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On thin ice: language, culture and environment in the Arctic

Lenore A. Grenoble

1. Introduction

Arctic indigenous languages provide excellent examples for studying issues of language sustainability. In the Arctic, as elsewhere, language vitality is linked to overall vitality of the speakers, their physical, mental and social well-being, and their ability to determine their own lifestyle, means of subsistence, and language. The issues of how communities can sustain languages and linguistic ecologies are closely linked to issues of sustainable human development, a position which is foundational to the Arctic Council Sustainable Development Working Group's Work Plan for 2009-2011 (SDWG 2009) and clearly articulated in the Tromsø Declaration (2009). As the broader context in which indigenous peoples are embedded changes, their capacity to adapt to these changes is a critical factor in determining the shape of their future. Because so many indigenous groups carry out subsistence or partial subsistence lifestyles, a critical test of their adaptability is provided by changes to the physical environment. Nowhere is this clearer than in the Arctic, where indigenous peoples continue to depend heavily on the products of the sea and of the land. Despite ongoing urbanization and Westernization throughout Arctic indigenous communities, many communities continue to maintain close ties to the environment; this is fundamental to their perception of their identity.

In the present paper I consider language sustainability within the context of community sustainability and argue that the two are inseparable. That is, language sustainability is at once an integral part of overall cultural sustainability while, at the same time, language usage needs to be understood within the broader context of sustainability. Accelerated climate change in the Arctic has already had significant effects on the physical environment and thus on Arctic ways of life, which in turn has an impact on language vitality and issues of sustainability and adaptability. In many parts of the Arctic, adaptability is viewed as key to long-term survival of both language and culture.

The paper is divided into four main sections. After discussing the status of Arctic indigenous languages, I turn to an analysis of Arctic language ecologies and how they are related to Arctic identity. I then consider the issue of language sustainability in the Arctic and discuss the interrelations between language and environment. Finally, I conclude with some thoughts on the role of external linguists in creating and maintaining vital language ecologies. I

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focus primarily on the indigenous languages of Greenland and Siberia, where I have the most firsthand experience, but refer to other Arctic indigenous languages as well. The views presented are my own, but they have been heavily influenced by my experiences in the field in Siberia and Greenland, and by my discussions with speakers and language activists in Greenland, Nunavut, and Siberia.

2. The Arctic

The Arctic linguistic landscape is populated with both indigenous and non-indigenous languages. This paper addresses only the indigenous languages, of which there are approximately 40, depending on how one defines *language* and how one defines *Arctic*. Let us start with the term 'Arctic'. On a strict geographic definition, the Arctic is understood as the region above the Arctic Circle. However Arctic specialists also include territory somewhat south of that. The Arctic Monitoring and Assessment Project (AMAP) defines the Arctic as a region, including both terrestrial and marine areas north of the Arctic Circle (66°32'N), and north of 62°N in Asia and 60°N in North America, modified to include the marine areas north of the Aleutian chain, Hudson Bay, and parts of the North Atlantic Ocean including the Labrador Sea (http://www.amap.no/; see also the Arctic Human Development Report or AHDR, Einarsson et al. 2003). This region cuts across international boundaries and includes: northern Siberia and the Chukotsky Peninsula in Russia; all of Alaska with focus on Northern Alaska and the North Slope area; the Canadian Arctic, the Lower Mackenzie River and Delta areas and Baffin Island; Greenland; the Kola Peninsula and Northern Fennoscandia area. Indigenous people living within this region tend to see themselves as Arctic peoples and have a strong sense of common goals and purpose through this Arctic indigenous identity. There is yet another view, that of the Russian Federation, which officially recognizes two categories of indigenous peoples, the small-numbered (less than 50,000) and the others. For the Russian Federation, the geography of what we call Siberia is divided into the North, Siberia, and the Far East, and the indigenous peoples I work with in Siberia tend to see themselves as Northern peoples (but not necessarily Arctic). An alternate view is provided by some of my colleagues in Greenland, who see dividing the region into the Arctic and (implicitly), the rest of the North as fractious, and they consider those Northern peoples to be Arctic. This just illustrates some of the challenges involved in labeling areas and peoples; there are multiple perspectives on all of the issues discussed here.

2.1 The Arctic Linguistic Landscape

There are some 40 or so indigenous languages spoken in the Arctic and Far North. With the notable exception of West Greenlandic, or Kalaallisut [kal], in Greenland,

all are undergoing shift and attrition. For our present purposes, we can consider Arctic language data presented in the Arctic Human Development Report (AHDR 2004). This is the report that is generally cited by Arctic committees and political bodies such as the Arctic Council.[1] Following AHDR, there are five macro families: Altaic, Uralic, Inuit-Yupik-Aleut, Na-Dene, and Chukotko-Kamchatkan, which is represented by Chukchi and Koryak, both spoken in Siberia. In addition, there are language isolates spoken in Sibera: Yukagir and Ket, recently identified as possibly having genetic affiliation with Na-Dene languages (Vajda 2010).

Within the larger Altaic family, we find two Turkic languages (Dolgan and Sakha (Yakut)), and two Tungusic languages (Even and Evenki) spoken within the Arctic; all four are spoken in Siberia. The Uralic family is represented by Finno-Ugric (Khanty, Komi and Saami) and Samoyedic (Enets, Nenets, Nganansan). Of these, all but Saami are spoken only in the Russian Federation. The Arctic Na-Dene languages are spoken primarily in North America, in Alaska (Athabaskan: Ahtna, Deg, Gwich'in, Hän, Hit'an, Holikachuk, Tanacross, Tanana, Upper Kuskokwim; and Tlingit, its own branch of Athabaskan-Eyak-Tlingit) and Canada (Chipewyan, Dogrib, Gwich'in, Hän, Tagish, and Tutchone, all Athabaskan). Finally, the Inuit-Yupik-Aleut languages are represented by Aleut, Alutiq and Central AlaskanYupik; AHDR treats all Inuit varieties as a single language as do many Inuit activists. In fact they are generally differentiated by speakers and linguists (e.g. Iñupiaq in Alaska, Inuktitut in Canada, Kalaallisut in Greenland; see below).

Linguistic classification is not the focus of the present paper, but it is important to consider the *social* ramifications of different kinds of classifications. Identifying different varieties as separate languages can be more linguistically accurate, and is perhaps important for revitalization programs. But at the same time it can fracture communities which otherwise have a common identity. And the sense of a pan-Arctic identity is very strong among Arctic indigenous peoples, even among peoples with clearly distinct ethno-linguistic backgrounds. Despite relatively small population sizes and some geographically large nation states in the Arctic, ethno-linguistic distribution does not correspond to national boundaries. We can see from the above that several 'languages' stretch across national boundaries: Gwich'in is spoken in both Alaska and Canada for example. More striking perhaps is the case of Saami, which is spoken in the Scandinavian countries, Finland and the Russian Federation. Linguists tend to recognize a number of different Saami languages. The *Ethnologue* (Lewis 2009) for example, lists 10 (Akkala, Inari, Kildin, Lule,

[1] Further discussion of the issues of linguistic classification of Arctic languages is beyond the scope of this paper; see Fortescue (1998). For a now somewhat dated overview of vitality, see Krauss (1997).

North, Pite, Skolt, South, Ter, Ume). The Saami Council, however, explicitly identifies a single Saami people:

> We, Saami are one people, united in our own culture,language and history, living in areas which, since time immemorial and up to historical times, we alone inhabited and utilized.
> (Saami Political Program 1986 / Saami Council Statements)

The Saami Council thus claims not only a single cultural and ethnic identity, but a single language and history, and explicitly territorial rights to the lands the Saami inhabit. These critical elements of Saami identity – language, culture, history and land – are intimately interwoven and Saami constructs of identity cannot be understood without reference to all of them.

Inuit similarly live in multiple nation states (Alaska, Canada, Greenland and Russia) and have a strong common sense of circumpolar identity. The Inuit Circumpolar Council (ICC) represents Inuit-Yupik-Aleut speakers from Siberia to Alaska to Canada to Greenland, and fosters a robust sense of a pan-Inuit identity, which is a key source of political unity and power. Both Inuit and Saami are deeply concerned with strengthening and sustaining language use. By invoking pan-Inuit, or pan-Saami, or pan-Arctic identities, they are able to create a larger, international speaker community.

Like the Saami Council, the ICC frames identity as a complex fusion of multiple elements. Consider the Circumpolar Inuit Declaration on Sovereignty in the Arctic, which was ratified and signed by Pat Cochran, then president of ICC, in April 2009:

We, the Inuit of *Inuit Nunaat*, declare as follows:

1. Inuit and the Arctic

1.1 *Inuit live in the Arctic*. Inuit live in the vast, circumpolar region of land, sea and ice known as the Arctic. We depend on the marine and terrestrial plants and animals supported by the coastal zones of the Arctic Ocean, the tundra and the sea ice. The Arctic is our home.

1.2 *Inuit have been living in the Arctic from time immemorial*. From time immemorial, Inuit have been living in the Arctic. Our home in the circumpolar world, Inuit Nunaat, stretches from Greenland to Canada, Alaska and the coastal regions of Chukotka, Russia. Our use and occupation of Arctic lands and waters pre-dates recorded history. Our unique knowledge, experience of the Arctic, and language are the foundation of our way of life and culture.

(Circumpolar Inuit Declaration on Arctic Sovereignty)

From the very outset of the declaration of sovereignty, the ICC clearly and explicitly lays out Inuit ties to the land, the sea, the animals and plants of the Arctic. Moreover, all of this is inextricably linked to *language*. The declaration further specifies rights which are recognized in the *United Nations Declaration on the Rights of Indigenous Peoples*[2] adopted 13 September 2007, all of which are relevant to the sovereignty and sovereign rights in the Arctic, including Article 3: the right to self-determination, to freely determine our political status and freely pursue our economic, social and cultural, including linguistic, development; Article 25-32: the right to own, use, develop and control our lands; and Article 29: the right to conservation and protection of our environment. Again, in the Arctic, it is impossible to consider one part of the ecology without considering the other parts. These are all cited under Article 1.4 of the Circumpolar Inuit Declaration on Arctic Sovereignty. This is just one example of Inuit taking control, to the best they can, of the political situation in which they find themselves.

In the Arctic, as elsewhere, the linguistic environment cannot be separated from the physical environment. This is not just because people need to support themselves through subsistence hunting and fishing, but also because they want to. Inuit have explained to me how basic Inuit values are taught through hunting, for example: children learn patience, they learn adaptability, they learn to be resourceful. They learn how to survive in a difficult environment. These core values have been successfully taught for centuries by being engaged in learning to live on, and with, the land.

Within the linguistic landscape of the Arctic, the only indigenous language which is not endangered is Kalaallisut (West Greenlandic, iso 639 kal). Although the total number of Kalaallisut speakers is relatively small compared to the world's major languages (some 50,000 or so), the number of speakers is growing and all or nearly all children speak the language. It is the official and national language of Greenland and is used in education, media and the government, thus in all domains, and is in an enviable position with respect to the remaining Arctic indigenous languages. Language has also been an integral part of the development of the Government of Nunavut, which has identified making Inuktitut the working language of the government by 2020 as one of its goals (Timpson 2009:215).

[2] See http://www.un.org/esa/socdev/unpfii/en/drip.html

3. Language ecologies in the Arctic

There is a high correlation between language retention and traditional lifestyle. While the links between language, culture and environment may not be obvious to outsiders, they are deeply embedded in the daily life of Arctic indigenous peoples. They live in close contact with the land, the sea, and the animals which inhabit both. Many indigenous peoples continue to live partial or total subsistence lifestyles, which is reflected in their languages, most obviously in their lexicons, but also in the contents of their everyday stories, which often involve hunting, fishing, and encounters with animals (especially bears). At the same time, many Arctic peoples have seen massive cultural shift over the last few decades, with increasing urbanization, shifts in demographics, and widespread adoption of Western technologies. In Greenland, climate change has opened access to natural resources, and public opinion varies as to whether, and how, they might be developed. The Greenland Self Government, seeking both political and economic autonomy from Denmark, has been particularly interested in developing these resources, an attitude which traces back to the days of Greenland's Home Government (Nuttall 1998:56). At the same time, many Greenlanders are wary of the changes that such development would bring, and ask for broader consultation and representation of different interest groups, community members and stakeholders (Nuttall 2010). Nevertheless, for many Arctic peoples, and certainly for the Inuit, their sense of identity and ways of life are deeply connected to the land and sea, and to hunting and harvesting wildlife. (See in particular Laidler 2006 for more discussion.) Language, culture, and the relationship to the land and sea are key parts of seemingly fragile and yet tenacious Arctic indigenous identities.

3.1 The linguistic encoding of Arctic identity

The close ties to nature are deeply embedded in the Arctic languages. Reindeer herders such as the Saami and the Evenki (a Tungusic people of Siberia) have extensive vocabulary not just for herding, but for identifying different kinds of deer, in terms of age, sex, purpose, whether they have been castrated, and so on. This is hardly surprising. The close relationship to nature is also evident in the stories people tell – a fieldworker can readily collect hunting and fishing stories, narratives about close encounters with bears, encountering the spirits in Greenland while picking berries and, increasingly, stories about strange weather, changes in climate, the unpredictability of sea ice and local weather conditions. Space does not permit an analysis of such narratives here, but see Cruikshank (1998) for a thorough discussion of the interrelation of narratives, local knowledge and culture among the Tlingit and Athabaskan peoples of the Yukon Territory, and of how life narratives can

provide useful knowledge to Western scientists studying environmental phenomena.

A potentially more obvious place to begin the study of the interaction of language, identity and environment is the lexicon. Not surprisingly, many Arctic languages have extensive lexicons for reindeer or caribou herding, for example, if their speakers are herders; others have extensive lexicons for seal hunting. Mühlhäusler (2003:60) makes the point that languages are 'well-adapted to the environmental conditions they have developed in,' and such adaptation is often found in terms of lexical development. Extensive, specialized lexicons often fascinate the general public in Western cultures which are fixated on enumerating things. But in reality the sum total of different words in one language for a category which in another has only one or two words does not, in and of itself, mean much linguistically. The great 'Eskimo snow hoax' (Pullum 1991) is one of the more classic myths about lexical encoding to an extreme degree. Evenki, a Tungusic language spoken in Siberia, has a range of different words for snow. This is not particularly surprising: as reindeer herders and hunters, Evenki traditionally live close to the land and their very survival is deeply intertwined with the snow. Myreeva (2003) notes approximately 50 words for snow in Evenki, but not all are based on different roots and not all are found in all dialects. These words for snow are summarized in Appendix 1. They fall into several overarching semantic categories:

- time of falling (or, roughly, the age of the snow, i.e., how long it has been on the ground);
- size (amount of snow or thickness of snowflake);
- place where the snow fell;
- place within the layer of snow;
- place within relation to human dwelling.

From a strict linguistic standpoint, it is hard to know what to do with the inventory of snow terms in Appendix 1. More research is needed to determine the use of these different words, including their exact distribution, both geographically and sociolinguistically. From Myreeva's list, we can tell only that they were attested in one or another dialect.[3] More than one form is

[3] Russian linguists tend to distinguish dialect (R *govor*) from a dialect group (R *dialekt*), with the latter composed of more than one dialect, making the translation of these concepts somewhat fluid.

attested in some dialect groups (e.g. both *imanna* and *əmanda* 'snow' are attested in the Ajan dialects, but there is no discussion of the differences in usage or distribution); in some dialects (e.g. Chul'man, Erbogachen and Nerchin) no basic snow word is indicated, but it is unclear if that means that it simply is not attested because no one thought to make a record of it, or that no such word is used in these dialects. Finally, no two dialect groups have identical inventories for snow terminology, which speaks to remarkable variation across dialect groups, or the need for deeper investigation. Then there are parts where the analysis is opaque. For example, there are two meanings for the word *siŋilgən*: (1) large, grainy snow; snow grains (R *krupnyj, zernistyj sneg; snežnaja krupa*) [in the Aldan, Chumikan, Iengra, Tokkin, and Uchursko-Zej dialects]; and (2) granular snow, frost (R *zernistyj sneg; inej*) [in the Aldan, Chumikan, Maj, Nep, Podkamenno-Tungus, and Uchursko-Zej dialects] (Myreeva 2003:136). It is unclear why there are two separate entries for 'large, grainy snow' and 'grainy snow' in some of the same dialects, for example. Moreover, the word *siŋilgən* is a dialect variant of *šiŋilgən* which is found in the Sym and Podkammen-Tungus dialect groups as a synonym for the basic snow word *imanna* (Myreeva 2003:135) – variation of [s] and [ʃ] is seen elsewhere in Evenki dialects – and whether the same speaker would use both of these words (or forms) is not stated. These ambiguities are due to incomplete documentation of the differing terms, as well as the tradition of Soviet linguists to view dialect variation as regional or geographic only,[4] and to ignore sociolinguistic variation.

Note that of all the words listed in Appendix 1, only three are Pan Tungusic: *imanna* 'snow'; *umkakta* 'snow, falling on tree branches'; and *luːnə* 'wet snow, slush'. Finally, note that Myreeva (2003) identifies only one borrowed word for snow: *kumuroː*, *kumurɔː* 'large, granular snow under a thick layer of snow', borrowed from Sakha (Yakut, a Turkic language) into some of the Eastern dialects where there is heavy contact with Sakha speakers. This is in and of itself interesting, suggesting a robust relationship with snow that is native to Evenki culture.

Pullum (1991:165) argues, and I agree, that this kind of lexical specialization is neither surprising nor linguistically interesting: 'Horsebreeders have various names for breeds, sizes, and ages of horses; botanists have names for leaf shapes; interior decorators have names for shades of mauve; printers have many different names for different fonts […].' But it is hard to agree that this kind of lexicalization has nothing to say about

[4] Two key sources of Myreeva's data are Vasilevich (1958) and Vasilevich (1969); see Brandist & Chown (2010) for a discussion of the development of Soviet sociolinguistics.

culture; in fact, quite the opposite. If we turn to the Evenki case, where there really are a number of different words for different kinds of snow, what is in fact interesting is just *what* has been lexicalized. Some of the terms refer to snow according to its depth in the snow layer, hardness, thickness, fluffiness. All of this is relevant for reindeer herding – the herds need to eat lichens buried under the snow, and the thickness and texture of the snow determine how hard or easy it is for them to get to their food supply. (Thick layers of ice can mean starvation.) Year-round ice gets lexicalized as does snow which falls early in the autumn. Such specialized terms are perhaps not surprising: mountain ice is melted and used for drinking water in some villages; year-round snow on specific mountain tops can serve as an important landmark. From the Evenki standpoint, at least, snow is not 'a constantly assumed kind of background,' as Pullum (1991:166) proposes it must be; the physical conditions of the snow vary and are extremely important. Moreover, there are some surprises: lexicalized terms to describe the snow around the chum (a Siberian tent) or snow which has been stomped down by reindeer, for example, suggest the importance of the interaction of humans, animals and environment.

This brings us to the issue of Inuit (or 'Eskimo'[5]) snow terms. From a theoretical standpoint, the interesting question is not how many there are, but rather what counts as a word in a polysynthetic language; how does one determine lexicalization when the nature of the morphology is such that new forms are created constantly, on the fly. (This is akin to determining when clauses in English have become fixed phrases, whose frequency and regularity are such that they warrant entries in a dictionary.) From an ethnolinguistic standpoint, the interesting part of the Inuit lexicon is actually sea ice (*siku*), not snow. Inuit sea ice has been the center of a major IPY (international polar year) project resulting in the publication of Krupnik et al. (2010). Sea ice is an important measure of climate change; thinning sea ice has been documented throughout the Arctic by Western scientists and local people alike because it is so visible, and its effects so immediate (section 4).

Tersis and Tavernier (2010) present two sea ice lexicons, for Kalaallisut (West Greenlandic) and Tunumiisut (East Greenlandic). There are over 100 entries in the Kalaallisut list but again, enumeration is not particularly informative and can be downright misleading. Not all these entries refer to ice (*siku*) per se, although many do (e.g. *sikuaq* 'dark nilas (a thin elastic crust of ice) 1-5 cm thick'). There are entries not only for kinds of sea ice, but also for

[5]It should be noted that Inuit consider the word *Eskimo* to be derogatory, and use *Inuit* instead. In contrast, in Alaska the word *Eskimo* is a legal term, as the word Inuit is not used in Yupik.

activities (human and animal) on the ice, or interacting with the ice. For example, *allu* 'seal breathing hole in sea ice' is a very distinctive kind of hole in the ice, to be distinguished from a thaw hole, which forms from melting**.** Finding an *allu* is important for both people and polar bears: it is an excellent place to hunt seals, which both depend on for sustenance. In addition, this glossary includes entries which are not separate 'words' but rather derived forms, e.g. *sinaaq* 'fast ice edge (the demarcation between fast ice and open water)' versus *sinaaniippoq* 's/he is at the *sinaaq*' **[***sinaaq-ni-ip-poq* ice edge-LOC-be-IND.3SG]; and *sinaasiorpoq* 's/he is walking or travelling along the *sinaaq*' [*sinaaq-sior-poq* ice.edge-move.about.in-IND.3SG]. Others include derivatives of *allu*, such as *alluaq* 'fishing hole chipped out in sea ice' [*allu-aq* seal.breathing.hole-alike] and *sassat* 'sea mammals trapped by ice (when sea ice forms) and who have only a small hole to breath'. Lexicalization of some terms is quite interesting, both linguistically and culturally, as in *aallaaniagaq* 'there is an animal (seal or sea mammal) in a hole in sea ice' [*aallaa-niar-gaq* shoot-FUT-PASS.PTCP *one, which should be shot*].

There is a significant contrast between this Kalaallisut lexicon and the standard scientific lexicon used by sea ice specialists. The differences stem from very different traditions, interests, and uses for sea ice. Western scientists are concerned with measuring sea ice, its density, the time of melting onset, and so on: among other things, these are important indicators of climate change. Inuit are also interested in sea ice density and melting, but from a different perspective. Sea ice is at the core of traditional Inuit *cultures*: it is necessary for travel, as it makes up their routes; thinning of sea ice due to climate change has been catastrophic for travel in the Arctic, resulting in numerous deaths in Alaska and Canada where people have fallen through ice which had always been reliably thick in places where it is now thin. Sea ice provides shelter, landing surfaces and hunting space for the marine mammals which have been key to Inuit survival. Thus it holds a very rich place in the social relations of the animals and people that constitute the Inuit world. It is a critical part of Arctic marine ecosystems and thus plays a central role in the social relations of the Inuit (animal and human) world. Sea ice has 'a profound social ontology, an existence as a social object by virtue of the deep-seated meanings and relations that connect it to Inuit life' (Bravo 2010: 446).

If we look at the scientific classification of sea ice, we find that the entries have more to do with the classification of ice than how people or animals interact, or live, with it. The Scott Polar Research Institute's *Illustrated*

Glossary of Snow and Ice (Armstrong et al. 1978)[6] is a standard handbook for sea ice specialists; the foreword notes that the size limits in the definitions of terms like 'ice cake' and 'floe' are in accordance with international standards as determined by the World Meteorological Organisation (WMO), such that, for example, an *ice cake* is defined as a *floe* less than 20 meters across (p. 21). Tersis and Taverniers do occasionally use such measurements in their wordlist (see below), The *Glossary* is a multi-lingual lexicon, with approximately 145 terms for snow, ice (floating ice and ice the atmosphere, which includes terms like *snowflake* and *hail*) and associated terms (such as *whiteout*). 67 of these include some form of the lexeme *ice*, and many are not compounds but word combinations – *close pack ice*, *consolidated pack ice, open pack ice, very close pack ice* and *very open pack ice* are separate entries – so even here in English it is not entirely clear how many words there are. Again, this is not the issue. Rather, what is important is what warrants a different scientific term. Like Evenki, the Scott Polar classification distinguishes age of snow (new versus old), and includes *firn*, a stage where old snow has changed into a dense substance between snow and ice. It includes terminology which refers to compactness of snow or ice, and with each term defined in precise measurements. (Thus *close pack ice* consists of floes mostly in contact, with ice cover 7/10ths to 9/10ths. *Very close pack ice* consists of floes tightly packed but not frozen together, with ice over practically 10/10ths. In contrast, in *consolidated pack ice* the floes are frozen together, and ice cover is 10/10ths.) By way of comparison, when I asked a Kalaallisut speaker about *iluliusaq***,** which Tersis and Tesnier (2010) define as 'bergy bit, a large piece of floating glacier ice, generally showing less than 5 m above sea-level but more than 1 m and normally about 100-300 sq. m in area,' she simply replied that she had no idea how big it was and it would never occur to her (or anyone else) to measure it. The Kalaallisut is morphologically transparent and *iluliusaq* comes from *iluliaq-usaq* 'iceberg-look like', i.e., smaller than an iceberg.

At some level, what is most informative is what is *not* included in each of these lexicons. The Kalaallisut sea ice lexicon and the Evenki snow lexicon alike lack entries or direct translations for certain sea ice and snow phenomena (*polyna, firn*) which are very important to Western scientists. Certainly both languages could express these concepts if the speakers wanted to, but lexical entries were not included in the wordlists. The Scott Polar *Glossary* does not provide any cultural information or indication of human connections with sea ice.

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[6] I am grateful to Don Perovich for bringing this to my attention and for his discussion of sea ice with me. The *Glossary* includes entries in European languages only: Danish, Finnish, French, German, Icelandic, Norwegian, Russian, Spanish and, of course, English. Another resource, MANICE, is readily available on the internet.

4. Language sustainability in the Arctic

The workshop which inspired some of the papers in this volume asked key questions about language sustainability, asking how communities can sustain languages and linguistic ecologies; what are the links between language maintenance and sustainable human development; and how we can affect the preservation of traditional knowledge and indigenous paradigms of teaching, learning, and research. In the Arctic at least, these three questions are all integral parts of a single issue. (This probably holds true for many or even most indigenous communities.) By single issue I mean that one cannot address one of these questions, or part of one of them, without taking into account all the others. In other words, it is impossible to speak of sustaining languages without understanding indigenous paradigms of teaching and learning, which are themselves linked not only to Arctic linguistic ecologies but, more broadly, to the physical environment in which those ecologies are situated. There is no dividing line between them. In the words of Sheila Watt-Cloutier, an Inuit activist who chaired ICC 2002-2006 and was nominated for the Nobel Peace Prize, 'everything is connected.' She argues that 'We must now speak environment, economy, foreign policy, health and human rights in the same breath. Everything is connected' (http://www.thelavinagency.com/speaker-sheila-watt-cloutier.html). For the Inuit political rights, the right to sovereignty, are deeply tied to the right to linguistic and cultural development in their own terms, and to protection of their physical environment.

4.1 Sustainability and stability

What does linguistic sustainability mean in the Arctic context? Prior to sustainability, we need to achieve a stable linguistic ecology which, as I have repeatedly argued here, cannot be separated from environmental ecology. (Mühlhäusler 2003 makes similar points for indigenous languages elsewhere.) At present, climate change is a major threat in the Arctic, where it is progressing rapidly and visibly (more so than elsewhere). In the period from 1954 to 2003, the mean annual atmospheric surface temperatures in Alaska and Siberia increased between 2 and 3 degrees Celsius. As a result, snow and ice are melting, sea ice is thinning and melts much earlier than it used to, and increasingly covers less surface. Warming is especially noticeable in the winter and spring. This also means that permafrost is melting, in particular in more southern areas, which in turn results in erosion (Marino and Schweitzer 2009:210)

For the Arctic at least, any plan for long-term sustainability for language needs to be part of a plan for long-term sustainability of lifestyle, and that lifestyle is dependent on close ties to the physical environment. Yet one of the

very notable changes in Arctic climate is that it has become unpredictable, making sustainability difficult to imagine achieving if sustainability requires stability and predictability. Arctic indigenous peoples do not see themselves as the drivers of climate change, nor do they see themselves as being in a position to change its course. They can only react, and among Inuit adaptation is considered to be the only reasonable path of action. As linguists, we can have little impact on the global environment. But an awareness of the connections between language ecologies and the changing physical environments in which they are situated can determine what we study and document now and how we prioritize our own research.

4.2 Adaptability

Throughout the Arctic, indigenous peoples are facing visible, rapid climate change, and equally visible and rapid social change. Feelings about climate change in Greenland, for example, are mixed. Some welcome warming, with hope that increased access to natural resources will enable economic independence from Denmark, and greater affluence in Greenland in general. Others are deeply concerned about the broader effects of warming in the Arctic ecosystem, such as the destruction of the ice habitats needed by sea mammals; the potential hazards (environmental and social) of the development that climate change promises to bring; and the impact of all these changes on Inuit daily life. The recent discovery of oil off the coast of Greenland by Cairn Energy is one point around which such groups clash (Wood 2010). Regardless of individual opinions about climate change, Inuit speak emphatically about their adaptability. Adaptability from a linguistic standpoint means deciding how to be Inuit in a modern world. Greenland's solution to this is to pursue modern and traditional paths simultaneously. They emphatically see themselves as hunters; they currently are actively engaged in defending their rights to hunt seals – perhaps the most contentious issue they face internationally – and they are fighting for self-determination throughout the Arctic, to very varying degrees of success.

Greenlanders have been fighting since the 1970's to revitalize and maintain their own language and have succeeded, as evidenced by a steady increase in the number of speakers over the last 30 years. This is the direct result of a focused language policy which actively promotes the official status of the language. Since Self Rule was instituted in June of last year, Kalaallisut became the official language of Greenland. Danish continues to hold official status and Greenlanders recognize the importance of their citizens speaking Danish.

In Greenland, adaptability is seen as key to language vitality as well as to overall sustainability, in keeping with the underlying concept that everything

is connected. Oqaasileriffik, the Greenland Language Secretariat, promotes the full and active use of Kalaallisut spoken in all domains. As a part of the Greenland Self Government, Oqaasileriffik has a bona fide authority in determining certain aspects of the language. Use of Kalaallisut in all domains demands that the language – and its speakers – be adaptable in an ongoing, continuous process. New vocabulary needs to be created for new technologies and concepts; these rarely stem from borrowings but are formed from native lexemes and morphemes. One sign of the language's vitality is that it is used freely and frequently by young people in texting. Kalaallisut words are long, so teenage Greenlanders use their own texting abbreviations as do speakers of European languages. Questions of shortening Kalaallisut words can spark lively discussions among young people, again a sign of the language's vitality and adaptability to new domains.

At the same time, in some spheres cultural revitalization is being achieved through language reclamation, not innovation, specifically in personal and place names.[7] The former is regulated by the Place Names Committee (a part of the Secretariat), which oversees the official list of authorized and acceptable personal names in Greenland, consisting of Kalaallisut names and European names in Kalaallisut form; names not on the list can be assigned only with consent of the Place Names Committee. This kind of control is surprising to people on the outside, but is based on the Danish Name Law, and an underlying principle of Greenlandic reclamation of personal names. The Place Names Committee similarly works to restore native names for places, replacing the Danish names which had at one time ousted them. Determining the preferred place name is a massive undertaking as there are many, many such names; to date, more than 5200 unregistered names have been collected.

Thus in the Greenlandic context, where use of the language in all domains is viewed as central to sustainability, adaptability means both the creation of new words and the reclamation of old ones. This model cannot be directly implemented in most or perhaps all other communities because the Greenlandic situation is so unique. But there is much to learn here, in particular how to balance the tension between old and new. Furthermore, adaptability in Greenland has meant promoting sustained multilingualism. This comes from the recognition that Kalaallisut is not a global language and that in order to be engaged in the world of today, Greenlanders need to know English. As part of the Kingdom of Denmark, they also need to know Danish. The solution is that a critical mass of the population must be functionally tri-

7 See the Greenland Language Secretariat website for more information on both of these committees, including the guidelines for their decisions: http://www.oqaasileriffik.gl/en

lingual, and all should be bilingual, with Kalaallisut as the first language. Speakers thus do not choose one language at the expense of the other, fostering shift and attrition, but rather use the one appropriate to a given situation. This is a bold philosophy but a necessary one for true sustainability.

5 Conclusion

Language, culture and the physical world are inseparable for many Arctic indigenous peoples. The lexical examples presented here may at first seem trivial: it is hardly surprising that cultures living with snow and ice have sophisticated lexicons for talking about them. Toponyms is another part of the lexicon where the intrinsic ties between language and place are manifest, but studies of the relationships between place, culture and language for indigenous peoples indicate that these ties are much deeper than a superficial study of names would suggest (see, for example, Basso 1996 for Apache; Nash 2003 for Australian Aboriginal languages; Thornton 2008 for Tlingit). Rather, they indicate that identity and place are intrinsically linked. Basso argues for an interanimation of places and peoples; Thornton (2008:4) emphasizes that 'for Tlingit and perhaps all indigenous peoples, place is not only a cultural system but *the* cultural on which all key cultural structures are built.'

I argue here that the current state of accelerated climate change is likely to result in massive cultural and linguistic disruption in the Arctic, a position which many Arctic indigenous peoples have also taken. Resiliency in the face of such disruption is framed in terms of sustainability and adaptability, and the present discourse in Greenland parts of Siberia centers around these core issues. Exactly what they mean in the current political, economic, and social global environment in which these cultures are situated continues to be a matter of debate. Arctic indigenous peoples tend to underscore that they are the recipients, not the drivers, of climate change. The emergence of declarations by groups like the Saami Council and the Inuit Circumpolar Council indicate that they are not willing to be sidelined in discussions of their future. Rather, they are fighting for recognition of their rights to define their own linguistic and cultural futures in their own terms and, in the words of Sheila Watt-Cloutier (2005), for 'the right to be cold.'

Appendix

Evenki snow words (adapted from Myreeva 2003)

snow		*dialect groups*
imanna[8]	(most common term)	A, Ald, Br, Čm, Z, Ie, N, PT, SB, Sx, Tmt, Tng, Urm
iman		S
imanda		Čm, S, SB
əmanda		A, Učr
time of falling		
libgəːməktə	snow which has just fallen	Čl, PT, Tk, Tmt
halgaː	1st not-deep snow	Čl, M, Tk, Tmt, Učr
ajanəː	not-deep snow	PT
hutu	big snow	Učr
size of flakes		
bagur	small, autumn flakes	Ald, Z
bagurin	small, autumn flakes	Z
burki	small, пороша (powder?)	Z, PT, Tmt, Učr
siŋiksə	snow granules (крупа) [sleet]	A, Chl, PT, Tk, Učr
butadʒariː	snow granules	N
butariː	snow granules	PT*
aluntə	granular snow	PT
fluffy snow		
alinta	snow, falling in large, fluffy flakes	PT
ləkər	sparse, fluffy snow	Tmt
ləːptəːrkəːn	flakes of fluffy snow	Učr
tʃəndʒəriː	fluffy snow	Ald
	according to flake size	
əpkəriːn	fluffy	Sx
tʃujurgə	fluffy	PT
snow which melts while falling & slush		

[8] This is a pan-Tungusic term: *emana, imanda* (Negidal, Solon); *emanra* (Even); *imasa* (Solon, Udihe); *simana* (Orok); *imaha* (Udihe); *simata* (Ul'ch); *semana, semata* (Nanai); *nimaŋi* (Manchu).

luːɲə		pan-Tungusic
uːɲə	melting, falling/slush	PT
uniːksa	‘ ’	M, Tk, Učr, Ur
uɲuːksa	‘ ’	E, N, Nr, PT, Učr
tʃapparak	‘ ’	Tk
maipkaːn	‘ ’	S
ɲəntə	slush, additional meaning: wind with wet snow	PT
paliː	slush	E, PT
paliː	thick snow with wind	Ie
sumu	1) wet snow; 2) rain with snow	PT

how snow lies on ground, layering

●*low layers*		
girgi	lower, granular layer of snow	PT
siŋilgən	large, grainy snow; снежная крупа	Ald, Chm, Ie, Tk, Učr
siŋilgən	granular snow, frost	Ald, Chm, M, N, PT, Učr
kumuro:	layer of granular snow under thick layer of snow	Tk, Tmt, Učr, Chm {<Yakut *komuruo*)
kumurə	‘ ’	VL, Sx, Urm
●*upper layer of snow, depending on thickness*		
tʃujur	hardened snowcrust on snow drift	Tk
tʃujun	snowdrift; snow waves on the surface; edge of drifted snow	Ald, Urm, Sx, PT, N
tʃəga	frozen top crust of snow	Tmt, Učr, Ald, Chm, Urm, Tng, Ie
darkin	frozen top crust of snow	Ald, Urm, Z, Sx, T, E, S
tuŋun	frozen top crust of snow	I
uŋnan	frozen top crust of snow	Sx

snow on top of mountains (used by Evenki in regions of Yablonovy and Dzhugdzhur mountain ranges where snow on the mountain peaks does not melt)

imandaːr	snow which stays on top of mountains year-round	Učr
tigən	snow which stays on top of mountains year-round	Učr
umloːn	snow which stays on top of mountains year-round	Ie
amnuːnna 1	ice which does not melt [usually found at foot of mountains and at the mouth of river moutains and springs]	Z, Urm, Sx, Tng, PT, N, E
amnuːnna 2	rocks which are found at the mouth of a	Tmt, Ald, Učr, Z,

	mountain river [and in summer usually have some unmelted ice on them]	Bnt
amnuːnna 1	grassy place in the taiga which appears after the ice melts	PT
amnuːnda	ice which does not melt	Učr, Bnt, SB, I
amnuːnra	ice which does not melt	

ice which doesn't melt

ulaːn	PT, N, E, I, E, S, SB
muːrəːn	Učr, Urm
unipkiː	Ald
higlən	I, PT
hogorkiː	PT, N, E
iːma	Tmt

fallen snow which has stuck to tree branches

umkakta	snow which has fallen and stuck to tree branches [falls in early autumn]	common Tungusic name
variants of *umkakta*		
	umkag	Nr
	umkaːg	Uchr, Urm, S
	uŋkakta, uŋkəkə	PT
hulgiː	autumn snow on tree branches	Tmt

snow around living quarters

imaniː	snow around chum, tent, or other dwelling	Uchr
ɲətʃi	snow around chum, tent, or other dwelling	E
ajaːn	snow, which is packed around tent on the outside	Urm
ajaːnŋi	snow on the inside edges of the tent	Tmt
tʃiːki	stamped-down snow	Tmt
tʃiːgdʒan	stamped-down snow	Ald, Ucr (Yakut tʃigdi)
aŋaßtʃa	snow which has been dug up by animal (e.g. caribou) hooves	Tmt, Ie, Uchr

Key to dialect names

A	Ajan dialect group
Ald	Upper Aldan-Zej dialect group
Br	Barguzin dialect group
Čl	Chul'man dialect
Čm	Chumikan dialect group
E	Erbogachën dialect group
Ie	Iengra dialect group
M	Maj dialect
N	Nep dialect
Nr	Nerchin dialect of the Vitimo-nerchin dialect group
PT	Podkamenno-Tungus dialect group
S	Sym dialect group
SB	Northern Baikal dialect group
Sx	Sakhalin dialect group
Tk	Tokkin dialect
Tmt	Tommot dialect
Tng	Tungir dialect of the Tokmin-Upper Lena dialect group
Učr	Uchursko-Zej dialect group
Urm	Urmij dialect of the Burein-Urmij-Amgun dialect group
Z	Zej dialect of the Upper Aldan Zej dialect group

Note: This is not a comprehensive list of all dialects or dialect groups as identified by Russian linguists; Myreeva (2004) includes many more.

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