

## On the ice of Lake Khuvsgul

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In the vast northern distances, summer voyages to certain areas can only be undertaken by helicopter. However, as winter sets in, the most remote village, Todzhinsky Kozhuun's Chazylary (Tyva Republic), is no longer isolated. While in the warmer months, it's reachable only by boat or horseback, with the arrival of winter, the snow roads unveil a convenient passage, making Chazylary more accessible. Similarly, villages dependent on summer ferries find newfound accessibility in winter. The journey between Khankh and Tsagaannur (Mongolia), which would require a 2 or 3-day endeavor during the summer, takes about five hours over the ice. In winter, roads lay across frozen ground, snow, and icy river and lake channels. These are aptly named "snow roads" or "ice roads." They serve to shorten distances, rendering many territories more accessible—not only settlements and communities but also hunting and fishing grounds.

The Indigenous and local communities have utilized these ice roads for centuries. However, with the changing climate, the winter lifeline of these locales has shortened. Where roads used to "freeze" in November, being navigable until April, now the warmth of April brings early thawing to the roads, turning them into water-filled ruts impassable for vehicles (except for all-terrain vehicles), even when the river ice is still solid.

Our journey across the lake ice took place from the end of March to early April 2023 as part of a research project on studying the role of transportation accessibility in preserving ecological cultures. We were interested in the familial, administrative, and economic relationships between various communities of the Sayan Crossroads, including how the ice affects the mobility of the population and their communication.

Khuvsgul Nuur, or lake, is located in northern Mongolia. It is a massive 2,760 square kilometer body of water that stretches almost to the border with

Siberia. It is the second-largest in Asia and one of the oldest lakes in the world, being among just 17 that formed over two million years ago. Mongolians call it 'ocean mother' and revere it as the country's main source of freshwater.

Between the settlements along the coast of the lake, there are ice roads. Where roads are absent, in most cases, one can travel on the ice, preferably with a guide, navigating around hummocks and cracks. Only at first glance, from a distance, the ice appears as smooth as a mirror. In practice, traveling straight across the ice is often impossible due to winding cracks, hummocky fields, and snowdrifts. Another characteristic of ice roads is the presence of densely packed snowdrifts, on which the vehicle jumps like on a trampoline. When overcoming frozen cracks and snow-covered hummocks, the vehicle suspension often experiences strong impacts.

Local people and fishermen have long mastered the icy expanses for moving around in cars. Nevertheless, drivers must possess extensive experience and knowledge of ice conditions, which they describe in 'colors'. "Black ice" is slippery ice on which driving a car is impossible, "white ice" is thin ice near the shore, and "blue ice" is the ice in the central part of the lake, appearing sky-like from a distance. Similarly, ice cracks have distinct characteristics: "Cracks come in two varieties. A white boundary occurs when plates of continental ice collide. The second kind is when the plates diverge, revealing black water between them, known as the black boundary. This happens due to the movement and breaking of ice, resembling dams. This is also considered a white boundary"(Male, 63 years old, Bayanzurkh, July 2023).

To reach our destination - Tsagaannuur soum (village), we traveled there across the ice. Significant cracks that had already appeared on the lake in March reminded us about the shortening lifespan of this winter road due to climate change.

In Mongolia, Lake Khuvsgul is considered sacred. Before embarking on a car journey across the lake's frozen surface, locals recite a prayer and perform a ritual to honor the spirits of the lake. Mongolian tradition involves taking a bit of water in one's hand, splashing it, and seeking the spirits' favor. Batmунh conducted the ritual of paying homage to the water spirits right at the beginning, and we stopped three more times in front of sacred places to perform the ritual. Our guide, Batmунh, advised the driver, Ubugun, on where it would be best for us to stop for the ritual at specific locations. One of these places was opposite a mountain called Dolon Khus (Seven Boys). According to legend, seven boys went to play in these areas, got lost, and were never found. Since then, residents have worshiped the spirits of this place, invoking the memory of those boys, seeking their assistance, and wishing for a safe journey.

In the beginning, driving on the ice didn't seem daunting, but as cracks started appearing, it became evident why drivers prepared so meticulously for the journey. When the car approached a crack in the ice, our Mongolian colleagues would step out of the vehicle and inspect it with a crowbar. They would consult and decide whether to cross the crack or turn around and find an alternative route. Based on many years of travel across the lake, drivers have developed a system of communication with each other. If the ice is deemed unsafe, the driver creates a sign indicating the impossibility of passing, by building something or throwing a sock or a boot warning of danger. However, as the ice situation can change rapidly due to the wind, drivers are always on alert during travel (Male, driver, 42 years old, Khanh, March 2023).

During our expedition, they examined the ice eight times. Before crossing a crack, my colleague and I would exit the car and jump over the crack ourselves, while the men drove the car over. During those moments, we genuinely felt fear. The entire journey took about 8 hours, covering a total distance of approximately 150 km, with around 50 km across the lake.

On the return journey, the weather began to change. Our driver warned us that in

adverse weather conditions, especially with strong winds, visibility on the ice became nearly nonexistent, making the path much more challenging and dangerous. However, we were lucky to reach the village without major problems.

For centuries, the indigenous and local inhabitants have relied on these ice roads as essential lifelines. These frozen pathways have been integral to their way of life, facilitating transportation and trade during the winter months. However, the changing climate poses a significant challenge to these time-honored routes. The winter season, once a reliable and extensive network of frozen passages, now is experiencing a noticeable contraction.

As temperatures rise and ice becomes less predictable, the reliability of these ice roads is increasingly compromised. This presents a pressing concern for the communities that have long depended on frozen roads. The consequences are far-reaching, affecting not only transportation but also the socio-economic and cultural fabric of these northern regions. As these changes unfold, adaptation becomes imperative for both the people and the landscapes they call home. However, some of these changes can become irreversible: with more and more people abandoning traditional ways of life and moving to the cities. Therefore, our trip has been one more reminder of climate action urgency highlighting the need to preserve the frozen state for human mobility and connectivity in this remote region.

*Edited and translated by Olga Zaslavskaya*