

“Northern Russia’s physical vulnerability to climate change is at best severe, considering the underlying permafrost and the threat that warming presents to that foundation.”

Climate Change Adaptation and Traditional Cultures in Northern Russia

SUSAN CRATE

Northern Russia is a vast and diverse territory, both ecologically and culturally. Especially when considering the largest part of this region, Siberia, many people envision a white frozen land, empty save for the gulag. To the contrary, it is a patchwork of arctic and subarctic

**Changing with
the Climate**

Second in a series

ecosystems that represent a sampling of most world regions in the same latitude. The second point to keep in mind as we explore climate change adaptation in the Russian north is that because of the cultural and linguistic diversity of the area—and given the history of colonization, Sovietization, and its undoing—how groups adapt is similarly diverse and complex.

As diverse as this area is, one feature is shared across most of its expanse: permafrost, the permanently frozen layer that lies beneath the soil surface and provides the foundation for the landscape. Permafrost also has a critical role in water circulation and overall ecosystem health. The extreme continental climate (with annual temperature variation of over 100 degrees Celsius in many places) has made its home complete and sustainable, in ecological terms, by fostering the intricate workings of permafrost.

Simply put, a permafrost ecosystem, of which there are many, depends on water in its solid state—ice. Like everything else on the planet, permafrost as a physical phenomenon is itself diverse to the extent that it “fits in” with local and regional conditions of geology, limnology, climate, and the like. It may be continuous, discontinuous,

sporadic, or in isolated patches. The key point is that when we talk about northern Russia, it is important to keep in mind that this is a huge region (spanning eleven time zones) and has a diverse physical makeup with the common presence of permafrost in various forms.

In direct complement to that ecological diversity, but with historical explanations that perhaps play a more important role, northern Russia is also culturally diverse. The area is home to dozens of indigenous groups who speak languages that belong to four language families (Altaic, Uralic, Yeniseian, and Paleosiberian). Their historical subsistence practices include reindeer herding, sea-mammal hunting, fishing, terrestrial hunting, foraging, and horse and cattle husbandry.

As with other pre-industrial groups throughout the world, northern Russia’s inhabitants have long subsisted by making use of—and also innovating based on—a set of historical/ancestral adaptations to their specific environment. Overall, because resources are relatively sparse in northern ecosystems, the various groups have depended on subsistence practices that utilize their environment across extensive distances. For example, Nenets of the Yamal peninsula practice reindeer herding, moving across the peninsula with their herds in search of forage. The Chukchi people, who live along the coast of Chukotka, carry out an intensive several-week-long sea-mammal harvest as herds migrate north.

Above and beyond this diversity in human-environment interaction, there is also a huge diversity in cosmology and orientation to the physical world. In other words, these groups have various ways of understanding their environment, most of which are not founded on natural science, as is the tendency in Western culture. This is not

SUSAN CRATE is a professor of anthropology at George Mason University’s Department of Environmental Science and Policy.

to say that northern Russia's peoples live in a vacuum apart from the modern world—in fact, they are very much a part of it, and many live according to modern perceptions of the world. Nor am I suggesting, however, that they no longer hold to their traditional cosmologies because of the influence of globalization. Indeed, ethnographic research makes clear that perceptions based on these cosmologies are often the rule and not the exception. This adds other layers to the discussion of adaptation, considering that how people respond and adapt to climate change has everything to do with how they perceive it.

The cultural diversity of northern Russia has also been shaped by historical change. Along with the complex history of how the various groups came to inhabit the area, the processes of Russian colonization and twentieth-century Sovietization, with its eventual collapse, had major impacts on their adaptive capacity. Russian Cossacks crossed the Ural Mountains in the mid-1600s and claimed the lands they found for the Russian empire, demanding *iasak* (a fur tax) from the local peoples and annexing some areas for Russian colonies. Although the levy of sable pelts added to the burden on indigenous groups that were already coping with challenging conditions for subsistence, the effect on their livelihoods by no means compared to the changes that the Soviet period would bring.

During the twentieth century, the groups were first invited and then forced to join collectives, contributing whatever wealth they had and gradually consolidating production into larger and larger collectives, and then into state agro-industrial operations in the 1950s. One main effect in terms of adaptation was that they no longer were able to continue an extensive subsistence practice. They also became dependent on a centralized system and lost much of the knowledge base of their historical adaptations.

After seven decades, the Soviet system dissolved and the inhabitants of the north were, in most cases, left to fend for themselves amid the decentralization of state power. Many have adapted to that tumultuous change by relying on some level of household food production, but now in the setting of concentrated villages. For example, the Sakha of northeastern Russia breed horses and cattle, harvesting two tons of hay per cow to see them through the long eight-month winter. Today this must be done from a village center, which means they require transportation to and from hayfields to cut, stack, and haul the needed forage.

The other confounding factor is that the hayfields are turning to lakes.

FAILING FOUNDATION

Northern Russia's physical vulnerability to climate change is at best severe, considering the underlying permafrost and the threat that warming presents to that foundation. Furthermore, this vulnerability can be thought of as having both a local and regional scale and a global one. The former is all about permafrost. We know that the permafrost has warmed significantly in the past two decades and that it has shown signs of failing in both urban settings, where building foundations are based on the ice, and in rural areas where once-level plains are now rising and falling to form valleys and hills.

The extent to which this is happening depends on the type of permafrost (which in turn depends on the geology of each place) and other specific local and regional context. For example, where the permafrost is deep under the soil surface, it will be thawing less than it would in a place with a shallow permafrost layer. On top of that, a place used by humans will have more thawing due to the increase of air flow (with warmer temperatures) through the soil. Likewise, the type of human use will affect the rate of degradation of the permafrost layer. Consider the urban context with its heat island effects (summers are intensely hot in many parts of northern Russia) compared with a rural area given over to herding animals, with no working of the land. The Russian north is more urbanized than other countries' arctic territories due to military-industrial development during the Soviet period.

Of course, the causes and effects of global climate change are not just local or regional. Northern Russia is part of a global system that is affected by many sources of greenhouse gases (GHGs) from around the world, all emitting GHGs into a shared atmosphere that, in turn, affects the planet's air and water circulation.

In many places in the north, annual rain patterns are skewed—formerly rainy springs are now dry, and formerly dry late summers are getting wetter. Winters that used to be dry, frigid, and devoid of snowfall have warmed, turning into a season of continuous snowfall, which severely alters ecosystem and human functions. Air patterns are also different now. With the shrinking of arctic ice cap coverage, more moist air arrives on land and increases the humidity of a once dry climate.

Similarly, there are several layers to the Russian north's vulnerability to climate change on a cultur-

al and human scale. Inhabitants have adapted to their extreme environment based on an evolving ancestral knowledge system, which was affected by both Russian colonization and the collectivization and de-Sovietization of the twentieth century. While local and regional contexts make each case different, it can be assumed that these communities are extremely vulnerable to climate change, given the lack of any form of government intervention or assistance, and the struggling Russian economy, especially in rural regions.

In some parts of the Russian north, on the level of republics (areas designated in the Soviet period as territories for large non-Russian cultural groups), there is an official recognition of climate change since their governments must respond to an increasing number of emergencies due to flooding, failing permafrost, and the like. However, on the federal level there has been denial and inaction, despite President Vladimir Putin's speech at the Paris conference in December 2015 about the need to tackle climate change. All of this adds to the vulnerability of northern Russia's inhabitants.

LOCAL KNOWLEDGE

My long-term ethnographic research (1991 to date) has focused on how global climate change is affecting local communities. My work is with the Viliui Sakha, a Turkic-speaking horse and cattle-breeding people residing in the Suntar region of the Viliui watershed, which is located in the western part of the Sakha Republic in northeastern Siberia. This window into one group shows how the details and complexities of place figure into climate adaptation. Other parts of the Russian north face similarly challenging effects, albeit varying with their local ecological and cultural context.

I had collaborated with Viliui Sakha on various projects investigating post-Soviet cultural and environmental issues. But in 2006, inhabitants began voicing their concerns about unprecedented changes related to climate. They noted that the winters were not as cold and summers not as hot as before; the rain was coming at the wrong times; their hayfields were turning to lakes; there was too much snow. With their commitment, I started a project to investigate these concerns. Through interviews, focus groups, and surveys, we found not only that the majority of inhabitants were observing these and other drastic changes, but that

they attributed them to causes other than global climate change, a phenomenon about which they had little information.

My collaborations with a Russian scientist, Alexander Fedorov of the Melnikov Permafrost Institute in Yakutsk, showed the direct connection of these changes to the global phenomenon. As an anthropologist who had worked and lived with these communities for over 15 years, I recognized that they had a different way of understanding change, most commonly not from a Western scientific perspective but through their local way of knowing.

Dr. Fedorov and I decided to create "Knowledge Exchanges" with these communities to bring an understanding of permafrost degradation and other forms of climate change into the local vernacular. We also sought to use their observations to document the variety of ways in which the global phenomenon was interacting with and affecting local ecosystems and cultures. In 2010, we conducted eight of these exchanges, four in our

research villages in the Suntar region and the rest in the four regional centers along the Viliui watershed. Based on the positive response of participants, we spent another three years collaborating further with the communi-

ties to coauthor a handbook designed to allow all the settlements in the Viliui regions to participate in the process.

In the course of this research, I realized that it was critical to also integrate the other drivers of change in order to fully grasp what was happening in my field site—most importantly, the outmigration of young people and the local economic effects of globalization. A decade earlier, I had concluded that Viliui Sakha adapted to the fall of the Soviet Union by developing household-level food production, keeping cows and horses for their mainstays of meat and milk while supplementing that with gardening, foraging, hunting, and fishing. I observed that cows were everything to Viliui Sakha life and could be seen everywhere in their villages.

One day in 2012, I noticed that this was no longer true. The streets seemed eerily absent of cows and one household after another was declaring its freedom from the daily routine of cow-keeping. Since I was immersed in the climate project, my first assumption was that this was happening be-

How people respond and adapt to climate change has everything to do with how they perceive it.

cause their hayfields, which provided the eight months of fodder they needed to see their herds through the winter, were turning into lakes due to the combination of permafrost melting and changed precipitation patterns.

But by asking about this change, especially among households I had known since 1991 and had been committed to cow-keeping, I soon learned it was not that simple. Many said they had turned to cow-keeping to make up for the shortage of products in the village stores, but now the stores were full. Some said the tables had turned: there used to be shortages in the stores and cow products were plentiful, but now the stores are well-stocked and cow products are scarce. The other major factor in the turn away from cow-keeping is that young people, for whom much of this household food is produced and who do much of the essential summer work of hay cutting, are increasingly staying in the urban centers once they go there for higher education.

As this example shows, research that pays close attention to local ecological and cultural particulars is not enough to understand how climate change is affecting a given community's livelihoods and social structures. At the same time, it is necessary to consider the other drivers of change that are in play, because climate change may combine with separate economic or demographic trends in complex, unpredictable ways.

ELUSIVE EQUILIBRIUM

It is difficult to tease out specific efforts to adapt to climate change that these communities in northern Russia are initiating, simply because they tend not to compartmentalize their actions in such a way. For the most part, people there live with a day-to-day focus—not that they don't think about the future, but their daily work and production is most important. In that context, they do what they have always done, having adapted to their changing world to the best of their ability. Sometimes it works and other times it doesn't. If not, they try something else. In recent climate change parlance, this is often referred to as adaptive capacity, or the ability of an individual, community, or system to respond to change in a way that restores equilibrium.

The problem with the Viliui Sakha's adaptive capacity in the context of climate change is that their

toolkit of adaptive practices increasingly does not work (as is the case with any specific culture that has adapted to existing local environmental and climatic regimes). For example, Viliui Sakha ancestors figured out adaptations to the northern ecosystem (they moved there in several waves from southern Siberia in the Ghengis Khan era in the twelfth and thirteenth centuries) that included ways to harvest hay across a cycle of wet and dry years. They created a system for their hayfields that retained water in dry years and released it in wet ones. In the past decade, this adaptation has been failing due to alterations in the cycle resulting from global climate change. Dry years have either gotten much rarer or disappeared completely. Hayfields are turning to lakes with more water than the old system can release. The inhabitants are doing the best they can to get the hay they need, but future prospects are doubtful.

Another important point in terms of understanding local responses to climate change is that, despite what looks like a grim future for the place

where the Viliui Sakha live, the majority do not consider relocation an option. Those of us in Western cultures may have a hard time comprehending this since many of us live transient lifestyles, and don't think twice about relocating for an attractive

job opportunity, place to live, or relationship. But this is not the case in most places where climate change is having its greatest impact today.

In our research, we asked 150 participants in a random sample survey, designed to test what we had found in our focus groups and interviews, which of the following options they would choose if the hayfields turned to lakes and they could no longer keep cows: 1) move to another place in order to continue to keep cows; or 2) stay and practice another food production strategy. A majority chose the second option, which told us that they had a stronger attachment to their homeland than to their historical subsistence practices. Many spoke of potentially moving to higher ground or finding some other way to raise their homes above the incoming water. But most would not consider relocating to another region altogether.

STAYING IN PLACE

One example of government efforts to assist in adaptation in this region is the case of the village of Kyllakh, located on an island in the middle of

*The hayfields
are turning
to lakes.*

the Lena River, not far from Yakutsk, the capital of the Sakha Republic. Fifteen percent of all villages and the homes of 7 percent of the republic's population are in the direct path of floods. These areas experienced catastrophic floods in 1998 and 2001, which were also two of the ten hottest years on record. In those two years combined, over 50,000 people were affected when 205 villages were inundated by floods. (Kyllakh village elders remember that catastrophic floods previously occurred in 1903, 1937, 1948, and 1969.)

In response, the Sakha government passed a resolution in 2002 to relocate the villages most affected by the floods. In Kyllakh, work to move the village from the island to a non-flooding terrace on the right bank of the Lena River began in 2005.

Despite the state's relocation effort, most of the population of Kyllakh has remained in place, mainly because of the huge expense households incur by moving (the government is only funding part of the cost, and half of all households are at the poverty line). There is also the psychological burden, especially for older inhabitants, of leaving their birth village and adapting to a new place. Another important reason many have stayed is the small size of the allotted land and the lack of accessible hayfields at the new site, since most Kyllakh residents breed horses and cattle.

The Sakha government has also responded to the increasing number of unprecedented floods by handling them through the republic's Rescue Service. For over a decade, emergency specialists have developed and refined an early warning system to evacuate areas that face an impending catastrophe. In the 2007 flooding of the Alazea River, which left the villages of Andryushkino and Argakhtakh waterbound, residents were evacuated to safety. Although many soon returned home, it wasn't until 2012 that they could utilize pastures as before.

If we compare the two villages, we see how unprecedented change can affect subsistence practices and mobility differently. Residents of Argakhtakh, who are Sakha horse and cattle breeders, immediately considered relocating when the waters first came, whereas the inhabitants of Andryushkino, a Yukagir settlement dependent on fishing, showed no intention of moving since the floodwaters improved their livelihoods.

Thanks to the early warning system, not a single person has died in floods since 2007. But the increasing frequency and severity of these emergency situations makes the cost of responding to them prohibitive. Perhaps more importantly, they are often managed without the necessary consideration of peoples' attachment to place and their livelihoods. Nonetheless, given the increasing number of similar natural disasters across Russia, this kind of early warning system deserves emulation. One example is a July 2012 incident that killed 99 people when several settlements in the Krasnodar region of southern Russia were inundated by flooding. Had Krasnodar put in place an early warning system, these lives may not have been lost.

ON THE GROUND

In the current political context, where there is still strong denial of climate change and an uncertain commitment to develop policies to address it, communities as well as local and regional governments must take a central role in the process of adaptation and building resilience. This is especially true in northern Russia, where the arctic/subarctic ecosystem has a greater propensity to change due to melting, and considering the absolute lack of federal involvement in climate change mitigation and adaptation. Unfortunately, Russia's political system, which may be characterized as an authoritarian kleptocracy, is no place to look for policy solutions or assistance for affected communities.

With its forward-thinking emergency response initiative, the Sakha Republic may be an exception to this state of affairs, but given the intensifying local impacts of climate change it won't be long before such measures inevitably prove insufficient. The best approach to encouraging climate change adaptation and resilience is a combination of increased citizen awareness and community building on the local and regional levels in the face of the emerging challenges. However, without more people on the ground initiating such movements, there is little hope of success. Anthropological methods can help facilitate awareness and adaptive responses by accommodating local knowledge and perspectives, and by translating scientific knowledge into the vernacular to show inhabitants how climate change is having local effects. ■