NSF Arctic-FROST ANNUAL NETWORK MEETING AND EARLY CAREER SCHOLARS WORKSHOP:

Arctic Sustainability in the Global Context:
What can we learn from or teach the rest of the world?

VIENNA, AUSTRIA, SEPTEMBER 9-12, 2016

Prepared by Andrey N. Petrov

Vienna-Cedar Falls, 2016
Acknowledgements

This meeting represents an annual activity of the Research Coordination network (RCN-SEE), Arctic-FROST supported by the following National Science Foundation grants: PLR #1338850, PLR #1532655 and PLR #1550260.

We would like to thank all workshop speakers and participants. In particular we are thankful to the members of the program and organizing committee: Andrey N. Petrov, Peter P. Schweitzer, Timothy E. Heleniak, and Ann P. Crawford. We are also grateful to the University of Vienna and to Ilja Steffelbauer personally.

Andrey N. Petrov, PhD
Arctic-FROST Principal Investigator
Director, ARCTICenter
Cedar Falls, Iowa, USA

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Update: Arctic-FROST Research Network in 2015

Introduction

Research Coordination Network “Arctic-FROST: Arctic FRontiers Of SusTainability: Resources, Societies, Environments and Development in the Changing North” (NSF PLR #1338850) is an international, interdisciplinary, and collaborative network of environmental and social scientists, local educators, and community members from all circumpolar countries. Its primary purpose is to enable and mobilize research on sustainable Arctic development. The network aims to support improved health, human development, and wellbeing of Arctic communities while conserving ecosystem structures, functions and resources. The intellectual goal of the project is to contribute to conceptual, applied, and educational aspects of Arctic sustainability science by supporting the dissemination of knowledge and exchange of methodologies across the four Arctic-FROST themes: sustainable regions, economies, cultures, and environments. Arctic-FROST is based at the UNI Arctic, Remote and Cold Territories Interdisciplinary Center (ARCTICenter).

Arctic-FROST address three overarching questions: What does sustainable development in the Arctic mean, locally, regionally, and globally? How is sustainable development attainable in a changing Arctic? What are the best ways of measuring achievements towards adaptation, thrivability and sustainable development in the Arctic?

Membership in Arctic-FROST is open to anyone with interests in sustainability and sustainable development in the Arctic. Since its inception in September 2013, the network has amassed more than 250 members from 20 countries including all Arctic jurisdictions with 55% coming from the U.S., 29% from Europe and Russia, and 15% from Canada. Alongside seasoned academics and community members more than half of the RCN members are early career scholars or graduate students. The network also involves Indigenous scholars and members of underrepresented groups.

The network has an extensive plan of activities for 2014-2018 consisting of annual meetings, early career scholar workshops, community workshops, the first Arctic Sustainability Education Forum in 2018, and multiple smaller theme-based conferences throughout each year. First-year events include the inaugural Arctic-FROST meeting-held in late 2013 at the University of Northern Iowa and the first annual meeting and early careers scholars workshop entitled “Sustainability and Sustainable Development in the Arctic: Meanings and Means” held in Anchorage, Alaska on September 18-20, 2014.
2015 General Events

In 2015 Arctic-Frost held its second annual meeting and early career workshop in St. Petersburg, Russia on August 15-17, 2015. This meeting’s theme was “Resources and Sustainable Development: Can, Should and Will Resource-based Development be Sustainable?”. It gathered a diverse group of researchers representing multiple disciplines, demographic groups and countries. The meeting was followed by the early career scholar’s workshop. In addition to St. Petersburg meetings, Arctic-FROST hosted and co-sponsored many domain and side meetings, as well as workshops. These include: five “Polar Geographies” sessions at the Association of American Geographers Meeting (Chicago, IL); ASSW 2015/International Conference on Arctic Research Planning III (Toyama, Japan), where Arctic-FROST held a special session on Arctic sustainability and ICARP III session/panel; “Sustainable development in the Arctic”. Sessions were also held at the International Geographical Union Meeting (Moscow, Russia) “Arctic Sustainability Research: Agenda 2025” and an ICARP III white paper workshop (Charleston, SC). The symposium, “Canada and U.S.: Allies and Partners in the Arctic” was held in (Cedar Falls, IA), and “Resources and sustainable development” northern community workshop co-sponsored with ReSDA (Kuujjuaq, QC), as well as multiple public events in Iowa to raise awareness about environmental and social change in the Arctic have taken place.

Arctic-FROST members are committed to deliver a number of key products, including two edited volumes devoted to sustainable development in the Arctic, a textbook on Arctic sustainability, other educational materials, academic publications, and a research plan for Arctic sustainability science for the next decade. The initial version of this plan was presented at the Third International Conference on Arctic Research Planning (ICARP III) on April 23-30, 2015, where Arctic-FROST co-organized two panels. The Arctic-FROST members also contributed to the “Northern Sustainabilities” volume edited by Gail Fondahl and Gary Wilson (UNBC).

In 2016 Arctic-FROST will hold its annual science meeting in Vienna, Austria The meeting will be devoted to “Arctic Sustainability in a Global Context.” (www.uni.edu/arctic/frost).
“Sustainability that Works” Community Knowledge Sharing Workshops

In 2015 Arctic-FROST actively collaborated with other research networks and organizations, such as Resources and Sustainable Development in the Arctic (ReSDA), Research Coordination Network in Arctic Urban Sustainability, International Arctic Science Committee (IASC), International Arctic Social Sciences Association (IASSA), Association of Polar Early Career Scientists (APECS), and others. At the ReSDA-Arctic-FROST Kuujjuaq workshop the two networks launched a collaborative initiative to hold a series of community workshops under the common theme “Sustainability that works”, where researchers and community members can exchange their practical experiences with sustainable development projects. The second workshop will take place in Alaska in 2016.

In March 2016 Arctic-FROST held a community knowledge-sharing “Sustainability that Works” workshop in Nome, Alaska. The workshop was a forum where Arctic-FROST researchers and community members shared that-of-the-art knowledge and community perspectives on sustainable development in the Arctic. Participants from Canada, Alaska and Russia to discussed their experiences in respect to successes and challenges of long-term, sustainable development in their communities. The event brought together nine researchers and Indigenous community members from outside Nome, as well as local participants/speakers from Kaverak Inc, Bering Straits Native Corporation, local village corporations, local utility and UAF Northwest campus. Some themes and ideas that emerged during the workshop included: (1) community interest in development when such development is done in a way that maximizes local benefits and minimizes negative impacts; (2) importance of resource and self-governance; (3) necessity of “post-resource” planning; (4) investments in local capacities and people in the community (transferable skills); (5) need for “new money” in Alaska economy, new economies will make communities more sustainable; (6) issues of Arctic youth; (7) role of leadership and entrepreneurship in ensuring sustainable development. Arctic-FROST will continue knowledge-sharing workshop in Arctic communities in collaboration with ReSDA and other partners.

Other 2015 highlights:

Annual meeting abstracts. Abstracts were produced for the Annual meeting and made freely available on Arctic-FROST’s website. A fancier version of abstracts/proceedings is coming shortly. Abstracts and selected paper for side and domain workshops were published by respective conferences.

Other publications. A book “Northern Sustainabilies” (edited by Gail Fondahl and Gary Wilson) with chapters written by Arctic-FROST members (ICASS VIII and annual meeting participants) is in print by Springer. Selected members published peer-reviewed articles and book chapters.

White paper “Arctic Sustainability Research: Agenda 2025.” Presented at ICARP III and prepared for publication.

Peer-reviewed volumes. Work has begun on the first peer-reviewed volume “Arctic Sustainability: A Synthesis of Knowledge”. We established writing team and developed a plan to move forward.

Arctic-FROST web portal is operational. Facebook page was launched. These are primary tools for publication, rapid circulation and dissemination of network activities. www.uni.edu/arctic/frost
Collaborative research proposals. Arctic-FROST members developed a number of successful collaborative interdisciplinary and international proposals, which directly benefited from Arctic-FROST activities in 2014-2015: Belmont Arctic call (NSF/Nordforsk/RFBR/RCN) synthesis project “Arctic Sustainability: A Synthesis of Knowledge” (PI Petrov), IASC Arctic Sustainability Workshop (PI Petrov, Fondahl and Schweitzer), Foreign Affairs Canada Arctic Symposium funding (PI Petrov and Cruz). Finally, a group of Arctic-FROST members collaborated with RCN in Russian Arctic Urban Sustainability to develop a successful NSF grant “PIRE: Promoting Urban Sustainability in the Arctic” (PIs Ortung, Heleniak, Laruelle, Streletsiky and Shiklomanov).
The Arctic-FROST research coordination network is pleased to announce The Third Arctic-FROST network meeting and Early Career Scholars Workshop on Arctic Sustainability in the Global Context in Vienna, Austria (September 9-12, 2016).

Arctic-FROST: Arctic FRontiers Of SusTainability: Resources, Societies, Environments and Development in the Changing North is a new NSF-funded international interdisciplinary collaborative network that teams together environmental and social scientists, local educators and community members from all circumpolar countries to enable and mobilize research on sustainable Arctic development, specifically aimed at improving health, human development and well-being of Arctic communities while conserving ecosystem structures, functions and resources under changing climate conditions

The theme of the Annual Meeting and Early Career Scholars Workshop is Arctic Sustainability in the Global Context.

Papers deal with (1) sustainability and sustainable development in the Arctic or Sub-Arctic of particular relevance to the rest of the world, (2) comparative studies of sustainability between Arctic and other regions, (3) studies from various geographic contexts, which provide valuable insights into Arctic sustainability, (4) studies that analyze the role of outside actors in arctic sustainable development are welcome.

- The main focus question of the conference is “What can Arctic sustainability research learn from or teach the rest of the world?”

At this first meeting the Arctic-FROST casts a wide net and welcomes papers that address one of the following broad categories:

- Sustainable environments
- Sustainable economies
- Sustainable cultures
- Sustainable regions/communities
INSTRUCTIONS TO ANNUAL MEETING PARTICIPANTS

This workshop will consist of both presentations and discussions. The main goal is to advance our understanding of the Arctic coastal systems via answering workshops four questions. All participant will contribute in two capacities:

(1) As presenters. This involves a formal presentation plus 7-8 minutes of questions. Since some of the participants were unable to obtain visas due to delayed processing, we will have virtual keynotes.

Please note that some (but not all) of the sessions are designated as "illustrated paper" (please check the program). Illustrated paper format means that each panelist gives a short (7-8 mins; 5-7 slides) presentation: context of the study(s)-results-main conclusion/discussion points [more of a summary/one or two main conclusions related to the theme of the meeting and sessions question - please see the program]; overall discussion moderated by the chair follows. Session chairs of illustrated paper sessions, please have a look at the presentation topics and guiding question ahead of time.

(2) As discussants: the main goal of the meeting is to instigate discussion around workshop’s questions and presentations. In addition to speaker/panelist role all participants can participate in discussions.

Session Chair/Discussion Lead:
Each session will have a chair and discussion lead. This person will also report the summary of the session at the final wrap up session (there will be a group discussion focused on session’s main findings). Chairs, please review the program and indicate whether you will be able to serve in this role.
Conference Venues

Hotel:

Hotel Regina
Rooseveltplatz 15, A-1090 Vienna
Tel. +43 1 404 46-0

Conference Venues:

Steering Committee Meeting [closed] (September 9th):
Institut für Kultur- und Sozialanthropologie, NIG (Neues Institutsgebäude)
Universitätsstraße 7, 4th floor
1010 Vienna
Room: Übungsraum

Annual Meeting: (September 10th and 11th) and Early career Workshop (September 12th)
Campus, Spitalgasse 2, 1090 Wien, Courtyard (Hof) 1
Room: AULA

Conference Dinners:
September 10th [8 PM]: Restaurant Kardos, Dominikanerbastei 8, 1010 Vienna. Meet at the hotel at 7:15 pm for a short walk to the restaurant.

September 11th: [8 PM] Heuriger Wieninger, Stammersdorfer Straße 78, 1210 Vienna, depart from the hotel by bus at 7:30.
NSF Arctic-FROST ANNUAL NETWORK MEETING AND EARLY CAREER SCHOLARS WORKSHOP:

Arctic Sustainability in the Global Context: What can we learn from or teach the rest of the world??

VIENNA, AUSTRIA SEPTEMBER 9-12, 2016

University of Vienna, Austria

PROGRAM

September 9th Friday

2:00-3:00   Steering Committee Meeting [closed]
SC members attending: Petrov (Chair), Fondahl, Hirshberg, Huskey, Larsen, Rasmussen, Shiklomanov, Schweitzer, Southcott, Vlasova, Crawford (ex officio)

3:30 pm Cultural program (local museums, places of interest): meet at Hotel at 3:30 pm

6:00 pm  Welcoming Reception & Dinner Cruise on the Danube, Schiffstation Wien/City, Franz Josefs Kai 2, 1010 Vienna

September 10th Saturday

9:00-9:30   Registration

9:30-10:15 Session 1.1 Opening and Introductions
Chair: Peter Schweitzer (University of Vienna, Austria)
Welcome from the University of Vienna
Andrey Petrov (Arctic-FROST PI) Arctic-FROST Milestones
Participant Introductions

10:15-10:45 Plenary Session 1.1: Arctic Sustainability Science: Global Origins, Connections and Challenges
Chair: Tatiana Vlasova (Institute of Geography, Russia)
Andrey Petrov, Peter Schweitzer, Gail Fondahl, and Annika Nilsson
Arctic Sustainability Research: Exploring Priorities and Global Connections

Discussion

10:45-11:15  Coffee break
Illustrated paper session 1.2: Setting the Stage: Arctic Voices in Sustainable Development

This session will feature four speakers who will set the tone for further presentation discussions: focus on current issues, achievements and questions related to sustainability research in the Arctic and how it is or can impact global discourses on sustainability and sustainable development.

Chair: Annika Nilsson (Stockholm Environmental Institute, Sweden)
Rasmus Ole Rasmussen (Nordregio, Sweden/Denmark) *Arctic Megatrends in the Context of Global Processes*
Chris Southcott (Lakehead University, Canada) *Globalization and the Circumpolar North*
Gail Fondahl (UNBC, Canada) *Northern Sustainabilities: What have we learned?*
Joan Nymand Larsen (Stefansson Arctic Institute, Iceland) *A Preliminary Framework for Analyzing Arctic Sustainable Economies in a Global Context*
Audur Ingolfsdottir (Bifrost University, Iceland): *Arctic Voices: The Relevance of Local Stories for a Global Problem*

Discussion

1:00-2:00
Lunch (Group lunch arranged from a nearby restaurant)

2:00-4:00
Illustrated paper session 1.3 Arctic in the Global Context: Changes, Drivers, and Implications for Sustainable Development

Q: What are the major global changes, drivers and processes that impact sustainable development in the Arctic?

Chair/Discussion lead: Nikolay Shiklomanov (The George Washington University, USA)
Elizabeth J. (Beth) Kerttula (USA) *U.S. Ocean Policy and the Arctic*
Lee Huskey (University of Alaska Anchorage, USA) *Global Connections of Alaska’s Economy: World War I, Frontier Fragility, and Jack London*
Barbora Padrova (Masaryk University, Czech Republic) *The role of non-Arctic states in the long-term sustainability of the Arctic region*
Xia Liping (Tongji University, China) *Relations between Sustainable China and Sustainable Arctic*
Nengye Liu (University of New England, Australia) *China’s Role in the Changing Governance of Arctic Fisheries*
Hunter Snyder (Dartmouth College, USA) *How autonomous countries within the realm of UN member states would implement the Voluntary Guidelines for Securing Small-Scale Fisheries*

**Discussion**

4:00-4:30 Coffee break

4:30-6:30 **Illustrated paper session 1.4: Sustainability Science and the Arctic: Global Contributions to Local Sustainabilities**

*Q:* What are the main linkages between Arctic sustainability research and global sustainability science? What are the key concepts, methodologies and approaches that are reflected in the Arctic sustainability research and where Arctic scholarship makes valuable contributions?

**Chair/Discussion lead:** Diane Hirshberg (University of Alaska Anchorage, USA)

- Marcus Carson (Stockholm Environmental Institute, Sweden) *Resilience in the Arctic: Lessons from the Arctic Resilience Report*
- Annika Nillson (Stockholm Environmental Institute, Sweden) *Can mining in the Arctic contribute to sustainable development?*
- Anastasya Kornilova (Moscow State University, Russia) *Social and Environmental responsibility of Russian oil and gas companies in the Arctic region*
- Doris Carson (Umea University, Sweden) *Lifestyle migration to the Arctic: implications for sustainable rural community development*
- Rasmus Gjedssø Bertelsen (University of Tromso, Norway) *Local Arctic Energy Research in a Global Framework for Sustainable Development: the Case of the UiT Renewable Energy Center and Collaboration with the Energy Studies Institute-National University of Singapore*
- Tatiana Vlasova, (Institute of Geography, Russia) *Socially-oriented Observations in understanding local-global interdependences for achieving Arctic sustainability*

**Discussion**

8:00 pm **Dinner:** Restaurant Kardos, Dominikanerbastei 8, 1010 Vienna. Meet at the hotel at 7:15 pm for a short walk to the restaurant.
September 11th Sunday

9:00-11:00   Illustrated paper session 1.5: Arctic Voices in Sustainable Development I: Global Impacts and Local Contexts of Arctic Sustainability Research: What Can Arctic Experiences Teach the World?

Q: What are the main contributions of Arctic sustainability research in the global knowledge base of sustainability science? What are the key concepts, methodologies and approaches that make Arctic sustainability research relevant and pioneering in the global debate?

Chair/Discussion lead: Joan Nymand Larsen (Stefansson Arctic Institute, Iceland)

Jim Powell (University of Alaska Southeast, USA) How three social determinants suggest adaptive capacity of the Kenai River Fisheries in Alaska

Katie Burkhart, Maxwell C. McGrath-Horn and Natalie Unterstell (Tufts and Harvard Universities, USA) Comparison of Pan-Arctic and Amazon Basin Regional Governance Mechanisms

Camille Escudé (Sciences Po Paris Doctoral School, France) Evaluation of the Arctic Council’s role in sustainable development norm-making in the Arctic: “the strength of weak ties”

Chris Southcott (Lakehead University, Canada) ReSDA Update: ReSDA Findings in the Global Context

Nathan Cohen-Furnier (Tufts University, USA) Local economic development in Nunavik

Vera Kuklina (V.B. Sochava Institute of Geography, Russia) Resource extraction and infrastructural networks in the North of Irkutskaya oblast

Ryan Bergstrom (University of Minnesota-Duluth, USA) Mining for Truth: Conceptualizing Precious Metal Mining in Northern Minnesota

Andrey N. Petrov (ARCTICenter, USA) From “The North” to North Dakota: Arctic Lessons in Sustainable Development North Dakotans Wished They New

Discussion

11:00-11:15   Coffee break

11:15-1:15    Illustrated paper session 1.6: Arctic Voices in Sustainable Development II: Global Impacts and Local Contexts of Arctic Sustainability Research: What Can Arctic Experiences Teach the World?

Q: What are the main contributions of Arctic sustainability research in the global knowledge base of sustainability science? What are the key concepts, methodologies and approaches that make Arctic sustainability research relevant and pioneering in the global debate?

Chair/Discussion lead: Gail Fondahl (UNBC, Canada)

Davin Holen (University of Alaska Fairbanks, USA) Climate Change Adaptation in Alaska: “I have a great anxiety for the future of my children.”
Joella Hogan (Na-Cho Nyäk Dun First Nation Self-Government, Canada), Susanna Gartler, Gertrude Saxinger, (University of Vienna, Austria) *Living Culture, Learning Skills, Telling our Stories: The case of the Na Cho Nyak Dun Cultural Center in global movements for cultural sustainability*

Anna Varfolomeeva (Central European University, Hungary) *The Discourses on Stone working and Sustainability in Two Mining Regions of Russia*

Herminia Din (University of Alaska Anchorage, USA) *Creative Practices of Sustainable Art in the Arctic*

Jennifer Jones (University of Guelph, Canada) *Researchers as Actors: Consideration of the role of research in creating sustainable Arctic communities*

Amanda Boyd (Washington State University, USA) *Communicating about Environmental Health Risks in the Arctic*

**Discussion**

1:15-2:15  
*Lunch* (Group lunch arranged from a nearby restaurant)

2:15-2:45  
Alexander Zolotarev (Skoltech/MSU, Russia) *Arctic-COAST Knowledge Sharing Portal for Arctic sustainability research*

2:45-4:00  
**Discussion in groups**  
Answers to the conference questions from each session. Each group is led by session chair. Produce summary 1-2 pager and 4-5 slides

**Moderators:** Gertrude Saxinger (University of Vienna, Austria) and Andrey N. Petrov (ARCTICenter, USA)

**Discussion**

4:00-4:30 *Coffee break*

4:30-6:30  
**Plenary and wrap up/Arctic Horizons discussion**  
Presentation of conference findings and their implications for future research in Arctic social sciences

**Chair:** Peter Schweitzer (University of Vienna, Austria)

**Panelists:** Annika Nillson, Gail Fondahl, Joan Nymand Larsen, Gertrude Saxinger, Nikolay Shiklomanov, Andrey N. Petrov, Diane Hirshberg

**Discussion**

8:00 pm  
**Dinner:** *Heuriger Wieninger, Stammersdorfer Straße 78, 1210 Vienna,* depart from the hotel by bus at 7:30
Arctic-FROST Early Career Scholars Workshop

September 12th, 9:00 am-3:30 pm

Übungsraum
Institut für Kultur- und Sozialanthropologie
NIG, Universitätsstraße 7, 4th floor, 1010 Vienna

2016 Arctic-FROST Fellows: Amanda Boyd (USA), Anastasya Kornilova (Russia), Anna Varfolomeeva (Hungary), Audur Ingolfdottir (Iceland), Barbara Padrtova (Czech Republic), Camille Escude (France), Davin Holen (USA), Hunter Snyder (USA), Jennifer Jones (Canada), Kathie Burkhart (USA), Max McGrath-Horn (USA), Nathan Cohen-Fournier (USA), Susanna Gartler (Austria).

9:00-10:30 am “Authors meet the critics”: Meetings with mentors=paper reviewers (could be done at the conference venue or at other locations as agreed with your mentors)

10:45-12:00 Panel 1: Making a difference: Knowledge communication in sustainability science in the Arctic and around the world
Moderator: Alexander Zolotarev
Panelists: Chris Southcott, Annika Nilsson, Marcus Carson, Jim Powell, Enrico Wensing, Xia Liping

Q & A and Discussion

12:00-12:45 Lunch

12:45-2:00 Panel 2: Arctic sustainability science as a career in and outside the Arctic region
Moderator: Emily Francis
Panelists: Andrey Petrov and Jessica Graybill (getting funded and publishing), Nengye Liu (post-PhD career management), Lee Huskey (a successful faculty career), Gertrude Saxinger (building academic career/doing research on Arctic in non-Arctic states), Tatiana Vlasova and Xia Liping (international collaboration)
This panel will focus on professional development and opportunities for early career scholars

Q & A and Discussion

2:00-3:30 Work in groups & reporting:
Conference highlights (2 pager or 4-5 slides from each)

Q: what are the most important things you learned at this meeting? Further directions? Ideas?
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<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>Paper Title</th>
<th>Mentor</th>
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<td>Amanda</td>
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Arctic-FROST Steering Committee

Andrey Petrov (PI)
Director, ARCTICenter, USA
Associate Professor of geography and geospatial technology. Directs the ARCTICenter and the Program in Research and Outreach in Geography between Russia and the United States (PROGRUS) at the University of Northern Iowa in Cedar Falls, IA.

Jessica Graybill (Co-PI)
Assoc. Prof., Colgate University, USA
Associate Professor of various Human and Physical Geography courses including, former Soviet Union area studies, and Arctic area studies. Also the winner of a Science and Innovation Fulbright award.

Timothy Heleniak (Co-PI)
Senior Research Fellow at Nordregio, the Nordic Centre for Spatial Development, SWEDEN
Senior Research Fellow, Nordregio, Sweden. Heleniak is a human geographer with regional expertise in Russia and other countries of the former Soviet Union and the Arctic.
Peter Schweitzer (Co-PI)

Prof., University of Vienna, AUSTRIA
Has taught social and cultural anthropology at universities in Alaska, Austria, and Russia. Has served as Director of Alaska EPSCoR (Experimental Program to Stimulate Competitive Research).

Gail Fondahl

Prof., University of Northern British Columbia, CANADA
Professor of Geography at the University of Northern British Columbia, and has served as Vice-President of Research there from 2008 to 2012. Focuses research on indigenous land rights and legal geography in the Russian North. Has also served as President of the International Arctic Social Sciences Association.

Diane Hirshberg

Prof., University of Alaska, Anchorage, USA
Professor of Education Policy at the Institute of Social and Economic Research, part of the University of Alaska Anchorage, as well as the Director of the Center for Alaska Education Policy. Research has included effects of boarding schools on Alaska Native students, and turnover of Alaska’s school teachers.
Lee Huskey

**Prof. Emer., University of Alaska, Anchorage, USA**

Economics professor, with courses including The Alaska Economy and Alaska Economic Issues. Has also been Co-Principal Investigator of two National Science Foundation funded projects, Migration in the Arctic and Understanding Migration in the Circumpolar North.

Joan Nymand Larsen

**Prof., University of Akureyri, ICELAND**

Professor, University of Akureyri; and senior scientist, Stefansson Artic Institute. ICELAND. Leads three international indicators and quality-of-life projects – Arctic Social Indicators (ASI – I and II) and AHDR-II (Arctic Human Development Report: Regional Processes and Global Linkages).

Vera Metcalf

**Director, Eskimo Walrus Commission/Inuit Circumpolar Council, USA**

Director of the Eskimo Walrus Commission (EWC), a Commissioner on US Arctic Research Commission, Advisory Panel member on North Pacific Research Board, a Steering Committee member on Alaska Center for Climate Assessment & Policy, and lastly, an ICC (Inuit Circumpolar Council) Executive Council Member for Alaska.
Rasmus Ole Rasmussen
Prof., Roskilde University, DENMARK
Senior Research Fellow, Nordregio, SWEDEN
Currently, a Senior Research Fellow at Nordregio (Nordic Centre for Spatial Development), as well as a geography professor at Roskilde University. Research includes focuses of regional development, GIS and Arctic and Northern regions.

Chris Southcott
Prof., Lakehead University, CANADA
Professor of sociology at Lakehead University and Yukon College. Currently, Leader of the UArctic’s Knowledge and Dialogue programs. He is the Principal Investigator for the Resources and Sustainable Development in the Arctic (ReSDA) project.

Nikolay Shiklomanov
Assoc. Prof., George Washington University, USA
Associate Professor of Geography at the George Washington University. Research interests include Arctic environment, development, and climate change.
Tatiana Vlasova
Senior Scientist, Russian Academy of Sciences, RUSSIA
Researcher at the Institute of Geography, RAS, in Russia, and has served as co-chair to the International Geographical Union Cold Regions Environment.

Ann Crawford
Administrative Assistant
ARCTICenter
University of Northern Iowa
USA

Emily Francis
Research Affiliate
ARCTICenter
University of Northern Iowa
USA

Ilja Steffelbauer
Department of Social and Cultural Anthropology
University of Vienna, Austria
(Vienna meeting local organizer)
Jessica K. Graybill (Ph.D., University of Washington) is an Associate Professor of Geography at Colgate University, where she also directs the Russian & Eurasian Studies Program. The focus of her research is on coupled human and natural systems in urban settings and in the Russian Far North. In ongoing research in the Russian Far East, she investigates the human responses to environmental change due to sociopolitical transformation, natural resource extraction, and climate change. Jessica is also a recognized interdisciplinary studies methodologist.

From the Editor of
Polar Geography

Hello Arctic FROST Participants,

I hope you are enjoying the Arctic Frost Conference in Vienna! I write to regarding Polar Geography, a journal devoted to publishing geographic and cognate disciplinary and interdisciplinary research about the polar regions. Our mission is to publish timely, forward-thinking, and cross-cutting research about the people, places, and phenomena in the Arctic and Antarctic, with additional attention to regions (such as the sub-Arctic) that are also important for understanding the Far North and the South.

As you consider publication outlets, please know that Polar Geography offers a quick turnaround time from initial review to publication, a dedicated editorial staff, a strong readership base, and a growing reputation as a leading journal in polar studies.

Right now is an exciting time to be part of this journal. I hope to hear from all of you, and especially from our Arctic FROST Fellows!

Sincerely,

Jessica K. Graybill

Contact the Editor:
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http://www.tandfonline.com/teochpogz20/current
Participant Biographies

Ryan Bergstrom (University of Minnesota-Duluth, USA)

Dr. Bergstrom received PhD in Geography from Kansas State University. After graduating from Kansas State, he accepted a position in the Department of Geography at Gustavus Adolphus College in St. Peter, MN, where he taught until arriving at the University of Minnesota, Duluth in August of 2014. His research is primarily focused on the complexity of coupled socio-ecological systems and the human dimensions of global change, with a focus on rural areas of the American West. He is particularly interested in understanding how natural resource-dependent communities impact their local environment and how these impacts facilitate or hinder a transition towards sustainability. As a human-environment geographer he straddles the worlds of physical and cultural geography, and uses geospatial sciences to better understand the relationship between humans and the natural world.

Rasmus Gjedssø Bertelsen (University of Tromsø-The Arctic University of Norway, Norway)

Rasmus Gjedssø Bertelsen is a Danish political scientist. He grew up in Iceland, which has made him deeply engaged personally and professionally in the past, present and future of the North Atlantic and the Arctic. Currently, he is Professor of Northern Studies and Barents Chair in Politics at University of Tromsø-The Arctic University of Norway. His other affiliations are to the Public Diplomacy Collaborative at the Harvard Kennedy School of Government, the Arctic Portal, University of the Arctic Thematic Network on Geopolitics and Security, Institute for Security and Development Policy (Stockholm) and University of Iceland. Rasmus also has a research agenda on the Middle East and in that connection is a founding board member of the Nordic-Iranian Chamber of Commerce. Rasmus’ field of research is transnational knowledge relations in international politics and political economy. Concerning the Arctic, he works on the role of science diplomacy (the foreign policy role of science) for managing the Arctic under globalization. The Arctic has for centuries been an integrated part of the international system (e.g. the Cold War). Arctic is a case to study international systemic processes of power transition and the role of knowledge in managing these processes. Science diplomacy plays a role concerning the Arctic adapting to the rise/return of China, where Sino-Arctic scientific cooperation makes it possible for China to enter the Arctic in a less provoking way and for the Arctic states to integrate China with greater confidence. Arctic
scientific collaboration between the West and Russia helps to insulate the Arctic from geopolitical competition between Russia and the West elsewhere.

**Amanda Boyd (Washington State University, USA)***

Amanda Boyd (PhD, University of Calgary) is an assistant professor of risk communication at The Edward R. Murrow College of Communication. Her research program focuses on health and science communication – particularly how risks are communicated to and perceived among rural and Indigenous populations. Her research focuses on two main areas including how environmental health risks are communicated to Indigenous populations. Much of this research includes understanding how contaminants are communicated to Inuit in the Arctic. The primary goal of this research is to examine the impact of communications on risk perceptions and behavior, and how to develop more effective and culturally relevant health risk communications. Her work also includes examining how rural communities and the general public perceives energy systems development (such as carbon capture and storage, nuclear power plants and hydro-electric projects) and how this impacts support for or opposition to technology development and implementation. Her research has been funded by the Institute for Energy, Environment and Economy (ISEEE), Carbon Management Canada, Northern Contaminants Program, among others. She has published in various interdisciplinary and communication journals such as Public Understanding of Science, International Journal of Greenhouse Gas Control, Energy Policy, Environmental Communication, Journal of Risk Research and Journal of Toxicology and Environmental Health. Boyd is affiliated with the Murrow Center for Media and Health Promotion Research and is a member of the Science Communication Research Group at The Edward R. Murrow College of Communication. She works with the Health, Environment, and Indigenous Communities (HEIC) Research Group at Trent University and is on the executive committee for the Center for Environmental Research, Education, and Outreach (CEREO) at Washington State University.

**Katie Burkhart (Harvard University, USA)***

Katie Burkhart is a U.S. Senate employee and a Master in Public Policy 2016 graduate at Harvard Kennedy School where she focuses her studies on maritime security and the Arctic region. She has represented the Harvard Kennedy School for the last two years at the Arctic Circle Assembly, the world’s largest forum on the Arctic. In 2015, she presented at the Conference on maritime security in the Arctic, advocating for governance structures that prevent resource competition from escalating to conflict. Her thesis project was completed for the German Foreign Ministry, using scenario planning methodology to assess Germany’s Arctic Policy. Prior to attending graduate school, Katie served
in the US Navy for seven years on ships around the world and on headquarters staff in Washington, DC. She has since left active duty, but continues to serve in the US Navy Reserves in support to NATO Allied Command Transformation. On campus, she is a Belfer International and Global Affairs fellow, has served as co-chair for the Diplomacy Professional Interest Council, and is active in the Harvard Veterans Organization. Most recently, Katie spent the summer of 2015 as a Rosenthal Fellow with the State Department's Bureau of Political Military Affairs. She plans a career in U.S. security policy.

**Doris Carson (Umeå University, Sweden)**

Doris is a human/economic geographer interested in the socio-economic development of small communities in sparsely populated areas. She has a Master’s degree in tourism and leisure management from IMC Krems University (Austria) and a PhD in economic geography from James Cook University (Australia). Her PhD work focused on the transition from extractive to attractive industries in remote resource peripheries, and the complex relationships between tourism and the “staples trap”. Subsequently, she completed a post-doctoral fellowship at the University of South Australia (Centre for Rural Health and Community Development) where she continued research on rural community resilience and local innovation capacity in rural and remote areas. She was also involved in a major research project looking at Indigenous mobility and homelessness in remote Australia. Since 2014, she has been a researcher and lecturer within the Department of Geography and Economic History at Umeå University in northern Sweden. Her current research focuses on understanding how different types of mobile populations—such as tourists, lifestyle migrants, seasonal workers, and other temporary populations—impact on innovation capacity in small rural communities. She is also a co-investigator on a major research project funded by the Swedish Research Council Formas, focusing on modelling the demographic futures of small rural communities in northern Sweden. She is currently an affiliated researcher with the Arctic Research Centre (ARCUM) at Umeå University and became a member of Arctic-FROST in April 2015.

**Marcus Carson (Stockholm Environment Institute, Sweden)**

Dr. Carson’s research focuses on social change processes, with an emphasis on the social/political drivers and obstacles involved in developing policy responses to climate change. Key theoretical elements in his work include the roles of paradigmatic beliefs, institutional arrangements, and organizational networks in influencing policymaking and social change processes. Over the past few years, he has focused on better understanding the nature of the drivers and obstacles that influence climate and energy policies in the US, Sweden, and in the European Union. With much of the important progress in reducing greenhouse gas
emissions currently being organized at the local scale where people live, work, consume and
engage, Marcus is increasingly interested in efforts to bridge the “implementation gap.” His work
has been supported by research funding from the Swedish Research Council, (Vetenskapsrådet),
Sweden’s Research Council for Environment, Agricultural Sciences and Spatial Planning
(Formas), Mistra’s Climate Policy Research Program (Clipore), European Union framework
programs, and the European Environment Agency, among others.

Nathan Cohen-Fournier (Tufts University, USA)*

Nathan is a graduate student in the Master of International Business at the Fletcher School. He is currently focusing on local economic development in rural areas and collective entrepreneurship. Over the summer 2016, she will work with the Kativik Regional Government, the Inuit governing body of Northern Québec, on a research project. The purpose of the project is to highlight the potential of local economic development in Nunavik. The results published could serve the local community in order to harness growth inclusive to their culture and identities. Since starting at the Fletcher School in September 2015, in addition to classes, he has participated in the organization of the Fletcher Opening Arctic Conference 2016. He has also led the Innovate Tufts: Innovation Week at Fletcher. Prior to graduate school, he worked for over four years at Bombardier Inc, a global manufacturer of planes and trains, in the Corporate Strategy Department. He graduated with a Bachelor in Finance from Concordia University in 2012 and completed the CFA designation. He was born and raised in Montréal, Québec.

Herminia Din (University of Alaska Anchorage, USA)

Prior to joining the faculty at the University of Alaska Anchorage in 2003, Dr. Din worked for seven years in the museum field with an emphasis on technology for children and families. It included designing the "Young at Art" Program at the Hirshhorn Museum and Sculpture Garden (Smithsonian Institution), and developing the first educational Web site for the Metropolitan Museum of Art in 1996. In addition, she was the Web Producer at the Children's Museum of Indianapolis, Indiana, the largest children's museum in the United States serving more than one million visitors every year. Her research interests include art education for children and educational technology in non-traditional learning environments. Her research focuses on how the use of new technologies in education offer the potential to transform teaching and learning in art. Currently, she is studying aspects of emerging technology for implementing creative initiatives to enhance arts education.
Camille Escude (Foundation for Strategic Research, France)*
Camille graduated with a research Master in Political Science from the Doctoral School of Sciences Po Paris and she holds a MA in Geography from the Sorbonne University. She is working on Arctic issues for almost four years now, especially with a political focus. She has been working on geopolitical issues of climate change in the Arctic, especially Arctic routes. She is now focusing on Arctic regional governance, and she wrote my Master's thesis on the role of the Arctic Council as environmental norm producer in the Arctic. She did therefore five week field work in Tromsø and she attended last year Arctic Frontiers and the Young Scientist Workshop. She is now working as a research assistant in research center in Paris (Foundation for Strategic Research), working also on Arctic issues, for the French Ministry of Defense, and the French Ministry of Foreign Affairs. She will soon begin a PhD in Political sciences on the consequences of climate change in the Arctic for environmental international governance. Her current research project is about soft law and the evaluation of the Arctic Council’s role in norm-making in the Arctic.

Emily Francis (U.S. Fish and Wildlife Service and ARCTICenter, USA)
Emily Francis is a Directorate Resource Fellow at U.S. Fish and Wildlife Service and a recent graduate of the University of Northern Iowa Master’s program. Emily’s research is focused on wild reindeer population in northern Russia, and more specifically on understanding spatial patterns of reindeer migration, explaining shifts in spatial distribution and modeling population dynamics. She has been working with both historical data and satellite collar data in Taimyr, Russia. Emily is a research Affiliate at the ARCTICenter where she serves as a media communication specialist. She is a student member of the Polar Geography Specialty Group of the American Association of Geographers.

Gail Fondahl (University of Northern British Columbia, Canada)
Dr. Gail Fondahl is a Professor of Geography at the University of Northern British Columbia, Canada. She holds a PhD in Geography from the University of California-Berkeley. Professor Fondahl’s research has focused the legal geographies of indigenous rights in the Russian North, the historical geography of reindeer husbandry in the Russian North, and co-management of resources and research in northern British Columbia. She is currently also involved in research on Arctic sustainability, with a focus on its cultural and legal dimensions. Dr. Fondahl is Canada’s representative to, and Chair of, the International Arctic Science Committee’s Social & Human Sciences Working Group. She also represents
Canada on the Social, Economic and Cultural Expert Group of the Arctic Council’s Sustainable Development Working Group. She served as the president of the International Arctic Social Sciences Association from 2011 to 2014 and remains on the governing council of IASSA. She co-edited the recently released second *Arctic Human Development Report* (AHDR-II).

**Susanna Gartler (University of Vienna, Austria)**

Susanna Gartler is a PhD candidate at the University of Vienna, Austria and holds a prae-doc position as assistant to her supervisor Prof. Peter Schweitzer. Her academic interests lie in Arctic Studies, Indigenous Studies, Visual Anthropology, Economic and Political Anthropology and Human interaction with Natural resources as well as Cultural Sustainability. She is currently collaborating on project “LACE – Labour Mobility and Community Participation in the Extractive Industries: Case Studies in the Canadian North”. She is an active member of the Arctic and Subarctic Working Group Vienna (AAS) as well as APECS Austria. Her PhD project focuses on cultural renewal and revitalization in small communities in the Yukon Territory (especially Mayo/the Na-Cho Nyäk Dun – a Northern Tutchone group). She is also part of the Young Scholars Forum of the Association of Canadian Scholars in German-speaking Countries (GKS). Scientifically and regionally she came across the Arctic while working on her MA thesis titled: “Subsistence – An anthropological subject analysis” where she analyzed several debates surrounding the term ‘subsistence’ in the Arctic spheres and put them into relation with discussions stemming from the German-speaking area. Susanna has travelled extensively during the past years and also during her studies and enjoys the academic exchange with international scholars at such venues as the NSF Arctic-FROST meeting. In her career so far she especially emphasizes the importance of supporting exchange between young scholars, which she also managed to achieve by securing financial support by Arctic FROST for an Early Career Session at the Alaska Anthropological Association meeting in Sitka.

**Diane Hirshberg (University of Alaska Anchorage, USA)**

Diane Hirshberg is Professor of Education Policy at the Institute of Social and Economic Research, University of Alaska Anchorage (UAA), and director of the UAA Center for Alaska Education Policy Research. Her research interests include education policy analysis, indigenous education, circumpolar education issues, and school change. She is co-author of the Arctic Human Development Report II chapter on Education. Dr. Hirshberg sits on both the International Arctic Social Sciences Association Council and the steering committee for the NSF-Funded Arctic FROST Research Collaboration Network. She also is a member of the “visionary group” for the Advancing Native Dialogues on Racial Equity project with the First Alaskans Institute. She teaches in the UAA
Honors College and the College of Education. She has a PhD in Education from UCLA, a Master of Public Administration from Columbia University and a bachelor’s degree from UC Berkeley.

Joella Hogan (First Nation of Na-Cho Nyäk Dun in Mayo, Canada)

Joella Hogan is Manager of Heritage, Culture, and Language with the First Nation of Na-Cho Nyäk Dun in Mayo, Yukon. Her mandate is the preservation, protection, and promotion of Northern Tutchone language, culture, and heritage. She has degrees in Environmental Planning (University of Northern British Columbia) and Native and Rural Development (University of Alaska Fairbanks). Her research interests are in the relationships between the natural environment and cultural identity, community development, cultural renewal. She has worked on projects in the Circumpolar North and is passionate about preservation of her Northern Tutchone heritage and culture. In addition to the above mandate, we also serve as a focal point for research for the central Yukon. We conduct interdisciplinary and collaborative research, bringing together scientists, community members, and Elders to meet the research needs of our community and region. She has recently co–authored a chapter entitled “It’s Just Natural: First Nation Family History and the Keno Hill Silver Mine (University of Calgary Press, 2015). Although she is dedicated to working for her community, she continues to share her experiences and expertise with others and has spoken and led workshops in Canada and internationally.

Davin Holen (University of Alaska Fairbanks, USA)*

Davin Holen is the Coastal Community Resilience Specialist for the Alaska Sea Grant Marine Advisory Program. Davin is affiliated and works collaboratively with the Alaska Center for Climate Assessment and Policy at the International Arctic Research Center at the University of Alaska Fairbanks (UAF). Davin is also a PhD student in the Department of Anthropology at UAF and will be defending his thesis in September 2016. His dissertation Fishery dependent communities in coastal Alaska: Salmon, people, and place examines the resilient nature of commercial and subsistence fishing in Alaska for food security, culture, and community well-being. Current projects at Alaska Sea Grant include facilitating workshops and developing tools for climate adaptation planning with coastal communities in Northwest Alaska and Southeast Alaska, with an interest in best practices for delivering climate change science to coastal communities in Alaska. Davin is also developing a project to create a coastal vulnerability index for the Cook Inlet region of Alaska based on recent wild resource harvest spatial data and interviews with residents in Cook Inlet communities. Davin is working with collaborators to connect local observers with science experts who can provide the tools necessary for climate change observations to fill the gaps in data.
gaps necessary for downscaled modeling of oceanographic and topographic climate related changes. Scientists can then act as facilitators rather than drivers for local efforts building a dialogue and feedback that empowers local communities.

Lee Huskey (University of Alaska Anchorage, USA)

Lee Huskey is Emeritus Professor of Economics at the University of Alaska Anchorage and Visiting Scholar in Geography and Arctic Studies at the ARCTICenter in Cedar Falls, IA. At UAA he has served as Chair of the Economics Department, Director of the Experimental Economics Program, and acting Director of the Center for Economic Education. He is a past President of the Western Regional Science Association. Prof. Huskey’s research has focused on the Arctic economy, migration and material well-being in the North. His current research interests include the structural change that accompanies economic growth in the circumpolar north and its role in community economic sustainability. He has served as the principal investigator for two research projects on migration in Arctic Alaska and around the Circumpolar North. He is currently associated with two circumpolar networking programs: Arctic Frontiers of Sustainability (Arctic Frost) and Resources and Sustainable Development in the Arctic (ReSDA) which is a Canadian SSHRC initiative.

Auður H. Ingólfsdóttir (Bifröst University, Iceland)*

Auður H. Ingólfsdóttir holds a BA degree in international studies from University of Washington (Seattle), a post graduate diploma in professional journalism from University of Iceland, and a Master degree in international relations from the Fletcher School of Law and Diplomacy, Tufts University (Boston). Her main interests are in the fields of international relations, environment and sustainable development, gender, security studies, conflict resolution and peace building. In addition to her post at Bifröst University, Auður is also registered as a joint degree Ph.D. student at the University of Lapland (Finland) and Univeristy of Iceland. Her doctoral research is focusing on the security dimension of climate change in the Arctic, using Iceland as a case study. The topic will be approached from a feminist perspective, applying concepts from gender studies as analytical tools. Her supervisors are Dr. Lassi Heininen (U. of Lapland) and Dr. Thorgerður Einarsdóttir (U. of Iceland).
Jennifer Jones (University of Guelph, Canada)*

Jen Jones has lived and worked in Yukon, Canada for over 20 years. Travelling North after an undergraduate degree in Geography and Women's Studies from Queen’s University, she lived off grid hauling water, feeding a wood stove to stay warm, and installing a 12 volt electrical system in a cabin made of salvaged materials. Her travel around Northern Canada has resulted in a career in a number of diverse sectors, including the performing arts, mining, and Indigenous health and well-being. Through this work, Jen has engaged with various governments (Territorial and First Nation), private businesses, and non-government organizations. The outcome of these collaborations has resulted in an understanding of the importance of building relationships among the diverse actors involved in defining the Northern landscapes. Jen’s recent return to academe, first to complete a Master of Public Health at the University of Alaska Anchorage (MPH class 2013) and now, a PhD at the University of Guelph, is a result of frustration from the ongoing need to explain to funders, the public, and governments why social issues continue to persist despite funding and research. Her work seeks to conceptualize a framework to understand and address, within the governance of the extractives sector, the impacts of colonization on the health and well-being of Northern Indigenous peoples. Jen has been awarded several scholarships and honors. She is a 2015 Trudeau Scholar; a recipient of a Social Sciences and Humanities Research Council (SSHRC) Doctoral Award and an Association of Canadian Universities for Northern Studies (ACUNS) Award. Jen currently resides in Whitehorse, Yukon, where she is sits as Chair for the Arctic Institute of Community Based Research.

Beth Kerttula (former Director of the U.S. National Ocean Council, USA)

Beth Kerttula is a life-long Alaskan who until June 2016 was the Director of the National Ocean Council, where she oversaw the Council’s efforts to implement the National Ocean Policy. In that capacity, she worked closely with stakeholders and with the nine marine regions to facilitate regional marine planning and other ocean management activities. Previous to that she was a Visiting Fellow at Stanford University’s Center for Ocean Solutions, where brought together policymakers from multiple disciplines to discuss the critical interplay of oceans, climate change, and society. She is a 15-year veteran of the Alaska House of Representatives, where she served as Minority Leader from 2006 to 2013, and has held positions in the State of Alaska Attorney General’s Office. Beth was the original sponsor of landmark U.S. cruise ship pollution legislation as well as other important environmental bills. She also led efforts to defend and improve the Alaska Coastal Zone Management Program and supported research efforts by the University of Alaska on ocean acidification and community sustainability. Beth was
also a member of the State of Alaska's first Arctic Policy Commission, which created Alaska's first Arctic policy recommendations for the state legislature.

Anastasia Kornilova (Moscow State University, Russia)*

Anastasia Kornilova is a postgraduate student, the Economic Department, Lomonosov Moscow State University. In 2012, she received a bachelor’s degree in political studies at MGIMO University of the Russian Ministry of Foreign Affairs. Her graduation paper was devoted to the global political importance of economic development in the Arctic.

While at MGIMO University, Anastasia became interested in the issue of sustainable development and environmental protection. To receive the necessary education, she enrolled in postgraduate courses at the Institute of Chemistry and Problems of Sustainable Development at Mendeleyev University of Chemical Technology, which she finished in 2014 with distinction and with a degree in the environment and land use. Her interest in climate change, sustainable development and business ethics led her to her postgraduate courses at Moscow State University’s department of environmental economics, where Anastasia is writing her thesis on Social and Environmental Responsibilities of Oil and Gas Companies in the Arctic.

Vera Kuklina (V.B. Sochava Institute of Geography, Russia)

Dr. Kuklina is a Post-Doctoral Student in V.B. Sochava Institute of Geography of Siberian Branch of the Russian Academy of Sciences, Irkutsk, Visiting Scholar at the Institute for European, Russian, and Eurasian Studies, George Washington University, Cofounder and Deputy Director of the non-governmental organization “Center for Environmental Studies and Education”, Research Associate of the Centre for Independent Social Research and Education. She has editorial experience (Guest editor of the issue “Peripheral Communities” in Inner Asia Humanities, Issue 2, 2013; Organizer of Special Forum based on papers presented at the session "Baikal Issues under Persistent State Care" at the 2012 Annual Meeting of the Association of American Geographers, published in Sibirica, Interdisciplinary Journal of Siberian Studies, Vol. 12, Issue 2, 2012). Participated in social impact assessments (Studies of labor strategies of unemployed former workers of Baikalsk Pulp and Paper Mill, Baikalsk in 2009; Prognosis of social development, social conditions, level of life and health of population in zone of impact of construction and exploitation of Mokskaya hydropower station on Vitim river, Bauntovsky district of Republic of Buryatia and Tungokochensky district of Zabaykalsky kray and Complex ethno-ecological investigations in zone of impact of Verhnechonsky oil and gas field and
construction of pipeline East Siberia-Pacific Ocean, Lensky district of Republic of Sakha (Yakutia) in 2008).

**Joan Nymand Larsen (Stefansson Arctic Institute, Akureyri, Iceland)**

Dr. Larsen is research director and senior scientist at the Stefansson Arctic Institute, Akureyri, Iceland, and professor of economics and Arctic studies at University of Akureyri. Her experience in Arctic research includes almost 20 years of working and publishing on issues and challenges of economic development and living conditions in the Arctic; socio-economic impacts of climate change; and the development of systems for long-term monitoring of human well-being. Among recent work is her leading roles in the work on the Arctic Human Development Report: Regional Processes and Global Linkages (2014), and Arctic Social Indicators (2010, 2014); her work on The New Arctic; a special issue of The Polar Journal on Polar Economics (2016); and her role of coordinating lead author of the Polar Regions chapter in the AR5 of the IPCC; in Climate Change 2014: Impacts, Adaptation, and Vulnerability. Current work also includes her role of partner in the Nordic Centre of Excellence in Arctic Research (2016-2021) on Resource Extraction and Sustainable Arctic Communities (REXSAC); her leadership of the Arctic Youth project (2016-2018); and partnership in ASUS (Arctic Sustainability: A Synthesis of Knowledge; 2015-18). She serves on numerous boards and committees including on the SSC of Future Earth Coasts, and IASC Social and Human Working Group.

**Xia Liping (Tongji University, China)**

Dr. Xia Liping is Dean of Institute of International & Public Affairs and Professor of School of Political Science & International Relations at Tongji University in Shanghai. He is Vice President of Shanghai Institute for International Strategic Studies (SIISS), and Vice President of Shanghai Association of International Relations, and Vice President of Shanghai Center for RimPac Strategic and International Studies (CPSIS). He is also Senior Guest Fellow of Institute of International Technology and Economics in Center for Development Studies under the PRC State Council. He specializes in Arctic security, global governance, nuclear nonproliferation and China’s foreign strategy. He holds a Ph.D. in world history from the East China Normal University. He got the Master Degree of Law from the PLA Foreign Language University in 1991. From December 2007 to April 2008, he was Director of Department of American Studies, and Director of Center for Latin American Studies at Shanghai Institute for International Studies (SIIS). From 1996 to November 2007, he was Director of Department of Strategic Studies at SIIS. From 1989 to 1996, he was Associate
Professor of Institute for Strategic Studies, National Defense University, Beijing. He has published many books and papers. Three of his latest books are “Contemporary International System and Strategic Relations among Major Powers”, “China’s Peaceful rise” and “Security and Arms Control in the Asia-Pacific Region”. He was Senior Fellow at the Atlantic Council of the United States from 1994-1995, visiting scholar at Monterey Institute of International Studies in 1999, the Hong Kong University in 2002, the Stockholm University in 2005, the Friedrich-Ebert-Stiftung EU Office in Brussels in April-May 2009, and visiting professor of University of Pennsylvania in March 2013.

Nengye Liu (University of New England, Australia)

Dr. Nengye Liu is a Senior Lecturer at School of Law, University of New England, Australia. He defended his PhD in Law at Ghent University, Belgium in September 2012. His PhD featured a comparative study of Chinese and European law on the prevention of vessel source marine pollution. Following his PhD, Dr. Liu was awarded a competitive German Research Foundation (DFG) “Future Ocean” Cluster of Excellence postdoctoral fellowship at the University of Kiel (Germany) and then a prestigious Marie Curie Intra-European Fellowship funded by the European Commission and hosted by the University of Dundee (UK). These interdisciplinary fellowships extended his PhD research and examined the EU’s role in enhancing the current regime for the protection of marine biodiversity in the changing Arctic. Dr Nengye Liu is also an Adjunct Professor of Shanghai Ocean University and a Senior Research Fellow at the Research Institute of Environmental Law (China’s national key institute in environmental law), Wuhan University, China. Over the past five years, Dr. Nengye Liu have produced more than 40 publications in leading journals in the fields of law of the sea and international environmental law.

Maxwell C. McGrath-Horn (Tufts University, USA)*

Maxwell C. McGrath-Horn is a Master of Arts in Law and Diplomacy 2017 candidate at the Fletcher School of Law and Diplomacy at Tufts University, where he focuses on sustainable development, international business relations, and human security in the Arctic. He represented the Fletcher School at the Arctic Circle Assembly 2015 in Reykjavik, and the Arctic Encounters Symposium 2016 at the University of Washington in Seattle. He was a key organizer of the Fletcher School’s Opening Arctic V Conference in 2016, and will lead the organizing team in 2016-2017. He is a Research Fellow at the Institute for Global Maritime Studies, where he focuses on issues related to the Arctic Ocean. Before attending the Fletcher School, he was at the Earth Innovation Institute (EII), a San Francisco based NGO that works on issues related to
deforestation and indigenous rights in tropical forest regions in Latin America and Southeast Asia. Research at EII focused primarily on payments for environmental services programs in the Amazon Basin and Central America. He worked closely with the leaders of the Coordinator of Indigenous Organizations of the Amazon River Basin (COICA) and the Mesoamerican Alliance of Peoples and Forests (AMPA).

**Annika Nilsson (Stockholm Environment Institute and KTH Royal Institute of Technology, Sweden)**

Dr. Annika E. Nilsson is Senior Research Fellow at Stockholm Environment Institute and Affiliated Faculty in Environmental Politics at KTH Royal Institute of Technology. She is currently a Mistra Arctic Fellow at the German Marshall Fund of the United States. Her work focuses on the politics of Arctic change, with research on environmental governance and communication at the science-policy interface. Nilsson has a PhD in environmental science and also over 20 years of professional experience as a science writer. She has followed Arctic science and politics since the mid-1990s. Nilsson’s current research includes the Formas-funded project Arctic Governance and the Question of Fit in a Globalized World, leading a work package on the global context of Arctic change in Mistra Arctic Sustainable Development - New Governance, and being part of the team leading a new Nordic Centre of Excellence on Resource Extraction and Sustainable Arctic Communities. She is also engaged in two Arctic Council assessments: Arctic Resilience Assessment and the Barents region study for Adaptation Action for a Changing Arctic (AACA). Her published writing includes several articles about Arctic politics related to Arctic Council activities and climate change science politics, as well as the edited volume Media and the Politics of Arctic Climate Change. In addition to academic publishing, she has written several popular science books and participated as a science writer in several assessments about the Arctic.

**Barbora Padrtová (Masaryk University, Czech Republic)**

Barbora Padrtová holds Master degree in Security and Strategic Studies from the Faculty of Social Studies of the Masaryk University in Brno. Since 2013 she has been pursuing her PhD studies in International Relations there. She also studied at the Metropolitan University in Prague and at the Universiteit Twente in Netherlands. In 2011 she was working at the Political Section of the Embassy of the Republic of Iraq in Washington, D.C. She was also working at the Bratislava-based Centre for European and North Atlantic Affairs (CENAA) as Programme Director for Transition and as junior research fellow.
Andrey N. Petrov (ARCTICenter, University of Northern Iowa, USA)

Dr. Andrey Petrov is Associate Professor of Geography and Director of the UNI ARCTICenter in Cedar Falls, IA. Dr. Petrov is an economic and social geographer who specializes in Arctic economy, regional development, demography and post-Soviet society. His current research is focused on regions of the Russian and Canadian North and concerns regional development, spatial organization, and restructuring of peripheral economies. Dr. Petrov leads the NSF Research Coordination Networks in Arctic Sustainability (Arctic-FROST) and coastal social-ecological systems (Arctic-COAST). He is also serves as the Chair of the American Association of Geographers Polar Geography Specialty Group, IASSA Councilor and U.S. Representative for the IASC Social and Human Sciences Working Group. He is a co-editor of Arctic Social Indicators II (2015) and a lead author of the Arctic Human Development Report II (2014). Dr. Petrov holds two doctoral degrees: from the University of Toronto (Canada) and from Herzen University (Russia). He received his Master’s degree at the University of Northern Iowa, and his bachelor’s at Herzen University in St. Petersburg, Russia.

Jim Powell (University of Alaska Southeast, USA)

Jim Powell is an Assistant Professor at the University of Alaska Southeast (UAS), where he teaches natural resource policy, sustainability, and local governance. His research includes community and institutional response and adaptation to climate change in Alaska, Greenland, and the Yukon Territory. Alaska Native observations and their adaptation to environmental change are central to Jim’s work. Before his appointment at UAS, Jim spent 28 years in environmental management, focusing on water quality and wetland issues. Among his other appointments, Jim was the Special Assistant to the Commissioner of the Alaska Department of Environmental Conservation (DEC) and was also an Assistant Director for the Division of Environmental Quality at DEC. His public service includes nine years on the City and Borough of Juneau Assembly with three years as Deputy Mayor. Today, Jim balances his teaching with serving on several state and local nonprofit boards; he also lectures and consults on sustainability planning. Jim has a PhD in Natural Resources and Sustainability Science from the University of Alaska Fairbanks, a Master in Public Administration from UAS, and a Bachelor of Science in Environmental Studies from Eisenhower College at Rochester Institute of Technology. He is a member of the Ecological Society of America’s Rapid Response Team, and is on the Board of Directors for the Arctic Winter Games Team Alaska.
Rasmus Ole Rasmussen (Nordregio, Sweden/Denmark)

Dr. Rasmus Ole Rasmussen is Senior Research Associate at Nordregio – Nordic Centre for Spatial Development – under the auspices of the Nordic Council of Ministers, and Professor at Roskilde University, Denmark. Dr. Rasmus Ole Rasmussen has research experience in relation to Regional Development, Regional planning, and Statistical Analysis. He has extensive knowledge in relation to the Nordic Countries, is recognized as a capacity in relation to the North Atlantic and Arctic development, among other things being responsible for the Nordic Arctic Research Program, and the main author of the book Megatrends (TemaNord 2011:527). He has working experience in relation to sparsely populated regions and the Circumpolar North which has involved assignments within the last decades as Associate Professor at NORS – North Atlantic Regional Studies, Roskilde, Denmark; Nordic Professor, Arctic Centre, Finland; Statistical Manager, Greenland Home Rule, and Visiting Professor in Canada (McGill University; Université Laval), Alaska (University of Alaska, Fairbanks), and Russia (Kola Science Center).

Gertrude Saxinger (University of Vienna and Austrian Polar Research Institute, Vienna, Austria)

I am a trained anthropologist and post-doctoral researcher/lecturer at the Department of Social and Cultural Anthropology at the University of Vienna, Austria, where I work in a research team on "Environments, Mobilities, Technologies" with Peter Schweitzer. As a founding member of the new Austrian Polar Research Institute (APRI), and spokesperson of the Regional Group Circumpolar and Siberian Studies of the German Association of Anthropologists (DGV), I am actively promoting Arctic social sciences in non-Arctic countries. Serving on the IASSA Council means that not only represent scholars from these regions, but also to foster scientific collaboration among newly emerging research groups and established scholars and centers. Furthermore, I am active in the University of the Arctic's Extractive Industry Working Group and the Pan-Arctic Ph.D program on extractive industries.
Peter Schweitzer (University of Vienna, Austria and University of Alaska Fairbanks, USA)

Peter Schweitzer is Professor at the Department of Social and Cultural Anthropology at the University of Vienna and Professor Emeritus at the University of Alaska Fairbanks. His theoretical interests range from kinship and identity politics to human-environmental interactions, including the community effects of global climate change, and his regional focus areas include the circumpolar North and the former Soviet Union. Schweitzer is past president of the International Arctic Social Sciences Association, and past chair of the Social and Human Sciences Working Group of the International Arctic Science Committee (IASC). He is the editor of Dividends of Kinship (Routledge 2000), co-editor of Hunters and Gatherers in the Modern World (Berghahn 2000), Arctic Social Indicators (Nordic Council of Ministers 2010), and Arctic Social Indicators II: Implementation (Nordic Council of Ministers 2015), and co-author of Russian Old-Settlers of Siberia (Novoe izdatel'stvo 2004; in Russian).

Nikolay Shiklomanov (George Washington University, USA)

Dr. Nikolay Shiklomanov’s main area of research is the response of the Arctic environment to climatic variability and change. He is also interested in Geomorphology, history of Arctic research, and socio-economic problems associated with development in Arctic regions. Dr. Shiklomanov’s educational background includes a BS in physics from Leningrad (St. Petersburg) University, Russia, a master’s in physical geography from SUNY-Albany, and a Ph.D. in climatology from the University of Delaware. For the last 9 years he held a research associate position at the University of Delaware’s Geography Department where he was actively involved in permafrost and climate research. His NSF- and NASA-sponsored projects include both field-based investigations in northern Alaska, Siberia, Mongolia, and China and simulation studies at regional and circumarctic scales. He strongly believes in international collaboration between scientists in all aspect of Arctic research through development of joint projects and of promoting international scientific exchange (including students). Native of St. Petersburg, Russia, Dr. Shiklomanov maintains close personal and professional ties with his home country. In the course of his research he has developed productive relationships with scientists from a wide range of Russian research and Educational institutions.
Hunter Snyder (Dartmouth College, USA)*

Hunter Snyder is a fisheries social scientist studying human behavioral ecology and social-ecological systems of small-scale fisheries in the PhD Program in Ecology, Evolution, Ecosystems and Society at Dartmouth College. Previously he was based at Harvard Business School in Boston, Massachusetts. He earned his Masters in Anthropology from the University of Oxford in 2014, during which he undertook fieldwork among small-scale fishers in the Nuuk Fjord of Greenland with support from the National Science Foundation, Arctic Social Sciences Program. While in Oxford, he earned a Fulbright US Student Program Research Fellowship to continue his fieldwork in Greenland for the following year. From 2014-2015, he studied the adaptation strategies of subsistence hunting and fishing livelihoods amid large-scale fishing activity and industrialization. Snyder is a Consultant with the Food and Agriculture Organization, a Research Associate with the Arctic Studies Center of the Smithsonian Institution and a member of the Hunters and Fishers Household Economies Working Group of IFRO, University of Copenhagen.

Chris Southcott (Lakehead University, Canada)

Raised in Northern Canada, he has been involved in community-based research in the Circumpolar North for almost 25 years. During these years he has published over 80 scientific reports, books, book chapters, and articles dealing with social and economic change in Northern Canada and the rest of the circumpolar world. Recently he co-edited the first ever work to analyze the effects of globalization on Arctic communities (Heininen and Southcott, 2010) and the first ever work on migration in the Circumpolar North (Huskey and Southcott, 2010). In 2009 he was asked by the Northern Development Minister’s Forum to write their major report on the changing economies of the North (Southcott and Irlbacher-Fox, 2009). Over the past 10 years he has led several major Canadian and international research initiatives dealing with social and economic development in northern regions. He leads the Social Economy Research Network for Northern Canada and Resources and Sustainable Development in the Arctic (ReSDA) project. In the recent past he led Canadian participation in the European Science Foundation-lead Boreas project dealing with migration in the Circumpolar North. Since 2005 he has been Chair of the University of the Arctic’s Research Outreach program. In 2009 he was chosen by UNESCO to represent Canadian social science in their International Experts project on Sustainable Development and Climate Change in the Arctic.
Natalie Unterstell (Harvard University, USA)*

Natalie Unterstell holds a Bachelor’ degree in Business Administration from Fundacao Getulio Vargas and a Master in Public Administration from Harvard John F. Kennedy School of Government. Natalie has worked in the Secretariat of Strategic Affairs of the Brazilian Presidency, in the Brazilian Ministry of the Environment, in the Government of Amazonas and in the Instituto Socioambiental. She has been a member of the Government of Brazil’s negotiation team at the United Nations Framework Convention on Climate Change (UNFCCC) and also acted as a civil society's observer to negotiations before that. Her work deals with the economic analysis of climate change impacts and related adaptation strategies. She is interested in how mediation and conflict resolution can help building safe space for dialogue on difficult climate-risks assessment and decisions.

Anna Varfolomeeva (Central European University, Hungary)*

Anna Varfolomeeva is a PhD Candidate at the Department of Environmental Sciences and Policy at Central European University, Budapest, Hungary. Her research is devoted to articulations of indigeneity and the relations of indigenous communities with extractive industries in two mining regions of Russia (Karelia and Buryatia). She holds her Master's degree (2012) from Central European University, the Department of Nationalism Studies; her MA thesis focused on the evolution of the concept "indigenous people" in the Soviet Union and the Russian Federation. Prior to starting PhD Anna conducted research at Uppsala Centre for Russian and Eurasian Studies within Uppsala University, including fieldwork in Jokkmokk, Sweden. The research was supported by Sverker Åstrom Foundation for the Furtherance of Swedish-Russian Relations. Anna is a Council member of Association of Polar Early Career Researchers (APECS) for 2014/15 and 2015/16 terms.
Tatiana Vlasova (Institute of Geography, Russian Academy of Sciences, Russia)

Tatiana Vlasova is a leading researcher at the Institute of Geography, Russia where she received her PhD in social/economic geography. She graduated from Moscow State University's Geographical Department as a physical geographer. Her experience in the Arctic is based on her fieldwork and participation in several international multidisciplinary projects such as; Arctic Climate Impact Assessment where she served as a representative from RAIPON, Local Health and Environmental Reporting from the Indigenous Peoples of the Russian North (UNEP Grid-Arendal), Arctic Social Indicators, and the Arctic Resilience Report as an IASSA representative. During the IPY 2007-2008 she served as a member of the IPY Committee of Russia and on the Sub-Committee on Observations. Her current research interests include socially-oriented observations and assessments of quality of life conditions and human capital development involving traditional and local knowledge. She is the leader of the project team devoted to the construction to the "Integrated Arctic Socially-Oriented Observation System" (IASOS), a network of observation sites in the Russian North, supported by the Russian Foundation for Basic Research (RFBR). She is a co-chair of the International Geographical Union Commission on "Cold Region Environments."

Enrico J. Wensing (Columbia University, USA)

Dr Wensing is research faculty at George Mason University, Old Dominion University, and The University of the Virgin Islands. Starting September 2016 he is a Postdoctoral Visiting Scholar at the Department of Human Development, Teachers College, Columbia University. Through his research he is seeking to implement an international core curriculum for civic engagement (CC4CE) that combines transdisciplinary community-based research with integration and implementation science (I2S). He is researching civic engagement education that empowers young learners (P-20) to take effective and ethical action across contexts and cultures on the mounting social and environmental challenges of our time. He is focusing on research that characterizes, optimizes, and mobilizes 21st-century competencies for civic engagement, interdisciplinary knowledge co-production, and transdisciplinary research collaboration. He is a cultural, educational, and social psychologist that is integrating these sub-disciplines in psychology for action on social and environmental problems that will help transition societies towards global sustainability. Therefore, as a psychologist, he is developing a new sub-discipline called Arctic Psychology, which builds on CC4CE to provide an opportunity for I2S specialization that focuses on action towards well-being in Arctic communities as it relates to their past, present, and future.
Alexander Zolotarev is the head of Press Office at the Skolkovo Institute of Science and Technology and adjunct Assistant Professor of multimedia journalism at Moscow State University in Russia. He is also a Visiting Scholar at the ARCTICenter in Cedar Falls, IA. Prior to this appointment he was founder and CEO of SochiReporter.ru, Innovator-in-Residence at the University of Nebraska-Lincoln and Fulbright Scholar at the City University of New York. Mr. Zolotarev’s research concerns the culture of journalism convergence in a multimedia world, as well as communication of science and scientific knowledge to the public. He also is a winner of the prestigious digital news innovation award, the Knight News Challenge. He authored two books and worker as staff editor in the Russian edition of the Esquire magazine, as special projects editor for Harvard Business Review (Russia), National Geographic (Russia), National Geographic Traveler (Russia) and other magazines. Mr. Zolotarev holds MS in International Journalism and ABD from Moscow State University School of Journalism.
Abstracts

Mining for Truth: Conceptualizing Precious Metal Mining in Northern Minnesota

Ryan Bergstrom, University of Minnesota, Duluth

Stretching from Duluth, Minnesota, north and east towards the Canadian border, the Duluth Complex, a 1.1 billion year old horse-shoe shaped intrusive component of the Midcontinent Rift System, is considered by many to be the world’s largest undeveloped deposit of precious metals including copper, nickel, palladium, and molybdenum. As a result, numerous extractive companies from across the globe are in the process of conducting Environmental Impact Assessments, and obtaining mining permits for future actions through the State of Minnesota, the U.S. National Forest Service, and the Environmental Protection Agency. Proponents suggest that extraction can be accomplished in an environmentally benign manner and in the process create nearly 1,000 jobs and $500 million in economic benefits annually. Opponents suggest that the 250,000 annual visitors to the Boundary Waters Canoe Area, the most popular Wilderness Area in the United States, and other tourists in northern Minnesota already provide over 18,000 jobs and $800 million in economic benefits annually, and that mining will permanently impair the regions environment and the tourism industry it supports. The precious metal mining debate has become highly polarized, and the upcoming decision by the State of Minnesota will determine the fate of the regions environment and economy for decades to come. Because of the highly contentious nature of these debates, it is imperative that the perceptions of local communities regarding resource extraction be documented, and a better understanding of the goals, indicators, trends, and driving forces of such perceptions is needed. The understanding to be gained is linked to questions of power, social and institutional interactions, and land use/land cover change, and will be particularly relevant for regions in which public land management agencies play important roles in determining resource management and land use. This study examined the conceptualization of the precious metal mining debate in Minnesota through the content analysis of local newspapers from four communities (Grand Rapids, Duluth, St. Paul, and Minneapolis) between 2014 and 2015. Findings suggest that while perceptions of precious metal mining differ based on proximity to and dependence on mining activity, they are also heavily influenced by local politics, and socioeconomic characteristics. It is hoped that this study will improve our understanding of how residents of resource-intensive communities and regional and local decision-makers perceive the impacts of resource extraction (environmentally, socially, and economically), how those perceptions inform locally produced and extra-local policies and are subsequently acted upon, and how institutions and agencies influence community goals. In addition, it is also believed that this study can be used as jumping on point for comparative assessments that critically examine socioecological interactions between resource-intensive communities in Arctic and Sub-Arctic regions, and those in the northern United States, and in the process highlight the importance of Arctic sustainability and its global relevance.

Local Arctic Energy Research in a Global Framework for Sustainable Development: the Case of the UiT Renewable Energy Center and Collaboration with the Energy Studies Institute-National University of Singapore

Rasmus Gjedssø Bertelsen, UiT-The Arctic University of Norway, Norway
This paper reports on and discusses the newly established transdisciplinary energy research center at the University of Tromsø—the Arctic University of Norway and the case of its emerging collaboration with the Energy Studies Institute of the National University of Singapore. The purpose of the paper is showing how a leading Arctic university can engage in transdisciplinary energy research including partnership with a leading Asian university with contributions to comprehensive sustainability both at a local Arctic level and a global level in Asia.

Arctic communities have historically been natural resource-based economies with challenges for comprehensive sustainability. Therefore, there is both research and policy interest in pursuing more knowledge-based innovative economic development in the Arctic, as in other natural resource-based economies. Arctic knowledge-based economic development around local human capital and natural resources promises a more comprehensively sustainable development. Such Arctic development can also hold important lessons for other regions of the world. Arctic communities should pursue supplying the world with ideas, knowledge and solutions rather than commodities. One area with promise of local knowledge-based development in the Arctic with valuable lessons for the world is energy. Therefore it is valuable to look closer at the example of the new energy research center at UiT and some of its global connections.

In spring 2016, the board of UiT decided to invest 13 mil USD in a new university-wide center for renewable energy research combining natural sciences, social sciences and technology. This center shall contribute to green transition of society, both locally and globally. The center will work in inter-faculty teams and projects concerning renewable energy and greenhouse gasses. The academic focus of the center is around six themes: a. renewable electricity generation; b. ethics and societal perspectives; c. distributed production and use; d. thermal energy; e. biomass; f. managing CO2.

Norway is increasingly cognizant of the need to develop a more sustainable socio-economic-environmental model than oil and gas. UiT is very aware of this as well, for instance, illustrated by UiT participation in the Paris COP21 and the upcoming Marrakesh COP22. UiT is also very aware of the need to engage in renewable energy teaching and research both for its institutional sustainability, employability of graduates and contributions to local, regional, national and global development.

This new UiT renewable energy center must engage in global cooperation to achieve local and global, academic and practical sustainability goals. One example is cooperation with the Energy Studies Institute of the National University of Singapore. The Arctic interest(s) of Singapore are particularly interesting for discussing Arctic knowledge-based economic development around energy in a global context.

Today the Arctic is deeply affected by globalization driven by Asian economic growth. This is reflected in the Arctic Council observer status of China, India, Japan, South Korea and Singapore since May 2013. Much attention has been given to the large Asian countries and their interest in Arctic natural resources and shipping routes. Less attention has been given to Singapore, which resembles the Nordic countries in being a small, highly developed country. Singapore has some of Asia’s highest ranked universities and is a regional center of research, innovation, education and knowledge-based products and services.

The Energy Studies Institute of the National University of Singapore aims to be Asia’s leading transdisciplinary energy studies institute and think tank. Energy use in Asia is of global sustainability consequences since Asia holds a majority of humanity and eventually of the world economy again. ESI-NUS is a driving force of Arctic research in Singapore and is engaging
partners from all Arctic states, UiT in the case of Norway, for Arctic energy research with relevance to Asia. Returning to the point that the Arctic should rather export solutions than commodities, Northerners in extreme Arctic conditions can easily fall prey to thinking that their conditions are unique and their solutions are not relevant to, for instance, tropical societies. However, the energy research dialogue between Asia and the Arctic through ESI-NUS is one interesting example of the Arctic to global sustainability questions. Island operations and micro grids are a major challenge to comprehensively sustainable energy supply in the Arctic, but that is also the challenges to countless islands and isolated communities throughout Southeast Asia and wider.

**Communicating about Environmental Health Risks in the Arctic**

*Amanda Boyd, Washington State University, USA.*

Indigenous populations are recognized as a potentially vulnerable group to environmental health risks due to their intimate relationship with the environment, and reliance on local environments for aspects of culture, health and well-being in many circumstances. This is true of Indigenous populations residing in the Arctic, who rely heavily on a traditional diet of marine mammals and fish. These foods are important for cultural and health purposes and are historically and culturally significant. Some of these traditional food sources have been contaminated by mercury that originates from industrial sources such as coal-fired power plants in the south, and is drawn to the Arctic by ocean and air currents. Therefore, it is critical for health authorities and communicators to better understand how to effectively communicate about both the benefits and potential risks of these food items.

There are numerous challenges associated with communicating about contaminants to Indigenous populations. Research examining the complexities of communicating about contaminants have found that language barriers between English and native languages is often a challenge. However, these challenges are further compounded by the use of western scientific language to communicate to a non-scientific audience and also the differing perspectives in which Inuit and scientists view the environment. The Inuit rely on a system of knowledge, referred to as Traditional Ecological Knowledge. Traditional Ecological Knowledge (TEK) “explains the world on the basis of centuries of observation, oral interpretation, and passing on of events and patterns, with an emphasis on the observable and a belief that humans and the physical/biological world are completely intertwined” (Furgal et al., 2005).

In some cases, early attempts at communicating about contaminants to the Inuit led to a shift away from traditional foods. A shift away from these foods can have negative economic and health impacts, as store-bought food is both expensive and can cause increased incidences of diabetes and heart conditions (Myers and Furgal, 2006). Furthermore, differing reports on mercury contamination in country foods have created a confusing mixed message (Myers and Furgal, 2006). Therefore, a critical need exists to examine and understand how to better communicate about environmental health risks to Indigenous populations of the Arctic. To meet this goal, a systematic literature review was conducted to consolidate peer-reviewed research published between 1980 and 2014 on the communication of environmental health risks to Indigenous populations. The comprehensive literature review procedures included searching databases and key journals that represented various fields in communication, environmental health, and Indigenous studies. The review yielded a total of 4,469 potential articles and a total of 14 of these
manuscripts met the inclusion criteria. The 14 articles were analyzed to provide lessons learned for effective risk communication.

Factors that influence successful risk communication strategies with Indigenous populations include: (1) Developing messages that are congruent with the populations’ cultural beliefs and understanding of the environment; (2) including Indigenous populations in message design and delivery; (3) using credible and trustworthy spokespeople in message delivery; (4) identifying and utilizing effective communication materials and channels; and (5) ensuring that messages are understandable to the target audience. Barriers to effective communication and health risk management were often linked to cultural, economic and geographic factors.

Gaps in the literature include the lack of longitudinal studies that empirically measure changes in perception, awareness and behavior, as well as a general lack of theory-based research. Results from this review will provide directions for future research to help guide the development of more effective risk communication research and strategies to Indigenous populations. The presentation will provide lessons learned and discuss how Arctic researchers can communicate their results better to Indigenous populations.

Comparison of Pan-Arctic and Amazon Basin Regional Governance Mechanisms

Katie Burkhart, Maxwell C. McGrath-Horn and Natalie Unterstell, USA

The steaming Amazon and icy Arctic may be polar opposites at first glance, but in fact share many characteristics. Both regions are intricate webs of complex ecosystem drivers and disruption in either region triggers global climate impacts. A comparison of regional governance mechanisms reveals critical lessons that each can learn from the other as they strive for sustainable development.

Regional approaches to development are required to meet local needs while protecting the global climate. Yet, existing governance mechanisms for inclusive decision making in the Arctic and Amazon, the Arctic Council (AC) and Amazon Cooperation Treaty Organization (ACTO), are still developing. The ACTO coordinates between eight nations, numerous non-governmental organizations, multilateral institutions, and outside actors, to formulate and coordinate regional policy. In the Pan-Arctic region, the AC is the primary governance body that brings together the eight Arctic nations, six indigenous peoples' organizations, and extra-regional observer states and organizations. Aside from these main bodies, both regions have multiple layers of governance from local cooperation structures to regional resource agreements and the overarching international laws. Yet despite the proliferation of governance bodies, both face major challenges. Currently, balancing development of natural resources with preservation in both regions depends on national interests and capabilities--lacking regional oversight and monitoring. This ad hoc approach is especially inadequate as the impacts of climate change alter whole ecosystems. The AC and the ACTO are able to coordinate between political groups and administer regional projects for data collection, measuring, and analysis. However, there is no regional normative system by which national and subnational actors can set rules, collaborate, and adjust responsibilities over time. Through comparison, bi-directional lessons emerge that can inform and enhance sustainable development efforts in both regions.

For example, the Arctic Council provides a superior framework for engaging indigenous peoples by incorporating them as Permanent Participants. Their participation not only promotes the interests of the indigenous groups within national and regional decision making bodies, but also
adds legitimacy to the AC itself. This legitimacy is important as the AC shifts focus to investment on sustainable development, enabling the AC to endorse, define, and implement norms and rules. While the ACTO has programs to protect indigenous peoples' rights and support their wellbeing, they hold no formal role in the governance structure. Norms for indigenous consultation, such as the “free prior and informed consent,” exist but are not codified in the political institutions, resulting in decisions that do not necessarily incorporate the interests of indigenous groups. Both regions have room to grow in their genuine inclusion of indigenous groups, and a comparative study between them can help identify gaps and formulate solutions.

An example of a local success from the Amazon biome can be applied in both regions: small-scale sustainable norms around specific commodities. In Brazil, private and public actors, through multi-stakeholder processes, were able to develop and implement sustainability standards for soybean cultivation that drastically reduced deforestation rates, created compliance mechanisms in the market, and increased farmers’ productivity. The “forest friendly soy” efforts can serve as a model for other industries, including mining and oil exploration, in both the Amazon and the Arctic.

Figure 1 shows annual deforestation rates and soy and beef prices in the Brazilian Amazon between 1994 and 2013.¹

In another example, Brazil’s leadership in the Amazon Basin helped the ACTO overcome a major funding constraint. A results-based payment for environmental services system was established, whereby meeting environmental goals like reducing deforestation, unlocks international funding. That experience has not only benefited Brazil but also lifted technological and financial barriers, giving other Amazon nations access to resources that would otherwise be unavailable. The importance of regional leadership can be applied in the Arctic, or on other tough issues in the Amazon.

Lifestyle migration to the Arctic: implications for sustainable rural community development

Doris Carson, Umeå University, Sweden

This presentation discusses the contributions of international lifestyle migrants to rural community development in the sparsely populated north of Sweden, drawing on a case study of the inland municipalities Sorsele, Arjeplog and Arvidsjaur. This region has recently managed to attract an increasing number of immigrants from Central Europe who moved to northern Sweden for rural lifestyle reasons and started up a range of small businesses and socio-cultural initiatives. Based on interviews with immigrants, as well as local government, industry and community stakeholders, the paper examines how the social, cultural and economic interactions between new immigrants and local residents impacted upon the formation of local community capital and sustainable development. The results show how immigrants emerged as important drivers behind new economic development initiatives, in particular tourism. They were successful at commercializing local resources in novel ways, by introducing new ideas, skills, market knowledge, and exogenous market and distribution networks. Yet, an in-depth social network analysis reveals that immigrants made limited contributions to networks, collaboration and knowledge exchange with other local stakeholders, thus limiting learning outcomes and innovation diffusion at a local system level. Reasons for this lack of systemic interaction were diverse and included: socio-cultural distance between immigrants and locals (including differences concerning language, operational practices, business attitudes, and social network priorities); limited trust among locals towards new immigrants resulting from high migrant turnover in the past; conflicts of interest between the immigrants’ lifestyle aspirations and local development priorities; and issues around the formation of expatriate networks and immigrant enclaves. Finally, the relevance of the theoretical framework is discussed in relation to its applicability to other immigrant mobilities in sparsely populated Arctic areas.

Arctic Resilience Assessment: Main Findings and Global Linkages

Marcus Carson, Stockholm Environmental Institute, Sweden

With its increasing popularity both within and outside of the Arctic, resilience comes in many variations; the ARA definition emphasizes the role of human agency, since once we begin to talk about social-ecological systems and how to respond to change, human agency becomes a central concern. This is true of both the Arctic and elsewhere. The assessment has identified 18 distinct regime shifts that appear to be underway in the Arctic – changes with thresholds that are potentially irreversible. Quite a lot is known about some (sea ice loss), less about others (fisheries collapse or disturbances in marine food webs), but very little is known about how these changes are likely to interact with each other, with potentially very messy and disturbing consequences. We also know that the changes taking place in this sensitive area won’t stay there, just as the most powerful factors driving Arctic change didn’t originate there. People are responding to Arctic change at many different scales. Among communities in the Arctic working to navigate the diverse localized changes taking place, the single most important characteristic conferring resilience – the capacity to effectively steer themselves into a changing and unpredictable future – is the capacity for “self-organization.” The AHDR frames this in terms
of fate control, and it is also described in other terms, but it speaks to both endogenous (i.e. Capacity to come together, come to consensus and carry out a set of actions in response to changing conditions) and exogenous factors (i.e. Legals rights) that influence action options. At the circumpolar scale, The Arctic Council has emerged as an important actor and a forum for discussion and deliberation. Unique in many ways, it operates in an increasingly complex and densely populated governance environment that are pushing it to redefine itself and its role. The social-ecological problems with which the AC grapples are also changing and expanding, growing beyond the AC structures that were built to understand or respond to them. How the AC will respond to these challenges remains an open question.

The ARA identifies a number of existing practices and pathways that hold promise for building resilience. By building on and further extending promising efforts already underway, the ARA highlights means for strengthening Arctic resilience that have a good chance of being implemented by being expanded, replicated and tested. We see opportunities for wider impact both through strategies for implementing change processes, and through lessons drawn from an especially sensitive and dynamic region.

**Local economic development in Nunavik**

*Nathan Cohen-Furnier, Tufts University, USA*

Over the past century, Inuit communities of Nunavik have experienced significant political, cultural, and economic transformations. In a context where the global race for the Arctic’s riches is speeding up, the living conditions remain disquieting and the region relies heavily on the government (Robichaud & Duhaime, 2015). “Past experiences have shown that Northern communities have benefited little from resource exploitation” (Southcott, 2013). Although resource development surely has potential, it will intrinsically be short-lived. Given the lack of job opportunities and a young, fast-growing population (Duhaime, 2008), local economic development deserves more attention. Increasingly, entrepreneurship is seen as a viable career path for youth around the world. In Nunavik, there has been few research on their role as agents of social change. My contention is that entrepreneurs can act as a collective force to bridge the region to the global economy in an empowered and self-determined manner. Since the signing of the James Bay and Northern Québec Agreement in 1975, we have seen some illustration of this trend (Air Inuit, Soleica, arts & crafts, etc). Most of the works on economic development in Nunavik have focused on: ! The links between extractive industries and sustainable development (Rodon, 2013, 2015; Duhaime, 2008). The social economy and the role of Land Claim Organizations (Rodon, 2013). The role of cooperatives as a supplement to entrepreneurs (Dana, 2010). !!Map!of!Nunavik Nathan Cohen-Fournier Local Economic Development in Nunavik 2 Objectives Throughout this research, I will strive to understand the context for small businesses and entrepreneurs in Nunavik. In the process, I will attempt to answer the following questions: ! What are some of the main challenges and opportunities faced by entrepreneurs in running their businesses, especially once they have secured funding? How is entrepreneurship defined and perceived in modern Inuit society? What are the broader implications of entrepreneurship in Nunavik? This research could serve as a case-study illustrating a remote population trying to cope with climate change and globalization in a post-industrial world. The results published could serve the local community in order to harness growth inclusive to their culture and identities. To fulfil this action research, I spent two months during the summer of 2016 in Nunavik. I collaborated
with the Kativik Regional Government and, more specifically, with the Regional and Local Development Department Team. I partnered with local economic agents to develop a community-driven deliverable. Together, we gathered both in-depth perspectives and quantitative information on local economic development in Inukjuak, an Inuit community comprised of approximately 1,600 inhabitants. For the greater region of Nunavik, I spent ten days in Kuujjuaq, the administrative center of Nunavik. I am collaborating with Makivik Corporation, the Land Claim Organization of Nunavik, and they will support me by connecting me with entrepreneurial and small businesses in the region. Project’s Approach, Significance, and Relevance Nunavik is in a unique position as a rural and extreme region, home to a distinctive culture that has undergone fundamental shifts as a result of globalization. The Arctic as a whole is receiving increasing attention from the Great Powers as global warming makes resources more accessible and maritime transportation a likely possibility. Unbounded economic development is likely to take place without international governance. Given their legal claims to these territories, Indigenous communities have a crucial role to play. How will the new generation of Inuit entrepreneurs shape the future of their communities? Which path to development will they adopt? An interdisciplinary approach and an open dialogue with the inhabitants of Nunavik to understand their perspective on development will enable me to answer these questions.

Creative Practices of Sustainable Art in the Arctic

Herminia Din, University of Alaska Anchorage

The environment is a global concern, both in global warming and pollution caused by human activity. Given widespread interest in connections with the Arctic, art can contribute to increased awareness of these concerns. A case can be made that not enough creative programs related to conceptualizing and creating sustainable art activities and/or displays in Anchorage. The goal of this paper is to present a collaborative learning experience among University of Alaska Anchorage faculty and students from diverse disciplines by focusing on two cases: Junk to Funk and Winter Design Project. Responding to the recycled-based art movement, Junk to Funk was created in 2008. The belief was that “closing the loop” by reducing consumption and reusing waste materials is an essential link in the recycling effort to save our valuable resources especially in the Arctic region. Six Junk to Funk art projects were developed that included a “plarn” (plastic yarn) shopping tote, magazine/wrapping paper bowl, old magazine notecard, recycled paper book using traditional sewing bookbinding technique, t-shirt scarf, and telephone wire & paper-bead eco-jewelry. A transformation was observed in how the participants began looking at “waste” materials differently. Perhaps the most rewarding aspect was the participants’ awareness of the quality of art that could be created from recycled products. This project also planned two major events during the academic year. In the fall semester, it worked with the UAA Bookstore to offer a First Friday fundraising event to raise fund for Kids’ Kitchen, a nonprofit organization dedicated to providing nutritional meals for children at no cost. In the spring, an event and auction sale of the recycled products was organized in collaboration with the Grassroots: A Fair Trade Store in midtown Anchorage, and UAA Office of Sustainability, a part of the “Earth Day” celebration. Community-based art education encourages the social responsibility of the artist and educator. When students learn how they can play a vital role in the health of their community through the arts, an integrated perspective is gained. Students find self-expression in relation to the world around them as the
community is strengthened in the process. The Junk to Funk project also gained broader attention within the Anchorage community. Further collaborations were undertaken including working with more community agencies to promote the recycling effort. These included the Homeward Bound/Rural Alaska Community Action Program that houses homeless people and works to find resources to help create self-sufficiency, Alaska Youth for Environmental Action Group, a high school environmental education and leadership program of the National Wildlife Federation and Older Persons Action Group that provides statewide advocacy of older persons’ issues through community action programs. In March 2014, three 90-minute Junk to Funk art series—family friendly workshops teaching visitors how to make treasures from trash, were offered at the Anchorage Museum in conjunction with Gyre: The Plastic Ocean1 exhibit. By collaborating and interacting with other community agencies, Junk to Funk inspired new ideas and elicited creative action from people who participated. Subsequently, the Winter Design Project was developed in 2013 in connection with the Arctic region and strengthens our collaboration with the University of the Arctic (UA) Thematic Network on Arctic Sustainable Arts & Design (ASAD). The Winter Design Project started as a pilot project to determine if the use of design intervention in an outdoor setting would enhance campus participation. With UAA administrative support from Facilities & Campus Services, Student Life and Leadership, Dining Services, University Advancement, the Office of International and Intercultural Affairs, the Office of Sustainability and the Center for Community Engagement and Learning, along with help from individual faculty, staff and students, the project successfully transformed the usually empty quad into an interactive winter outdoor playground using sustainable medium only. There were over 55 staff and faculty, and more than 250 students directly involved. It was evident that the variety of these educational experiences enabled the faculty and students to participate and transform a campus outdoor space. Faculty were able to design and incorporate a class assignment within their disciplines, and most importantly to engage participatory experience in an under-utilized winter outdoor space. This project required much time and effort, but the collaborative effort produced a greater interest among faculty and students about these issues and to further explore how to create a more participatory experience on campus. Grounded in educational theory and practice, the most meaningful outcome of these projects was to engage students in hands-on learning experiences focused on a theme of global significance. It gave them a strong foundation of “best practice” in community- and environmental-based teaching and learning, and to cultivate their artistic practice for future endeavors. In addition, these projects provided faculty an opportunity to connect university and the Anchorage community, and the satisfaction of serving others through sustainable art forms. It reinforced the benefits of collaborative effort directly related to artistic expression. By presenting this paper, it is hoped that these experiences will provide participants a new perspective through a focus on art/design practice, recycling and local sustainable resources.

**Evaluation of the Arctic Council’s role in sustainable development norm-making in the Arctic: “the strength of weak ties”**

*Camille Escudé, Sciences Po Paris Doctoral School, France*

In this paper, I will try to make a critical assessment of the impact and influence of the Arctic Council as main environmental norm producer in the Arctic. The key to success of the Council
lies in its generative role, and over the years the AC has built a foundation on shared norms and values. We will therefore observe the progress of AC deliverables and agreements, the consequence of the evolution from a norm and policy-shaping to an increasingly policy-making body, and the political visions that underlines its production.

The AC has often been viewed as politically ineffective, with lots of talks but little action on issues relating to its mandates of environmental protection and sustainable development. It turned out that despite - or thanks to its internal limitations, the AC reached big results in terms of norm-making, after the twenty first years of his term.

The mandate of the Arctic Council is the sustainable development in the Arctic: what can the rest of the world learn from the AC on sustainable development issues? In the AC, the sustainable development can be understood as a very flexible concept. This concept is balanced between the growing economic development and the environmental protection. It is very interesting to note, that in the AC, the environmental norms are subsumed by the wider goal of sustainable development. That’s why norm-making in the AC has shift from a “environmental protection” focus to an “economic development” focus.

We would like to accentuate the paradox of a soft law body that produces binding agreements, advocating for the "Strength of Weak Ties”, resuming Mark Granovetter's expression (1973). Ironically, the strength of the AC is to have managed to remain flexible with its structure and organization of soft law, which could be a precursor medium to cooperate in the global field of environment, given the relative failure of current international environmental negotiations. It is this strength of flexibility, this ability to bend without breaking flexibility in international relations that seems particularly valuable in operation of the AC, as a facilitator of regional cooperation.

We will therefore need to make a quick return on the emergence of soft law concept in the international law context, which has a growing usage and power for thirty years in order to respond to new forms of cooperation and norms in the field of sustainable development. Soft law is often viewed as a step in the development of the standard that would evolve in time in hard law. My approach is on the contrary to consider the soft law as a new and particularly effective method to implement environmental and sustainable development standards. It seems to be the direction the AC moves, which is likely to implement binding agreements retaining its soft law structure. The persistence of soft law instruments may have significant advantages in regions like the Arctic, where the history of cooperation is very short and where our understanding of problems is evolving very quickly. In this way, this paper will try to answer to the following question: “What Can Arctic Sustainability Research Learn Teach the Rest of the World?”

**Living Culture, Learning Skills, Telling our Stories: The case of the Na Cho Nyak Dun Cultural Center in global movements for cultural sustainability**

*Joella Hogan, Na-Cho Nyäk Dun First Nation Self-Government, Canada, Susanna Gartler, University of Vienna, Gertrude Saxinger, Austria*

Cultural centers around the globe play a vital role in the cultural revival efforts of indigenous societies. With increased agency and self-determination the focus has shifted from sole display and preservation towards an active engagement with the living culture of resilient and active peoples. This is the case not only in Canada, but across the globe in different cultural contexts (Hendry 2005, Comaroff and Comaroff 2009). Mayo, and the Na-Cho Nyäk Dun First Nation (a Northern Tutchone group) specifically, represents a community influenced greatly by state expansion via settler colonialism and the development of the extractive industry in the Canadian
North in the 20th century. Cultural centers and associated activities can be seen as part of what Neufeld (2016 forthc.) frames as cultural revanche – the ongoing process of resistance, maintenance of resilience and agency amongst (in this case fairly recently) colonized peoples in order to achieve cultural sustainability. This paper aims to bring forward lessons from the planning process of the NND culture center in Mayo, Yukon Territory and interlink it theoretically to movements and debates elsewhere on the globe. Northern Tutchone people became sedentary after the mining booms at the turn of the 20th century turned the confluence of the Mayo and Stewart Rivers into the transportation hub of Mayo. First Nations people became part of the cash economy and, in 1915, built their own village across the river from the current town. The Federal Government intervened at this location in the early 1950s and an enforced move was undertaken from what is now the “Old Village” to the east side of Mayo. The Federal Government required the move to this particular land, but elders told that the people’s intention was to move, when possible, to the clay cliffs that are on the Mayo side of the river. The ancestral burial grounds are here, the land is sacred and the topography stable. Finally, a decision was made at a General Assembly in 2002 to plan a move to this high ground. Plans were drawn up for a new Government House and sub-division that would utilize the geothermal aspect of this site. A core area for future development was identified. A cultural centre was envisioned as a part of the complex at that time. It is anticipated that the proposed cultural centre will provide the community with a gathering place that everyone takes pride in and which instills the appreciation of the rich, long history of the Northern Tutchone people and reflects the diverse cultural backgrounds. The cultural center will be place for citizens to learn traditional skills and knowledge to live their lives in a good way. It will be a welcoming place for the broader community to learn about NND heritage and culture. People want to see their culture being lived and practiced at the cultural centre. It is not just a museum to display and talk about “old ways” - it is a place to bring our old ways into life today, and to foster the pride and joy that comes with them. Skills like sewing, working with hides, making medicines, drumming and singing, and making tools could all be taught and learned at the centre. In this way, the main focus of the centre is on serving the community’s cultural growth, with other visitors being a secondary consideration. The community wants to make sure that the cultural centre includes the stories of the NND. These stories start from the legends of the long-ago time, to the stories of life on the land and in the Old Village, through residential schools, influx of miners and their families and land claims negotiations, and right up to modern self-government. Cultural centers are always also conditioned by transcultural and transnational factors and can be seen as part of the “mechanisms by which groups attempt to articulate with the outside world” (Harkin 2004: xxxiv). Thus - and in accordance with an ontology that values good relationships above all – an active engagement with culture, the transfer of skills and the wisdom of the First Nations’ stories will help to ensure cultural sustainability and well-being for settlers, First Nations and visitors alike. While Mayo and the Na-Cho Nyak Dun First Nation is a case study of only 600 people, the dimension of cultural loss through colonization and the strong efforts and success over the past years in revitalizing culture is of significant relevance to put it into a broader, global context. On the one hand this can support NND citizens to learn from previous efforts of other societies. In turn, discussing the NND cultural house contributes to the global debates of rather recent colonialism and effects of hegemonic assimilation policies. This paper also highlights the strength and self-determination that led in the late 20th century to the rather unique system of the Yukon self-governing First Nations. Cited literature: Comaroff, J. L. and J. Comaroff (2009). Ethnicity, Inc. Chicago, Ill.; London, University of Chicago Press. Harkin, M. E., Ed. (2004). Reassessing Revitalization Movements. Perspectives from North America and the Pacific Islands.
Climate Change Adaptation in Alaska: “I have a great anxiety for the future of my children.”

_Davin Holen, University of Alaska Fairbanks, USA_

Climate change as a global phenomenon that offers an uncertain future is often amplified by the media. Lost in this discourse is clarity in the message to northern communities of the state of the science and how local observations are taken into consideration in the verification of climate impacts at the local level. It has become difficult for local people to understand what are actual effects of climate change and what are weather and climate variability. Alaska has more coastline than the rest of the United States combined and a high degree of variability of climate impacts. On the northwest Arctic coast of Alaska climate impacts include changing weather patterns and more frequent storms, rising sea levels, coastal erosion, flooding along rivers, reduction of the snow pack leading to less water in the environment, sea ice reduction, and permafrost thaw. In other parts of Alaska, and also observed in the Arctic, climate change produces longer term and more unpredictable climate related events such as heavy rains causing flooding, ocean acidification affecting shellfish and lower trophic level species important in the food web, warming ocean temperatures affecting salmon, snowfall variations, warm springs followed by frost affecting wild berry production, changes in the forest environment including the die off of cedar trees, invasive species, and toxins in marine species important for subsistence. All of these factors impact food security and culturally important resources in the marine, coastal, tundra, and forest environment. There is now a rush to assist communities in creating climate change adaptation plans. These plans emphasis providing funding and resources to tribes to draft their own climate adaptation plans. In the process residents are flooded with the message that there will be severe changes to their communities in the coming years that will gravely affect their way of life. Projections of climate change such as sea level rise, increased storm events, and warming trends melting permafrost are often for the end of the century or even further in the future, extending well past what residents might see in their own lifetimes. Having observed residents in climate change adaptation workshops and meetings these projections of change cause great anxiety and a lack of hope for the future for participants and hope for the future of their children. The message has also been reduced to how much money will be needed to move communities or assist them in adapting. This furthers the dependency of communities on the government and decision makers in far off cities in the South. This presentation will discuss recent climate change adaptation efforts in rural coastal communities in Alaska. There will be a focus on how climate scientists can refine their message to show communities how the environment is changing now, what are the drivers of that change, and how current drivers align with what local residents are observing. Examples of some of these efforts by climate scientists working in Alaska will be given. The presentation will also present how communities can be part of and empowered by the process of data collection as they are keen observers of the environment. This presentation will argue that the discussion needs to be about how residents can take small steps to adapt today to what is occurring and begin the planning process to adapt to changes that they will see in their lifetimes. Climate change will impact communities and adaptation to these changes can be an opportunity to empower communities to
build capacity and provide for improved community wellbeing and sustainability. Alaska Natives have been adapting to climate change and rising sea levels for thousands of years. Knowledge and observations made by rural residents of Alaska of the changing climate can become part of the solution to adaptation and provide feedback for scientific observations creating a dialogue with climate scientists that will ultimately lead to the adaptation solutions of the future.

**Alaska’s Economy: World War I, Frontier Fragility, and Jack London**

*Lee Huskey, University of Alaska Anchorage, USA*

The economic history of resource frontiers has often been written as a story of boom and bust. In Alaska the mining boom of the early 20th century was brought to an end by the economic bust that commenced with the start World War I. The War affected the Alaska economy both directly and indirectly. The wartime inflation and the opportunities for work in the wartime industries resulted in the collapse of gold mining in the Territory and the exodus of much of the non-Alaska Native population. Increased problems with shipping and the delay in the construction of the Alaska Railroad magnified the economic hardship. While the copper and fishing industries prospered during the war years both suffered decline at the end of the War. The economy remained in the doldrums until World War II ushered in the next Alaska economic boom.

The boom-bust story of the frontier economy assumes the economy is fragile. Frontier economic growth mirrors the growth of its staples production which depends on external markets and natural conditions. The end of staples production in this story meant the end of the economy. Observing the Klondike gold rush Jack London concluded that the frontier economies might be less fragile than usually assumed. He suggested that staples economic booms might leave something behind after the staples sector declines. Some firms in the supporting industries attracted to a region by the resource boom may stay behind after the bust. London predicted that the left behind businesses and infrastructure would create future economic opportunities.

The Jack London Hypothesis can be stated as “Resource development changes the support sector in ways that last beyond a particular resource boom and encourage future economic activity”. This first part of the hypothesis was tested by comparing the changes in the support sector of the Alaska economy to changes in the overall economy and its staples component. The 1910 and 1920 US Census and the 1915/1916 and 1923/1924 Polk Directories provided data for the test. The pattern of change in the support sector in response to the decline in the staples industries after World War I was consistent with the first part of the hypothesis. Decline in support sector industries did not mirror the decline in the staples industries. As London predicted the support sector was changed in ways that lasted beyond the resource boom.

Economic resilience in Northern resource based economies is still a concern. Northern communities often see mineral or petroleum production as the only opportunity for economic growth (Southcott, 2015). However, since the resources are finite this development comes with an eventual end. The boom-bust story predicts the finite resources place a limit to the growth of the local economy. The Jack London Hypothesis presents the possibility of a more optimistic post resource boom story. Structural changes that occur during the resource booms may change the economic environment in ways that promote future opportunities. Local policy makers may wish to pay attention not simply to resource development but also to the part of the economy that is left behind after the boom.
Researchers as Actors: Consideration of the role of research in creating sustainable Arctic communities

Jennifer Jones, University of Guelph, Canada

Impact and benefit agreements (IBAs) and health impact assessments (HIAs) are outside actors in the development of sustainable communities in the Arctic. These mechanisms are increasingly being used to assess, address, and mitigate impacts associated with extractives sector developments, such as a mine, in places across Northern Canada. IBAs and HIAs, through a combination of procedures, methods, and tools analyze how a proposed mine might influence the health of a population. Coupled with the growing authority of Indigenous governments, shifts in regulatory obligations, and societal expectations of mining firms, these mechanisms have done much to challenge the long unequal relationship between mining firms and Indigenous communities. Despite these achievements, mechanisms used in the governance of the extractives sector remain problematic, particularly in Northern, largely Indigenous jurisdictions. Community members often comment that impacts of residential schools, dispossession, and loss of culture have not been addressed in the assessment and negotiation of a mine. This is largely because mechanisms like HIAs, IBAs and associated licenses are challenged to recognize the impact (both historical and contemporary) of colonialism on Indigenous health and well-being. Moreover, these mechanisms are imbued with Eurocentric concepts, terms, and language that position theses mechanisms as outside actors that Indigenous governments need to navigate to ensure benefit to their communities. However, these mechanisms and their challenges, along with industries and governments involved in the governance of the extractives sector are not the only outside actors that require an analysis of their role in the sustainable development of the Arctic. It is important to include the ‘researcher’ and ‘research institution’ in the list of actors that impact, influence, and contribute to the health and well-being of Northern Indigenous populations. Often driven by institutional agendas, research networks, funding priorities and/or timelines, it is important to question how the researcher, as an outside actor, informs the outcomes of a research project and subsequent policy. Even with the use of community-engaged methodologies, the interaction between the community and a researcher and/or research team can lead to situations where the research findings do not necessarily reflect what is really at issue. What the researcher understands to be at issue; how the community chooses to engage with the project; and, what is funded as a result of funding agency priorities may differ and indeed result in outcomes that continue to miss what really matters to Arctic communities. Implementation of research that considers the ability of mechanisms used in the governance of the extractives sector in Yukon to address the legacies of colonialism on Indigenous health and well-being reveals the importance of considering the intersection of the multiple outside actors, including academic researchers, in shaping research and subsequent policy. Building from a strengths-based approach, and Submitted by Jen Jones, PhD Candidate, Department of Geography, University of Guelph 3 recognizing that research in the Arctic is committed to responding to community level concerns, this presentation aims to stimulate conversation on the role academic researchers as outside actors have in defining research outcomes and what this might mean for research addressing issues of sustainability in the Arctic. Findings draw upon decolonizing research scholarship and critical observations made during the implementation of the PhD research objectives. Community-based and participatory approaches guide this research and have included the development of a community advisory committee, hiring and training of research assistants, and a signed agreement with the First Nation Chief and Council. This presentation also benefits from findings of a systematic realist literature review that sought
to reveal how Arctic health research seeks to respond to community level concerns. Concentrating on the role of negotiating entry into a community, the relationship between the community and the researcher, and the role that community vetting of information may play in the research outcomes, as well as situating Arctic research in a history of mistrust by communities, this presentation seeks to offer new ground for those working with communities in the Arctic and globally in which the legacies of colonialism continue to prevail.

The United States National Ocean Policy and a Sustainable Arctic

Beth Kerttula, (former Director, National Ocean Council, USA)

This presentation will discuss lessons from the United States National Ocean Policy for the Arctic. In 2010, through Executive Order 13547, President Obama established the National Ocean Policy for the United States. Far-reaching in its goals for the ocean of sustainability, ecosystem-based management and collaborative governance, it was the first policy in the United States to join federal, state, and tribal governments to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems. The policy calls for its implementation through the National Ocean Council, and federal agencies and creates nine locally based marine regions across the country. Alaska is its own region, but has not yet created a Regional Planning Body. If a region voluntarily participates through the formation of a Regional Planning Body and creates a marine plan that is concurred with by the federal agencies, the “federal agencies … will use the marine plan to inform and guide their actions in the region consistent with their existing missions and authorities.” Marine Planning Handbook, National Ocean Council, 2013 https://www.whitehouse.gov/sites/default/files/final_marine_planning_handbook.pdf This is a powerful tool, somewhat similar to the United States Coastal Zone Management program and provides direct input for traditional and local knowledge, information and data into federal decision making on ocean issues.

There are many things that Arctic sustainability research can learn from the National Ocean Policy and the work that has already happened under it, including its requirement that Tribes be at the table as Co-Chairs of Regional Planning Bodies. Other important actions under the National Ocean Policy include its requirement of coordination across federal, tribal, state and local governments to deal with critical ocean issues such as ocean acidification and harmful algal blooms. There is currently a Task Force formed under the National Ocean Council that is creating a new national process to deal with illegal, unregulated and unreported fishing. Other important areas of work include dealing with marine debris and sea level rise. This talk will discuss the National Ocean Policy and the work that has taken place under it, including a description of the United States’ first Draft Regional Ocean Plans in the Northeast and Mid Atlantic Regions. These plans were adopted by the Northeast and Mid Atlantic Regional Planning Bodies earlier this year and are currently out for public notice. When they are formally concurred with, they will incorporate the use of robust data portals that will be used by decision makers concerning regional ocean decisions. See NE Data Portal here: http://www.northeastoceandata.org Ship traffic, whale migration, recreational use, and fisheries information will be, for the first time, readily available for use in a manner that will allow decision makers to easily see what is happening in the ocean region. This is of particular interest for the Arctic, given the tremendous increase in shipping, recreation, and interaction with subsistence hunters.
Social and Environmental responsibility of Russian oil and gas companies in the Arctic region

Anastasia Kornilova, Moscow State University, Russia

Social and Environmental responsibility of Russian oil and gas companies in the Arctic region Nowadays corporate social and environmental responsibility (CSR) practices are becoming more widespread and popular among the world. Russian companies also take CSR as a basis for future long-term development what is confirmed by the fact that almost 150 Russian companies are now reporting on their CSR activities (Moscow Exchange Annual Reports Competition, 2015). The reasons for the implementation of such responsible practices are not only the preservation of brand and reputation of companies but also the awareness of the Russian companies’ heads that such practices are essential and necessary for preserving natural and cultural heritage for future generations and developing human potential (KPMG, 2014). For the purpose of this research, following UNIDO, CSR can be defined as the way through which a company achieves a balance of economic, environmental and social imperatives (“TripleBottom-Line-Approach”), while at the same time addressing the expectations of shareholders and stakeholders and managing social and environmental risks. CSR practices elaborated and implemented with the help of best practices of stakeholder engagement and risk-management can help companies create real societal value by internalizing companies’ externalities (KPMG International, 2014). Externalities may be positive or negative. Positive externalities are defined as economic, social or environmental benefit that a company creates for society and for which it may not be rewarded in the price of its goods and services (Bobylev, 2010). Negative externalities are economic, social or environmental costs that a company inflicts on society for which it does not directly pay a price. For instance, pollution of the river by the lemonade factory is a negative externality for which local people pay by cleaning the water from this river for their needs. The establishment of educational programs for the staff by a company is an example of positive externalities – Starbucks pays for the employees to attend distance learning courses. Internalization of externalities is a process through which a company is more fully rewarded for the societal benefits it creates and/or pays for more of the costs it inflicts on society (Bobylev, 2010). And only through the internalization of externalities, realization of CSR practices companies can create societal value – economic, social and environmental value created for society in the course of doing business. The issue of this research concerns CSR activities of Russian oil and gas companies that operate in the Arctic region. Key research question is how do Russian oil and gas companies that operate in the Arctic implement best international sustainability and responsibility practices and, therefore, create societal value. What are the main projects that are undertaken by the companies, how do they minimize negative social and environmental externalities and increase positive ones, do they understand urgent problems and needs of their stakeholders, whether they engage stakeholders into the dialogue or not, and whether positive externalities, made by the companies, exceed negative ones. Answers on these questions are based on the Russian oil and gas companies’ Annual Non-financial Reports 2014 as these reports may be perceived as the best official source of reliable information about sustainability and responsibility practices of the companies. All the reports show how the 2 companies perceive the value they create, which achievements are they proud of and which scopes for development do they envisage. The analysis is undertaken for the following six Russian oil and gas companies: Gazprom Neft, Lukoil, Rosneft, Zarubezhneft, Surgutneftegas, and Novatek. The analysis shown the following results: • All the six companies undertake many efforts to mitigate their negative influence on the environment and society. They implement educational, health and safety projects,
charity and sponsorship, support for local communities and indigenous peoples, energy-efficiency programs, GHG emissions reduction, waste-management, recultivation of soil etc. Moreover, corporate social and environmental responsibility is indicated as one of the companies’ priorities in the reports of all the six companies. However, social and environmental risks are perceived as significant by only 4 companies such as Gazprom Neft, Zarubezhneft, Surgutneftegaz, and Novatek. In addition, only Gazprom Neft and Lukoil have identified their key stakeholders, engage them into the dialogue and receive constant feedback from them concerning the relevance and effects of the implemented responsible projects. As a result of this research we can conclude that CSR practices are mostly perceived by the six companies as essential activities of environmental and social responsibilities such as emission reduction or charity projects, however, social and reputational risks are rarely included into the list of the most significant risks of the Russian Arctic oil and gas companies. There are several scopes for development for Russian oil and gas companies that operate in the Arctic region: to identify and evaluate main environmental and social risks; to identify main stakeholders and establish more profound relationships with them in order to indicate the main needs and problems in order to help solve them; to invest more in the creation of positive externalities; to invest more in the minimization of the negative externalities. These activities will help Russian oil and gas companies create more value for the long-term perspective and achieve sustainable development in the Arctic region.

**Resource extraction and infrastructural networks in the North of Irkutskaia oblast**

*Vera Kuklina, V.B. Sochava Institute of Geography, Russia*

Sustainable development is a challenging task for planners and communities relied on resource extraction. In order to extract rich natural resources of Siberia the network of cities, roads and transportation hubs was built in its remote parts in the Soviet time. With significant amount of northern provision, wage benefits, and use of propaganda many young and active people were attracted to the North. After the collapse of Soviet system and subsequent out-migration construction of pipeline “East Siberia - Pacific ocean” in 2006-2009 was presented as an impetus for social and economic development of Siberia. Although current industrial development is mostly provided by commuting workers, as it was proposed by Hill and Gaddy (2003) and the recent strategies of economic development of Siberia. Such practice does not take into account neither the long history of inter-mix and mutual assimilation of indigenous peoples and “starozhils”, nor existing from the Soviet time urban infrastructure. Moreover, in case of Irkutskaia oblast and Republic of Sakha (Yakutiia) new private infrastructure is more in use. Development and maintenance of urban infrastructure, its informational, waste, sewage, food and energy flows are becoming the main challenges for cities and especially in conditions of remoteness. Increasing complexity of informational systems and software requires recruitment of the specialists with higher qualification, who have higher demands on quality of life.

In order to achieve balance between social, economic, and environmental concerns the local communities might develop more advanced sociotechnical networks. According to ANT-theory these networks might include practices, things, technologies, and animals (Latour, 2012). The authors will discuss additional efforts and technologies that are needed to achieve sustainability in these remote regions? The theoretical framework is provided by B. Latour (Latour, 2005), S. Graham (Graham, 2000), and C. Humphrey (Humphrey, 2005).
Data gathered from participant observation and 16 interviews with local authorities, representatives of small businesses, and ordinary people are supplemented with quantitative information from censuses, community and government records. Infrastructural networks of extractive companies now are catching up with highly developed parts of the world offering previously assumed public goods – roads, airports, electricity and gas services, and telecommunication links. It is interesting that in remote areas of Siberia such process is outpacing more economically developed and populated areas of the southern parts of Russia. Especially it is evident in case of roads and telephone connection.

At the same time irregularity and limited access of local dwellers to public transportation lead to occupation of houses in the margins of the cities, where less resources are needed for housing and the prices for apartments are lower than in the central parts. Staying for several weeks with relatives or former neighbors they reproduce the rural ways of life (use of water from the rivers, absence of sewers, food from village or forest).

Such practices change the notion of urbanism in different directions: in man camps and among tourists in Irkutsk region urban practices spread beyond the city limits, while in the outskirts of small towns rural practices penetrate in the cities. As a result, the prospects of development of a new approach to the notion of urban sustainability are needed to be discussed.

A Preliminary Framework for Analysing Arctic Sustainable Economies in a Global Context

Joan Nymand Larsen, Stefansson Arctic Institute & University of Akureyri, Iceland

A set of basic pillars for a framework for analysing Arctic sustainable economies in a global context, which includes attention to resilience, and human wellbeing is presented. Examples from Greenland are presented. The Arctic Social Indicators framework - building on the findings of the latest ASI and AHDR reports – is used as a point of departure. Analysis is presented on some of the necessary adjustments and fine-tunings needed to update and extend the indicators framework while incorporating a number of bio-physical considerations. The framework is employed to help identify existing and potential future stressors to be considered in studying adaptation and resilient Arctic community futures. Possible adaptation options and strategies are considered, including constraints on implementation to enable transformation to a more resilient future with lower risk. Preliminary reflections are made on possible ways of connecting results from analysis within this framework, including indicators data and measurements, with the policy level. The focus of the presentation is on Arctic sustainable economies and the broader question of what Arctic sustainability research can learn from or teach the rest of the world, while also addressing questions related to the broader theme of sustainability and sustainable development in the Arctic or Sub-Arctic of particular relevance to the rest of the world. The presentation shows the importance of getting the social and bio-physical indicators right, and the need for effective risk management and effective identification of key risk factors as a way of providing opportunities for effective adaptation measures to reduce risk and increase resilience, and to help further the pathway towards more sustainable economic futures.
Relations between Sustainable China and Sustainable Arctic

Xia Liping, Tongji University, China

Three major pillars of sustainability:
There are three major pillars of sustainability: economic development, social development and environmental protection. The three pillars of sustainability are not mutually exclusive and can be mutually reinforcing. In fact, the three pillars are interdependent, and in the long run none can exist without the others. The three pillars have served as a common ground for numerous sustainability standards and certification systems in recent years.

In order to realize regional sustainability, we must reach the two major balances:
- Balance between economic development and environmental protection;
- Balance between social development and environmental protection.

Sustainable development consists of balancing local and global efforts to meet basic human needs without destroying or degrading the natural environment. The question then becomes how to represent the relationship between those needs and the environment.

Impact of the Changing Climate Conditions of the Arctic on China:
With the warming of the Arctic, which speed has been faster than what people expected before, the ice sheet of the Arctic has been melting. The sea lanes of the Arctic will be open and the environmental change of the Arctic has been under way. The impacts of the environmental change of the Arctic on China will be very complicated. The melting of the ice sheet of the Arctic will cause more adverse extreme weather in China, which may lead to more natural disasters, having negative impacts on the ecological security and food security of China. The openness of the sea lanes of the Arctic will benefit the international transportation and foreign trade of China. China has been also faced with the opportunity of exploitation of the natural resources in the Arctic. The environmental change of the Arctic is of importance to future existence and development of the human beings, and also of importance to the national interests of China. China, as a country near the Arctic, must pay the attention on the environmental change of the Arctic Region and its impacts on the common interests of human beings and national interests of China. China should have proper policy towards the environmental change of the Arctic and its impacts.

The concept of Harmonious Arctic should become the fundamental thinking of governance of the Arctic. There are three levels of the concept of Harmonious Arctic Region, including:
- Harmony between human beings and nature.
- Harmony between countries concerned.
- Harmony between people and people.

What China should Do in Order to Contribute to Sustainable Arctic:
- China should realize its domestic balance between economic development and environmental protection and domestic balance between social development and environmental protection.
- China should accept Sustainable cultures as one of the new concepts of its national development.
- China can actively contribute so that the Arctic serves the joint interests of all humankind.
- China should actively participate in international organizations relating to the Arctic, participate in the establishment and completion of an international Arctic system, and play active roles in Arctic-related international organizations. These are important methods and ways for China to participate in Arctic matters as a reasonable stakeholder.
China’s Role in the Changing Governance of Arctic Fisheries

Nengye Liu, University of New England, Australia

As the Arctic Ocean becomes gradually accessible, an enhanced governance of fisheries in the Arctic Ocean is urgently needed. Although the Chinese government has never published China’s official position on the Arctic, China is no doubt very interested in the Arctic. Nowadays China has become an economic powerhouse and an increasingly influential global player. As one of rising powers – countries with significant economies that aim to expand their influence abroad while pressing for reform of global governance – China is seeking to deepen participation and expand national interests in international regimes. Since December 2015, two meetings on High Sea Fisheries in the Central Arctic Ocean were held in Washington D.C, United States. China, the European Union, Iceland, Japan and the Republic of Korea were all invited to engage within a broader process toward the prevention of unregulated commercial fishing in the central Arctic Ocean. This paper examines China’s role in the changing governance of the Arctic fisheries. The paper first describes China’s increasing fishing interests in the Arctic. Then the paper focuses on answering the question: what role would China play in the Arctic fisheries governance. This has two aspects. First, China’s domestic decision-making process on Arctic issues is analyzed. This is to provide a clear picture about China’s current Arctic policy and its potential external impact in the Arctic Ocean. Second, China’s participation in negotiations of Arctic fisheries issues within various organizations is assessed. The paper would pay attention to ongoing meetings on the establishment of Central Arctic Ocean fisheries management regime, meetings of the Arctic Council and the United Nations negotiations on an international agreement to govern the conservation and sustainable use of the high sea.

Can mining in the Arctic contribute to sustainable development? A multidimensional framework for assessing impacts of extractive industries

Annika E. Nilsson, Stockholm Environment Institute, Sweden

The concept sustainable development is abundantly used as a normative goal for Arctic policy and overarching frame for research in the Arctic, but its full meaning is rarely integrated into explicit analytical frameworks. This is a challenge when Arctic communities or national policy makers need to assess the potential consequences industrial projects, such as extractive industries, and also address current shortcomings in meeting basic human security needs and development expectations.

The overarching conceptual base for sustainable development is well established and the global policy community has taken several steps towards operationalizing the goal. Importantly in 2015, 17 specific Global Sustainability Goals were adopted with the overarching aim to “end poverty, protect the planet, and ensure prosperity for all” by 2030. This definition includes the three standard pillars of sustainable development – environmental, social, and economic – but lacks explicit attention to time as a key dimension of not “compromising the ability of future generations to meet their own needs”, made explicit in the 1986 Bruntland report. Moreover, neither of these potential foundations for assessing impacts of extractive industries includes attention to the multi-scalar nature of the social and environmental processes in today’s globally connected society. For the purpose of research that aims to investigate the potential impacts of industrial development on sustainable development or proposed policies, it is therefore necessary to further operationalize the concept.
As part of efforts in a recently funded Nordic Centre of Excellence – Resource Extraction and Sustainable Arctic Communities (REXSAC) – this presentation will provide some initial thoughts about specific concerns that need be included in a serviceable analytical framework. They range over three dimensions: time, issue areas, and space. The assessment of any specific activity would need attention to all three dimensions.

The time dimension is about not compromising the choices available to future generations, but can also serve as a way to highlight how present opportunities and challenges are the result of past choices. It ties into the discourse of resilience with its dynamic systems perspective and also to an increasing focus on adaptation as a long-term process and a need to ensure generic long-term adaptive capacity. It requires identifying ways to monitor and assess the features of society and the environment that contribute to this capacity, and how these features are linked to each other. The presentation will highlight some conceptual work from the Arctic Resilience Assessment and the assessment Adaptation Actions for a Changing Arctic, but also point to a need to link these efforts to various existing indexes of human development and environmental status in order to make the conceptual understanding operational in an assessment setting.

The issue dimension has received substantial lip service and has more recently also been in focus for methods development. One example is the attempts to link environmental status to human well-being as well as to economic value with concepts such as ecosystem services. The concept has its critics and limitations, not least in an Arctic context, but nevertheless illustrates efforts towards a more systematic approach. Another example is the nascent work of translating the Global Sustainability Goals into specific assessable targets. So far the SDG efforts have not focused on the Arctic, but would be relevant to explore as a way of connecting Arctic and global assessment frameworks. Similar to the point raised about time dimensions, it should build on previous method development aimed at assessing human development and environmental status, such as the work related to Arctic Social Indicators.

The spatial dimension is about attention to global-local interactions. While assessments usually choose one focal scale, such as a specific locality/community, the national level, or the global, many local activities can have national and global impacts and vice versa, global processes and national decision often have important local impacts. Moreover, most industrial activities in the Arctic are closely connected to global markets, which in turn raise sustainability issues related to both production and consumption of resources. Whether extractive industries in the Arctic can contribute to sustainable development is thus a much larger issue than looking at the local sustainability impacts.

It is usually difficult to include equal attention to all these dimensions within any one research project. However, this presentation will argue that the development of a more explicit framework that takes, time, space, and issue dimensions into account is an important first step in operationalizing sustainable development as a dependent variable when Arctic communities and national decision makers need to assess the pros and cons of suggested projects or policies.

The role of non-Arctic states in the long-term sustainability of the Arctic region

Barbora Padrtova, Masaryk University, Czech Republic

The importance of Arctic region is growing fast as it opens up for new opportunities as well as challenges for all Arctic states. However, the Arctic is not an isolated region. The developments on the global level influences the regional developments as well. The recent developments in Ukraine has changed the security architecture in Europe as whole and thus has influenced the
security dialogue in the Arctic. It is important for the West to keep open the communication channels with Russia, however behavior of one actor in a specific region cannot be separated from the rest of the world. Thus, it should be the utmost priority of all Arctic states to keep the region as a zone of peace and stability. Although, the official military cooperation between NATO and Russia has been halted, the dialogue and cooperation in several other areas on the local level still continues. Besides "Arctic Five/Eight", many non-Arctic countries have expressed their interest in the Circumpolar region. Since 2013, there are 12 observer states in the Arctic Council. The presentation aims to answer whether it is sustainable to keep open for more and new observers. Three EU member states are members of the Arctic Council. Furthermore, the European Union has been on the "waiting list" for obtaining full observer status quite a long time. The aim of my presentation is to seek the answers questions like ‘where non-Arctic states can contribute to long-term sustainable development of the region?’ Some of the non-Arctic countries have been admitted as permanent observers to the Arctic Council. What is their role? How those states can be engaged in the socio-economic development of the Arctic? Moreover, majority of European countries are also NATO and EU members. How current security developments and recent changes in the European security architecture, affects the cooperation in the Arctic, especially in regard to relations with Russia? How the refugee crisis influences the security developments? Those are some of the questions my presentation will address. The key focus will be on the sustainability of the Arctic from the prism of non-Arctic states, more specifically from the Central European states.

Arctic Sustainability Research: Exploring Priorities and Global Connections

Andrey N. Petrov, Gail Fondahl, Annika Nilsson, and Peter Schweitzer (ICARP III White Paper on Arctic Sustainability Research Working Group)

The Arctic is among the world’s regions most affected by ongoing and increasing cultural, socio-economic, environmental and climatic changes. Over the last two decades, multiple stakeholders and rights-holders—local and indigenous communities—scholars, policymakers, extractive industries, local-global governments, local and indigenous communities—have turned their attention to the Arctic, its peoples and resources, and to challenges and benefits of impending transformations. This paper presents a progress report on Arctic sustainability research, identifies related knowledge gaps and global connections, and provides recommendations for prioritizing research for the future, in particular in relation to global knowledge base of sustainability science. Over the last decade sustainability scholarship in the Arctic made substantial progress in respect to theoretical development, empirical knowledge base and methodological advancement. There are four major methodological transitions: (1) move to integrate trans/interdisciplinary and mixed methods research, (2) re-orientation from looking at sustainable development as an outcome to studying, and engaging with sustainability as a process, (3) rise of knowledge co-production as a central epistemological paradigm, and (4) evolution of indicators research. Despite this progress there are considerable knowledge gaps, one of which the lack of integrated understanding of socio-ecological transformation in the Arctic, of how the Arctic is transforming and the consequences thereof, both in and beyond the Arctic. Despite some efforts to provide inter-regional, integrated analysis of socio-ecological transformations in the Arctic (for example, through circumpolar assessment, such as AACA, AHDR, ARA, etc.), there is still limited integration and synthesis of
existing case studies and findings from disciplinary research. Arctic sustainability scholarship is still attempting to establish its place in the global knowledge base of sustainability science. Although there are a number of areas where Arctic sustainability researchers may take a leading role (such as community-based work and knowledge co-production methodologies), there is a limited understanding of these contributions by scholars outside the region. Conversely, new trends and concepts in sustainability science developed in other regional contexts may have been slowly adopted in the Arctic-based scholarship. Expanding interregional and comparative studies, building connections to global and regional knowledge hubs around the world is one of the priorities of sustainability research in the Arctic.

From “The North” to North Dakota: Artic Lessons in Sustainable Development North Dakotans Wished They New
Andrey N. Petrov (ARCTICenter, USA)
This paper discusses social impacts of resource development in northwestern North Dakota in 2005-2015. The hydraulic fracturing oil boom in the state was associated with unprecedented social and economic changes in rural and small town North Dakota communities. The paper investigates these changes using local data and interview with residents. A particular attention is given to the role of companies and local governments in planning the boom and local persecutions of subsequent bust. A comparison is made to similar development processes in the Arctic. It is noted that the institutional weakness of North Dakota remote communities significantly undermined their ability to adapt to and benefit from the oil boom. A number of lessons can be drawn from the experiences in the Arctic to inform and improve the wellbeing of residents in the continental U.S.

How three social determinants suggest adaptive capacity of the Kenai River Fisheries in Alaska
Jim Powell, Krupa, M., Cenek, M., and Show, I. (University of Alaska southeast)
To survive the rapidly changing social-ecological systems in the North, communities must have adaptive capacity. From a social systems vantage point we studied social and institutional resources held by the community around the Kenai River Fishery in Alaska, one of the most intensely managed fisheries in the world. We employed semi-structured interviews and a social network analysis to survey the Kenai River’s natural resource managers, local elected officials, and non-profit organizations, about their perceptions of and responses to observations of climate change, and about social networks used to make decisions about resource management. We found evidence of individual and institutional learning, which are key features of adaptive capacity. Three social determinants interlinked by learning were identified: 1) local knowledge, 2) institutional response to climate change, and 3) social networks. Based on our survey results, the three social capital determinants listed above suggest the existence of community adaptive capacity on the Kenai River. First, there was a significant level of local ecological knowledge among elected officials, natural resource managers, and non-profit organizations of diverse demographic and educational backgrounds. Second, institutions at the local, state, and federal levels are responding to observation of climate change – using differing methods such as reactive
ad-hoc activities, collaboration, institutionalizing, and mainstreaming adaptive programs and procedures. Third, social network data showed highly connected communication networks across all stakeholder groups. The three social capital determinants suggest that community governance of Kenai River fisheries has a high level of social capital that indicates a high adaptive capacity.

**How autonomous countries within the realm of UN member states would implement the Voluntary Guidelines for Securing Small-Scale Fisheries (the SSF Guidelines) raises consequential uncertainties about the fate of small-scale fisheries writ large.**

*Hunter Snyder, Dartmouth College, USA*

Greenland, a former colony of Denmark, is ostensibly well-positioned to implement the SSF Guidelines for several reasons. However, despite a national emphasis on a more efficient offshore fishing fleet, Greenland continues to perpetuate an interdependent relationship with small-scale fishers. As a result, the resilience of both small-scale fishing (SSF) livelihoods and the region’s living marine resources are being challenged by growing opportunities on the world market, sole employment among small-scale fishers as well as the introduction of select neoliberal fisheries management throughout the Arctic (Thornton & Hebert, 2014). Greenland’s growth ambitions are not singular; it is a Northern country whose movements stage an array of regionally particular but globally parallel concerns for the recognition and development of small scale fisheries. A worldwide concern for drastic shifts in SSF’s is precisely what the Food and Agriculture Organization of the United Nations (FAO) seeks to address through the implementation phase of its SSF Guidelines.

As Greenland has not ratified the SSF Guidelines, we would like to (1) articulate the policy and management foundations that give rise to the assumption that Greenland should be well placed to implement the SSF Guidelines, (2) describe an empirical study of the interdependent relationship between small-scale fishers and large-scale fishing and industrial operations and (3) explore how the SSF Guidelines may address not just political recognition for SSFs, but may also stage socio-ecological perturbations that would have a significant effect on the relationships that SSFs have with large-scale operations, the natural environments in which they work and the political ecology of fisheries in Greenland.

Our study investigates the political ecology of Greenland’s small-scale fisheries in advance of their implementation (Forsyth, 2003). We cast our inquiry by way of explaining SSF governance in Greenland and how it shapes and is shaped by the country’s small-scale fishing activities that occur in large towns and settlements alike. Focusing on one settlement, we marshal empirical evidence of how Greenland’s SSF’s function and how the Guidelines may highlight the relational complexities between small and large scale fishers and buyers as well as upset a stable configuration of SSF stakeholders to their resources. Building upon an understanding of Greenland’s SSF policies and data from our study of SSFS, our analysis tests several hypotheses:

**H1:** If Greenland’s national policies emphasize both small-scale fishing traditions, human rights, gender equality, among others, as well as integrate small-scale fishers within the economy, then implementing the SSF Guidelines in Greenland should be programmatic and feasible.

**H2:** If the SSF Guidelines implore states to recognize and improve the competitive capacity of small-scale fishers, then the historical relationship of dependence and limited competition between small-scale fishers and large-scale operators will need to be deconstructed and reconfigured.
Scrutinizing the state of Greenland’s small-scale fisheries through the implementation of the SSF Guidelines would catalyze a debate which, we argue, would not be singular to Greenland. Instead, the process of deliberation could serve as early indicators for how other dependent member states implement the Guidelines as they reconcile competing interests, in particular low-effort fishing and cultural emphasis and local dependence upon small-scale fishing activities. If the SSF Guidelines are designed to recognize and support SSFs, then we find it necessary to understand where they are currently situated, how they function in relation to their competition, and ultimately of what utility the SSF Guidelines may be not just for small-scale fishers, but also what larger perturbations may emerge through implementing them.

The Discourses on Stone working and Sustainability in Two Mining Regions of Russia

Anna Varfolomeeva, Central European University, Hungary

The aim of my presentation is to analyze the influence of dominant discourses on the relations of indigenous communities with stone working in two regions of Russia. The research will focus on two case studies: the Vepses in the Republic of Karelia and the Soyots who reside in the Okinsky district of Western Buryatia in Siberia. The presentation will be based on participant observation fieldwork, in-depth interviews as well as the analysis of newspaper publications, legal acts and NGO documents. The articulation of indigenous identity and the definitions of indigeneity in many cases reflect the general relations of power in the society. Within these dominant discourses, which date back to colonial practices and the Enlightenment’s concept of “noble savage”, the relations between indigenous communities and extractive industries are often presented through oppositions such as “traditional activities” vs. “mining development” or “indigenous person” vs. “industrial worker”. The existing power relations are nowadays often questioned, and the emergence of indigenous subjectivities is the process taking place in different parts of the world. However, in trying to establish their subjectivities indigenous communities may still succumb to powerful dominant discourses of the state, extractive businesses or external actors (Donahoe 2011, Novikova 2014). The backgrounds of the case studies chosen for the in-depth analysis are similar in many aspects, and this factor influenced the choice. Both Vepses and Soyots reside close to rare mineral deposits (gabbro-diabase and raspberry quartzite in Karelia, nephrite in Buryatia), and they engaged in the extraction of these minerals already in the 18-19 centuries forming strong historical ties with stone working. During the Soviet period these indigenous minorities were to a large extent assimilated; this process resulted in significant linguistic and cultural loss. Both the Vepses and the Soyots started re-establishing their indigenous identities after the fall of the Soviet Union and the beginning of revitalization campaigns (Mongush 2012, Strogalschikova 2012). While in the case of Soyots an important part of revitalization campaign was the collaboration with American organization Ecologically Sustainable Development, the Vepsian campaign was influenced by several organizations based in Finland as well as Barents Region authorities. Both state discourse and these foreign influences could impact indigenous interactions with landscape and industry. Local connection to precious stones in Karelia and Buryatia remains strong even today when private companies are controlling mining in both of these territories. The relations of indigenous communities with extractive businesses in the region undoubtedly influence their perceptions of stone working in the regions of study. The Vepses and the Soyots have experienced several changing systems of power: the assimilation politics of the Soviet state, the cultural revitalization (alongside with the influx from their Western neighbors) in the 1990s and the current recentralization. Each of these discourses influenced their social identity, including their positions
towards extractive industry development. The case studies will be viewed in the general context of indigenous relations with mining in Russia. As many indigenous communities in the country share similar experiences of Soviet and post-Soviet periods, the research will contribute to the general scope of studies focusing on indigenous peoples and extractive businesses in the post-Soviet space.

Socially-oriented Observations in Understanding Local-Global Interdependences for Achieving Arctic Sustainability

*Tatiana Vlasova, Institute of Geography, Russian Academy of Sciences, Sergey Volkov, Institute of Agricultural Economy, Russian Academy of Sciences, Russia and Andrey N Petrov, ARCTICenter, USA*

The importance of the Arctic for the globe is becoming more and more evident from both biophysical point of view and goals for achieving social sustainability. The Arctic currently is experiencing not only unprecedented rapid change but threshold changes, which are generally difficult to reverse because they involve feedbacks that reinforce the changes. The rapid decline of Arctic sea ice is an example of such a threshold change, where large new expanses of open water prime the Arctic and the globe for further warming. Urbanization and demographic threshold changes having a cascading character also present challenges for the functioning of societies and environments. Anthropogenic impacts (land fragmentation by industrial and transport activities, pollution, global climate change) have cumulative effects. Major interlinking aims should be established and steps made in trying to investigate and control such spatially and temporarily cross-cutting changes and impacts that have both global ecological and local quality-of-life concerns of people living in the Arctic. Moreover it is necessary to find emerging new opportunities and appearing sources of resilience in complex socio-ecological systems to improve quality of life and rise capacities of northern people to response to change. Thus in prioritizing measures to adapt to such threshold changes and to mitigate negative forces and processes contributing to them, it is extremely important to consider their impacts on local people’s quality of life including health, access to food and drinking water, medical services, education, traditional cultural ecosystem services, etc. The Arctic complex multi-scaled and cross-boundary issues present challenges to management and regulatory control at different levels - from global, pan-arctic, national and local. In this respect the methodology of multi-scaled socially-oriented observations (SOO) of life quality and human capacities for responses to Arctic changes is going to be discussed. Implementation of the SOO in diverse Arctic local communities in different natural environments, countries, regions and localities tell us that Arctic communities experience not only locally specific, but common changes and mega-trends, both negative and positive for them. These changes and trends could be addressed through collaborative pan-Arctic and global activities such as sustainability monitoring, which methodology is now under development within the Belmont Forum “Arctic sustainability: the synthesis of knowledge” project.
An Introduction to Arctic Psychology: Towards a New Sub-Discipline for Integration and Implementation Science

Enrico J. Wensing, Columbia University, USA

We report here on our early development of a new sub-discipline to support Integration and Implementation Science (I2S) called Arctic Psychology. Emergent from the psychological sciences, it is presented in its current format as a synthesis of cross-cultural psychology, clinical psychology, health psychology, community psychology, and educational psychology. Our immediate objective with Arctic Psychology is to address the well-being of Arctic people and their communities as it relates to their past, present, and future. As described, research in Arctic Psychology seeks to help resolve the mounting social and environmental problems facing Northern communities, brought on by the impacts of a rapidly changing world, through I2S specialization in the psychological sciences. We seek to support the development of community-based I2S specialists in Arctic psychology through linked cross-boundary international knowledge networks that are community-based and university driven. At the same time, we are seeking to construct Arctic psychology as a model for I2S specialization in the psychological sciences so that it can be utilized worldwide for sustainable global futures.
### Participant Emails

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<td>Anna</td>
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<td>Tatiana</td>
<td>Vlasova</td>
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<td>Enrico</td>
<td>Wensing</td>
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<tr>
<td>Alexander</td>
<td>Zolotarev</td>
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