of the land a rest and moving our harvesting to other areas. We were confident in our knowledge of how to roll with the cycles of change that were a normal part of life in Denendėh. But what can be done when the changes are happening everywhere across our territory, in unpredictable ways, and at such an alarming rate?

Not long ago, our two elder brothers/cousins set a net in one of our most reliable fish lakes during the late summer spawning season. After a day they checked the net and were surprised to find it empty. They left it in for two more days but caught not a single fish. They were stunned. As they related this to family members, the feeling was that somehow the circular relation of reciprocity had been cut: the land could not provide for them as it always had. Whether it is the fish, or the moose, or the berries and medicines, the land provides for us because we show there is a need and we demonstrate gratitude for what we receive. What might be the link between climate change and a breakdown in our roles and responsibilities in this order of reciprocity?

The Elders of our parents' generation—those whose stories we have told in these pages—always said that this was not the first time our people have experienced environmental change. We have transformed with the land in the past and can do it again. However, by the start of the 2020s, many of the Elders who guided our early climate change work had passed away. As youth continued to leave the community in search of study and work opportunities, we became increasingly worried about the intergenerational transmission of our Dene Knowledge and ways of life. We know that these concerns are shared across the Dehcho Region and by remote Indigenous communities across the North, but solutions are complex and long-term. To keep evolving with the land we need our Dene identities and cultural ways to remain strong, and to do that we need to reinforce the intergenerational chain of knowledge transmission.

Building a new partnership

One thing in our favor as we neared the start of the 2020s was a national agenda for reconciliation rising out of the 2015 report of the Truth and Reconciliation Commission. A change in national government also brought a decade of increased funding for Indigenous initiatives, including for climate change adaptation. However, much government funding comes on a short-term project basis, with application and reporting requirements putting additional demands on Indigenous governments. The treadmill of project-based work was making it hard for T̄h̄ets'ėhk'edėł̄ First Nation and others to tackle climate change adaptation in meaningful and sustained ways. In response, we turned once again to partnerships with researchers to augment our capacity and continue our work.

The collaboration between Margaret Ireland and Alex Latta that led to the formation of our research team began with conversations over several years during Alex's previous work to support environmental stewardship and climate adaptation in other Dehcho communities. In late 2020, in the thick of the COVID-19 pandemic, we collaborated on a grant application for climate change adaptation programs funded by Canada's federal government.

In a tragic irony, the funding approval was received the same week in May 2021 that the community was evacuated and severely damaged due to flooding. Many community members lost their homes. When Alex, along with fellow academic researcher Miguel Sioui and master's student Mack Bell, arrived in the community in December of that year to start the research, about a third of the community was still living in temporary shelter. Our first work together was moving furniture, files, computers and other equipment back into the newly reopened Band Office.

Collaboration for adaptation strategy building

The interviews conducted during that first visit by our university partners helped inform the research approach, centering Dene values and community members' experiences and concerns. In August of 2022 we held the first community workshop, where T̓h̓e̓t̓s'̓é̓h̓k'̓e̓d̓é̓l̓ First Nation members discussed ideas of environmental change, climate-related risk, and adaptation. There, we also discussed and confirmed priorities for subsequent workshops and related activities. Finally, we solidified the research team of academic and community partners reflected in the authorship of this article.

Based on what we heard in those early community engagements, we set out to build on T̓h̓e̓t̓s'̓é̓h̓k'̓e̓d̓é̓l̓ First Nation's past work to identify adaptation strategies to support Dene ways of life, as well as the community's overall health and wellbeing. We committed to elevating Dene Knowledge, learning through dialogue across Western and Indigenous knowledge systems, exchanging knowledge with other Dehcho communities, and collaborating with Dehcho First Nations. A crucial next step was for members of our academic team, led by Julia Gyapay and Ashley Falconer, to synthesize the findings and outcomes of the community's previous climate change research and planning. This made that existing knowledge more accessible to community members and helped inform our approach to the research.

Between November 2022 and March 2024, we went on to hold two more workshops in T̓h̓e̓t̓s'̓é̓h̓k'̓e̓d̓é̓l̓ and a health and wellness gathering in Fort Simpson (see Figure 7). We held two additional meetings in T̓h̓e̓t̓s'̓é̓h̓k'̓e̓d̓é̓l̓ in 2024 and 2025 to share and receive feedback on findings, provide updates on project outputs, and discuss future pathways for the community after the end of this project.

Across the 2–3 days of each workshop or gathering we facilitated community discussions, held focus groups with Elders and other community members, and hosted presentations from

academics and Dehcho First Nation staff. We included cultural and other activities alongside data collection, such as fire feeding ceremonies, art projects, fish sampling and processing, participatory Dene Zhatie language sessions, and community feasts. As part of regional knowledge sharing, we also traveled with several community members to a gardening workshop in another Dehcho community. Overall, 30 members of the community participated in data collection at least once during the project, with more than half of those participating on multiple occasions. Participants included youth 16 years of age and older, adults, and Elders. Additional community members, including children, took part in research-related activities where no data was collected.

Workshop structure, activities and topics were planned during virtual and in-person meetings between the academic and community members of our research team. A consultant hired by the community worked with the team to assist with project management and to lead the drafting of an eventual adaptation strategy. Workshop facilitation was shared between the academic members of the team, the consultant, and Margaret Ireland. Margaret, along with Gladys Norwegian and Marilyn Hardisty, provided ongoing direction, with additional guidance and support from former and present chiefs: Stanley Sanguéz, Nolene Hardisty, and Melanie Norwegian (Gladys Norwegian is also a former chief). Ariel Sanguéz contributed from her perspective as a young adult and in relation to protected area and Indigenous Guardians work that she was leading on behalf of the community. Other community members contributed in various ways to the cultural and other activities that were not directly related to data collection.

Our academic team members bring prior methodological orientations to their work with Dene communities, but as a team we looked primarily to Dene values of relationship, mutual respect, and reciprocity to guide the work. We aimed to balance the core objective of working toward an adaptation strategy with wider goals of promoting dialogue and shared learning. This meant being flexible to meet individuals and the community on their own terms, which varied with global and regional events, the health or employment status of community members, transitions in leadership, and the unpredictable extremes of weather. One of our team members described our approach in relation to the Dene philosophy of teaching, which gives individuals a chance to sit with information and ideas, pursuing new layers of learning according to their own initiative. New understanding builds in a spiral way on top of previous learning, and by working with that learning to internalize it. Community members often approached us for additional informal conversations outside the workshop sessions, as they reflected further on the topics discussed there and related them to their own experiences. Those follow-up conversations also happened outside the envelope of the research project, as members of the research team reconnected with community members around other activities, like when one of the team members (Pludwinski) led a canning workshop in the community on behalf of a Yellowknife-based environmental organization, or like when another team member (Latta) reconnected with community members in an intra-community protected areas gathering.

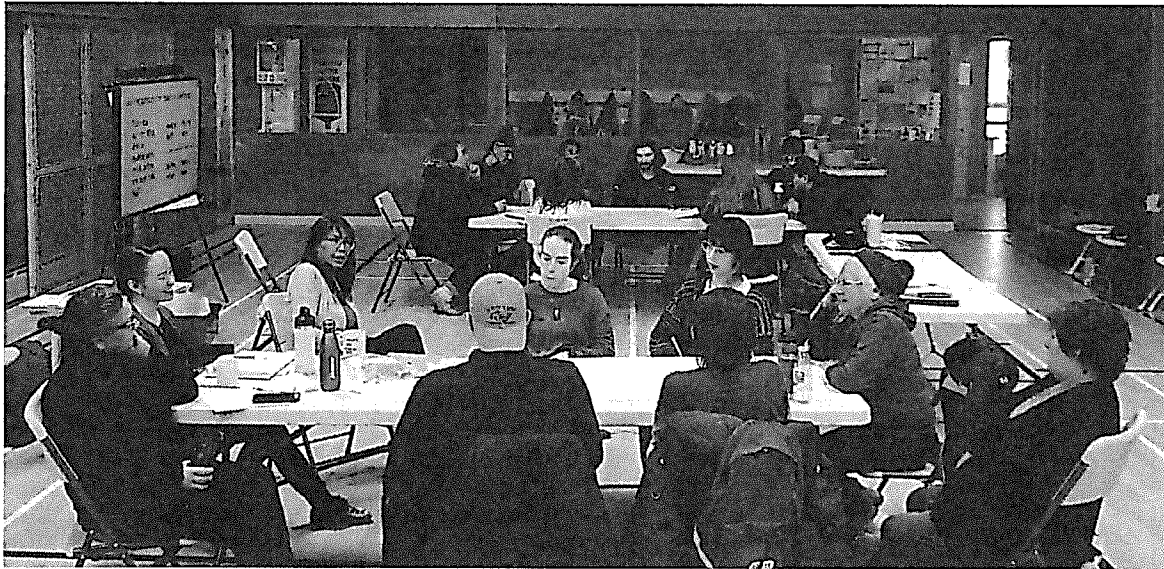


FIGURE 7
February 2023 community workshop on climate change and wellness © Thets'ehk'edeh First Nation.

As the research evolved, our team engaged collectively with a handful of academic sources related to methodologies, and others that could help us relate the experiences of Tthets'ehk'edeh First Nation to other work in the field of Indigenous climate change adaptation. We aimed to balance breadth of reading with manageability, considering both the jargon of academic writing and the limits on our time. To facilitate the sharing and discussion of these ideas, our academic team members wrote plain-language summaries for the sources we decided could be most important for our work.

One core commitment we made was to a strengths based approach to the research, aiming to support resilience through affirming and nurturing existing community capacity for collective action. We found it useful to consult Straits et al. (2022), who explored the concept of strengths-based approaches, based on Indigenous cultural resilience, as an alternative to the dominant deficit-based response to the mental health dimensions of climate-related and other environmental disasters (see also Reed et al., 2024, p. 24). In the next section, we elaborate on what this meant in the context of our research journey.

Our Dene-informed approach to the research aligned with Indigenous methodologies for knowledge co-creation (Latulippe, 2015; Hill et al., 2020; Kovach, 2021). Our approach to the research also shared elements with Community-Based Participatory Research (CBPR) (Koster et al., 2012; Israel, 2013), and we aimed to prioritize equity, inclusion, and active participation. Recognizing the challenges of conducting research collaborations in the context of ongoing colonial relations in settler society (Leeuw et al., 2012; Morton Ninomiya and Pollock, 2017; Goldhar et al., 2022), we did our best to follow the principles of CBPR and Indigenous methodologies, engaging with the community as much as we could—and as seemed appropriate under shifting circumstances.

Beyond the limitations of the research team and the circumstantial challenges for conducting the research in a good way, there are other deeply rooted barriers to generating Dene-led knowledge and action on climate change. Even as we attempted to center Dene knowledge and values, we have to recognize that colonization has changed the way Dene think; many of our community members speak English as their first language and have only fragments of the cultural teachings that were the fabric of our pre-colonial society. Mohawk thought leader Alfred (2009, p. 165) writes that “disconnection from heritage is the real cultural and physical disempowerment of a person.” This dimension of colonization is addressed also by Waziyatawin and Yellow Bird (2012, p. 3), who assert that decolonization means “restoring cultural practices, thinking, beliefs, and values...” and also “the birthing of new ideas, thinking, technologies, and lifestyles...”. As we share the final stage of our collaboration and conclude the article, we reflect on these and other challenges and pathways forward, looking to story as one approach to reviving the connections with Ndéh that are the wellspring for our Dene identity.

A strengths-based approach leads us into healing and story

Working from a strengths-based approach was not easy in the face of the immediate impacts of climate change. The research was delayed by recovery from the 2021 flood, as well as the near- and long-term impacts of COVID-19 and subsequently a 2023 wildfire season that saw Tthets'ehk'edeh First Nation and eighteen other NWT communities evacuated. We were forced to cancel a planned

on-the-land camp that was to conclude the research in August 2023. However, these events brought not merely project disruptions; they impacted many community members' mental health. We experienced first-hand the challenges of planning for the future when prioritizing short-term safety, preparation for evacuation, and recovery efforts.

In the face of these impacts, community members consistently affirmed that physical, mental, emotional, and spiritual wellness are necessary starting points for climate change adaptation. Working from strengths doesn't mean ignoring challenges but rather facing them with open eyes. It was in response to this feedback that we switched gears as we sought to replan the final gathering of the project after the cancellation of the August 2023 on-the-land gathering. Through a three-day health, wellness and trauma workshop in March 2024, members reconnected with themselves, each other, and the land. We saw this culminating gathering as itself a form of climate adaptation action.

The strengths-based approach also led us to another kind of unanticipated climate action: documenting the stories in this article. We learned that community members shared a common set of stories about how their parents' and grandparents' generation had adapted to permanent settlement in Tłtshé'édél. The research team decided that the community's history of being self-sufficient and evolving with change was a valuable collective resource when putting a climate change adaptation strategy into action.

We had not centered Indigenous storytelling approaches or story documentation in the research interviews and workshops. Nevertheless, our approach was aligned with the centrality of story in Indigenous methodologies. As Kovach (2021, p. 156) highlights, story is much more than a mode of relating information: "Story nurtures relationship. Story kindles reciprocity. Story compels responsibility. Story thrives where there is respect. Story is a gift" (see also Wilson, 2008). We consistently created space for storytelling as knowledge sharing, an approach that also aligns with CBPR's emphasis on collaborative, community-based work rooted in relationship and trust (Datta, 2018). As we worked on this article, the research team continued to solicit recollections of the shared stories about Tłtshé'édél's history. When we needed to clarify details, we talked with Elders and reviewed historical documents. Those documents included a community history project completed during an adult education class in 1996 (Hardisty et al., 1996).

The writing process was iterative and collaborative: we would discuss the stories, the academic members of the team would draft a section, we would review the draft and meet for feedback, and then repeat the cycle. As described by Datta (2018), the extended process of telling, receiving, and documenting stories prompted our team to continuously reflect on our positionality, voice, role, and responsibilities throughout the project. We took things slowly as we balanced different team members' availability; the writing stretched out over more than a year.

In January 2025, a new opportunity came to our story work. Wilfrid Laurier University offered us knowledge mobilization funds to animate the stories in short videos.²⁰ Our team has been working

²⁰ The funding came through the *Northern Water Futures* project, which was the central part of Wilfrid Laurier University's participation in the Canada

with an artist based in Yellowknife²¹ to convert each story into a short narrative, with illustrations informed by historic photographs from the NWT Archives at the Prince of Whales Museum and by a community visit in June 2025. The videos will be owned by the community and will provide an enduring way to engage new generations about their history of adaptation, and to share Tłtshé'édél First Nation's experiences with other communities, future collaborators, and policy makers.

Lessons, reflections, and conclusions

As we worked on this article, we were inspired by the interconnections with a selected body of academic literature regarding Indigenous climate change adaptation. The literature helped us think through the challenges climate change presents, but also the capacities and avenues for Tłtshé'édél First Nation to respond. The authors of the 2024 *For our Future* report on Indigenous resilience (Reed et al., 2024, p. 24) assert that "impacts from the climate crisis are inextricably linked to ongoing processes of colonialism, dispossession and rights violations" (see also Whyte, 2017; Council of Canadian Academies, 2019, p. xi). Straits et al. (2022, p. 318) highlight this same intersection of climate and colonialism in relation to mental health and wellbeing: "the intersection of Indigenous mental health and climate change must be contextualized within an understanding of colonization's destructive effect on the cultural and social structures of our people".

Given the colonial context for climate change adaptation, the literature emphasized responses that point to Indigenous resurgence. For instance, self-determination was highlighted in the North America chapter of the Sixth Assessment of the Intergovernmental Panel on Climate Change (IPCC). There, Hicke et al. (2022, p. 1,945) sustain that "Indigenous self-determination and self-governance are the foundations of adaptive strategies" (see also Whyte, 2017; Reed et al., 2024). In this way, our conversations in Tłtshé'édél about adapting to a changing climate are directly connected to other ongoing struggles, like the Dehcho-wide negotiations toward a modern treaty with the Government of Canada, and also to our ongoing work to advance Indigenous-led protected areas in our region.

We found other parallels in the literature for our focus on Dene knowledge and value systems in our adaptation work. Turning again to the Sixth Assessment of the IPCC, Hicke et al. (2022, p. 1,943) note that where Western approaches to knowledge reflect a dualistic and utilitarian relationship between humans and nature, "Indigenous legal orders are based on duties, obligations and responsibilities to the land and all beings," with Indigenous Knowledge reflecting wider conceptions of humans as

First Research Excellence Fund project, *Global Water Futures*. *Global Water Futures* was led by the University of Saskatchewan, and in addition to Laurier included the University of Waterloo, and McMaster University as partners.

²¹ Alison McCreesh is a Yellowknife-based artist. Though non-Indigenous, she has over fifteen years of experience working in the north and is widely renowned as a graphic recorder for community-based research and planning workshops, meetings, and assemblies, often with a focus on the changing climate. More about her work can be found on <https://www.drawnorth.ca/>

a part of nature. In this vein, Citizen Potawatomi Nation scholar Kyle Whyte (2017, p. 158) discusses the revival of Indigenous Knowledge systems as a process of “renewing relatives” and restoring reciprocity between humans and non-humans. As one example, renewing relatives means recognizing that bears and wolves are now more present around our community because they too are adapting to change, especially after the land has been ravaged by wildfire. Further still, we assert that such renewal requires us to remember the wisdom of our Dene prophets and relearn attentiveness to the teachings from our dreams. These are forms of knowledge that were discounted by Western science but are now experiencing a resurgence. This is occurring as Dene and other Indigenous knowledge traditions help the world recognize that while the mechanism for climate change may be greenhouse gas emissions, the root cause is broken relationships. Our Dene ways of knowing can help us do our part to restore balance and reciprocity with Ndéh.

Straits et al. (2022) take a related approach to mental health and wellbeing, underlining the holistic and collective character of Indigenous resilience. This led the Dene members of our author team to reflect on the holistic spiritual training in traditional Dene culture. The Dene language does not have a concept like mental health. However, spiritual and related cultural practices have the outcome of psychological and emotional wellbeing, grounded in an orientation of gratitude, empathy, and humility in our connection with Ndéh. One example of this is the Dene tradition of fire feeding, where tabaco and food are placed in the fire as part of a prayer accompanied by the beat and voices of our drummers. When we were growing up, this was an annual ceremony to bring in the new year, both to express gratitude and to ask for abundance in the year ahead. Today it is conducted more often, for instance at the opening of important regional meetings of our Dehcho First Nations. A similar way of making offerings in gratitude to Ndéh traditionally happened as a regular part of being with the land during harvesting. In the middle of winter, hunting success was everything to our survival. After killing a moose, our harvesters would save a piece of the fat from around its eyes or its kidneys—the most valuable fat for the nutrients it holds—and burn that fat to express their gratitude. These intimate ceremonial expressions of connection and reciprocity need to be continued, revived, and reimagined as a way of promoting the wellbeing of both Dene and Ndéh.

In the face of drought, wildfires, and flooding, it can be harder to practice gratitude and reciprocity, and the trauma of these events can be a significant factor impacting Dene wellbeing. But here too, we can turn to our Dene teachings to help us understand and respond in ways that rebuild relationships as the foundation for our own physical, mental, and spiritual health. One of the ancestral practices that we discussed during the work on this article was the Dene way of child-rearing that grounded each person in connection to their surroundings. Infants would be taken along with the family to harvesting sites and were often wound up tightly in blankets and placed in a location where they could observe their surroundings. This kept them safe and warm, but also prevented them from getting distracted by their hands, so they would be able to take in all of the sights, sounds, and smells around them. Teachings like this open sensitivity to the connection with Ndéh and make us more aware today of the pain Mother Earth feels due to climate change.

Seen from another angle, one of our Elder brothers/cousins has stated that the earth too is a living thing, and like any living thing it will try to protect itself when threatened. We have heard Elders from other nations make similar remarks in relation to changes like the disappearance of fish, telling us that we need to respect their decision to go elsewhere for their own protection during these times of low water levels. Empathy for Ndéh can help us process our own trauma around natural disaster, redirecting it into renewed respect for the land and a renewed sense of responsibility to care for the earth.

If the adaptation challenges facing Tthets'ėhk'edėł and other northern First Nations seem at times insurmountable, the Sixth Assessment of the IPCC reminded us that “Adapting to change, in all its forms, has since time immemorial been one of the defining characteristics of Indigenous cultures on Turtle Island” (Hicke et al., 2022, p. 1,944). Even the colonial experience can be considered to uniquely equip Indigenous Peoples for the adaptation challenges ahead. As Whyte (2017, p. 160) puts it, “Indigenous imaginations of our futures in relation to climate change...begin already with our living today in post-apocalyptic situations” (2017, 160). Despite having been through apocalyptic change, the people of Tthets'ėhk'edėł are still here. Like other Indigenous Peoples across Canada, we have been resilient in our culture, identity, and relationships with the land. In particular, and following Ridges et al. (2020), we point to the integral role of our culture in sustaining core Dene values, with adaptation emerging through kinship, connection to Ndéh, and relational responsibility.

Understanding and valuing past experiences of change and resilience may be key ingredients for Tthets'ėhk'edėł First Nation and other communities like ours to continue evolving with the land and the times. Whyte (2017, p. 160) calls for a focus on generating Indigenous-led interpretations of “histories and futurities” as key to the “continuance of flourishing future generations”(160). In this space between past and future, stories act as connective threads within Indigenous cultures, legal systems, and ways of life. In the words of Kimmerer (2013, p. 341):

Stories are among our most potent tools for restoring the land as well as our relationship to land. We need to unearth the old stories that live in a place and begin to create new ones, for we are storymakers, not just storytellers. All stories are connected, new ones woven from the threads of the old.

Data availability statement

The datasets presented in this article are not readily available because the data is owned by Jean Marie River First Nation. Requests to access the datasets should be directed to rmc@jmrnf.com.

Ethics statement

The studies involving humans were approved by Wilfrid Laurier University Research Ethics Board. The studies were conducted in accordance with the local legislation and institutional

requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

MI: Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing. GN: Conceptualization, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. MH: Conceptualization, Investigation, Validation, Writing – original draft, Writing – review & editing. AI: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. JG: Conceptualization, Data curation, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. MS: Conceptualization, Funding acquisition, Investigation, Methodology, Supervision, Writing – review & editing. BP: Conceptualization, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. AS: Conceptualization, Validation, Writing – review & editing. AF: Data curation, Formal analysis, Investigation, Writing – review & editing. MB: Data curation, Formal analysis, Investigation, Writing – review & editing.

Funding

The author(s) declared that financial support was received for this work and/or its publication. The research collaboration for this article was funded by the Social Sciences and Humanities Research Council of Canada (Grant No. 435-2019-0955); the Climate Change and Health Action Program and the Climate Change Preparedness in the North Program, both administered by Crown-Indigenous Relations and Northern Affairs; and ArcticNet.

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Acknowledgments

We are grateful to the Tłtshets'éhk'edéł First Nation Band for supporting this work, including hosting members of our team from outside the community on numerous occasions and making band office spaces available for meetings, workshops, and community feasts. We extend thanks also to Dehcho First Nations staff for their support, advice, and collaboration in the research. Finally, we express our appreciation to all the community members who participated by sharing their observations, concerns, ideas, and visions for the future.

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was not used in the creation of this manuscript.

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