



## ICASS IX

### Session 5.10:

#### Meaningful multi-disciplinarity and the governance of evolving global dynamics in the Arctic:

##### Towards a more materialistic study of world politics

This session discusses inter-disciplinary coordination and multi-stakeholder cooperation in the Arctic through the notion of boundary object from Science Technology Studies (STS). It consists of two parts. The first part takes the form of a roundtable-session (Monday 12.6 at 10.30-12 in Session room 2). The second part is workshop (Monday 12.6 at 13-14 in Session room 2). This information package consists of an outline of the two sessions, a copy of the presentation abstracts and biographies of the presenters, and a summary of the boundary object literature in STS with a glossary explaining of some of the key concepts.

#### Part I:

Exploring the usefulness of the notion of 'boundary objects' in Arctic social and political sciences

Monday 12.6 at 10.30-12

Session room 2

The first part of the session is organized according to a roundtable format. It begins with a short overview of the boundary object –concept and how it has been used in the structuring of the session. It continues with four 8-minute presentations that discuss different experiences in participating or organizing multi-disciplinary and multi-stakeholder projects that have used specific material entities to facilitate communication and cooperation between different **social worlds**<sup>1</sup>. After their talks the presenters discuss how these kinds of innovations in multi-stakeholder engagement contribute to a more comprehensive understanding of the challenges and opportunities for human activity in the future Arctic, as well as address how their approaches compare with each other and the boundary object - notion. The session ends in each of the presenters explaining how they would change their presentation if the audience consisted of: a) scientists of a different discipline b) journalists c) governmental working group preparing an Arctic agenda d) industry.

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<sup>1</sup> At the end of the information package, there is a glossary of all the terms that are underlined and bolded in the text.

## Introduction

- **Justiina Dahl**, KTH Royal Technical Institute, Stockholm: “Challenges and opportunities for interdisciplinary coordination and multi-stakeholder cooperation in the Arctic”

## Presentations:

- **Tracie Curry**, University of Alaska Fairbanks:

### Visual tools as boundary objects to support knowledge transmission and shared understanding in transdisciplinary interactions

Environmental governance in the context of complex social-environmental systems involves a diverse range of stakeholders including representatives from local communities, academia, industry, state and federal agencies, and from various disciplinary backgrounds. A major challenge in environmental governance is a misalignment in communication between diverse actors who approach challenges with different levels of information and from different mental modes of understanding. Visual tools (maps, photographs, diagrams, drawings, etc.) as boundary objects create opportunities for stakeholders to communicate across their differences. The presence of visuals can ground a conversation and give each party a common reference point to build further discussion from. This talk will briefly describe two contrasting multi-stakeholder interactions. One where the presence of visuals made the difference in the public’s support of a proposed project and another where the lack of visuals created difficulties in communication between opposing sides. The primary point of this talk is, in the presence communication barriers (whether they be cultural or disciplinary), visuals and other boundary objects may provide a means through which deeper understanding can be obtained among diverse actors.

- **Sarah Inman**, University of Washington:

### Data Upstream: Multidisciplinary Collaboration for Wild Alaskan Salmon

This presentation draws on the work of the State of Alaska’s Salmon and People (SASAP) project. Taking the work of SASAP and the National Center for Ecological Analysis and Synthesis (NCEAS) as a point of departure, this research looks at how data integration occurs across multiple domains. Collaboration without consensus is the concept that Star and Griesemer (1989) put forward in their groundbreaking piece on boundary work. While influenced by actor-network theory, Star showed that rather than going through narrow “obligatory passage points” (Law, 1982) to translate people into interests, people can collaborate without consensus. By studying the challenges of drawing together and interoperating heterogeneous Alaskan Salmon datasets, this research focuses on the practical processes of cooperation amongst national and state government, subsistence and commercial fisheries, tribal councils, Indigenous Alaskans, and academia, and how participants align their goals with one another. Through ethnographic and archival research, this research looks at the ways in which data circulation and stakeholder engagement produce salmon as an object of inquiry. For every stakeholder, the salmon represents something distinct. For some, salmon is symbolic of a healthy environment. For others, salmon is a data point in regulation. For many, it is a source of sustenance and citizenship. As some (Fujimura 1991, Lee 2007) have shown, Star and Griesemer’s study is constrained by the things that constrained actor-network theory. Namely, the data limitations lend the case study to be told with a managerial bias. As such, this

research attempts to overcome these criticisms by paying close attention to the “contested collaboration” (Lee 2007) and studying the spaces in which artifacts and social negotiation have become invisible.

- **Eduard Zdor**, University Alaska Fairbanks:

From Customary Law to Policy: Lessons from Working with Indigenous Marine Mammal Hunters, Scientists, and Legislators

The amazing natural features of the Bering Strait, located at the junction of the Arctic and Pacific Oceans, have shaped a unique human landscape over millennia. According to researches, the ancestors of the Chukchi and Siberian Yupik occupied the Chukotka at the turn of the 4,000-2,000 BC. The traditional activities of the Chukotka’ indigenous peoples include reindeer herding, sea hunting, fishing, and hunting. Religious restrictions and taboos restrained the anthropogenic pressure on the animals’ population. Observing rituals and beliefs was essential not only for survival of the inhabitants of Chukotka in difficult Arctic conditions, but also for developing harmonious and sophisticated culture and spirituality.

The history of Chukotka in the 20th-21st Centuries was accompanied by radical and dramatic changes in the indigenous people’s lives. These changes have resulted in extremely shocking and traumatic exogenous processes, alienating the local society from the original culture. Nevertheless, the Chukotka’ indigenous peoples retained the basic values and sociocultural practices of their cultural heritage. People still observe traditions of hunting and distributing hunting results. During the harvest they keep superstitions, pay attention to the signs given to them by animals and nature, and also respect most of the taboo. Thus, despite the incorporation of indigenous communities to modern civilization, customary laws continue to regulate the life of indigenous communities.

The Russian Constitution and three federal laws establish the cultural, territorial and political rights of indigenous peoples. Yet, the existing legislation does not acknowledge indigenous peoples’ inherent right to their ancestral territories. Based on their traditional occupancy, they are merely granted usufruct rights to hunt, fish, and herd their reindeer on the land. Russian legislation also does not provide for the self-management of their traditional resources. Regional legislation grants the right for the indigenous organizations to delegate their representatives to the regional government advisory commissions only.

- **Jamie Snook**, University of Guelph:

Indigenous Co-management as a Boundary Object

There is a sense of urgency across the Arctic and Circumpolar North in Arctic marine governance, with many diverse pressures and the inherent uncertainty associated with this time of change. Despite these challenges, a network of Indigenous co-management organizations are alive and robust within the management of fisheries in Canada and, subsequently, forms an important part of Arctic marine governance.

There are 26 comprehensive land claims agreements in Canada, which include detailed processes for the co-management of lands, wildlife, plants, and fisheries in Indigenous territories. Co-management regimes cover the Canadian Arctic and form the foundation of wildlife management in all four regions of Inuit Nunangat. Indigenous co-management in the

Labrador Inuit settlement region of Nunatsiavut, Labrador is implemented through the Labrador Inuit Land Claims Agreement and the Torngat Joint Fisheries Board (TJFB).

In recognition that wildlife and fish cross jurisdictional boundaries and that different regions struggle with similar socio-ecological issues, this presentation will seek feedback and consider if the theory of boundary objects may facilitate opportunities for enhanced collaboration, and actions that will inspire policy change as a result of co-management recommendations and decisions in the Canadian Arctic.

## Part II:

Using the notion of 'boundary objects' as a passage point in cooperation and coordination between different social worlds

Monday 12.6 at 13-14

Session room 2

The second part of the session is an open workshop that starts with a more in-depth presentation of the kind of work the boundary object notion has been applied to in STS. It continues with a set of individual and group exercises in communicating one's own work, interests and goals to different audiences and social worlds by using the insights of this notion.

Introduction: "The notion of 'boundary objects' as a passage point to meaningful communication and cooperation between different social worlds in the Arctic" (Justiina Dahl)

### Exercises:

- Exercise: Mapping different social worlds present at or connected to your work site(s)
- Group discussion: What actors/**actants** are possibly missing from the standpoint of other participants and disciplines? Are these purposefully **implicated actors/ actants**? What kind of consequences, challenges and possibilities their inclusion would have to the research design might pose for your work?
- Exercise: How to present to and communicate with audiences of a) scientists of different natural sciences b) journalist c) governmental working group preparing an Arctic agenda d) industry.
- Group discussion: Importance and added value of being aware of the normative and ontological assumptions of different actors working with science, technology, environment and society that contribute to the development of governance of evolving global dynamics in the Arctic.

## Presenter biographies

**Tracie Curry** is a PhD candidate in the department of Natural Resource Management at the University of Alaska Fairbanks (UAF). Her research focuses on transdisciplinary knowledge processes, involving the generation, transmission, and use of information supporting environmental governance in North Slope, Alaska. She is exploring the means through which information is communicated among diverse actors and the potential benefits of visual tools for integrating differentiated sources of information, such as local and indigenous knowledge, into environmental planning and decision-making. Tracie has researched issues at the intersection of Arctic climate change, indigenous communities, economic development, and graphic communication since 2011. Before beginning her PhD, Tracie completed her Masters in Landscape Architecture at Harvard University, Graduate School of Design (2013), and before that obtained a Bachelor of Science in Economics at University of Pennsylvania, Wharton School of Business (2007). She has worked in the public sector as a planner and consultant, and has been involved in numerous multi-stakeholder meetings as an organizer and observer. Tracie is a member of the Beijer Young Scholars group through the Beijer Institute in Stockholm, Sweden, and a fellow of the Resilience and Adaptation Program at UAF.

**Sarah Inman** is a PhD student in the Human Centered Design and Engineering program. Her work focuses on the sociotechnical practices of distributed collaborative knowledge work, specifically the practices of domain scientists and data scientists. She is also interested in the ways in which data mediates the public's relationship with the environment. She received her master's degree from Georgetown University, where she conducted an ethnographic study of how citizens engaged with scientific data in the context of extractive industries. Her research interests are on how scientists, the public, and the state manage complex or contradictory information to make real-world decisions in the face of uncertainty.

**Eduard Zdor** is a PhD candidate at the University Alaska Fairbanks. The focus of his research is traditional ecological knowledge of the Maritime Chukchi. He is a former Executive Secretary of the Association of Traditional Marine Mammal Hunters of Chukotka. Zdor represented hunters in international and regional forums and works closely with the indigenous community. He represented the hunters by lobbying for more subsistence quotas, as well as developing relationships with other leaders and organizations. He has worked extensively with other indigenous groups in both Alaska and Chukotka and is an advocate for the benefits of shared indigenous knowledge and observation. Zdor has been involved in joint Alaska-Chukotka research projects as partner and Principal Investigator of the Traditional Ecological Knowledge for over 15 years. He also attended the Moscow Humanitarian University, where he completed studies in July 1988. In 2011 Zdor received the David M. Hopkins Award, which recognizes Zdor's commitment to his people.

**Jamie Snook** is a leader, politician, researcher, and community advocate, who works at the intersection of environment, management, governance, health, and Indigenous culture. He is currently the Executive Director of the Torngat Wildlife, Plants, and Fisheries Secretariat, a tripartite-funded co-management organization, resulting from the Labrador Inuit Land Claims Agreement and a PhD student in Public Health at the University of Guelph's Department of Population Medicine. From the former, Jamie has first-hand experience of Indigenous co-management in Canada, and is immersed in inter-governmental and interdisciplinary dialogues integrating Indigenous and Western sciences for decision-making. He has represented the Torngat Secretariat at many national and international forums, including the North Atlantic Salmon Conservation Organization, North Atlantic Fisheries Organization, and the Convention on International Trade in Endangered Species of Wildlife, Fauna, and Flora. Jamie is also a Labradorimmiut (Inuit from Labrador) and a member of the NunatuKavut Community Council.

## The notion of boundary object

### History of the term

The boundary object -concept first emerged in the context of **interactionist research** in STS in the late 1980s. This type of social study of science and technology focuses on the social elements in the process of knowledge production as well as its product (Sismondo, 2010, pp. 19–21). It is related to the wider **social constructivist** strand of STS.

Social constructivist STS has used an array of different historical, sociological and anthropological case studies from different natural and technical sciences to illustrate the social nature of all knowledge production. (E.g. Collins 1985; Latour and Woolgar 1979; Lynch 1985.) According to Susan Leigh Star (2016, p.26) - one of the creators of the boundary object –approach, the more general aim of this kind of science study is to demonstrate how reports of science that are stripped of production history – accounts discussing the social, technical, and material dimensions associated with knowledge production – overlook the necessary social elements in the organization of what counts as legitimate natural and material knowledge. In short, how the outcomes and content of science, as well as access to it as a profession, are determined by larger social and political structural commitments, positions, and other institutional considerations.

One of the main analytical arguments that has followed from the social constructivist cases studies of science and technology is that the social study of science and technology cannot be separated from the study of professional governments, from medicine, or from any other profession (Star 2016, p. 25). In short, because science and technology cannot exist as somehow separate from society they should not be studied through a primacy of any one viewpoint. Instead, they should be approached through an allegory of “**ecologies of knowledge**” (Star 2016, p. 20). One approach in this kind of science study is the analysis of science as a job and scientists as people who are doing a certain kind of work together (Star 2016, p. 25). Another is the study of the different **social worlds** present in complex institutional scientific and technical settings such as voluntary staff for fieldwork and specimen collection for a museum of zoology, the technology and technical crew maintaining a specific technical unit in a laboratory, the janitor, or imagined users of birth control pills (Bowker and Star 2000, p. 147; Clarke and Star 2008, p. 121; Star and Strauss 1999).

### Boundary objects

The first case study of “boundary objects” in STS is Star and James Griesemer’s (1989) research of the division of labor between different social groups connected to the Museum of Vertebrate Zoology at the University of California, Berkeley between 1907 and 1939. Their analysis of the cooperation between the different social worlds in this arena focused on the nature of relations and action across the arrays of people and things that encountered and confronted each other in this specific scientific institutional space. In other words, the concept was used as an analytic entrée for the descriptive study of the different negotiations and other work occurring in the museum space (Clarke and Star 2008, p. 118).

Boundary objects in Star and Griesemer’s (1989, p. 392-393) study are those scientific objects that both inhabit several intersecting **social worlds** and satisfy the informational requirements of each of them. Examples of these kinds of objects in the context of the Museum of Vertebrate Zoology include the terrain of the state of California, the habitats of collected animal species and physical factors in California’s environment such as temperature, rainfall and humidity. These scientific objects qualify as

boundary objects because they are “objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites.” (Star and Griesemer 1989, p. 393) In other words, the basic social process of **translation** allows these objects to be (re)constructed to meet the specific needs or demands placed on them by the different social worlds (Clarke and Star 2008, p. 121).

Star (2010, p. 602-603) has later clarified how the focus in the study of boundary objects is on how a single object can be used for different purposes for different groups that wish to cooperate without sharing a paradigm. In relation to the concept itself she describes how the first part, ‘boundary’, refers to the stuff of action and the second part, object, to something that people act towards and within. Otherwise put, the materiality of these objects derives from action, not from a prefabricated stuff or “thing”-ness. In transferring these basic analytical insights of the boundary object -concept to a more materially focused discussion of the evolving global dynamics in the Arctic, the exercises in the workshop imply Charlotte Lee’s (2007, p. 308) summary of this kind of study as one that empirically illustrates how a single object can be used for different purposes for different people. Star (2010, p. 602) conceptualizes this as the **interpretive flexibility** of (boundary) objects.

### **Towards a “more material” study of evolving global dynamics in the Arctic**

The “more material” in the topic of the session refers to the way studies of boundary objects approach the study of the relationship between the material and the social worlds in the context of complex institutional settings.

In more traditional social and political studies, material entities come secondary to existing disciplinary paradigms associated with concepts such as power, social status, identity, structure, and system. In the study of boundary objects the material universe, the spaces, sciences, materials, infrastructures and technologies that enable different actors to work together, are, in contrast, the starting point in the mapping of these more traditional social aspects of scientific practice.

The presentations in the first part of the session give concrete examples of different ways in which actors inhabiting different social worlds have come together in collaborating on Arctic issues. They offer one insight to the importance of empirically studying and illustrating the different – hard to detect – normative and ontological assumptions of different actors working with science, technology, environment and society in the development of Arctic governance. Because of the lack of accumulated experimental knowledge of the materiality of the Earth under anthropomorphic global warming, the identification of these normative and ontological assumptions is especially important in the development of new peaceful forms of Arctic governance in the twenty-first century.

## Glossary

**Actants:** An analytical term from semiotics that is used in the descriptive study of the actions of both humans and nonhumans in specific contexts. A deductive method of analysis where the competences (and motives) of actors are described through the study of their performances in the course of recorded action.

**Ecologies of knowledge:** An anti-reductionist research method that focuses on the identification of different communities, **social worlds**, and things that spaces of scientific and technical inquiry are composed of; how these elements interact with each other; and how these interactions can change not only the relationships between the specific social worlds, but also their identities in other contexts. In short, the study of how potentially infinite relations across different social worlds are formed and managed in specific arenas of scientific or technical inquiry. The specificity of this approach is how its main unit of analysis is not the point of view of an individual actor, but the whole enterprise. In other words, how the research design includes of all the elements of the ecosphere: bugs, germs, computers, wires, animal colonies, and buildings, as well as scientists, administrators and clients or consumers.

**Interactionist research:** Social studies of science that focus on the political and relational aspects behind what is considered as knowledge. Specifically concerned with the empirical illustration of how science is not neutral, but that its outcomes and content as well as access to it as a profession are determined by different temporally and spatially specific social structural commitments, political positions, and other institutional considerations. Early strands were closely connected with sociology of work, and the study of what people *do* as well as what they say they do, and the connection of these discourses with larger societal clusters of careers, materials, techniques, theories, organizations, and professions. Simplified; the study of science as a profession and scientists as people doing a specific kind of job together.

**Interpretive flexibility:** An analytical tool for the study of how the same object can have different meanings for different actors, and how these meanings can lead to radically different ways of using and interacting with these objects.

**Social constructivism (in STS):** Qualitative method of study for how scientists and technologists build knowledges and things and how these processes are socially situated. Social, political, anthropological and historical strands have empirically illustrated, how neither unmediated knowledge of reality, nor a single complete set of truths, are possible. Closely related to **interactionist research**. Both approaches argue that there is a need to focus social study of science and technology on both, the product (individual knowledge claims or technologies) and the process of its production. This argument is often referred to as the need to “open up the back box” of science and technology.

**Social worlds:** An analytical term used in the identification and description of the collective identities that individuals participating in scientific work have; how the perceptible boundaries between the different social collectives are established and maintained; and how they change in interactions with others. Each of the social worlds present in a specific scientific site has at least one primary activity, a particular site of operation, and technology that they use. Once cooperation between different social worlds is under way, a more formal organization that furthers specific activities typically evolves. An approach that allows for a more open and fluidly bounded empirical study of discursive collective identification and action than those associated with organizations, institutions, or social movements.



**Implicated actors/ actants:** Actors silenced or discursively presented by other actors in specific social settings. In more specific terms, actors whose needs, rights and interests are presented by others, without consent or consultation, for their own purposes: i.e. women in the development of much of twentieth century reproductive medicine. Main analytical question associated with the study of these actors is who is discursively constructing, what, how, and why?

**Translation:** The study of how individuals from different worlds find common languages through which to conduct their joint work. In other words, the study of how scientists and other actors contributing to scientific work negotiate, debate, triangulate and simplify their concerns, methods, work and findings in order to cooperate.

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