

State territoriality is a historically quite new phenomenon. It emerged in the late 17th century with Vaubans' fortification of France's external spatial relations in the form of a hexagon and became legally a central principle in the Westphalian system of treaties between 1648 and 1748. However, not until the organized railway system was well in place in the last decades of the 19th century, did territoriality become central to at least some of the world's then dominating states. But waterways and water-based integration of societies have been much more important in the limitation of societies (Harste 2013). The Aegean sea was basic to Hellenic civilization; the big rivers were vital to the early kingdoms of Mesopotamia and Egypt; the Mediterranean Sea was the highway of the Roman Empire; the Channel was of vital importance to the Norman construction of England; Norway and Denmark were water- and coast-integrated societies and constituted a Kattegat based kingdom; before that time, the North Sea reached to the Shetland and Faroe Islands and Iceland and finally covered the whole North Atlantic to Greenland and Svalbard; at the same time, Sweden stabilized as a Baltic kingdom. There are a number of additional examples from riverside and coastal societies to archipelago or island societies. Greenland is such an example; it can obviously not be integrated in the medium of land and has to use coastal transport and more recently air transport. Now the North Pole will melt for still bigger parts of the year and the questions are what will happen and how could we observe and conceptualize it (Brigham 2010: 73)?

The point is that we and the communication systems used in our deliberations about ongoing phenomena tend to communicate about land, sovereignty, fertility and especially do so when politically induced changes should be subject to political control. Political systems are especially bound to land and territoriality. Land and territory are not identical in the sense that "land" is a culturally traditionalized concept embedded into historical symbols while territory is constructed, formed and transformed more abstract and subject to steering and control. When we communicate and reflect politically, we cope with notions of participation and representation and claim some kind of coherence and consensus between what participants wish and what is decided as output and outcome by political systems that ideally use participation as input (Easton 1965; Rousseau 1762/1971). Yet systems tend to deliberate as if the programs are ready to solve the problems long before they are identified.

Problem solving is primarily using programs (Luhmann 1968; Heisler 1974; Luhmann 2010). Yet whether we reflect in terms of land or territory, our conceptual frames and forms of communication must be emancipated from the rather concretized ways that frame society. For a couple of centuries, we used to observe and frame "society" according to maps in the school; some younger generations have forgotten this frame, yet without catching up on anything more adequate than a fantasy loaded face-book or app downloading form of communication completely dissociated from the physically, biologically or state governed environment, they too operate with forms of mapping and spatial orders. However this virtual fantasy world is not the form of emancipation called for in a world that seems to offer substantial challenges to future world perceptions. Rather we have to re-establish structural couplings between social systems and living and physical systems in new ways that offer forms and models about socio-technical systems at a macro-level in order to re-code and reform how social and technical systems should reframe systems at a meso- and micro-level.

Therefore I propose to use a concept functionally equivalent to territoriality, namely aquatorality. Whether we communicate about territoriality or aquatorality, both conceptions and delimitations are contingent to the communication systems that arrange the organization, coordination and integration of a given space on Earth. I will differentiate this conception according to functionally equivalent communication systems that sustain each other in the construction of territorialities and aquatorialities. To approach the question of the future of the Arctic region, I distinguish between six communications systems that differentiated from each other seem to become involved in the new deals emerging around the Arctic (Luhmann 1986). In coping with the Arctic, I will use a military coding, an economic coding of communication, legal coding, codings for ecological communication, and codings for tourist communication. These codings could appear in their structural coupling to a political system in the form of an organization that appears in the Arctic Council. In the following, I will shortly describe some of these codings, their observations and the problems and paradoxes that develop when these five differentiated systems are used to observe the Arctic. Finally I will point towards the methodological approach used when the issue of the Arctic is observed with Niklas Luhmann's systems theory. We may ask what we do mean with "the Arctic system" (Potts & Schofield 2008: 175).

To observe a phenomenon as the Arctic is to observe between distinctions that select what is and what is not observed. The Arctic may be submitted to some kind of rationality such as military rationality, economic rationality about for example fishing or ship transport, tourist rationality that tries to reconcile experience and aesthetics with travelling and use of money, to ecological rationalities about waste or sustainability, or a legal or political rationality about who should be concerned, why and when. Yet when we analyze what is meant by such diverging rationalities, we have to observe the different communication codes used to select what is and what is not relevant. So to say, tourists can (only) observe matters that offer experiences that can be communicated as surprises beyond what is boring. Economic rationality is characterized by reducing and reifying according to economic codes such as payments, price, interest, profitability and growth. The systemic point is that such codes reinforce themselves and refer to themselves in self-referential systems.

The consequence is that such self-referential systems find it difficult to observe each other's rationalities. They cannot communicate together, which is an achievement because it deals with specialization but it is also a risky achievement. Here my initial theme is that the Arctic and the North Atlantic since the beginning of the Second World War basically was dominated by codes of war handled by opposed military systems (Tamnes 2013).

I. The military observation system

The Second World War discovered the Arctic as an ambiguous object that was not simply a remote outskirts of a state or an empire dominated outskirts beyond reach. The Arctic and in particular Greenland was central for weather observations. The extremely cold winters in 1941-42 more than anything stopped the German Barbarossa operation and posed the problem of long term weather forecasts. If temperatures in Greenland were well below the normal, then the weather on European battlefields would be warm and vice versa. That was the basic lesson. Yet of course, weather systems are much more complex. Iceland and Svalbard was included, especially because the convoys from USA to Murmansk had to go free of the Norwegian coastline and because temperatures sometimes sank to minus 50 degrees Celsius. Clouds hindered German airplanes to discover the convoys. Thus, to control weather observations was to control the war, the supplies and the operations, and did not Carl von Clausewitz in some of his important analyses in *Vom Kriege* speak about "the fog of war" (Clausewitz 1832/1952: 160, 177)? At the same time, WWII's real battle was in the Soviet. After the Germans had conquered Ukraine - the larder of the Soviet - the Red Army, and especially its armament production, the cities and the agricultural population almost starved to death; about 20 million Soviet citizens died of hunger (Collingham 2012). The convoys were therefore extremely important. The Germans tried to establish meteorological stations at the East coast of Greenland just as the Royal and US Navies. Before the WWII expeditions, North-East Greenland was hardly anything more than ideas of imperial outreach and scientific projects of mapping for the sake of mapping. They were of course useful for later discoveries and elaborations, also today as descriptions of ice cover.

Iceland, Greenland and the Faroe Islands could leave the Kingdom of Denmark simply because an ever increasing network of post-national constitutionalisation of law and organization has developed since WWII. So Greenland may leave Denmark to be enrolled in an international order where Denmark and the other smaller countries or weaker powers, like the Nordic countries and Canada, unite tightly linked to EU and NATO.

During the Cold War, the Atlantic part of the Arctic was subject to a complex increase in surveillance and operational plans, not for convoys but for the opposite: missiles and B-52

attacks that were all supposed to fly over Northern Greenland or even as South as Iceland and over Svalbard. At the same time, Soviet submarines used the North Atlantic more frequently to escape from the closed Soviet water ways. Soviet's and Russia's geographical marine and geopolitical problem has always been to connect the harbors in the north (Murmansk, Archangelsk) with the big Oceans. Vladivostok is or was blocked by ice half the year and is anyway hopelessly far to the East whereas the Black Sea and the Baltic was closed by narrow belts and straits easily controlled and closed by NATO. Transport ships also had to pass those belts if they did not want to use the northern harbors with their harsh cold winter conditions and dark unfriendly accommodations.

However, today Norwegian Vice Admiral Haakon Bruun Hanssen claims that "The Arctic is probably the most stable area in the world." (Hansson 2013: 1) Accordingly, investments in military naval vessels should no longer be an urgent strategic necessity due to arctic developments. His basic argument is that Norway and Russia for centuries have cooperated about for example Svalbard (Spitsbergen). Yet if, and when, the Arctic Sea opens up in longer and longer periods of the year, not only from July to September but still earlier and later, Russia will open up for ships, submarines and even be able to establish transportation all along the coastline of northern Russia south of Zemlya where 52 ships passed during 2012. "After the collapse of the Soviet Union we witnessed a large reduction in activity. During the last years this activity has increased again. An increase that can be explained by improved economy and renewed focus on re-establishing a credible military force that matches Russia's international ambitions." (Hanssen 2013: 4) This will increase and strengthen Russian independency and impact, trade routes and bargaining power especially in relation to weaker states as Greenland/Denmark, Norway, Iceland and Canada; at the same time, new conflict scenarios with USA may emerge. Russia will have a much shorter naval route over the North Pole from East to Western Russia, just remember the long sea route taken by the Russian Imperial fleet in 1904 from the Baltic Sea over the Indian Ocean just to be defeated by Japan in the Battle of Tsushima.

War systems are often thought of as land battles that have, however, mostly been a narrative

for political systems (Smith 2005: 3-35). In military systems there are conflicts between army, air force and navy for resources, armament and political attention as well as prestige. The Russian navy will certainly increase its importance and claims for resources just as the other Arctic navies. Historically, these conflicts have been subject to more important conflicts than most distant observers recognize. Elites and regions compete for resources and try to communicate about their narratives, hence narrative conflicts about access to and importance for the opened Arctic theatre will become a new future and a new risk approaching the political coastlines. Hanssen is probably very correct when he estimates a future with a “good order at sea” where war is not so much a task for naval vessels; their new commissions will more be observation, protection, control of pollution, emission, climate change etc.

II. The economic observation system

Economic systems observe territories and aquatories. For centuries, aquatories and waterways have been politically neglected in favour of land and territory, but trade routes have been extremely important and sea-based trade has always been extremely much cheaper than land-based trade. For a few decades before WWI, only the US, German, Russian and French railway systems challenged and contested this asymmetry. Yet various systems of production, transportation and consuming were central to economic systems during the classical industrialism. Previously, trade routes and transport systems were also important, but their financial impact was just as important when silver transportation from Latin America was to decide the European power balance in the 16th and early 17th centuries. The point is that today financial systems have detached themselves from any structural coupling to area-bound production. Since the US dollar was detached from gold in 1971, derivatives have

“bubbled” the financial system with a self-referential and self-organizing autopoiesis of money, credits and finance. Increasingly, finance does not need production to survive whether we nick-name it amoral greedy operations or not, but financial communication does not care as long as Tobin taxes or the like controlling devices of the speed of financial trade is not elaborated, coded and used as programs for the major monetary systems.

Hence the transformed Arctic Sea will not challenge the economic system as easily as we normally would expect from our production based economic paradigm. Russia may facilitate transportation costs. But the Alaska adventure with soil based oil production may become more important. The US foreign debt has increased severely and until very recently this seemed to be a dead end for US economic dominance since the US trade balance was simply structurally out of balance in favour of China, Japan, Saudi Arabia and Germany. US actually only have only the fourth biggest export in the world. But new forms of oil production in Alaska have established new conditions, and US may even become a net exporter of oil, not to say among the two or three biggest oil producing countries. Opportunities that will be more and more developed with new shipping trade lines over the Arctic Sea, and still large undiscovered oil and gas reserves may be found there (Tan & Tsai 2010). Of course this too leads to extremely endangered ecological problems for the already fragile Arctic Sea as well as to increased emissions of CO₂ caused by growing oil consumption. To this picture, we should add off-shore oil adventures with their increased risks for environmental damage; remember the Exxon Valdez disaster in March 1989 in the sea just South to Alaska when 48 million litres of oil slipped into fragile waters. It is particularly interesting to observe how Alaska’s republican lieutenant governor Mead Treadwell in his speeches use communication codes, different systems and especially economic systems. He has economic interests in the trans-Alaskan oil pipelines, yet has also advised Alaskan communities in the Exxon Valdez affair:

Changes in the Arctic sea ice are expanding the likelihood that energy and minerals produced in the European Arctic can serve markets in the Pacific region, and that goods produced in Alaska, Eastern Russia, and Canada can be more competitive in Atlantic Europe. An open

Arctic sea ties the two great oceans together. That means, for the world, the Arctic is a strategic seaway, potentially vital to commerce. And that means - throughout the Arctic - our own lives and livelihoods can flourish, too... We've been given a 'new ocean' of possibilities - and dangers - and we need to do everything we can prepare for both (Treadwell 2013).

Another economic transformation emerges for the fishing fleets all around the Arctic Sea with overfishing as a possibility; for example, some fishes as the halibut may be further endangered by transformations into smaller icebergs (Hovelsrud 2013; Boje & Nygaard 2013). New fishing opportunities emerge and huge conflicts about how to exploit those new areas may appear. Japan's and Spain's big fishing fleets may enter and compete with Russia and Norway - surely to the relative disadvantage of Greenland and Iceland.

Icebreakers will not disappear due to the melting of the ice cap, on the contrary, ships will pass at moments when they can suddenly get caught in ice formations in spite of clear waters. This will demand assistance and cooperation among icebreakers all around the Arctic (Treadwell 2009a). Tankers will be used and oil spill resource funds already function, but research and new technologies about how to recover or dissolve spilled oil in the Arctic will have to increase.

III. Ecological systems: The risks

In his book *Ecological Communication* from 1986, Luhmann's analysis is based on his seminal publication *Social Systems* from 1984. To those who work with empirical analyses of ecological risks, sustainability, and garbage systems, Luhmann's sharp and distinctive analysis has far more to offer than his contemporary Ulrich Beck, another German sociologist, in his *Risk Society* also published in 1986. Beck writes stimulating and - especially in German - with a flavour of fantasy. But Beck never clarified his basic methodology nor convincingly analyzed empirical findings. With Luhmann it is all about theory, and the methodological devices are extremely well founded in a coherent theory (Harste 1997; 2003). The foundational and risky problem Luhmann observes with his systems theory is that we have a number of differentiated systems that create a number of immense ecological problems:

- First, systems are specialized in self-observation; they observe themselves and their own codes far better than they observe their environment. Or to say it in another way: They only observe their environment in terms of their own codes which may be those of warfare, economics, law, science, tourism or whatever. But they can only observe a crisis if that crisis appears according to the indicators operative in each of those systems. They are blind towards other problems in the environment as surrounding world, or what in German is called the "Umwelt".
- Second, systems cannot observe their own blindness, or more precisely they may recognize that they have limits and that problems are outside their range of observation. So they can try to correct themselves and introduce staffs that can advise them on alternative measures. They can even introduce critics. But only to a certain limit. "Systems cannot observe that they cannot observe what they cannot observe" (Luhmann 1986: 52, 59). In that sense systems are real, they are doomed to recognize their own reality and its blind limitation as an "an sich" beyond observations. The reality is not only in the environment but also in the blind self-observation of an economic, a political, a mass media, a legal or a scientific system.

- Third, the functionally differentiated systems of modern society observe according to different codes that disagree about what they see since they do disagree about their codes. This can of course be organized by organization systems that establish “consensus conferences”, or COP 15, 16, 17, 18 etc., where different experts meet, communicate and listen. But the different expert groups and the different representatives from groups, NGOs, pressure groups and states operate with different codes; they send different and even opposed messages and information. This does not assure communication, only information and messages but not communication as understanding, that is: useful communication that continues themes and discussions with the same forms and codes. On the contrary, the so-called “consensus conferences” about climate, emissions, transport, quotas or what else tend to disrupt into “dissent conferences”.
- Fourth; as established in Luhmann’s later book, *Risk - a sociological theory* from 1991, functional differentiated systems (and organizational systems) do operate with different temporal codes. They bind time for different time periods. Military armament may have quite short temporal bindings in times of escalation, yet some investment programs have a time length of 40-50 years (ships, airplanes). Economy may have a six to eight years investment period as the limit of range; political systems a four or even two years temporal range whereas other places such as China may have a much longer range. Legal systems may develop environmental law over a 20 years period as in the European Union from mid-1970s to mid-1990s before it was well established with its so called *acquis communautaire* of directives, decisions, and verdicts. Educational systems also operate with a 20 years range from entrance to schools to final examinations; and love affairs with marriage and children operate with an even longer range of a >100 years before the grand children leave society. Mass media synchronize society and have an extremely short deadline of only a few days. Scientific systems of research operate inside paradigms; and changes in paradigms are often due to pensions as well as fashions and investment programs rather than outdated theories and invalid research, that may or may not establish temporal bindings of 10 or 20 years. Yet organizational systems are everywhere in the functional systems and operate with careers from acceptance and inclusion in membership of organizations to top level

hierarchies, say officials from 25 years to 45-60 years of age. Hence, all together this means that functional systems operate with conflicting temporal scenarios. It is probably not easy to state if short term visions may dominate long term visions, but they may find it easier to ignore long term scenarios.

- In sum, the risk of the risk society is that it has the systems it has. The risk is not in some long term remote future of an endangered world: the risk is that we observe the future and the world with systems that are present to us right now and that we only have the systems we have. If we should change and transform the systems, we should change and transform the systems themselves. All those systems are blind towards one another and even to their own limitations. They conflict about the world and about their different codes, about what counts as long term and short term.
- A second conclusion is that there is a risk that it is not possible to give a holistic interpretation that could allow an overall idea of the “whole as the sum of its parts”; rather “the whole is less than the sum of its parts” (Luhmann 1982: 238). Each functional or organizational system may establish its own interpretation of what is really possible and really endangered. How should they unite in the Arctic?

In climate science, we have a whole range of endangered futures. A wealth of reports and observations document that the ice cap at the North Pole melts just as other ice caps in the world: the ice cap and glaciers of Greenland and the Arctic. Some commentators foresee a coming anarchy (Borgerson 2008). Too many subsystems are involved in the new complexities and not a single subsystem can unite them. Of course in a few places heating the atmosphere means more rain and snow, and thus the ice cap can actually grow when the weather becomes warmer. But generally, it melts. Glaciers retreat. One of the quite alarming findings is that we can observe self-referential processes when melting ice or even water darken the surface of the Earth and therefore absorb more sun than the colder ice reflects (NOAA 2012a; 2012b; 2012c). In recent years, Greenland’s inland ice cap has had melting ice

all over during summer. Lakes of melted ice appear on the surface of the ice cap. Therefore the frost limit level goes up from say 800 meters to 2000 meters. This implies a rapid transformation in the surrounding ecosystems as well as in the ecosystems at the ice cap of the North Pole.

IV. Legal systems: The challenge of hybridity

Law is not the final solution to problems and conflicts. Legal systems may absorb conflicts and are preferred to wars as an alternative to conflict resolution machinery. But their words, verdicts and possibilities are rarely at a level that necessitates programs to be implemented to sustain and organize penalties or measures. There is a constitutional deficit of international courts. According to the International Law of the Sea (2013), exclusive economic zones extending 200 nautical miles from shore may be established as of course is the case in the Arctic Sea; nevertheless nautical borders are still not settled (Peary 2007; Potts & Schofield 2008; Tan & Tsai 2010). Inside such zones, regulations of fisheries, installations and off shore industry may be established. This implies enormous coastal zones for Russia, Canada, Norway, USA and Greenland because islands are also parts of such zone extension. Furthermore, they are subject to military purposes and environmental regulation.

Yet environmental regulation may be important for some emissions, but emissions from big industrial centres or cities are not as obvious as floating emissions due to lack of responsibility and liability regulations. Especially deficits about common liability regulations are due to possible conflicts. Ships may simply cause environmental disasters that are in no

way comparable to the liability regulations implemented after the Exxon Valdez disaster causing 38,000 litigations and amounted to a repayment of about three billion dollars. Thus the legal problem is less to observe aquatories similar to the model of territorial possession rights. The problem is more to establish environmental law that concerns all kinds of legal hybrids in-between for instance fishing rights, vulnerabilities for fish populations, off shore production, and ship regulations. The UN convention on the International Law of the Sea describes the problem of liabilities in article 235:

In respect of all damage caused by pollution of the marine environment, States shall cooperate in the implementation of existing international law and the further development of international law relating to responsibility and liability for the assessment of and compensation for damage and the settlement of related disputes, as well as, where appropriate, development of criteria and procedures for payment of adequate compensation, such as compulsory insurance or compensation funds.

Remark that China's Ambassador Zhao Jun at the Tromsø Conference in 2013 uses the term cooperation 18 times in his presentation just as Lt. Governor Treadwell from Alaska (Treadwell 2009b). A penetrating somewhat different though still cooperative and open interpretation is offered by the Chinese-Norwegian US educated lawyer Olya Gayazova who compares the Arctic with the Chinese Sea as opened waters (Gayazova 2013: 90). Yet the risk is that almost every concept in article 235 is in need of legal interpretation by courts as well as cooperative institutions in order to establish implementations. Article 235 is a frame that must learn from other similar frames like the EU legal evolution of liabilities. Still, a number of emissions cannot be regulated on this basis and has to find more global regulations: Ships do spread far more damaging emissions into air than cars or planes simply because most ships use raw oil and are not only subject to CO2 emissions but to far more complex chemical impure emissions.

The hybridity of international environmental law implies complex developments in regulations and in the international court of justice (Teubner & Lascano 2006; 2007; Febbrajo & Harste 2013). Clashes between legal traditions are obvious, some observe the environment, say waste, with codes of negative price setting, others use technical devices, and still others biological devices or aesthetical codes etc. (Hannequart 1993). On a second order level of observation, not only legal codes may conflict because of conflicting functional systems and organizational systems, but the legal traditions and institutional path dependencies may conflict about how to solve legal problems between China and USA, or Russia and Denmark, Iceland or Canada. In the Law of Sea, article 234 is of particular relevance since it concerns the Arctic aquatorialities:

Ice-covered areas: Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence. (Art. 234 in UN International Convention on Law of Sea).

Several legal codes seem to be open to interpretation and conflicts, especially codes of "control", "severe climatic conditions" and the codes used in the final phrase "based on the best available scientific evidence". Niklas Luhmann describes law as society's "immunity system" (Luhmann 1993). However, a second order observation of the use of such conventions in legal systems seems to describe a double immunity: conflicts may be dissolved, but they may also be bracketed and embedded into eternal legal quarrel and sub-committees that should work for further clarification. An Arctic Treaty probably would have to compromise all those conflicts and subsystems, interests and states and thereby would not add anything not already contained in the UN International Law of Sea.

V. Aesthetical narratives

By combining mass media, art and tourism, all societal themes may become subject of narratives that mobilize motivations for action and coordination. Yet mass media and tourism have their temporal codes. They bind attention for shorter or longer periods. An older conflict can illustrate this problem, i.e., the demonstration against the Alta Dam and power plant in the north of Norway. The Sami people had reasons to protest against the power plant, but thousands of demonstrators joined them under harsh and cold conditions. Some may have come from a series of other valleys with plans to implement power plants, but the bulk of the attention was widespread far beyond the Nordic countries and came from people acquainted with the Norwegian mountain regions through tourist travel. This is less about mass tourism, but about traveling and hiking that demands high investments; hence the temporal codes of such “tourism” develop long term narratives. The structural coupling to political protest is easily motivated with the result that all those other plans for power plants based on rivers and waterfalls so to say evaporated. Another explanation for the evaporation of plans for plants is, of course, that Norway in those years developed their oil extraction from the North Sea.

The Arctic is subject to increasing tourism and still more narratives binding attention and motivation. Eight huge cruise ships each with about 3,000 passengers pass Spitzbergen in the peak season (Hanssen 2013: 3). Tourism itself can become a risky affair for fragile waters and coastal regions. However, the particular experiences in those remote and so-called uncivilised areas raise questions and motivations with another modality than is normally seen

in politics. A famous example that received worldwide attention is the three grey whales trapped in ice in October 1988 in the Beaufort Sea near Point Barrow. Again the political point was not about the particular whales but about the far more general narrative about protection of animal life in the Arctic. A third somewhat more contested case concerned the white seal killing in Northern Canada. Here media star Brigitte Bardot was brought into a narrative about animal protection but with disastrous consequences for Greenland's seal hunters and seal coat production; the trade-off between protecting human indigenous life and protecting animals came into debate.

VI. Conclusions

In this sense, the Arctic has become a medium for what political scientist William Connolly has named "essentially contested concepts" (Connolly 1983). The aquatorialities of the Arctic Sea and its coastal regions is a contested medium for different codes, forms and systems. A number of systems and states, NGO's and international organizations, expert groups and others begin to communicate about the Arctic and interpret whatever may affirm their particular view. Some may be more cooperative and structurally coupled to other views than others and some may even become specialized in cooperation like the Arctic Council.

Political narratives may mobilize energies and resources to coordinate among all those conflicts. This rarely occurs. Realities show that solutions are displayed in improbable possibilities that may establish coordinated solutions simply because programs are available and organized interests find common solutions that may create organizational build-ups. The

aim would be to establish functional spill-overs comparable to what has been seen in the self-constituting and self-organizational evolution of a European environmental law. Smaller and weaker states may cluster together with some international organizations and new policies may appear only if some of those organizations have an interest in developing themselves by means of such common cooperation. The risky if not tragic, but not hopeless, point is that aims to solve the problems of the Arctic Region only develop if we can follow institutional goals about self-organizational systems.

This displays a constructivist view on environmental politics. Yet the risk is that we have the systems we have and that new systems can only be constructed by means of already established systems and their needs for innovations and self-development. The systems theoretical second order observation of observations may describe and analyse various agents and organizational systems and their communication codes. Empirical analyses of reports, speeches and meetings will probably reveal a still more contested communication form. The cooperative organizations should probably be able to develop more expertise, more differentiated codes and knowledge about the risks and potentialities developing in the Arctic.

References

Boje, Jesper; Nygaard, Rasmus (2013): 'Greenland halibut - a fishing resource vulnerable to changes in the Arctic', National Institute of Aquatic Resources. Arctic Frontiers 2013.

Borgerson, Scott (2008). 'Arctic Meltdown. The Economic and Security Implications of Global Warming' in *Foreign Affairs*, Vol. 87, 2: Mar/Apr: 63-77.

- Brigham, Lawson (2010). 'Think Again: The Arctic', in *Foreign Policy*, sept/Oct Vol. 181: 71-74.
- Clausewitz, Carl von (1832/1952). *Vom Kriege*, Bonn: Dümmler.
- Collingham, Lizzie (2012). *The Taste of War. World War Two and the Battle for Food*, London: Penguin.
- Connolly, William (1983). *The Terms of Political Discourse*, New Jersey: Princeton University Press.
- Easton, David (1965). *A Systems Analysis of Political Life*, New York: John Wiley.
- Febbrajo Alberto; Harste, Gorm (eds.) (2013). *Law and Intersystemic Communication. Understanding Structural Coupling*, London: Ashgate.
- Gayazova, Olya (2013). 'China's Rights in the Marine Arctic' in *The International Journal of Marine and Coastal Law* 28: 61-95.
- Hannequart, J.-P. (1993). *Le droit Europeen des Dechets*, Institut Bruxellois pour nla Gestion de L'Environnement.
- Hansson Vice Admiral , Haakon Bruun (2013). 'The role of the armed forces in a changing Arctic' Tromsø: Arctic Frontiers Conference January 2013.
- Harste, Gorm (1997) 'The Paradoxes of Risk Society' in Ministry of Foreign Affairs: *Conditions for Social Progress*, UN Report, Copenhagen, pp. 95-110.
- Harste, Gorm (2003). 'Une théoïre kantienne de la société du risque: Niklas Luhmann et la globalisation du système militaire' in *MANA. Revue sociologique et d'anthropologie*, No. 12-13, 2003: 91-112.
- Harste, Gorm (2013). 'The Improbable European State' in Robert Egnell; Peter Haldén (eds.). *New Agendas in Statebuilding*, London: Routledge.
- Heisler, Martin (ed.) (1974). *Politics in Europe*, New York: David McKay.
- Hovelsrud, Grete K. (2013) 'Traditional marine harvests no more: What are the climate change challenges?', Nordland Research Institute and CICERO – Center for Climate; Tromsø: Arctic Frontiers Conference January 2013
- Law of the Sea, *Encyclopedia Britannica*, <http://global.britannica.com/EBchecked/topic/530433/Law-of-the-Sea> (available 25 April 2013)

Luhmann, Niklas (1968). *Zweckbegriff und Systemrationalität*, Frankfurt: Suhrkamp (1973).

Luhmann, Niklas (1982) *The Differentiation of Society*, New York: Columbia University Press.

Luhmann, Niklas (1984). *Soziale Systeme*, Frankfurt: Suhrkamp (Engl. transl.).

Luhmann, Niklas (1986). *Ökologische Kommunikation*, Opladen: Westdeutscher Verlag (Engl. transl.)

Luhmann, Niklas (1991). *Soziologie des Risikos*, Berlin: De Gruyter (Engl. transl.).

Luhmann, Niklas (1993). *Das Recht der Gesellschaft*, Frankfurt: Suhrkamp (Engl. Transl.)

Luhmann, Niklas (2010). *Politische Soziologie*, Frankfurt: Suhrkamp.

NOAA (2009). *Arctic Research Program Summary for FY2009*, National Oceanic and Arctic Administration

NOAA (2012a). *Arctic Report Card*, <http://www.arctic.noaa.gov/reportcard/> (available 25 April 2013)

NOAA (2012b). 'Press Release', Arctic Report Card, <http://www.arctic.noaa.gov/reportcard/> (available 25 April 2013)

NOAA (2012c) 'Less Glitter', *Climate Watch Magazine*,
<http://www.climatewatch.noaa.gov/article/2012/less-glitter-greenland-ice-sheet-continued-to-darken-in-summer-2012> (available 25 April 2013)

Peary, Robert (2007). 'Scramble for the Arctic', *Financial Times* (August 19, 2007) (pseudonym)

Potts, Tavis; Schofield, Clive (2008). 'Current Legal Developments. The Arctic', in *The International Journal of Marine and Coastal Law*, 23: 151-176.

Rousseau, Jean-Jacques (1762/1971). 'Du contrat social', i *Oevres completes T.2*, Paris: Seuil.

Smith, Philiip (2005). *Why War?*, Chicago: Chicago University Press.

Tamnes, Rolf (2013). 'Geopolitics in the High North' Tromsø: Arctic Frontiers Conference January 2013.

Tan, Wei-en; Tsai, Yu-tai (2010). 'After the Ice Melts: Conflict Resolution and the International Scramble for

Natural Resources in the Arctic Circle', *Journal of Politics and Law*, Vol. 3, No 1, March 2010: 91-99.

Teubner, Günther; Fischer-Lascano, Andreas (2006). *Regime-Kollisionen*, Frankfurt: Suhrkamp.

Teubner, Günther; Fischer, -Lascano, Andreas (2007). 'Fragmentierung des Weltrechts', in Mathias Albert, Rudolf Stichweh (Hrsg.). *Weltstaat und Weltstaatlichkeit*, Wiesbaden: VS Verlag.

Treadwell, Mead (2009a). 'US strategic interest in the age of an accessible Arctic', U.S. Arctic Research Commission, University of Alaska Anchorage (available 25 April 2013)

Treadwell, Mead (2009b). 'Climate Change and the Arctic: New Frontiers of National Security', U.S. Arctic Research Commission, House Committee on Foreign Affairs (available 25 April 2013)

Treadwell, Mead (2013). 'Safe, secure and reliable at sea: the geopolitics of a new ocean', Tromsø: Arctic Frontiers Conference January 2013

UN International Convention on Law of Sea, [www.un.org/Depts/los/convention_agreements/texts/.../unclos_e.pdf](http://www.un.org/Depts/los/convention_agreements/texts/unclos_e.pdf) (available 25 April 2013)