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Climate change and Globalization in the Arctic: Compression of Time and Space?

Keynote speech at the Nordic Environmental Social Studies Conference,
June 13, 2003, University of Turku

Abstract

The globalization of the environment has extended to the Arctic. This has taken place at least according to the globalizing scientific discourse on climate change in the polar regions. In this discourse the Arctic is the region in the world where climate change and its impacts are seen fastest and most clearly at the moment. This paper discusses the globalization of the Arctic environment in maps as discourses on environmental change and human impact in the Arctic, local media discourses on climate change in Northern Canada and Northern Finland and discourses in national climate reports by the Arctic states to the international secretariat of the UN Framework Convention on Climate Change (UNFCCC). These different discourses show how the environmental concern in the Arctic is not only globalized, but localized in the media discourses and regionalized in the political discourses. The research is based on a discourse analytic model developed by John Dryzek to study ontological and hierarchical assumptions as well as on the assumptions of agency and the use of metaphors in discourse. The analysis reveals different and conflicting spatio-temporalities between scientific, media and political discourses. Discrepant conceptions appear in particular in discourses dealing with the meaning of temporality and change as well as the relationship between the past, the present and the future.

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Globalization of the environment in the Arctic

According to the 1997 evaluation of the Intergovernmental Panel on Climate Change (IPCC)², the Arctic is perhaps the region in the world where climate change is seen fastest and most clearly. Robert Corell, chair of the Arctic Climate Change Impact Assessment (ACIA) pointed out last year at the Arctic Monitoring and Assessment Program (AMAP) conference that in terms of the impacts of climate change what is happening in the region right now will take place elsewhere in the next 25 years³. According to the globalist scientific discourse, climate change does not only affect the Arctic today, but changes in the Arctic will impact the global climate system in turn.⁴

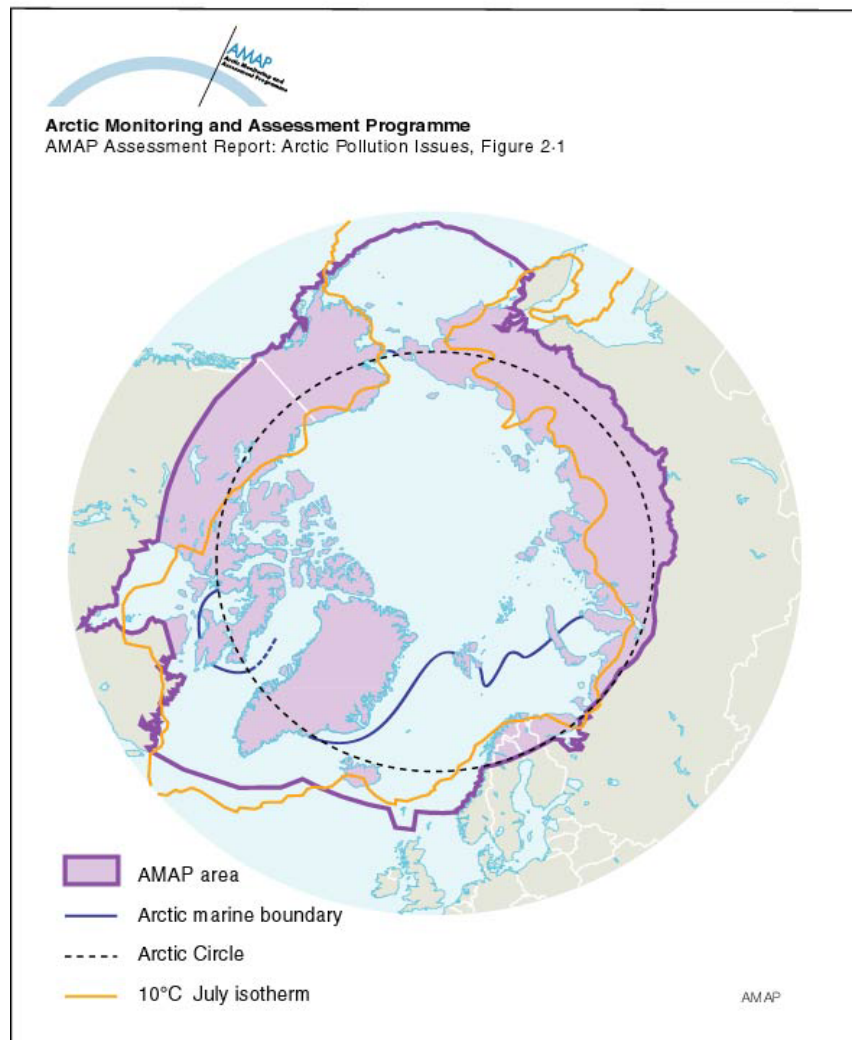
The Arctic covers the northernmost part of the globe. The southern boundary of the region has been defined using many criteria. On this map (1), there are three criteria used to define the Arctic area: the Arctic circle, the marine boundary and the July isotherm. This map also shows a political definition of the region. The political boundary is used in the Arctic environmental cooperation between the eight so called arctic states, that is the Nordic countries, Russia, Canada and the United States.⁵

² IPCC 1997.

³ Presentation at the AMAP symposium on Environmental Pollution in the Arctic, 1-4 October, 2002, Rovaniemi, Finland.

⁴ AMAP 1997a, 161.

⁵ AMAP 1997a, 6-7.

Map 1. The Arctic⁶

The Arctic environment is very often described using words such as “pristine”, “fragile” and “vulnerable” in the dominant Arctic environmental discourse. The language used by the Arctic Monitoring and Assessment program (AMAP) is a good example of such discourse. According to the AMAP, in terms of climate, the Arctic is “a cold reservoir in a global heat machine” with great regional variability⁷. There are only about 4 million people and many groups of indigenous peoples living in the area. In most Arctic countries indigenous peoples are minorities, since it is only in Northern Canada and

⁶ AMAP 1997b.

⁷ AMAP 1997a, 14.

Greenland that the number of indigenous peoples exceeds the non-indigenous population. The region is rich in natural resources but it's a political and economic periphery. A special concern in the region is the relationship between indigenous peoples, cultural survival and the degradation of the environment. The population as a whole, not only indigenous peoples, lives close to the nature in the Arctic.⁸

In addition to the scientific discourse on climate change in the Arctic, globalist environmental discourse has reached other fora as well. In the Arctic Council, which is the political forum for high-level regional environmental cooperation between the Arctic states, concern over climate change dominated the 10th anniversary meeting in summer 2001.⁹ Global environmental problems are also figure daily discussions in the local media. There are debates about whether the reindeer herds have been hit by the climate change in northern Finland or how to reconcile economic development based on the oil and gas industry with the concern over the impacts of climate in the Northern Canada. My analysis of the local Finnish and Canadian media will take up these later.

One could therefore claim, following Anthony McGrew, that globalization of the environment is taking place in the Arctic. According to McGrew, globalization has two distinct dimensions: 1) the scope or extent of global processes, and 2) intensity, that is the deepening of these processes.¹⁰ Climate change in the Arctic expands the geographic boundaries of discourses on climate change. In addition, climate change and its impacts also affects actors inside and outside the Arctic more intensely than before. In the Arctic, there is a sense in much of the climate literature that the end of an era has come, including the threat that something that we know as the Arctic, something unique and special, will disappear from the world as the warming occurs and can never be replaced.¹¹

⁸ AMAP 1997a, 68-69.

⁹ See Ten years of Arctic Environmental Cooperation 2001.

¹⁰ McGrew 1992, 23; Järvelä & Wilenius 1996, 45-46.

¹¹ Bernes 1996, 219.

Compression of time and space

Historically, climate has been a constant context of human action and a source of explanation for human behavior and development of institutions.¹² The environment can be understood in spatial terms. Agents' relations to their surroundings depend on physical, biological and social processes and their relevance to the agents themselves. There are multiple spaces and times implicated in different these processes.¹³ They conflict between different agents. A well-known geographer David Harvey points out that discursive differences over what is meant by "the environment" are irreconcilable. We cannot talk about the environment without simultaneously revealing how space and time are being constituted within such processes of defining of the environment.¹⁴ According to Harvey, the social constitution of spatio-temporality cannot be divorced from value creation. The way we very often value the environment is in terms of monetary values. Monetary valuations are based on a certain structure with regard to time as well as to space. These processes of valuation do not operate in but, rather, actively construct space and time.¹⁵

Harvey suggests that the discourses on the environment can be seen as moments of talking about, writing about and representing the world.¹⁶ This makes "the environment" in a discursive sense an effect of whatever discourse happens to be hegemonic in a particular time and place.¹⁷ The representations of spatial and temporal relations are important since they guide social practices and aim at securing a particular social order. Harvey points out that transformations of spatial and temporal relations are "neither neutral nor innocent" with respect to practices of domination and control. They are "fundamental framing decisions" that govern people and their lives.¹⁸ Representations of space and time arise out of the world of social practices but then become a form of regulation of those practices. This is why they are so frequently contested. Shifts in

¹² See Fleming 1998; Lamb 1995.

¹³ Harvey 1996, 53.

¹⁴ Harvey 1996, 263.

¹⁵ Harvey 1996, 153.

¹⁶ Harvey 1996, 78.

¹⁷ Harvey 1996, 90.

¹⁸ Haarvey 1996, 44.

spatial and temporal discourses result from “struggles” between different actors. In discursive conflicts actors struggle to gain control of institutions, social relations and material practices for particular purposes.¹⁹

According to Harvey, the objective qualities of our world have changed due to globalization to the extent that our representations of relations between time and space need to be changed. Here Harvey refers to the diminished importance of geographical distances and the increased pace of development.²⁰ This development is connected to economic processes and their changes. The economic practices, representations of spatial and temporal relations as well as people’s collective and individual experiences of them vary considerably.²¹ The question is how the representations of the Arctic environment are changing, if at all. The questions for further study become: Which discourses dealing with the Arctic environment are the most dominant ones? Are there hegemonic discourses? What do they mean for the people who live in the area?

These moments of writing, talking and representing the Arctic as part of the world are important since they are also moments “of persuasion or discussion between persons regarding lines of action and beliefs”. These discourses have a certain spatial field of operation as well as a temporality. Both dimensions depend upon socially constructed and technologically mediated capacities for communication dealing with space and time.²² These constraints make it particularly challenging to communicate the concern over the environment in the region and to appeal for further international action to address the environmental challenges.

Spatio-temporalities in Arctic climate change discourses

I am studying representations in three kind of materials: maps, the Arctic states’ national climate reports, and local media in two Arctic locations in Northern Finland and Northern

¹⁹ Harvey 1996, 174.

²⁰ Harvey 1990, 240.

²¹ Harvey 1990, 211.

²² Harvey 1996, 82.

Canada. Maps have an important role in the production globalist scientific discourse on climate change and its impacts in the Arctic. Maps describe the use of natural resources and their management as well as report the state of the environment and change.²³ A map has always an author, a theme and an object.²⁴ Maps themselves are discourses of spatiality. They also have temporality squeezed onto their surface, as Denis Wood has pointed out.²⁵

The media presents us with local discourses of climate change and its impacts in Arctic communities. As media researcher Esa Väliaverronen has pointed out, the media creates a common time-space between different events, actors and institutions. The media also have their own temporality, which they force on others.²⁶ I have chosen to study two sets of materials from two different locations - Finnish Lapland and Northern Canada – over a period of four years (1998-2001). *Lapin Kansa* is the main daily newspaper in the Finnish Lapland. The northern Canadian material I have collected from an internet data base called Northern News Service, which compiles material from five newspapers around Northern Canada. In both cases there were about 100 hundred articles about “climate change”, the “greenhouse effect” or “global warming”, which were the search words I used.

A third discourse studied comprises the political discourses of the eight Arctic states. All the Arctic states participate in the international cooperation to tackle greenhouse gases. Political discourses of Arctic states on climate change, its impacts and efforts to cut emissions can be found in the national climate change reports submitted to the UN Framework Convention on Climate Change. I have analyzed the first and second national reports of these states and the reviews of them by the international experts. These reports discuss the reduction of emissions and vulnerability to the impacts of climate change from a national perspective, dominated often by the discourse of national economic and

²³ Black 1997, 78-82.

²⁴ Wood 1992, 24.

²⁵ Wood 1992, 125-130.

²⁶ Väliaverronen 1996, 135.

short-term interests. This material is not overtly political and contentious but with careful reading one can find the main points of conflicts.²⁷

I have studied these discourses with the help of a discourse analytic model by John Dryzek. To Dryzek, a discourse is “a shared way of apprehending the world”²⁸. This model of analysis focuses on 1) the ontological assumptions of the discourses, studying which are the basic entities in the discourses and especially in what connection one can find the Arctic; 2) on the hierarchical assumptions of the discourses, that is, the relations and the nature of relations between different actors; and 3) on assumptions of agency, which can refer to either individuals or collectivities, human or non-human actors. In addition, this analysis directs attention to metaphors in the discourses.²⁹ Metaphorical thinking is important when trying to explain and translate a rather abstract, scientific problem for a larger audience of decision-makers and the general public. Climate researchers themselves use metaphors, such as the greenhouse effect. Metaphors derive their power from the social and material practices and experiences of the world.³⁰

²⁷ Dryzek 1997, 74-75.

²⁸ Dryzek 1997, 8.

²⁹ Dryzek 1997, 16-18.

³⁰ Harvey 1996, 164.

Table (1) below presents an overview of the results of my analysis.

Table 1. An overview of three discourses on climate change in the Arctic

	Cartographic discourses	Local media discourses		Discourses in national climate reports
		Lapin Kansa	Northern News Service	
Ontology	Tradition of climate zones (Arctic and Antarctic)	The Arctic, Finland, Nordic countries, Northern Europe Lapland, Sami Home area	The Arctic, local, North, Canada	Arctic adaptation
Hierarchy	Religious, economic and scientific interests	Scientific, local expertise	Scientific vs. local expertise	National economic interest
Agency	From environmental determinism to a view that the human being is a global agent	Finnish state and international institutions	Individuals, territory and the Canadian state	Arctic states and arctic excuses for emissions
Metaphors	Traffic lights, warning lights	Species retreating northwards, the climate as a sleeping bear	Nature begging for help at the door	Flexible mechanism

Cartographic discourses

There is a long tradition of thinking of the Arctic in terms of climate zones. This tradition goes back to the ancient Greece where theories were made of regions which were considered hospitable for human beings.³¹ The place of the Arctic on the world map has changed throughout the cartographic history. The place of the Arctic on world maps has depended on the religious, economic and scientific interests of the time. In medieval times, it was on the edge of the known world and the place of horrors of nature. Later, great hopes were attached to the Arctic as a potential route to the China and its treasures. The Arctic was of great interest to Dutch and English mapmakers.³² Finally, at the end of 19th century, the Arctic became an object of scientific cooperation and national competition to conquer the top of the world.³³

In the era of scientific interest in the Arctic, researchers wanted to understand the climate of the polar regions and the dynamics of glaciers. Arrhenius and others thought that the Arctic could show the first signs of climate change. However, at that time the potential human impact on the climate was considered to be improvement of the climate.³⁴ This view has now changed radically: the human being is a global agent endangering the global climate system. In many cases this is definitely not a question of an improved climate. But for climate researchers, this new role of the human agent yielded new opportunities for experiments.³⁵

This new understanding of the human role as a global agent in the Arctic can be seen in maps produced by the GLOBIO project. The project aims to describe the impacts of human activities in the Arctic. On these maps one can see how human activities could extend to the Arctic region in the future. The project has reviewed the development between 1940-1990 and then created different scenarios for the future development of the region. These maps were presented at the Arctic ministers 10th anniversary meeting of

³¹ Sanderson 1999.

³² Spies 1997.

³³ Cosgrove 2001, 216-217.

³⁴ Fleming 1998, 79-82.

³⁵ Weart 1997.

Arctic environmental cooperation in Rovaniemi, Finland 2001³⁶. What the maps indicate is that the human influence in the Arctic is intensifying due to modernization and industrialization. In these maps, the message is conveyed in metaphorical terms as “TRAFFIC LIGHTS”: green means go, yellow warns of change, and red is an order to stop.³⁷ The amount of red color in the most pessimistic scenario covers most of the Arctic region.

It is not only the traffic lights that warn of the human influence in the Arctic. The “WARNING LIGHTS” are on: some change has already taken place. The colors of danger and threat – red and yellow on a black background – aim at alarming the viewer, as in this map used in the BESIS project³⁸. BESIS is a climate impact study in the Bering Strait region. The message varies in strength on these maps: the BESIS map has a considerably stronger message than the one of the latest AMAP report³⁹, which uses a much more subdued color scheme. Both these maps show the temperature change in the Arctic between the 1960s and the 1990s using different colors to inform us about the change. These maps reinforce the scientific message that a new era of global human influence is upon us.

Local media discourses

The two local media discourses studied show the diverse ways in which local actors interpret climate change within the Arctic region. The Arctic is not the main spatial reference in these discourses. It is only one among many such references. In the Finnish discourse, climate change is discussed in Finnish, Nordic, North European and Lappish as well as Sami contexts. In the Canadian discourse, the spatial reference is mostly northern and local, and then Canadian. The international scene is portrayed as being much more complex in the Finnish material. In the Canadian discourse, the international scene is dominated by the relationship between the U.S.A and Canada.

³⁶ GLOBIO 2001.

³⁷ Monmonier 1996, 171.

³⁸ BESIS 2003.

³⁹ AMAP 2002.

In the northern Finnish discourse, the media's favourite expert is a local researcher who was probably born and educated somewhere else than in Finnish Lapland but who has lived in the region for many years. This gives the person the right to express not only his/her professional opinion on climate change but also to contribute his/her personal interpretation of the situation. This is not the case in northern Canada. There the experts remain scientific experts, but references to the expertise and experiences of the local population can often be found. In northern Canada, climate change and its impacts are "a reality", and the local people report the changes that they have seen in their surroundings. Climate researchers are criticized for not taking the local observations seriously enough. In the Finnish discourse, the reports of potential impacts of climate change in other parts of the world are generally evaluated as being more reliable than the reports of local changes in Finland.

In terms of agency, the northern Finnish discourse emphasizes state action and international cooperation at the expense of individual responsibility and change of behavior. In the Canadian discourse, the polarity is the reverse: the individual responsibility and behavior are the dominant focus. There are many views presented about the Northwest Territories' programs to reconcile goals of economic development based on the more intense use of local oil and gas resources and the observations of climate change and its impacts in the region. The sense of acute conflict between economic and ecological interests is clearer in the northern Canadian discourse on climate change.⁴⁰

Both local media discourses are rich in metaphors. Following a classification by Iina Hellsten⁴¹, I have divided them into five categories. There are many bodily and physical metaphors "THE ISSUE OF CLIMATE CHANGE IS HOT, BUT THE PEOPLE ARE

⁴⁰ The differences in my study seem to follow the national differences in environmental concern. According to some international comparative studies, compared to other nationalities Finns are not as much concerned with changes in the nearby environment as are with changes globally compared to other nationalities (Suhonen 1994, Sairinen 2001). Canadians show more concern for the state of both the local and global environments (Einsiedel & Coughlan 1993).

⁴¹ Hellsten 1997, 87.

COOL TO CLIMATE TALK”⁴². There are metaphors based on hearing in the Canadian material such as “WE CAN HEAR THE PERMAFROST MELT”⁴³, or “THE ALARM BELLS STARTED RINGING”⁴⁴. In the Finnish discourse, climate change “ADDS STEAM IN THE SAUNA”⁴⁵. There are metaphors referring to direction and movement, for example, “THE KYOTO PROTOCOL CANNOT STOP THE EMISSIONS BUT IT CAN ACT AS A BRAKE ON THE GROWTH OF EMISSIONS”⁴⁶. Another example of a metaphor using directions is “WE CANNOT POINT THE FINGERS AT OTHERS”⁴⁷. There are also structural metaphors that connect two different conceptual fields. Such metaphors refer to the international scene of climate change cooperation between states as “A GAME”⁴⁸ or “A ROAD”⁴⁹ and bring in metaphors such as “WINNERS AND LOSERS IN CLIMATE CHANGE” or “PATHS AND STEPS” in international cooperation. Other metaphors use history in many ways, for example, by referring to the agricultural and industrial history of Finland⁵⁰.

Discourses of national climate reports

By “Arctic states” I mean the Nordic countries, the United States of America, Canada and Russia. These countries participate in the politics of and cooperation in international climate change.⁵¹ They have produced two - in some cases - three national reports to the secretariat of the UN Framework Convention on Climate Change (UNFCCC). I have also studied the reviews of these reports by the international expert groups. I have compared the way the Arctic states discuss their concern for climate change in the Arctic in these reports to the way the concern is discussed in the regional environmental cooperation between the same states. As Myerson and Rydin observe, discourses of scientific concern and political action on climate change never meet; “the arguments from science and

⁴² NNS 27.10.2000; NNS 3.5.1999.

⁴³ NNS 30.7.2001.

⁴⁴ NNS 23.10.2000.

⁴⁵ LK 20.12.1998.

⁴⁶ LK 31.10.1999.

⁴⁷ LK 5.7.1999.

⁴⁸ LK 4.11.2000a; LK 4.11.2000b; LK 22.7.2001, LK 24.4.2001.

⁴⁹ LK 20.12.1998; LK 5.7.1999; LK 30.4.1998.

⁵⁰ LK 4.11.2000c; LK 30.4.1998; LK 2.9.2000.

⁵¹ Kyoto Protocol Ratification Status 2001.

diplomacy, the new information and new practice discourses, therefore, circle each other, like the paths of two orbits around a planet, crossing at times, then passing out of sight of each other”.⁵²

One might also add that the regional and global concern and action does not meet. This is at least very much the case in the Arctic; one cannot find much concern over the state of the Arctic or its future in the national climate reports. Some of the Nordic countries, such as Denmark⁵³ and Finland⁵⁴ are more concerned about the impacts of climate change around the world than in their Arctic regions. Some of the assessments, such as those carried out in Canada, Iceland, Sweden and Russia, do include an evaluation of the impacts in the Arctic. In the Icelandic evaluation, warming is expected to have positive effects in most respects on the island itself, although its effects on the fishing banks are less certain.⁵⁵ In Sweden, sub-arctic ecosystems are evaluated as sensitive, but not vulnerable, to climate change.⁵⁶ In the Russian Federation and Canada, the concern over vulnerability of their region is stated clearly. In the Russian Federation, a substantial shift to the north of the permafrost zone, which covers a large part of the country, could take place. This shift will influence human settlements, infrastructure, roads, airports and energy facilities.⁵⁷ In Canada, the vulnerability of Arctic ecosystems is the main concern.⁵⁸

In this political discourse, which is dominated by national economic interests, the Arctic is an area of adaptation to climate change. Most of the countries seem to expect that their northern areas have already adapted to climate change and can adapt to future changes. Most of the countries rely on future research on the needs of adaptation. With the exception of the Russian Federation, these countries have not been successful in stabilizing their emissions during the 1990⁵⁹, and most do not expect to do it before 2020

⁵² Myerson & Rydin 1997, 92.

⁵³ Denmark's Second National Communication on Climate Change 1997, 12, 64.

⁵⁴ Finland's National Report under the United Nations Framework Convention on Climate Change 1995, 101.

⁵⁵ Status Report for Iceland Pursuant to the United Nations Framework Convention of Climate Change 1994, 50.

⁵⁶ Sweden's National Report under the United Nations Framework Convention of Climate Change 1994, 10.

⁵⁷ First National Communication of the Russian Federation 1994, 52.

⁵⁸ Canada's National Report on Climate Change 1994, 20–21.

⁵⁹ National communications from parties included in Annex 1 to the Convention. Greenhouse gas inventory data from 1990 to 1998 (2000).

or after that. In fact, the Arctic conditions provide more of an excuse for high emissions than a motivation for action. The harsh northern conditions, abundant energy resources in some of these states or a lack of them, economic necessities and past energy policies provide explanations and excuses for growing emissions by the Arctic states.

Climate cooperation could be described using many metaphors typical of politics, such as “A GAME”, “A THEATRICAL PRODUCTION” or “A WAR ”.⁶⁰ However, this material was dominated by the metaphor of “MECHANISM”⁶¹. “FLEXIBILITY” was another metaphor⁶². “MECHANISM” constructs a particular understanding of human agency in climate cooperation; drawing on the notion of a machine. “MECHANISM” refers to a collective result that does not demand a commitment of the individual parts to the common goal. The mechanism metaphor is based on a view of the social and political system as a self-regulating machine. The machine rests “on the actions and interactions of persons undisciplined by moral orientations towards the general good”. In terms of the machine metaphor, “concerns with incongruencies between words and actions, with hypocrisy, become marginalized”⁶³. The metaphor takes certain traits of the physical world as given. The metaphor of “FLEXIBILITY”, on the other hand, is based on the idea of giving options for action for agents in an uncertain situation. It allows them to adjust their actions and institutions to the future. This allows the Arctic states to consider the future with their options open. “FLEXIBILITY” also allows them to find ways of cutting emissions in a most convenient way for them. In the national climate reports, the most frequently mentioned manifestation of flexibility is the forests as sinks for greenhouse gas emissions.

Timescape of Arctic discourses on climate change

In terms of spatialities in these discourses, one can find globalizing, localizing and regionalizing discourses. To climate researchers, the Arctic is a laboratory for climate

⁶⁰ See Romaine 1996.

⁶¹ Ezrahi 1995.

⁶² Edwards 1999.

⁶³ Ezrahi 1995.

change. Arctic climate change and its impacts is embedded in globalist scientific discourse. In the local media discourses, the Arctic is just one of many references incorporating spatial thinking. In most cases, when climate change in the Arctic is mentioned, it is discussed in the traditional scientific way that focuses on the global importance of the region. There are very different ways of discussing climate change and its impacts in Finnish Lapland and Northern Canada. Both discourses localise climate change in different ways. They also reflect the differences in national environmental discourses of the two countries.

I would like to add a third category - regionalizing discourses – to Steven Yearley's⁶⁴ localizing and globalizing discourses of science, media and politics. The regional concern over climate change in the Arctic could lead to more cooperation between the Arctic as well as to coordinated effort at the international level. This was suggested by the message of Arctic Council to the Johannesburg Summit on Sustainable Development last year. According to this message:

The fate of the Arctic is largely dependent on progress in global efforts to adjust human economic activities to the capacity of nature. Global action, with the circumpolar North as an active partner, is essential for the future of the Arctic.⁶⁵

However, so far in the international political scene of climate cooperation, the Arctic concern has a very marginal place in the statements of the Arctic states themselves. The Arctic conditions serve more as an excuse for emissions than a reason for measures to reduce emissions in the short term.

Globalization theorists' idea of temporality centers on the present and the expectations for the future based on the current trends in development. The metaphor of "PATH" and "ROAD"; particularly frequent in the local media discourses, is also based on this idea. One continues to walk on the path of the present to the future. Robert W. Cox suggests

⁶⁴ Yearley 1996.

⁶⁵ Ten Years of Arctic Environmental Cooperation 2001, 12.

that we should not take the temporality of most of the globalization theorists as given. He calls for the opening of the one-dimensional temporality of globalization theories. In his view, the ideology of globalization is sustained by spatially oriented thinking in which the present is fixed and determined and the future is imaginable only as a further development of tendencies apparent in the present.⁶⁶

Here, I also have found the idea of Barbara Adams helpful who points out that taking a closer look at temporality shows the context in which human beings and society act, not only in space but in time. Her concept of timescape provides a context where human beings live and act and transforms space to a common temporality of interaction. A timescape perspective stresses the temporal features of living such as rhythm, timing and tempo, changes in them and contingencies. The concept urges us to study conflicts that arise from different societal, natural and cultural rhythms and temporal understandings.⁶⁷

Conflict 1: Understanding of time

Scientific thinking, which is based on an abstract, objective and rational understanding of temporality, conflicts with the multiplicity of temporal relations in society. The temporality of scientific discourses extends far back into history as well as many decades, even centuries, ahead into the future. Even if scientific discourse is an important source for understanding climate change and its temporality my analysis shows different ways that people try to come to terms with the speed of change and its meaning.

In the media discourses, the language of scientific records dominates the discourse. The media discourses are dominated by scientific reports of record warm summers, decades and centuries. People try to come to terms with the speed of change through spatial thinking: “THE PROBLEM MOVES FASTER, NOT SLOWER”⁶⁸ or by comparing the future climate of Finland to that presently found in Denmark and the Baltic countries.⁶⁹

⁶⁶ Cox 1997, 26.

⁶⁷ Adam 1998, 9-11.

⁶⁸ NNS 4.9.2000.

⁶⁹ LK 22.9.2000

In the local media discourses, one can see how local actors try to make the scientific understanding of temporality work in a concrete way. Time is given a more easily understandable face. In the northern Finnish discourse, different species are given the human characteristic of being stressed and in a hurry. Different phenomena and changes in natural organisms such as reindeers, birds and fish represent changing time. Nature's time is understood also in economic terms, like "A GENE BANK" which can be depleted and destroyed by climate change.⁷⁰ In the northern Canadian discourse, village elders and their stories of changes make the impacts of climate change more understandable with practical examples. Their time horizon extends back some 20 to 50 years.⁷¹

Conflict 2: The past, the present and the future

Helga Nowotny points out that our hopes for the future are limited. The ecological crisis makes the future more immediate as choices that must be made in the present instead of being left for or postponed into the future.⁷² Climate researchers' message is one of the end of time in the Arctic: the Arctic as we know it is disappearing. Time is running out in the Arctic. The message is one of a profound change, a transition into a new era with a sense of loss of the past.⁷³ This acute sense of crisis can be seen in the Canadian media discourse. In the Baker Lake, hunger has driven grizzly bears near to the communities. The cause for hunger could be climate change according to the newspaper. The question is: "How much longer can we stand by and allow nature, desperate and hungry, to claw at our doors".⁷⁴ However, in the Finnish discourse, the options for the future are still open. The climate is "A SLEEPING BEAR" which one should avoid waking since the bear might attack the intruder.⁷⁵

⁷⁰ LK 19.8.1999.

⁷¹ NNS 5.4.1999

⁷² Nowotny 1990, 49-52.

⁷³ See also Myerson & Rydin 1997, 88-89.

⁷⁴ NNS 13.7.2001.

⁷⁵ LK 11.2.1998.

Even in the political discourses, where the concept of time is closer to the scientific understanding of temporality, there is an obvious conflict. The national political discourses are based on the idea of time as abstract, measurable and controlled, what Adams calls “industrial time”⁷⁶. Time is a resource to be owned, exchanged, planned and managed. However, the temporal horizon of the political decision-makers is not the same as that of climate researchers. There is a clear conflict between the suggestions of climate researchers calling for action to tackle the growth of emissions and the perceptions of the states regard future reduction in emissions. There is a hope that the mechanism with its flexibility will help the participants adjust to the required actions. The idea of cost efficiency dominates the discourse, although, my interpretation of the material is that the costs of adaptation are not as accurately estimated as the costs of cutting emissions. The strategy of climate research has been to start talking to states about so called no regret options in order to persuade them of benefits of the emission cuts. In terms of adaptation, the future is an open horizon with a variety options, but in terms of cutting emissions it is restricted.

A final example

I would like to conclude with an example of these conflicts in the Arctic timescape. This picture is from the cover of the *Sila Alangotok* video.⁷⁷ This video reports Inuit observations on climate change and its impacts in their region in Northern Canada. It is the result of collaboration between the local Inuit community and the International Institute for Sustainable Development completed a couple of years ago. The video was presented at the Hague climate conference at the end of 2001 in the Netherlands for the participants in the international negotiations. The picture nicely combines the main points of my discourse of scientific, cartographic discourses with the media and political discourses of climate change in the Arctic.

⁷⁶ Adam 1998, 11.

⁷⁷ See International Institute for Sustainable Development 2001.

As Doreen Massey has pointed out, the experience of compression of time and space differs among individuals and collectivities: “the ways in which people are inserted into and placed within time-space compression are highly complicated and extremely varied”⁷⁸. This picture, the cover of the *Sila Alangotok* video, shows the dominant way of situating the Arctic and its people in the compressed of time-space in climate change discourses. This picture gives a human face for climate change in the Arctic. In the globalist scientific discourse the Arctic is described as “the refrigerator” in the global climate system⁷⁹. This particular image is interesting from a human perspective: no one lives in a refrigerator.

In the cover picture, one can see a young indigenous person in traditional dress in a white snowy background. This person is alone, driving home the point of Arctic emptiness. In the left corner, one can see a map of the circumpolar North, also drawn in white colour. This one person thus stands for the whole population of the circumpolar Arctic. The picture is lit with the yellow color of the sun, presumably to give suggest the effects of global warming in the cold and dark North. This is an interesting picture related to climate change since it gives a human face for climate change. In many cases, it has been a lonely polar bear that represents life and action in the polar regions.⁸⁰

The picture is interesting in terms of temporality. The traditional dress and snowy, empty landscape make one think of traditional ways of life in the North. The past dominates this picture. Moreover, a concern for the future can be seen in the picture despite the warm, sunny color in it. This picture makes one wonder what will happen in the future. The snowy landscape might disappear. How will this person make a living in the future? The concern over the future meets the climate researchers concern, which is focused on the impacts of climate change on the traditional livelihoods of indigenous peoples. As the 1997 IPCC report points out, the most vulnerable are the indigenous peoples in the Arctic who depend on traditional occupations. Well, what will happen to the people who are not

⁷⁸ Massey 1993, 62.

⁷⁹ AMAP 1997a, 14.

⁸⁰ See, for example, UNEP 2003 or Greenpeace 2003.

dependent at all or so dependent on traditional livelihoods. What about the modern lifestyles in the Arctic? Will they be affected and, if are, so how?

To my mind, this picture describes the conflictive relationship between climate researchers and local communities in the Arctic. The indigenous peoples claim to have traditional, ecological knowledge which is based on their survival and culture in harsh, northern conditions. In many cases, this knowledge has not, at least according to the indigenous peoples, been recognised by the scientific establishment as much as it could have been. Accordingly, the observations on the video could complement or even contest the scientific knowledge on climate change and its impacts in the Arctic. The question is: Who knows the Arctic best – the scientists or the local people? Who is the best to evaluate the impact of the changes? How can better evaluate the changes and their impacts?

References

Adam, B. (1998) *Timescapes of Modernity. Environment and Invisible Hazards*. Routledge, London and New York.

AMAP (1997a) *Arctic Pollution Issues: A State of the Arctic Environment Report*. AMAP, Oslo.

AMAP (1997b) *The Arctic as defined by temperature, and the Arctic marine boundary, also showing the boundary of the AMAP assessment area*. <http://www.amap.no/maps-gra/show.cfm?figureId=13> 13.5.2003.

AMAP (2002) *Temperature change in the Arctic 1961-1990*
<http://www.amap.no/assess/AP2002Pathways.pdf> 13.5.2003.

Bernes, C. (1996) *Valoa ja kaamosta – arktinen ympäristö pohjoismaissa*. NORD 1996:24. Pohjoismainen ministerineuvosto, Kööpenhamina.

BESIS (2003) *Arctic Temperature Trends*
http://www.besis.uaf.edu/images/fig2_big.gif 13.5.2003.

Black, J. (1997) *Maps and Politics*. Reaktion Books, London.

Canada's National Report on Climate Change (1994)
<http://unfccc.int/resource/docs/natc/cannce1.pdf> 13.5.2003.

Cosgrove, D. (2001) *Apollo's Eye. A Cartographic Genealogy of the Earth in the Western Imagination*. John Hopkins University Press, Baltimore and London.

Cox, R. W. (1997) A Perspective on Globalization. In J.M. Mittelman (ed.), *Globalization: Critical Reflections*. Lynne Rienner, Boulder and London.

Denmark's Second National Communication on Climate Change submitted under the United Nations Framework Convention on Climate Change (1997)
<http://unfccc.int/resource/docs/natc/denn2.pdf> 19.5.2003.

Dryzek, J.S. (1997) *The Politics of the Earth. Environmental Discourses*. Oxford University Press, Oxford.

Edwards, R., Nicoll, K. & Tait, A. (1999) Migrating Metaphors: the globalization of flexibility in policy. *Journal of education policy* 14(6):619-630 [EBSCO].

Einsiedel, E. & Coughlan, E. (1993) The Canadian Press and the Environment: Reconstructing a Social Reality. In A. Hansen (ed.), *The Mass Media and Environmental Issues*. Leicester University Press, Leicester.

Ezrahi, Y. (1995) The Theatrics and Mechanics of Action: The Theater and the Machine as Political Metaphors. *Social Research* 62(2):229-323. [EBSCO]

Finland's National Report under the United Nations Convention on Climate Change (1995) <http://unfccc.int/resource/docs/natc/finnc1.pdf> 19.5.2003.

First National Communication of the Russian Federation (1995) <http://unfccc.int/resource/docs/natc/rusnc1.pdf> 19.5.2003.

Fleming, J.R. (1998) *Historical Perspectives on Climate Change*. Oxford University Press, Oxford.

GLOBIO (2001) *Changes in human impact on biodiversity and ecosystems between 1990 and 2050 using three different rates (50-100-200%) of growth in infrastructure and resources utilization compared to 1940-1990*. <http://www.globio.info/press/2001-06-01.cfm> 13.5.2003.

Greenpeace (2003) *Polar Meltdown Campaign*. <http://archive.greenpeace.org/~climate/polar/> 10.6.2003.

Harvey, D. (1990) *The Condition of Postmodernity*. Blackwell, Oxford.

Harvey, D. (1996) *Justice, Nature and the Geography of Difference*. Blackwell, Oxford.

Hellsten, I. (1997) *Metaforien Eurooppa. Näkökumia suomalaiseen EU-journalismiin*. Tampereen yliopisto, Tampere.

International Institute for Sustainable Development (2001) *Sila Alangotok*. Inuit observations on Climate Change. http://www.iisd.org/casl/projects/video_purchase.htm 19.5.2003.

IPCC (1997) *The Regional Impacts of Climate Change: An Assessment of Vulnerability*. A Special Report of IPCC Working group II (R.T. Watson, M.C. Zinyowera, R.H. Moss) (eds.), *Summary for Policymakers*. <http://www.ipcc.ch/pub/reports.htm>. 4.12.2000.

Järvelä, M. & Wilenius, M. (1996) *Ilmatoriski ja ympäristöpolitiikka*. Gaudeamus.

Kyoto Protocol Ratification Status (2002). <http://unfccc.int/resource/kpstats.pdf> 5.11.2002.

Lamb, H.H. (1995) *Climate, History and the Modern World*. Routledge, London and New York.

Massey, D. (1993) Power-Geometry and a Progressive Sense of Place. In J. Bird ym. (eds.), *Mapping the Futures. Local Cultures, Global Changes*. Routledge, London and New York.

McGrew, A. G. (1992) Conceptualizing Global Politics. In A. G. McGrew ym. (eds.), *Global Politics. Globalization and the Nation-State*. Polity Press, Cambridge.

Monmonier, M. (1996) *How to Lie with Maps*. The University of Chicago Press, Chicago and London.

Myerson, G. & Rydin, Y. (1996) *The Language of Environment. A New Rhetoric*. UCL Press, London

National communications from parties included in Annex 1 to the Convention. Greenhouse gas inventory data from 1990 to 1998 (2000a). Report on national greenhouse gas inventory data from Annex 1 parties from 1990 to 1998. Note by the secretariat. UNFCCC/SBI/2000/11.

<http://www.unfccc.int/resources/docs/sbi/2000/11.pdf>

Nowotny, Helga (1990) *Time. The Modern and Postmodern Experience*. Polity Press, Cambridge.

Romaine, S. (1997) War and Peace in the Global Greenhouse: Metaphors We Die By. *Metaphor and Symbolic Activity* 11(3):175-194. [EBSCO]

Sairinen, R. (2001) Public Support for Environmental Policy in Finland: Cultural Interpretations of Survey Results. *Scandinavian Political Studies* 24(2):129-149. [EBSCO]

Sanderson, M. (1999) The Classification of Climates from Pythagoras to Koeppen. *Bulletin of the American Meteorological Society* 80(4):669-673.

Spies, M. (1997) *Arctic Routes to Fabled Lands. Olivier Brunel and the Passage to China and Cathay in the Sixteenth Century*. Amsterdam University Press, Amsterdam.

Status report for Iceland pursuant to the United Nations Framework Convention on Climate Change (1994) <http://unfccc.int/resource/docs/natc/icenc1.pdf> 19.5.2003.

Suhonen, P. (1994) *Mediat, ympäristö ja me*. Hanki ja jää, Helsinki.

Sweden's National Report under the United Nations Framework Convention on Climate Change (1994) <http://unfccc.int/resource/docs/natc/swenc1.pdf> 19.5.2003.

Ten Years of Arctic Environmental Cooperation. A Compilation of Speeches 11 June 2001, Rovaniemi, Finland. Ministry of Foreign Affairs of Finland, Helsinki.

UNEP (2003) *Thinning of the Arctic Sea-Ice*.

<http://www.grida.no/db/maps/arctic/images/arcticicethin.jpg> 13.5.2003.

Väliverronen, E. (1996) *Ympäristöuhkan anatomia. Tiede, mediat ja metsän sairaskertomus*. Vastapaino, Jyväskylä.

Weart, S.R. (1997) The Discovery of the Risk of Global Warming. *Physics Today* 50(1):34-41. [EBSCO]

Wood, D. (1992) *The Power of Maps*. Guilford Press, New York and London.

Yearley, S. (1996) *Sociology, Environmentalism, Globalization*. Sage, London.

Newspaper articles

Lapin Kansa

LK 11.2.1998 Uudet ympäristötutkimukset osoittavat. Ilmasto lämpenee luultua nopeammin.

LK 30.4.1998 Kansainväliset sopimukset tie päästöjen leikkaamiseen. Laskeumamittauksissa nähtävissä jo myönteinen kehitys.

LK 20.12.1998 Ihmisen pelottavat jäljet.

LK 5.7.1999 Ilmastonmuutos ja kansainvälinen yhteistyö.

LK 19.8.1999 Luonnonsuojelu talouden ja yhteiskunnan perusedellytys

LK 31.10.1999 Ilmastonmuutos kaipaa Kioton sopimusta jämäkämpää jarrua

LK 2.9.2000 Hätkähdyttävä raportti ympäristöstä.

LK 22.9.2000 Suomi panostaa arktiseen ympäristöyhteistyöhön. Halonen huolissaan ilmastonmuutoksista.

LK 4.11.2000a Matkailu kasvihuoneilmiön voittaja.

LK 4.11.2000b Ihmiskunnan lämpimimmät ajat 50-100 vuoden päästä.

LK 4.11.2000c Kasvihuoneilmiö sataa matkailun laariin.

LK 22.7.2001 Lähi-itä ja ilmaston lämpeneminen asialistalla.

LK 24.4.2001 Yhdysvallat vastaan muu maailma.

Northern News Service

NNS 5.4.1999 Arctic turns tropic? Elders reflect on the North's changing weather patterns.

NNS 3.5.1999 Arctic protection hot topic.

NNS 4.9.2000 Warming warning. Global change puts species at risk, says WWF study.

NNS 23.10.2000 Witnesses to global warming. Dorset students note global warming changes.

NNS 27.10.2000b Climate change, hot topic.

NNS 13.7.2001 Baker's Bear problems lead to George Bush.

NNS 30.7.2001 It's still getting hotter.