PART 2
Anthropological Encounters

Chapter 5

Gone the Bull of Winter? Contemplating Climate Change's Cultural Implications in Northeastern Siberia, Russia[1]

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Introduction

The bull of winter is a legendary Sakha creature whose presence explains the turning from the frigid winter to the warming spring. The legend tells that the bull of winter, who keeps the cold in winter, loses his first horn at the end of January as the cold begins to let go to warmth, then his second horn melts off at the end of February and finally, by the end of March, he loses his head as spring is sure to have arrived. It seems that now with the warming, perhaps the bull of winter will no longer be. . . .

—male Sakha elder, b. 1935[2]

Sakha, Turkic-speaking native horse and cattle breeders of northeastern Siberia, Russia, personify winter in the form of the *Jyl Oghuha* (Bull of Winter), a white bull with blue spots, huge horns, and frosty breath. *Jyl Oghuha*'s legacy explains the extreme 100°C annual temperature range of Sakha's sub-Arctic habitat.[3] Accordingly, in early December the *Jyl Oghuha* arrives from the Arctic Ocean to hold temperatures at their coldest (–60° to –65°C; –76° to –85°F) for December and January. Although I had heard the story many times while working with Viliui Sakha[4] since 1991, in the summer of 2005 it had an unexpected ending. The realization that a cultural story, which for centuries had explained the annual temperature event of sub-Arctic winter, could perhaps become a story of how things *used to be*, alerted me to the cultural implications of global climate change. This elder's new way of recounting Sakha's age-old story of *Jyl Oghuha* was my "ethnographic moment"[5] to enter the field of climate change research. In this chapter I explore Viliui Sakha observations of global climate change, bring to light the cultural implications of global climate change, and highlight anthropology's privileged approaches to understanding different ways of knowing to move anthropologists from impartial observers into the realm of action-oriented researchers.

Sakha's Turkic ancestors migrated from Central Asia to southern Siberia around 900, and then northward to their present homeland beginning in

the 1200s. They inhabit a sub-arctic region characterized by continuous permafrost with annual temperature fluctuations of 100° Celsius from –60°C (–76°F) in winter to +40°C (104°F) in summer. Viliui Sakha have adapted their southern agropastoralist subsistence to an extreme sub-Arctic environment and adapted to the throes of Russian colonization and Soviet and post-Soviet forces (Crate 2002, 2003a, 2006b). Today the majority of rural Viliui Sakha communities practice household-level food production via a system termed "cows and kin," focused on keeping cows and exchanging labor and products with kin (Crate 2003a, 2006b). They also rely heavily upon other subsistence production including gardens and greenhouses, forage (hunting, fishing, and gathering) and other domesticates including horses, pigs, and chickens. Theirs is a mixed cash economy, with most of their cash originating from state transfer payments in the form of state salaries, subsidies, and pensions.

Encountering Global Climate Change in Viliui Sakha Communities

In 2004,[6] 90 percent of the Viliui Sakha participants in my field research expressed their concerns about local climate change,[7] saying that they were seeing unprecedented change in their local areas and that they were concerned it threatened their subsistence (Crate 2006a).[8] In response to this result, in summer 2005 we worked with village youth, already engaged in our project's elder knowledge initiative (Crate 2006c), to interview thirty-three elders about their local observations of climate change. We asked a simple set of questions about what elders observed, how their lives were affected, what the causes were, and what they thought the future would bring. The elders impressed upon us that they possess ecological knowledge about how the climate was and how it has changed. In lieu of availability of comprehensive local climatic data,[9] village elders' knowledge is vital. Most elders offered testimony similar to this:

> The climate is definitely different from before. When I was little, the winters were very cold, minus 50–60 degrees. When we spit, it froze before it hit the ground and flying birds sometimes would freeze and die. The summer was a wonderful hot temperature and the hay you just cut would dry very quickly. In the last few years the climate has changed. We have rain, rain, rain all the time and winter comes late and so does spring. For people who live with a short summer when there needs to be the right weather to accomplish all for the winter and there is cool rainy times so that the hay does not dry and has to sit and sit and the quality is bad because of that. It is the right time for haying but the conditions are all wrong. (male Sakha elder, b. 1938)

What are the changes people are observing? Sakha elders reported that they cannot read the weather anymore: "From long ago we could read the weather and know what weather would come according to our "Sier-Tuom"

[Sakha sacred belief system]. But we can't do that anymore" (female Sakha elder, b. 1942). This is particularly urgent in the extreme environment of the Arctic where each day of summer is crucial to winter survival. Elders also commented that the timing of the seasons had changed, further jeopardizing winter survival. For the last decade, spring and fall have come several weeks late.

Elders also said that the climate had softened, referring again and again to *Jyl Oghuha*: "Winters have warmed and summers are not so warm. All is softer. The north is especially warming. It will be cold in winter and suddenly get warm in winter. It was never like before. Strong cold held for months. We have the legend about the bull of winter losing its horns" (male Sakha elder, b. 1925). Additionally, two qualities of the climate, both critical to survival in the north, are reported to be different: a tendency toward long periods of calms and a relative lack of humidity. The summer heat is no longer dry, but laden with humidity that stifles in high temperatures: "Before it got very hot also, like it does now, but there was air—now it gets hot and you can't breathe [humidity]." Both the lack of calms and the humidity make the Viliui Sakha's environment that much more challenging to negotiate. Although these barriers are still surmountable, elders report that family members spend more time in the seasonal tasks, most notably haying and winter activities such as hunting and wood hauling, due to the increased challenge that these climate changes pose.

Several elders commented on the loss of familiar species and the arrival of new species from the south, including a variety of insects that prey on many of the garden and forage plants that Sakha depend on. They talked about other changes in their local environment, including increased rain during the haying season, too much winter snow, increased occurrences of thunder, and a change in the quality of sunlight. Many also correlated these changes with poorer health and more diseases among their people.

We next asked elders how climate change was affecting people's daily lives. First and foremost, they talked about the effects on harvesting forage for their animals:

> It ruins the hay harvesting when it rains for two months solid. There is no winter forage for our cows and horses. Even if you plan to work every day at the hay, the weather keeps you from it. Every day it is raining. The land is going under water and the hay lands are smaller and smaller and if you keep a lot of animals, it is very hard. The hay itself has less nutrition and then when it is cut and lays and gets wet and dries many times, it also loses its nutritious quality. (male Sakha elder, b. 1932)

They talked about the negative impact on their ability to raise enough food to see them through the long winter: "So much water is bad for the garden. Potatoes rot in the ground and there are many new insects. Gardens are very late. The water and cold mean we plant potatoes a month late and some not until July" (female Sakha elder, b. 1930).

Next elders talked about how difficult it has become for their horses, which spend all winter outside and dig through the snow to find fodder. In the last decade elders have witnessed increasing amounts of snow due to warmer winter temperatures[10] and an impervious ice layer beneath the snow from a freeze/thaw that occurs commonly in the fall with warming and prevents the horses from reaching fodder. They also expressed concern about hunting, a supplemental source of food for many contemporary households, especially in the post-Soviet context: "We hunters can't hunt. I go trapping in January when the snow is thinner. But as the snow is deeper I can't go and the deep snow is bad because dogs can't run and horses can't walk. In spring and fall hunters also can't hunt because there is so much mud and boggy land" (male Sakha elder, b. 1933). Not only are hay, hunting, and foraging areas diminished due to flooding, all land areas are threatened. In one of our four research villages, there is deep concern about how water is inundating the grazing and gardening areas in the village center, another source of sustenance in these communities: "All the water ruins the usable areas near our homes—it diminishes all our land—with all the water, no one has any land anymore."

Elders also mentioned that they noticed the land was sinking in places: "The flat fields are sinking in and we want to know why—perhaps the permafrost is melting?" The most graphic of these accounts of sinking land tell of how an island near the village of Kuukei is submerging: "We have an island on the lake but now it has fallen. I have been watching for the last ten years and I see this happening" (female Sakha elder, b. 1933). However important it is to understand whether the island is in fact sinking because of melting permafrost, and whether the melting is in fact due to climate change,[11] when I heard these testimonies I was more concerned and curious about how the perception of the land actually sinking is affecting how Viliui Sakha orient themselves to their environment. Their sense of place and their understanding of "homeland" are both tied directly to an ecosystem dependent on water in its solid state. Although feeling "at home" in such icy confines is foreign to most of us, it is the familiar and the understood territory of comfort for northern inhabitants (Nuttall 1992). This was clear when we asked, "Isn't it good that it is not so cold in winter and not so hot in summer?" In response, elders unanimously argued to the opposite:[12]

> It is not bad to have warm winters, being an old person, it is great! But as Sakha people, we need strong cold here. It is how our lives are organized and how the nature works here. The big cold is good. The diseases are gone. When it is warm it snows too much and it is not warm or cold. The winter warmth affects people's blood pressure. And the heat in the summer is different, humid and very hard for people to go. It is bad for the way of life here and for survival. The nature, people, animals, and plants here are supposed to have very cold winters and very hot dry summers. That is the best for all life here. (female Sakha elder, b. 1929)

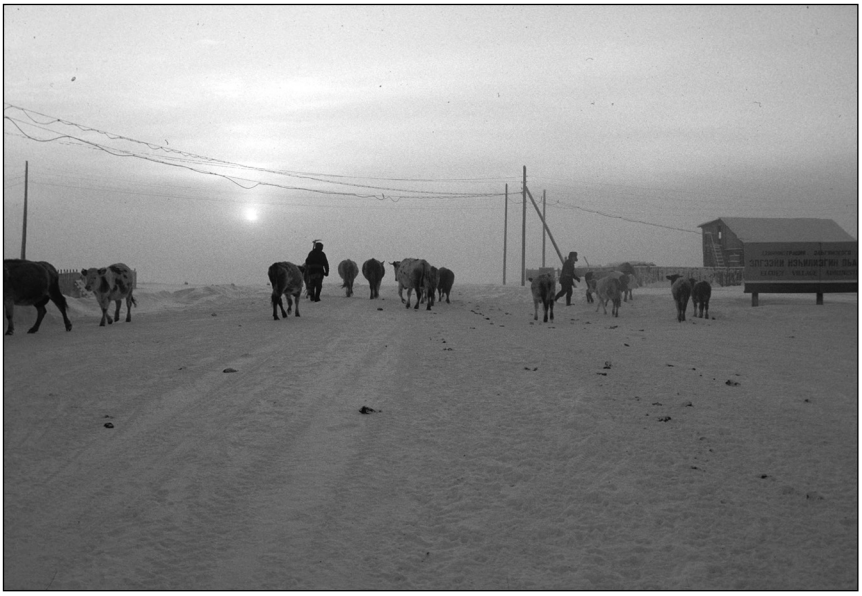

Figure 5.1: Village inhabitants take their herds down to the river to drink in the depths of the Siberian winter.

When we asked elders how they thought these changes would affect the future, all felt that conditions would progressively get worse: "As it gets warmer and warmer, the permafrost will melt and our land will be a permanent swamp and we won't be able to do anything—no pastures, no hay fields, just the high areas will remain. If it continues, then the permafrost areas will stop being frozen and it will all melt" (male Sakha elder, b. 1936). Many also made the connection between warming and its effects on health: "The worst part is that diseases will multiply in the future if it continues to get warmer and warmer. People's lives will get shorter with all the disease and no one will be able to keep animals here anymore" (female Sakha elder, b. 1944).

Some elders made a link between the local effects of global climate change and the breakdown of their contemporary social fabric: "People's attitudes will get worse and worse and things will go crazy. People's character and the way they relate has changed and I think it is because of the climate change. The way people are so violent these days I think is connected to the change in air and climate" (female Sakha elder, b. 1930). Making such connections is not unfounded. Similar cases of contextualization, the ways in which people associate changes in the natural environment with changes in their social environment, can be found in different local settings in northern Russia (Karjalainen and Habeck 2004; Simpura and Eremitcheva 1997). There are also studies in the field of biometeorology that are making such correlations in other cultural contexts.[13]

We also solicited elders' perceptions of the causes of global climate change. Many cited the presence of the reservoir of the Viliui hydroelectric station—constructed in the 1960s to supply electricity mostly for the then nascent diamond mining industry (Crate 2003b). However, studies have shown that the presence of the reservoir only results in a microclimatic change that would not include the extent of changes observed by the elders. Most elders agreed that the climate is changing due to a host of other reasons:

> They go into the cosmos too much and are mixing up the sky. When I was young they didn't go into the cosmos and we knew the weather. It rained when it was supposed to. Now it is all mixed up. Maybe from the mining activity and the electricity makers, the hydro stations, it all affects. They say the Sea [hydro station reservoir] affects us, but I don't agree. The natural climate is all mixed up. (male Sakha elder, b. 1933)

Elders commented that climate change is due to both natural and human-induced causes. When they talk about the human causes, it is important to remember that in their lifetimes they have seen the introduction and the widespread use of technology. They were born and raised on remote homesteads without electricity and now live surrounded by most varieties of technology. It is an easy step to relate the changes in their physical environment with the entry and advancement of this technology. Explaining the changes as "caused by nature" also makes sense given that they live in a highly variable climate to begin with and also know there have been climatic changes in the past.

Natural causes elders talked about included changes from nature itself, the changing direction of the Earth and all planets, each with a magnetic pull that is affecting us, changing sky and clouds, and the melting of the ice on the Arctic Ocean, bringing lots of clouds and rain. Human-induced causes included the "breaking" of the atmosphere by rockets and bombs that go up into the sky, and by humans going into the cosmos too much and mixing up the sky; the changing of the atmosphere by something in the atmosphere that makes it all very warm, and by all the "technika" people are using that fouls the air; the holes in the ozone and the other wreckage done with all our technology; and too many atom bombs. Although at first consideration some of the contributing factors these elders mention seem irrelevant to Western scientific thought on the subject, their ideas are both relevant and culturally provocative: the former because many of their ideas are related to the anthropogenic drivers known to be partially causing global climate change, the latter because so much of their attention is focused on activities in the sky and outer space that have to do with Soviet technologies introduced in their lifetimes.

Some elders provided explanations that related to phenomena other than global climate change. One commented, "The elders said it was like this last century also and they say that every century the same conditions come

around—one hundred years ago also the land was under water." Sakha also have a cultural understanding of there being dry and wet years:

> They said that we would be having dry years now, but it is the opposite. Very wet years have come, lots of rain. Not in the spring when we need it, but in the summer when it gets in the way. There are many times as much water as there should be in the wet years, and if it continues like this, we will all go under water. We had the wet years and so it should be dry by now. (male Sakha elder, b. 1932)

These are important historical events that need further investigation in order to tease out just how Sakha's ancestors adapted to and survived these cyclical changes prior to the Soviet period. Additionally, several elders explained that the waterlogged fields had more to do with Sakha's negligence to work the land as they did in centuries past: "Before—in the Soviet time and before that—since our ancestors first came to these parts, we would make the fields so they were free of water, but not now." However, understanding the inundation of fields by water in the context of other observed changes attributed to climate change refutes these explanations.

Many of the elders' testimonies reveal that they seek to understand local climate change not only based on their observations, but also by integrating knowledge from other sources. One source was the ancient Sakha proverb "Tiiiekhtere ool uieghe, khachchagha Buus baiaghal irieghe," meaning, "They will survive until the day when the Arctic Ocean melts." Several elders recollected this proverb when they heard of the 2005 summer catastrophic flooding that occurred of the Yana River in the north of the Sakha Republic. Three villages were so heavily flooded that the residents had to permanently relocate. Reporting of this incident substantiated it not as an isolated phenomenon but directly related to the "fact" that the Arctic Ocean is no longer freezing up completely in the winters, resulting in increased water regimes for the entire republic.

In the summer of 2005, I identified only two media sources addressing global climate change that reached the villages. One was the British Broadcasting Company (BBC)'s airing of *The Day After Tomorrow*, the 2004 action/adventure, science fiction/fantasy thriller, on midday local television several times that summer. It is likely that many of the elders' comments about the global implications of local climate change were based on images and sound bites from this film.

The second media source was an article in the republic-wide *Komsomolskaia Pravda v Yakutii* by a Dr. Trofim Maksimov, a biologist and climate scientist in the capital city, Yakutsk (Ivanova 2005).[14] His extensive research in the Sakha Republic shows that average temperatures have risen by 2–3.5°C in the last one hundred years and that average winter temperatures for the same time period are 10°C warmer. This correlates directly with the elders' observations. His findings also document the movement of floral species

Figure 5.2: Cow-keeping households need to harvest two tons of hay per cow (approximately the size of the pictured stack, once it is finished) to fodder them through the nine-month winter.

northward and more temperate species coming into the republic from the south. Again, elders have made similar observations. Despite Maksimov's outspokenness and comprehensive information, only a handful of Viliui inhabitants subscribe to this newspaper or have received either his message or other outside information about the extent and causes of global climate change.

The elders' testimonies reveal no debate about *whether* climate change is occurring. Like most indigenous cultures practicing subsistence, they are, by default, ethnoclimatologists. With a continuous stream of experiential data, they know things are changing. Working with these communities to facilitate adaptive responses to these physical changes is critical. Anthropologists have a unique role, as interpreters of culture, to understand and act in response to global climate change's cultural effects.

The Cultural Implications of Global Climate Change and Indigenous Peoples

Transformations of both symbolic cultures[15] and subsistence cultures, such as the changes described here, reframe the implications of unprecedented global climate change. Global climate change, in causes, effects, and amelioration, is intimately and ultimately about culture: Global climate change is caused by the multiple drivers of our global consumer culture, transforms

Figure 5.3: Hay fields like this one are increasingly inundated with water due to the local effects of climate change.

symbolic and subsistence cultures, and will only be forestalled via a cultural transformation from degenerative to regenerative consumer behavior. Accordingly, anthropologists are strategically well suited to interpret, facilitate, translate, communicate, advocate, and act both in the field and at home, taking action and responding to the causes of change and communities facing and adapting to change.[16] As the cases presented in this volume show, climate change is forcing not just community adaptation and resilience, but also relocation of human, animal, and plant populations. Lost with those relocations are the intimate human-environment relationships that not only ground and substantiate indigenous worldviews but also work to maintain and steward local land-scapes. In some cases, moves also result in the loss of mythological symbols, meteorological orientation, and even the very totem and mainstay plants and animals that ground a culture.

We need not be over confident in our research partners' capacity to adapt. Although it seems completely plausible that highly adaptive cultures will find ways to feed themselves even if their main animals and plants cannot survive the projected climactic shifts, as anthropologists we need to grapple with the cultural implications of the loss of animals and plants that are central to daily subsistence practices, cycles of annual events, and sacred cosmologies (Crate 2008). The cultural implications could be analogous to the disorientation, alienation, and loss of meaning in life that happens

when any people are removed from their environment of origin, like Native Americans moved onto reservations (Castile and Bee 1992; Prucha 1985; White 1983). The only difference is that while in some cases communities themselves will move, in other cases it is the environment that is moving.[17] As the earth literally changes beneath their feet, it is vital to understand the cognitive reverberations within and cultural implications for a people's sense of homeland and place.

If we agree, as Keith Basso convincingly argues, that human existence is irrevocably situated in time and space, that social life is everywhere accomplished through an exchange of symbolic forms, and that wisdom "sits in places" (1996, 53), then we need to grapple with the extent to which global climate change is and will increasingly transform these spaces, symbolic forms, and places. It follows that the result will be great loss of wisdom, of the physical make-ups of cosmologies and worldviews, and of the very human-environment interactions that are a culture's core (Netting 1968, 1993; Steward 1955).

Exploring Anthropological Research Approaches to Address Global Climate Change

Anthropologists can be most effective by using the tools of applied, advocacy-oriented, and public anthropology (Borofsky 2006; Chambers 1985; Gould and Kolb 1964; Kirsch 2002; Nagengast and Vélez-Ibáñez 2004; Rylko-Bauer et al. 2006). Advocacy is key not only in our collaborative relationship with communities but also in representing their best interests in policy and other advocacy contexts. In many parts of the world, indigenous peoples are actively advocating for themselves. However, there are places, such as northern Russia, where civil society and self-advocacy do not have the legacy that exists in Canada, Greenland, and Alaska, where indigenous groups are proactive on issues such as global climate change.[18] In such places anthropologists can work as communicators both to our indigenous research partners (what information they need about global climate change and in what proper form[s]) and by seeking out the local, regional, and national channels through which local voices can affect policy. Similarly, we can link our research partners with other communities who have gone through similar experiences (Cutter and Emrich 2006; Hoffman and Oliver-Smith 2002; Oliver-Smith 1996, 2005; Thomalla et al. 2006).

Research on climate change, the bulk of which to date is in the Arctic, does not address global climate change's cultural implications. Observations and perceptions of local effects of climate change, such as those of the Viliui Sakha presented here, reveal a need to develop research projects focusing on the cognitive/perceptual orientations of communities. Our research agendas must first investigate how our research partners perceive change (Crate 2008), and then use their understandings to encourage positive change. Now that many of our research partners are actively listening to their

elders, the time is ripe for those elders' messages to inform the world and for anthropologists to take to heart and fully fathom the cultural implications and our innate responsibilities to act on all of our behalf. In the end we discover that each culture has its own *Jyl Oghuha* that is not only central to how that culture orients their daily/seasonal activities, worldview, and cultural identity, but is also part of the amalgamation of ethnodiversity that, like biodiversity, is intrinsic to the robust health and continued human, plant, and animal habitation of the planet.

Notes

1. I would like to acknowledge the people of the Viliui regions of western Sakha, Russia, with whom my ongoing research is possible. For constructive comments I thank Mark Nuttall. The research documented in this article was supported by the National Science Foundation under Grant No. 0532993. Any opinions, findings, conclusions, and recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation. This chapter is largely based on parts of an article for *Current Anthropology*. The material was originally published in *Current Anthropology*, vol. 49, issue 5, page #. To these ends, I also gratefully acknowledge Wenner-Gren.
2. All quotes are anonymous, except for birth year and gender.
3. There are several portrayals of the Bull of Winter in classic Sakha ethnographic texts (Ergis 1974: 123–24; Kulakovskii: 1979: 45–46; Seroshevski 1993:26; Sivtsev 1996: 131).
4. Refers to Sakha inhabiting the Viliui River watershed of western Sakha Republic.
5. A term I use based on Stuart Kirsch's use (Kirsch 2002:175) and for which he gives credit to Marilyn Strathern (1999).
6. In context of my 2003–2006 NSF project entitled "Investigating the Economic and Environmental Resilience of Viliui Sakha Villages: Building Capacity, Assessing Sustainability, Gaining Knowledge," engaging local Viliui Sakha communities in defining sustainability and identifying barriers preventing them from realizing those definitions.
7. We administered surveys to a stratified sample of 30% (Elgeeii: n=63, Kutana: n=24) of all households surveyed by Crate in 1999–2000 (Elgeeii: n=210, Kutana: n=79). The survey instrument was developed based upon both the communities' definitions of sustainability generated during the first field season of the project and standardized questions used in the Survey of Living Conditions in the Arctic project (http://www.arcticlivingconditions.org/).
8. This was a collaborative project involving myself, one research assistant from the US, a research assistant in each of the four villages, and the direct involvement of the communities themselves. Hence, my use of the pronoun "we."
9. There are regional stations that provide data on a republic-wide level. However, these data are not translated into public information specific to the villages where these elders live.
10. Typically it snows in these areas from mid-September to mid-November and then again from mid-February to mid-March. In the deep winter it is too cold to snow. In the last decade or so, as winter temperatures are milder, it tends to snow for longer periods in both the fall and spring and the cold period of no snow is increasingly briefer.
11. Many of the pastures of the Viliui Sakha communities are located in thermokarst depressions known under the local name *alaas* (Crate 2006b: 9–11). *Alaas* are characterized by very specific processes of freezing and thawing, permafrost degradation

but also permafrost build-up. See Washburn (1979: 274) for an illustration of *alaas*' development cycle.

12. Granted, shorter winters may actually be beneficial for cattle and horse breeding. Horses and cattle will spend less time in the stables and barns (and more time on the pastures) if the annual average temperature increases. However, more precipitation (snow) and a higher frequency of freezing/thawing events will have an adverse effect.
13. For a broader context for the influences of climate on psychological factors, see *International Journal of Biometeorology* and http://biometeorology.org/.
14. The *Suntaar Sonunnaar*, the regional paper that most inhabitants subscribe to if they get any paper, was lacking in information on climate change from 2003–2005.
15. In this article I use the term *culture* to refer to both the series of prescribed human activities and the prescribed symbols that give those activities significance; both the specific way a given people classify, codify, and communicate experience symbolically and the way that people live in accordance to beliefs, language, and history. Culture includes technology, art, science, and moral and ethical systems. All humans possess culture and the world is made up of a diversity of cultures. Accordingly, I use the term in both its singular and plural forms.
16. Although it is beyond the principle focus of this article to discuss the multiplicity of causes for and effects of the transformation of culture resulting from unprecedented global climate change, I do want to mention these larger implications as I see them. The causes and effects of global climate change are about people and power, ethics and morals, environmental costs and justice, and cultural and spiritual survival. Scholars are beginning to address the equity and justice implications of climate change. See, for example Thomas and Twyman (2005). On a temporal scale, the effects of global climate change are the indirect costs of imperialism and colonization—the "nonpoint" fall-out for peoples who have been largely ignored. These are the same peoples whose territories that have long been dumping grounds for uranium, industrial societies' trash heaps, and transboundary pollutants. This is environmental colonialism at its fullest development—its ultimate scale—with far-reaching social and cultural implications. Global climate change is the result of global processes that were neither caused by, nor can they be mitigated by, the majority of climate-sensitive world regions now experiencing the most unprecedented change Thus indigenous peoples find themselves at the mercy of and adapting to changes far beyond their control.
17. I take poetic license here by saying that "the environment moves." It works well within the analogy. I fully acknowledge that the environment cannot move but that it changes.
18. I am not implying that it is necessary to install "civil society" in Viliui Sakha communities from scratch. I am emphasizing here that Inuit and other northern communities are far more successful when it comes to expressing their concerns and interests in the wider (global) public. Since the fall of the Soviet Union there has been a gradual increase in existing political institutions, NGOs, and researchers-cum-advocates in the Russian North. For example, in the case of the Eveny, local elites can articulate their concerns—at least to some extent—via RAIPON (the Russian Association of Indigenous Peoples of the North). Vasilii Robbek and his team of researchers in Yakutsk have been trying to address several politically relevant issues in their research, and at least with some success (see http://www.sitc.ru/ync/narod1.htm). Places and spaces for self-determination in Sakha and the Russian North in general are very different from those in Alaskan or Canadian Northern communities. Local educational institutions, such as schools, libraries, houses of culture, etc., do play a significant role in ecological/ environmental education and campaigning, and these institutions should be considered and included in the process of local "capacity building."

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