



Edited by
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THE SIBERIAN WORLD



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The Siberian World provides a window into the expansive and diverse world of Siberian society, offering valuable insights into how local populations view their environments, adapt to change, promote traditions, and maintain infrastructure.

Siberian society comprises more than 30 Indigenous groups, old Russian settlers, and more recent newcomers and their descendants from all over the former Soviet Union and the Russian Federation. The chapters examine a variety of interconnected themes, including language revitalization, legal pluralism, ecology, trade, religion, climate change, and co-creation of practices and identities with state programs and policies. The book's ethnographically rich contributions highlight Indigenous voices, important theoretical concepts, and practices. The material connects with wider discussions of perception of the environment, climate change, cultural and linguistic change, urbanization, Indigenous rights, Arctic politics, globalization, and sustainability/resilience.

The Siberian World will be of interest to scholars from many disciplines, including Indigenous studies, anthropology, archaeology, geography, environmental history, political science, and sociology.

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CHAPTER 10

CLIMATE CHANGE THROUGH THE EYES OF YAMAL REINDEER HERDERS



Alexandra Terekhina and Alexander Volkovitskiy

“Since the land was born it started to change”

Ivan Petrovich Vanuito, Nenets herder and fisherman

Climate change is the most significant problem among the other global challenges facing humanity. Different scientific issues related to the new climatic trends have been examined in scientific literature, and the number of publications concerning climate change is increasing extensively. These changes are manifested with particular force in the Arctic, which is warming at more than twice the average rate as the rest of the globe (Przybylak & Wyszyński, 2020). The cascading effect of temperature rise affecting natural systems also directly impacts the Indigenous populations of the Arctic, which depend primarily on the utilization of these natural systems (ACIA, 2005; AHDR, 2004; AHDR II, 2015; Pachunari, Meyer, & Core Writing Team, 2015).

Global processes associated with new climate trends have been in the focus of anthropology for several decades (Crate, 2011; Crate & Nuttall, 2009). Regarding the Arctic, scientists elaborate both global and theoretical issues as well as regional and local practices of adaptation, problems of sustainability and resilience of socio-ecological systems, and scientific and traditional/local knowledge within case studies.

Our research focuses on the Yamal Peninsula (Russia), which coincides with the territory of the *Iamal'skii raion* (district) of the Yamalo-Nenetskii autonomous okrug (YNAO). It has maintained the image of a unique region where family nomadism of the local people, the Nenets, has persevered, in close proximity to intensive industrial development associated with hydrocarbon production over recent decades. Currently, in *Iamal'skii raion*, ca. 1,000 families (ca. 5,500 people) continue to lead a nomadic lifestyle and graze ca. 225 thousand reindeer.¹

As in other regions of Siberia during the Soviet period, previously isolated households of the Yamal Nenets were united into large state enterprises after the confiscation of private herds. State reindeer were grazed by herders of *brigade* (single unit of state farm formed by five to seven herders and several *chum* (nomadic tent) workers) who received salaries but preserved their own family herds limited in numbers by the authorities. The grazing was carried out on the basis of scientifically calculated grazing capacity of pastures, with obligatory seasonal rotation. After the collapse

of the USSR, significantly-reduced former socialist reindeer enterprises were transformed according to the new economic conditions, but the principle of their brigades' migration patterns has not changed. At the same time, since the 1990s, the dominant group of tundra nomads (in terms of population and number of reindeer owned) are private owners (so-called *chastniki*), possessing up to ca. 80% of the Yamal reindeer (Golovnev & Osherenko, 1999; Stammler, 2005). It should be emphasized that the results of the transformation of Soviet reindeer herding in Yamal were utterly different than in other regions of the Russian Arctic, where reindeer herding declined in the 1990s. In the YNAO, until the 2010s, there had been steady growth in the numbers of reindeer, especially those connected with private households.

In recent years the wide range of issues concerning reactions of the Yamal Nenets to climate change has attracted growing interest. Crucial events in Yamal that caused the widest resonance—the mass mortality of reindeer because of the icing in 2013 and the outbreak of anthrax in 2016 (Forbes et al., 2016; Golovnev, 2017; Hueffer, Drown, Romanovsky, & Hennessy, 2020; Sokolov, Sokolova, Ims, Brucker, & Ehrich, 2016)—have crystallized interest in this research area. Even so, climate change discourse in Russia has its own specifics, as Forbes and Stammler (2009) noted. Perceiving climate issues as a manifestation of the Western political agenda, many Russian politicians and scientists were skeptical about the problem until recently, at least in the public sphere, and the official media often portray climate activists in an ironic style. In parallel to propaganda influencing the nation, quite an opposite rhetoric is also present on the official level (Katsov et al., 2017). Nevertheless, the population is much more familiar with the skeptical attitude, and any field study related to climate change in Russia hears the echo of this attitude of authorities.

Based on our long-term fieldwork in Yamal in 2008–2020, we would like to consider the global issues of climate change within the framework of local cases demonstrating the perceptions of people and their reactions (psychological and behavioral) to these changes.

Reflecting on our observations of nomadic daily life over a number of years, our continuing conversations in *chums* (nomadic tents) on environmental changes and analyzing the results of interviews, we decided to group the views of the Yamal tundra people into two types. One type includes several cases related to the temporality of climate change as observed by Indigenous people. The other type is spatial and includes the Nenets' responses to adverse events, as seen in changes in migration patterns and tundra mobility.

METHODS

A micro-regional approach

While conducting research in different parts of the Yamal peninsula, we adopted a micro-regional approach to model differences in areas on Yamal. Local peoples often refer to smaller regions on the peninsula as a “tundra” associated with a place name. In our opinion each tundra has specifically observable characteristics, such as landscape features, access to natural resources, structure and history of local Indigenous groups, migratory patterns, local economy of reindeer herding and fishing, and

modern infrastructural development. One of the important parameters of a micro-region is the common identity of the people inhabiting it. Local people living in one micro-region create a social network consisting of nomadic camps and people, and have a certain pattern of migration including the same infrastructural points of attraction, such as villages, trading posts, industrial villages, and roads. We must emphasize that allocation of micro-regions to a great extent is a subjective and situational process, since it strongly depends on the trajectory of a researcher's fieldwork. Nevertheless, thinking within territorial case studies gives a possibility to avoid broad generalizations referring to all the Yamal Nenets, which may be erroneous, and also provides data for better understanding and comparing the socio-ecological processes taking place across the district.

In this chapter, we will use the data of our field studies carried out in three micro-regions: *Mordy-Iakha*, *Erkuta*, and *Sabetta* as we defined them (Figure 10.1). We do not have the opportunity to give a detailed description for each territory, so we will present brief characteristics.

The people of the *Mordy-Iakha* micro-region identify themselves as *mordy'ter* (Nenets, Mordy River people), since their summer pastures are located on the left bank of the Mordy-Iakha River across from the village of Bovanenkovo, the center of one of the largest natural-gas production facilities in Russia in the western part of the peninsula. Another informal name for this territory among the Nenets is the Left North. The local people (about 30 families) administratively belong to the Iarsalinskaia tundra and are registered in Yar-Sale, the regional center of the Iamal'skii raion, far to the south near the mouth of the Ob River. *Mordy-Iakha* families are consisted of various tundra collectives: brigades of the Iarsalinskoe reindeer herding enterprise, private reindeer herders ranging from big owners with 1.5–2.5 thousand reindeer to small owners with 50–100 reindeer, and sedentary fishermen.

Erkuta (in Nenets, Iorkuta) is located on the border of Priural'skii and Iamal'skii raions of YNAO in the southern tundra of Yamal. It covers the lower Iorkuta-Iakha River, which flows into the Baidaratskaia Bay of the Kara Sea, and its tributaries. Its western border stretches along the western coast of the bay to the north of the Polar Urals. The borderline character of the territory is expressed in a number of administrative collisions, since the Nenets (19 families) identifying themselves as *Ierkutintsy* are registered in Priural'skii raion, but "their" land belongs to the Iamal'skii raion. In the Soviet period, the *Erkuta* Nenets worked as hunters procuring Arctic fox furs, and now they are mostly private reindeer herders with small herds (150–200 reindeer). In addition, several reindeer herders from the neighboring Iamal'skii raion transit through this territory in summer, and until recent years have had winter pastures.

The *Sabetta* micro-region was named after another large industrial hub—the Sabetta working village camp and seaport, located in the northeastern part of the Yamal Peninsula on the bank of the Ob Bay. This territory is part of Iamal'skii raion and belongs to the Seiakha tundra with the administrative center in the northernmost Yamal village of Seiakha, where all local tundra people are registered. The reindeer herders living within a distance of 100 km from Sabetta village (almost 50 families) identify themselves as residents of the Sabetta and Tambei tundras. All of them migrate relatively close to the gas production facilities, so they interact with



Figure 10.1 Micro-regions *Mordy-Iakha*, *Erkuta*, and *Sabetta* on the Yamal Peninsula.

the industrial enclave with varying degrees of intensity. In Soviet times, hunters lived here and owned small personal herds as in *Erkuta*. *Sabetta* was used as a transition area for two brigades of the Yamalskoe reindeer herding enterprise which was liquidated in 2018.

Fieldwork

Our main research method was participant observation. Living with reindeer herders and participating in economic practices allows us to see and literally feel the climatic events in the Arctic along with the Yamal nomads' responses. In 2015–2016, throughout the whole year, we migrated together with *Mordy-Iakha* reindeer herders, with whom we later spent the winter seasons of 2018–2019 and 2019–2020, so we could observe the adaptation strategies of the same collectives over a number of years.

Fieldwork in *Erkuta* and *Sabetta* micro-regions was carried out as a parallel track to the long-term ecological monitoring of these sites by the team of Arctic Research Station (Labytnangi). In the spring-summer of 2019, we conducted semi-structured interviews with the *Sabetta* and *Erkuta* Nenets, recording their migratory routes and key loci of cultural landscapes. Questions about climate change were compiled in collaboration with our biologist and ecologist colleagues. Questions were divided into several thematic blocks. Our interviews, focusing specifically on reindeer herders' perceptions, overlap with several similar studies conducted in the Arctic, including the Sami in Sweden (Furberg, Evengård, & Nilsson, 2011) and on Yamal and Taimyr Peninsulas in Russia (Makeev et al., 2014). Lavrillier's (2013) study of perception of climate change by Evenkis specifically avoided the term "climate change" in order not to influence Indigenous narratives. Crate (2014) extended a pure climatic agenda and discussed with her informants the "complexity of changes, including the local effects of global climate change, the economic forces of globalization, and the demographic change as youth are increasingly leaving the rural areas." We, on the contrary, primarily were interested in how the external discourses of climate change affect the views of the tundra people. In this context the first question was: have you heard about climate change? If so, how did you know such a term, what is your source of information? How do you feel about this problem? The answers to these questions implicitly provide data on how much reindeer herders watch TV, use the Internet, and communicate with people producing climate change discussions. We must point out that all the answers to these questions showed that the concept of climate change originated somewhere outside the reindeer herding community.

Then we left aside the unfamiliar word "climate" (even the Nenets word *Num* refers to the major deity and to weather, but not to a climate) and discussed various environmental changes in recent years and in comparison with the earlier periods of the informants' lives. After Nenets shared their personal observations, we asked additional questions based on scientific assessments concerning the emergence of new species in tundra, the dynamics of common species expansion, and changes in weather and hydro-regimes. The timing of the seasons and their characteristics as well as changes in the timing of periods important for reindeer herding and nomadic lifestyle (calving, rut, mosquito month, etc.) were discussed separately. People responded with the characteristics of a "normal" year and "normal" seasonal deviations, and explained what they considered "abnormal." A particular block of questions referred to the weather events crucial for reindeer, such as rain-on-snow, sudden thaws, long-lasting snow blizzards, and extreme heat or frost. For this chapter, we do not present a full analysis of the survey results but focus on several prominent issues.

“THE CLIMATE IS NOT CHANGING, THE WEATHER DOES”: THE TEMPORALITY OF CLIMATE CHANGE

Answering the questions about the conception of climate change and private perception of these changes, our informants presented a complicated view. Most of them claimed that they “believe” in climate change (as an external concept) and “see” such changes. This position was most actively expressed by a young group, under 40. They explained that they had heard about it on TV and read about it on the Internet. At the same time, older people less inclined to use information technologies, either denied global changes, were not aware with the term itself, or mentioned that they had heard about it on TV, but “do not believe.”

Describing the environment, reindeer herders often use temporal categories important to them: “this happened already” or “this has never happened before” / “I have never seen such [a thing]”. Nenets “climate change dissidents” refer to a cyclical character of natural changes in the tundra and assert that the global climate issue is a far-fetched problem. Some people, reacting to a non-native and poorly understood word “climate”—pronounced in Russian and lacking a Nenets analog—claimed that “the climate is not changing, the weather does,” and then they started to talk about the abnormal weather events they observed, trying to remember as much as possible. These remembrances resemble the perceptions of the Sami reindeer herders of Scandinavia described by Ingold and Kurttila (2000). Another reaction concerned various environmental changes in tundra, observed by nomads in recent years or over many years (usually put as “the last five to ten years”). The narratives describing these changes were often the same for both age groups. For example, they talked about the movement of boreal species northwards and the increasing area occupied by shrubs. Both factors are considered to be the consequence of climate change in scientific literature (Mod & Luoto, 2016; Sokolov et al., 2016).

Discussion of seasonal shifts lacked consistency about earlier onsets of spring and later onsets of autumn as expected with climate change. This seemed strange given our experience migrating with the Nenets during the very “early” 2015 and 2020 springs and the “short” autumn of 2015 compared to the “long” one of 2019. However, recollections of the past few years indicated fluctuating timing of seasons shifts. Autumn and spring are the periods of intensive migrations between seasonal pastures, so the success of crossing wide watersheds is essential. Changes in the timing of breakups and freezing of rivers can make the migration of nomads and their herds seriously more difficult. Among such crucial barriers are the Gulf of Ob, which is crossed twice a year by all the brigades of the Iarsalinskoe and Panaevskii reindeer enterprises and private herders (Makeev et al., 2014: 52), the coastal zone of Baidaratskaia Bay (Stammler, 2008), and Iuribei and Mordy-Iakha, as well as the inner rivers of the Yamal Peninsula. Hydrological problems related to climate changes and weather affect Scandinavian Sami reindeer herders in a similar way. New conditions are blamed for forcing them to implement new migratory and slaughter timing (Furberg et al., 2011). In Kanin tundra in European Russia, changing hydro-regimes has reduced the availability of medical care for reindeer herders (Amstislavski et al., 2013).

Our respondents argued that issues described above are of more concern for the brigades of reindeer herding enterprises, who have to migrate according to a clear

established schedule, while private households can vary the time of their movements more flexibly. Many herders in the spirit of natural scientists claimed that earlier spring and late autumn are beneficial for reindeer, for such shifts increase the length of time when animals can forage green vegetation.

When discussing significant changes in the timing of periods crucial for reindeer herding, almost all the Nenets pointed to the lengthening of the “insect time.” Statements included “there are more mosquitoes now,” “mosquitoes used to end in August, but now they fly until September,” “we used to escape from mosquitoes on a sea coast, but now there are many of them even there.” One expression about these insects being harmful to reindeer is indicative. “That year mosquitoes, midges, and gadflies started to fly at the same time, and earlier in different times”; it’s not for nothing that Nenets have traditional names for summer months *Nenjang iry* (Nenets, mosquito month) and *Pilu iry* (Nenets, gadfly month).

In the larger climate change discourse, the theme of global warming is most vivid (at least in Russia until recent times), and so it was not a surprise that Nenets started talking about summer temperatures first. Older herders confidently stated that the extreme (as it seemed) heat of the several last summers (2013 and 2016) occurred before, so such peaks should not be treated as something new. Despite the fact that hot and dry summers negatively affect the health of reindeer, especially calves, critical events during winter, historically eight or nine months a year, are more significant for reindeer herding. Once again, we witnessed that any abnormality was judged from the perspective of reindeer.

One of the most dangerous climate events for reindeer in winter is the development of ice crusts that block access to forage. Reindeer herders describe a detailed hierarchy of icy conditions, which have various causes and consequences for tundra households. The strongest crust is caused by the rain-on-snow phenomenon, which typically occurs in autumn and early winter (Forbes et al., 2016). Ice crusts can be exacerbated by further combinations of thaws and frosts, leading to reindeer mass mortality throughout the whole winter season. According to reindeer herders’ claims, strong ice happens once in ten years; extremely strong ice, leading to a massive death of weakened reindeer as it was in 2012–2013 winter, happens once every 30–50 years (Golovnev, 2017). The structure of a snow surface covered with a sudden autumn rain is of significant importance. If an ice crust is formed “between the snow,” then reindeer can punch through it with their hooves and get to forage. We witnessed an immediate appearance of solid local ice crust in the Iarsalinskaia tundra in the winter of 2018–2019 caused by *iba had* (Nenets, warm snow blizzard), as well as sharp temperature fluctuations from +2 °C to –35 °C in December and January.

The most threatening conditions arise when rain falls on clear snowless ground followed by a frost. When this happens, lichen and other vegetation remain under a layer of ice, which then gets covered with snow. Thus, it is more relevant to speak of rain-on-ground in autumn as a major danger. It is also important to note that icing events cause reindeer to starve and also, as a Nenets described, “the reindeer’s stomach deteriorates like ulcer,” which dooms an animal to death after a while. The formation of ice crust is also facilitated by the proximity of open water, therefore it occurs, as scholars believe, more often along the western coast of Yamal, where the sea freezes later than the Gulf of Ob (Makeev et al., 2014). At the same time, the Nenets living on both coasts believe that the coastal climate is milder, without severe

frosts, so it is easier for reindeer to dig snow for forage there in the second half of a winter. In the northernmost tundra of the peninsula, with the *Sabetta* micro-region in its southern border, ice crusts usually form wide strips of land, leaving some areas free of ice (Makeev et al., 2014: 56). Moreover, in 2018–2019, reindeer mortality in this area which was a consequence of the icing at the end of the snow season, which is considered by local Nenets as more common than icing in the beginning of a winter.²

In addition to the icing problems, Nenets herders argued that strong snow blizzards have become more frequent making it impossible to hold a herd or migrate to a new location. In 2018 while migrating to the forest zone from the peninsula, the household with whom we lived was stopped in the middle of the peninsula by a blizzard that lasted for three weeks. Such weather made the planned migration impossible, and the family's 90-year-old patriarch stated that he had "never seen such weather."

Residents of *Sabetta* also point to an increase in duration of severe frosts, which, in their opinion, was not typical for Yamal in the past. Frosts occurring in ice crust conditions and limited reindeer pastures also have a detrimental effect on the health of the herds.

Although tundra reindeer herding is accompanied by regular risks of weather fluctuations, the Nenets' local knowledge includes ways of responding to these risks (Golovnev, 2016). The Yamal nomads expressed great concern mainly over changes in recent winters. Temporal patterns are the core of concern. All our interlocutors emphasize, firstly, the frequency of climate crisis events (or in other words unfavorable weather conditions), and secondly, their duration. According to very emotional statements of some Nenets, local ice crusts are now occurring every year, which adds to a general mood of despair and impending disaster in reindeer herding.

Discussing climate problems led many of our informants to reasoning about their causes. Natural changes and anomalies in their opinions of many were associated with the intensive industrial development of Yamal, especially among the nomads living in the vicinity of large industrial facilities. A widespread cause identified in interviews was the influence of icebreakers, providing winter navigation via the Gulf of Ob for the Yamal LNG project in *Sabetta* and the oil terminal in *Mys Kamennyi* on the Yamal's west coast in the mid-2010s. "Icebreakers open the bay, steam rises from water, and wind carries this humidity and steam to the shore, so the fogs happen" or "because of steam from water, the air gets warmer, and then ice is happening," as Nenets claim.

SPATIALITY OF CLIMATE CHANGE FOR NOMADS

Rethinking the perceptions of climatic changes by the Yamal reindeer herders and their reactions to these phenomena, we can consider them not only in the temporal categories but also with a spatial perspective. Spatiality refers to the ability of reindeer herders to react to weather events. The cruciality of such events which are framed in the conception of climate change in natural science is manifested for Nenets through their frequency. Golovnev (2019) asserts that in the mentality of nomads, space and time are inseparable, in contrast with the sedentary world view where they are separated. Here, we consider Golovnev's metaphor regarding the inseparable perceptions

of the people from three micro-regions of any environmental changes and their spatial and temporal responses to such changes.

Nenets households in the three micro-regions described above have different and unequal opportunities for spatial responses to emerging environmental changes. Some cases of maneuvering in tundra have been described elsewhere (Golovnev, 2017; Perevalova, 2015). These studies describe the tactical actions of several nomadic families in the 2013 anomalous ice year. We discuss the possibilities for strategic long-term spatial solutions under new climate conditions.

Mordy-Iakha. The households associated with this micro-region have demonstrated for many years the classic meridional route of Yamal nomadism, staying all the year on the territory of the peninsula. There are two exceptions—the brigade of a reindeer herding enterprise and the family of a wealthy private herder—both of which winter on the right bank of the Ob River. Recent climate events have only strengthened these remaining Mordy-Iakha collectives in their reluctance to migrate across the southern tundra of Yamal, as they fear moving over the ice-covered pastures in cases of possible rain-on-snow. As a result, they are forced to intensively change scarce winter lichen pastures in the tundra from year to year in order to ensure the survival of their herds. At the same time, they retain the ability to completely change their strategy and to start southward winter migrations to the forest zone in case of total depletion of tundra lichen pastures. In recent years, some of these nomads and their neighbors have switched to this migratory pattern, acknowledging all the risks of moving southward but considering them acceptable.

Erkuta. A small group of *Erkuta* reindeer herders moves westward in summers beyond the Ural Mountains, but their winter is spatially restricted by the unusual status of being non-residents in Iamal'skii raion. Regarding the perspective of migrating to forest lichens as a new possible response to worsening conditions in tundra, they suspect problems in arranging the new routes which require special negotiations with potentially new neighbors. They also admit personal lack of skills to migrate in unfamiliar environments and still are doomed to stay in the depleted tundra winter pastures with limited spatiality. Lack of strategic mobility has forced them to rearrange their winter grazing practices to so-called “free grazing” under conditions of lack of forage for reindeer and frequent ice crusts. They try to place their winter chums along the perimeter of a relatively large zone, where reindeer belonging to different households are kept. Control of the herd is carried out on snowmobiles, while the animals are left to disperse over a large area, copying in a sense the ecology of wild reindeer foraging and reducing intensive pressure on poor lichen pastures.

Sabetta. Local herders in comparison with the first two regions are faced with the highest degree of spatial constraints, limiting their possible responses to climate changes along with deteriorating pasture conditions. The annual routes of Sabetta herders look like short eight-form loops, often intersecting with neighboring migratory corridors. At the same time, the character of the local threats differs from the other two micro-regions. The *Sabetta* tundra is rarely covered with a solid crust at the beginning of winter. Ice here usually forms locally and, as a rule, at the end of the snow period. In recent years, some local reindeer herders have developed new nomadic patterns. In the second half of winter, they move directly to the coast of the Ob Bay, since they believe that warmer weather creates better grazing possibilities regarding the conditions of snow.

In this section, we did not specifically discuss the problem of overgrazing—the key concept of the discussion concerning the prospects for the Yamal reindeer herding in general—as it requires a special approach. For some ecologists, botanists, and lichenologists, the degradation of lichen tundra in Yamal is directly associated with intensive reindeer grazing (Ektova & Morozova, 2015). For the others, mainly social scientists, overgrazing is a political instrument of influence by the authorities over Nenets nomads. This influence is especially relevant for Yamal, where the problem of land exclusion for the purpose of industrial development is acute (Dwyer & Istomin, 2006; Forbes & Stammler, 2009).

We claim that at least for our informants—in contrast to the state designers of reindeer herding—the grazing capacity of pastures is dynamic, subjectively perceived (by reindeer and respectively by herder), and closely related to climatic conditions. The spatial responses of different groups of reindeer herders described above are associated with their perception of climate change merged with their assessment of pasture capacity.

Also, in the context of spatiality, we did not raise the issue of increasing pressure by industrial infrastructure on the Yamal Peninsula. Hydrocarbon production undoubtedly removes grazing area, but it also restricts the opportunities for spatial responses of reindeer herders (Degteva & Nellemann, 2013; Golovnev et al., 2014; Kumpula, Forbes, & Stammler, 2010). The reaction of reindeer herders to an emerging industry is reminiscent to some extent of nomadic perceptions of crucial climatic conditions. The flexibility of Nenets households demonstrates the potential for adaptation to a limited and gradual spread of gas production facilities, but this impact turns out to be critical when the rate of development outstrips the possibility of inventing a spatial response. Finally, as in the case of the response to climate change, different tundras with different industrial pressures have initially unequal opportunities to respond, which is highly determined by a complex of local specifics.

CONCLUSION

The concept of climate change, catalyzed by the media, Internet, and communication with village relatives and incoming scientists is now a part of discourse among the tundra-dwelling Nenets reindeer herders. People who have more access to gadgets and are more “tech-savvy” formulate the regional case in the global rhetoric style. However, the concept of global environmental change, as Ingold and Kurttila wrote (Ingold & Kurttila, 2000: 187), most often boils down to a discussion of weather events. Our research shows that “believers” and “non-believers” in climate change often make similar observations of the environmental changes. Nevertheless, the skeptics in Yamal, mostly older people, are confident in the cyclical character of natural phenomena in the tundra. However, both younger and older people rather emotionally discuss an increase in the frequency of critical events, thereby emphasizing temporality in climate change.

Speaking about adverse weather cases, Nenets herders make assessments primarily from the perspective of reindeer well-being, because “a human can be patient, but not reindeer.” The increasing frequency and duration of critical conditions is thrust upon a background of depleting pastures and industrial advancement, forcing tundra households to change grazing patterns or to vary migratory routes. In other words, the

tactical response to single events is replaced by long-term strategic decisions. However, the opportunities for such variation are far from present throughout the entire territory of Yamal, which can be seen in the examples of the three micro-regions.

It is notable that while the national Russian political agenda often excludes, at least publicly, the human influence on global processes, some Yamal Nenets perceive climate change as a direct consequence of local industrial development because “if gas is drilled, then something must be disturbed in nature.” The anthropogenic influences which are so actively debated in some circles are involuntarily expressed in the views of Nenets reindeer herders, although with a slightly different interpretation.

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NOTES

- 1 Data from January 1, 2020 were provided by the Department of Agriculture of YNAO and by the Department of the Indigenous Peoples of the North issues of YNAO.
- 2 While this chapter was being edited, a huge icing event occurred in the northern Yamal in the 2020-2021 winter, after December rain-on-snow followed by hard and prolonged frosts. This icing not only has become the cause of mortality among reindeer but also forced them to disperse in all the tundra far from their herders in search for areas with accessible forage.

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