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

Community Sustainability in the Arctic:

What sustainability theories and practices work and what fail in Arctic Communities?

QAQORTOQ, GREENLAND, SEPTEMBER 12-19, 2017

Prepared by Andrey N. Petrov

Cedar Falls, 2017

ARCTICenter
Arctic, Remote and Cold Territories Interdisciplinary Center
University of Northern Iowa

Acknowledgements

This meeting representa an annual activity of the Research Coordination network (RCN-SEES) 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, Rasmus Ole Rasmussen, Jessica Graybill, Joan Nyman Larsen, Timothy E. Heleniak, and Ann P. Crawford.

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

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Update: Arctic-FROST Research Network in 2016

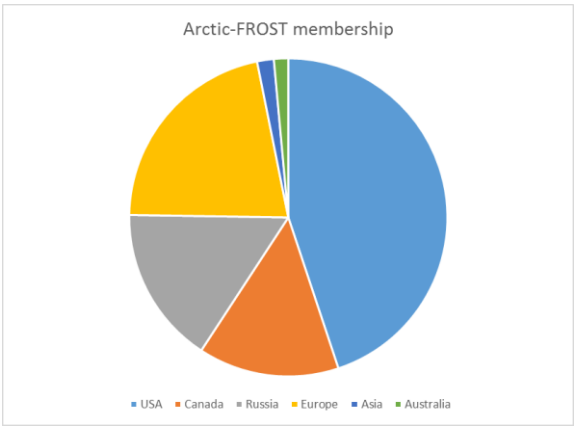
Andrey N Petrov (Arctic-FROST PI)

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 University of Northern Iowa's 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 400 members from 20 countries including all Arctic jurisdictions with 45% coming from the U.S., 22% from Europe, 16% from Russia, and 14% 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. Earlier events included the inaugural Arctic-FROST meeting–held in late 2013 at the University of Northern Iowa, 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, and the second meeting "Resources and Sustainable Development in the Arctic" in St. Petersburg, Russia on August 15-17, 2015.

2016 General Events

Annual Meeting. In 2016 Arctic-FROST held its third annual meeting and early career workshop in Vienna, Austria on September 9-12, 2016. This meeting's theme was "*Arctic Sustainability in the Global Context: What can we learn from or teach the rest of the world?*" It gathered a unique group of researchers representing multiple disciplines, demographic groups and countries, including scholars who do not study the Arctic or study Arctic affairs from the perspectives of non-Arctic nations. The meeting was followed by the early career scholar's workshop. The meeting concluded that (1) Arctic social sciences occupy the leading edge of multi-, inter- and transdisciplinary research focused on complex coupled systems dynamics and multifaceted transitions; (2) the Arctic is emerging as a region of research interest on a par with other parts of the world, and possibly a critical region of inquiry; (3) the contributions of Arctic social scientists to "non-Arctic" conversations, journals, and debates often remain less visible than those from social scientists working in other regions; and (4) comparative research is key to bridging the knowledge gaps.

In addition to the Vienna meeting, Arctic-FROST hosted and co-sponsored domain and side meetings, as well as workshops. These include: five Polar sessions at the American Association of Geographers Meeting (San Francisco, CA); Arctic Science Summit Week 2016/Arctic Observing Summit (Fairbanks, USA), International Geographical Union Meeting (Beijing, China). Arctic-FROST also held workshops "Artic Anthropology and Sustainability" in Sitka, Alaska (for early career scholars) and Mayo, Yukon (for Indigenous residents), both proposed by Arctic-FROST members. Arctic-FROST actively participated in the Arctic Horizons process, a multiyear initiative that aims at soliciting and synthesizing community input on research and funding priorities in the Arctic Social Sciences.

Community Workshops. In 2015 Arctic-FROST launched a collaborative initiative with the Canadian as Resources and Sustainable Development in the Arctic (ReSDA) project to hold community knowledge sharing workshops "Sustainability that works", where researchers and community members can exchange their practical experiences with sustainable development projects. The first workshop was in Kuujjuaq, Quebec (October 2015) and the second took place in Nome, Alaska (March 2016). The third community workshop will be focused on the issue of Indigenous entrepreneurship, cultural and social economies as tools of sustainable development in Arctic communities. The event is organized in Moscow on the sides of the "Treasures of the North" Festival that brings together Indigenous artists and crafters from the Russian Arctic and beyond.

Arctic-FROST Fellows Program. The new dimension of the Arctic-FROST work in 2016 was a further development of our early career scholars programming. To date, almost 40 early career scholars attended Arctic-FROST meetings and received individualized and group mentoring. Starting in 2016 the Steering Committee decided to designate all Arctic-FROST annual workshop

participants as Arctic-FROPST Fellows. The Fellows are expected to be active throughout the year of designation, develop suggestions for the network activities and represent the network wherever appropriate. The Steering Committee works with the Fellows to provide financial support to the proposed events and, together with the mentors, maintain academic advisement to the Fellows. This program will continue through the reminder of the Arctic-FROST RCN, and we expect two more cohorts of scholars to join the Fellows ranks.

2016 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).*

Arctic-FROST members are committed to deliver a number of key products, including two 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. Annual meeting proceedings are available at www.uni.edu/arctic/frost. The Arctic-FROST also prepared the first monograph "Arctic Sustainability Research: Past. Present and Future" (Routledge) expected for a release in 2017.

Plans for 2017. In 2017 Arctic-FROST will hold its annual science meeting in Narsaq, Greenland (September 13-17, 2017). The theme of the Annual Meeting is Community Sustainability in the Arctic: What sustainability theories and practices work and what fail in Arctic Communities?" This includes: (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. See www.uni.edu/arctic/frost

In addition, other events are in the plans at the International Congress of Arctic Social Sciences (ICASS IX, 2017) where Arctic-FROST leads the Sustainability Theme, Arctic Science Summit Week in Davos (2018), and Arctic Circle 2017.

2016 Arctic-FROST Annual Meeting, Vienna, September 9-12, 2016

Other 2016 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.

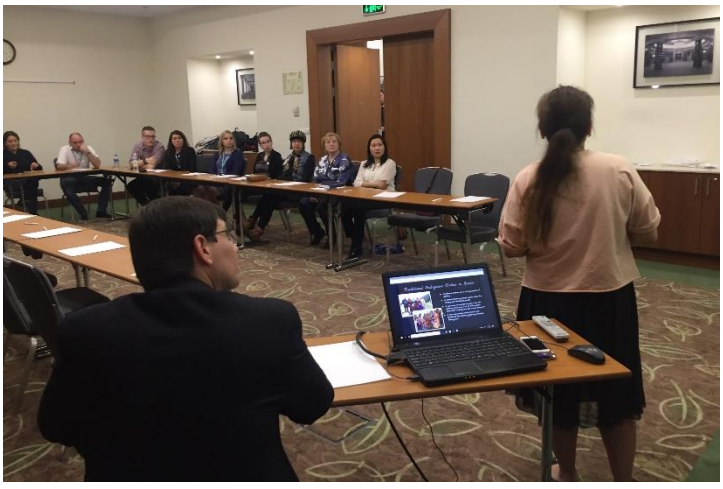
Other publications. A book "Arctic Sustainability Research: Past, Present and Future" is in print by Routledge. Selected members published peer-reviewed articles and book chapters including a keynote paper in Polar Geography of research priorities in Arctic sustainability science.

Peer-reviewed volumes. Work has continued on the first peer-reviewed volume "Arctic Sustainability: A Synthesis of Knowledge". A reporting workshop was held in Santa Fe, New Mexico as a part of the Western Regional Science Association meeting.

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 benefited from Arctic-FROST activities in 2015-2016: "Arctic Horizons: Social Science and the High North" and "PIRE: Promoting Urban Sustainability in the Arctic." Finally, a group of Arctic-FROST collaborated with RCN Arctic-COAST and CACCON network to hold a coastal community resilience workshop in Murmansk-Teriberka, Russia.

"Sustainability that Works" Community Knowledge Sharing Workshop:



In 2016 Arctic-FROST actively collaborated with other research networks and organizations, such as Resources and Sustainable Development in the Arctic (ReSDA), Arctic-COAST, Research Coordination Network in Arctic Urban Sustainability, International Arctic Science Committee (IASC), International Arctic Social Sciences Association (IASSA), and others.

In April 2017 Arctic-FROST held a knowledge-sharing "Sustainability that Works" workshop in Moscow, Russia entitled "Cultural Economy in Indigenous Communities." The purpose of this activity was to share results of particular studies and personal experiences of Indigenous cultural entrepreneurship from USA, Russia and Canada. The workshop coincided with the largest Indigenous arts and crafts festival in Russia "The Treasures of the North". The workshop gathered academics, fashion designers, Indigenous artists, businessmen and government representatives. The participants identified major

opportunities and challenges for cultural economy in Arctic Indigenous communities. Key opportunities: new sources of income and employment (especially for women), opportunity to take back cultural rights and minimize cultural appropriation by outsiders, re-connection of young people with land and sea, education and training, etc.; main challenges: access markets, finances, and qualified labor, high costs, potential for commodification of culture and inability to engage with cultural production in cases when access to land and see is limited by the state.

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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 **Community Sustainability in the Arctic.**

Papers deal with ***(1) community sustainability in the Arctic: definitions, understandings, theories and practices; (2) community-government and community-corporate relationships; (3) community resilience and sustainable development in changing social, political, economic and natural environment; (4) community-based research in sustainability: methods and practices***

The main focus question of the conference is ***"What sustainability theories and practices work and what fail in Arctic Communities?"***

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.

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 and Conference Venues:

Qaqortoq (September 12-17):

Qaqortoq Hotel

Post box 509, 3920 Qaqortoq Greenland

Phone: +299-492722

www.hotel-qaqortoq.gl

Narsaq (September 17):

(field trip only)

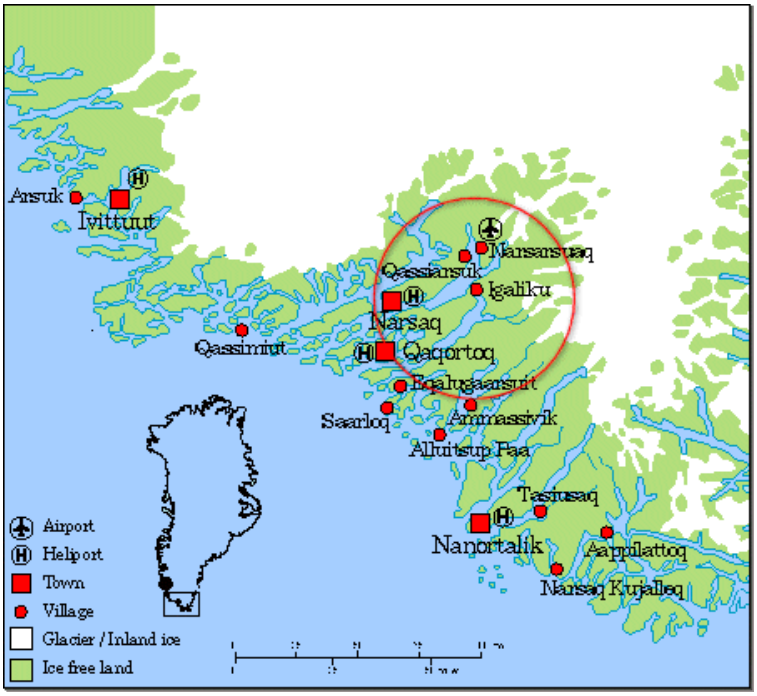
Narsarsuaq (September 17-19):

Hotel Narsarsuaq

PO Box 504 3923 Narsarsuaq Greenland

Phone: +299 665253

Email: receptionnars@mit.gl



Source: Greenland Tourism

Important emergency phone numbers:

Rasmus Ole Rasmussen: +45 21603954 or +299 582160

Andrey Petrov +7-906-268-7487 (text only)

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PROGRAM

September 12th Tuesday

2:00 pm Arrival to Narsarsuaq
3:30 pm Departure from Narsarsuaq (boat tour through the fjords)
6:00 pm Arrival to Qaqortoq
6:30 pm *Registration* and Welcoming Dinner (Hotel Qaqortoq)

September 13th

9:30-11:00 am **Steering Committee Meeting [closed]**
SC members attending: Petrov (Chair), Graybill, Heleniak, Hirshberg, Huskey, Larsen, Rasmussen, Shiklomanov, Southcott, Vlasova, Crawford (ex officio)

12:00 pm **Local field trip and program in Qaqortoq [all participants]**

Lead: Rasmus Ole Rasmussen (Municipality of Kujalleq)

6:00 pm Dinner

September 14th

9:00-9:30 am *Registration*

9:30-10:00 Opening

Chair: Rasmus Ole Rasmussen (Municipality of Kujalleq)

Representatives of the Municipality
Andrey N Petrov (Arctic-FROST PI and President, IASSA)

Ann P. Crawford (administrative announcements)

10:00-10:45 **Plenary Session 1.1: Arctic Sustainability Science: Perspectives and Prospects**

Chair: Tatiana Vlasova (Institute of Geography, Russia)

Andrey Petrov (University of Northern Iowa, USA)
The State of the Arctic-FROST
Defining Future of Social and Sustainability Sciences in the Arctic: Lessons from Arctic-FROST and Arctic Horizons Projects

10:45-11:15 Coffee break

11:15-1:15 **Illustrated paper session 1.2: Community Sustainability in the Arctic: Understanding Challenges, Resilience and Adaptation I**

Chair: Jessica Graybill, Colgate University, USA

Chris Southcott (Lakehead University, Canada) ***Sustainability and Population in the Canadian North***

Klaus Georg Hansen (Government of Greenland, Greenland) ***Aspects of demographic sustainability in Greenland***

Timothy Heleniak (Nordregio, Sweden) ***Viability of remote communities in the Nordic Arctic***

Nikolay Shiklomanov (The George Washington University, USA) ***Impacts of socioeconomic and climatic changes on urban infrastructure in the Russian Arctic***

Barbara Johnson (University of Alaska Fairbanks, USA) ***A New Affordability Indicator for rural Alaskan water utilities***

Tatiana Vlasova (Institute of Geography, Russia) ***Community sustainability monitoring: main approaches***

Discussion

1:15-2:00 pm Lunch

2:00-4:15 **Illustrated paper session 1.3: Community Sustainability in the Arctic: Understanding Challenges, Resilience and Adaptation II**

Chair/Discussion lead: Nikolay Shiklomanov (The George Washington University, USA)

Joan Nymand Larsen (Stefansson Arctic Institute, Iceland) ***Arctic Youth and Community Sustainability: Youth indicators and their contributions***

Alexandra Yingst (University Center of Westfjords, Iceland) ***Gender and Quality of Life in the Westfjords of Iceland: A Case Study for Arctic and Subarctic Fishing Communities***

Elena Guk (St. Petersburg State University, Russia) ***Tourism and Recreation System in Norilsk Region: Development, Current State and Modeling***

Marco Eimermann (Umea University, Sweden) ***Lifestyle migration and community sustainability in northern Sweden***

Jessica Graybill (Colgate University, USA) ***Examining (in)capacity for resilience in Teriberka, Russia: Questions, trends, futures***

Michael Brady (Rutgers University, USA) ***Local views of shoreline change risk along Alaska's northern coastline***

Maria Tysiachniouk (Center for Independent Social Research, Russia and Wageningen University, Netherlands) ***Between Oil Development, nature conservation and traditional way of life in Kaktovik, North Slope of Alaska: is sustainability possible?***

Discussion

4:15-4:45 Coffee break

4:45-7:00 **Illustrated paper session 1.4: Community Sustainability in the Arctic: Policies, Strategies and Capacity Building**

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

Lee Huskey (University of Alaska Anchorage and UNI, USA) ***Petroleum and Alaska's North Slope: an Arctic development strategy or another Northern example of the resource curse***

Leneisja Jungsberg (Nordrregio, Sweden) ***Capacity building and strategic management of resource based industries in the Nordic Arctic***

Sonja Bickford (University of Nebraska Kearney, USA) ***Community Sustainability in the Arctic: the role of communication in CSR and SLO practices***

Mia Bennett (University of California, Los Angeles, USA) ***From state-initiated to indigenous-driven infrastructure: The Inuvialuit and Canada's first highway to the Arctic Ocean***

Kristeen McTravish (Trent University, Canada) ***Public Participation and Sustainability in a Social Planning approach to Community Food Security: Case Study of the Community-Led Food Assessment Process in Nunatsiavut and Nunavut***

Julia Olsen (Nord University, Norway) ***Local adaptive capacity of Solovetsky community in the context of increasing shipping***

Rasmus Ole Rasmussen (Municipality of Kujalleq) ***Building local resilience and sustainability in Kujalleq Municipality, Greenland***

Discussion

7:15 pm **Dinner**

September 15th

9:30-10:00 am *Registration*

10-11:00 **Plenary Session 1.5: Towards Sustainable Greenland: Past, Present and Future**

Chair/Discussion lead: Timothy Heleniak (Nordregio, Sweden)

Klaus Georg Hansen (Government of Greenland) ***Three hundred years as a colony - analysis of five constitutional changes***

Discussion

11:00-11:30 Coffee break

11:30-1:00 pm **Plenary Session 1.6: Local Perspectives on Community Sustainable Development in Greenland**

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

Keld Jensen, Naja Lund Nielsen ***Handling Vulnerable Groups***

Rasmus Ole Rasmussen, Camilla Christensen, Poul Halberg ***Handling the NEET - Not in Employment, Education or Training***

Keld Jensen, Rasmus Ole Rasmussen, Jukka Teräs ***Entrepreneurship, SME development and Smart Specialization***

Discussion

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

2:00-3:30 **Plenary Session 1.6: Local Perspectives on Community Sustainable Development in Greenland (Cont.)**

Discussion

30:30-4:00 Coffee break

4:00-6:00 **Plenary and wrap up**
Summaries from session chairs. Presentation of conference findings and their implications for future research in Arctic social sciences

Chair: Andrey N. Petrov (University of Northern Iowa, USA)

Panelists: Jessica Graybill, Timothy Heleniak, Diane Hirshberg, Joan Nymand Larsen, Rasmus Ole Rasmussen, Nikolay Shiklomanov, Tatiana Vlasova

Discussion

6:30 pm **Dinner**

September 16th
Early Career Workshop

9:00 am-4:00 pm Workshop (early career scholars, mentors and panelists – see a separate program)

September 17th

9:00 am-4:00 pm Field trip to *Narsaq*

We will be visiting the slaughterhouse where sheep and lambs are slaughtered as we are there in the middle of the slaughtering season. The slaughterhouse also do the slaughtering of Musk Oxen and Reindeer for sale in Greenland. We are also considering visiting the training school Inuili where cooks, restaurant personnel are trained and where they also develop new receipts for making use of fish, animals and plants on the Greenland market. Finally may visit the company working on the development of rare earths and uranium mining activities.

September 18th

Stay in *Narsarsuaq* (field trip to the glacier and Norse village)
During the morning visit across the fiord to the Sheep farming core village and the old Norse settlement. And in the afternoon a visit by boat close to the glacier.

September 19th

Departure from *Narsarsuaq* to *Copenhagen*

Arctic-FROST Early Career Scholars Workshop

September 16th, 9:00 am-4:00 pm

2017 Arctic-FROST Fellows: *Alexandra Yingst, ICELAND, Barbara Johnson, USA, Elena Guk, RUSSIA, Jula Olsen, NORWAY, Kristeen Mc Travish, CANADA, Leneisja Jungsberg, SWEDEN, Mia Bennett, USA, Michael Brady, USA, Marco Eimermann, SWEDEN, Sonja Bickford, USA*

9:00-11:00 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)

11:00-12:30 Panel 1: ***Making a difference together: Working with communities in sustainability research and practice***
Moderator: Diane Hirshberg (university of Alaska Anchorage, USA)
Panelists: Chris Southcott, Jessica Graybill, Tatiana Vlasova, Rasmus Ole Rasmussen

Q & A and Discussion

12:30-1:15 pm Lunch

1:15-2:45 Panel 2: ***Arctic sustainability science as an academic, policymaking and community development career***
Moderator: Emily Francis (U.S. Fish and Wildlife Service and UNI, USA)
Panelists: Lee Huskey (a successful faculty career), Joan Nymand Larsen (policy-relevant academic work in the Arctic Council and beyond), Andrey Petrov (getting funded), Klaus Georg Hansen (career in Government and policymaking), Tim Heleniak (policy advising), Maria Tysiachniouk (Fulbright experiences)

Q & A and Discussion

2:45-4:00 **Work in groups & reporting**:
Chair: Emily Francis (U.S. Fish and Wildlife Service and UNI, USA)
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?*

Arctic-FROST 2017 Fellows and Mentors

Fellows	Paper Title	Mentors
Alexandra Yingst, ICELAND	Gender and Quality of Life in the Westfjords of Iceland: A Case Study for Arctic and Subarctic Fishing Communities	Rasmus Ole Rasmussen Joan Nymand Larsen
Barbara Johnson, USA	A New Affordability Indicator for Rural Alaskan Water Utilities	Diane Hirshberg Lee Huskey
Elena Guk, RUSSIA	Tourism and Recreation System in Norilsk Region: Development, Current State and Modeling	Nikolay Shiklomanov Andrey N Petrov
Jula Olsen, NORWAY	Local adaptive capacity of Solovetsky community in the context of increasing shipping.	Jessica Graybill Tatiana Vlasova
Kristeen Mc Travish, CANADA	Public Participation and Sustainability in a Social Planning approach to Community Food Security: Case Study of the Community-Led Food Assessment Process in Nunatsiavut and Nunavut	Tatiana Vlasova Chris Southcott
Leneisja Jungsberg, SWEDEN	Capacity building and strategic management of resource based industries in the Nordic Arctic	Lee Huskey Timothy Heleniak
Mia Bennett, USA	From state-initiated to indigenous-driven infrastructure: The Inuvialuit and Canada's first highway to the Arctic Ocean	Chris Southcott Joan Nymand Larsen
Michael Brady, USA	Transforming coastal vulnerability assessment for decision support: Local views of shoreline change risk in Alaska's Arctic Slope Region	Jessica Graybill Diane Hirshberg
Marco Eimermann, SWEDEN	Lifestyle migration and community sustainability in northern Sweden	Timothy Heleniak Rasmus Ole Rasmussen
Sonja Bickford, USA	Community Sustainability in the Arctic: the role of communication in CSR and SLO practices	Klaus Georg Hansen Maria Tysiachniouk

Arctic-FROST Steering Committee

Arctic-FROST Steering Committee	Institution, Country, and Bio
Andrey Petrov (PI) 	**Assoc. Prof., University of Northern Iowa, 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), all at the University of Northern Iowa. Andrey Serves as the 9th President of IASSA.
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** Director at the American Geographical Society and editor of the journal *Polar Geography*. 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) and 4th IASSA President.
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 the 7th 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 	**Senior Scientist, University of Akureyri, ICELAND** Currently, senior scientist with the Stefansson Arctic Institute, Akureyri, 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). Joan served as the 6th IASA President
Vera Metcalf 	**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 	**Municipality of Kujalleq, GREENLAND** Currently, a Senior Researched for the Municipality of Kujalleq. Formerly Senior Research Fellow at and 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, also Chair and Research Director of the Social Economy Research Network for Northern Canada (SERNNoCa).
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,* *Cedar Falls, IA*	
Emily Francis *Research Affiliate* *UNI ARCTICenter* *and* *U.S. Fish and Wildlife Service* *Albuquerque, NM*	

Participant Biographies

Alexandra Yingst (University Centre of the Westfjords, Iceland)

Alexandra Yingst holds a bachelor's degree in biological sciences, sociology, and international and area studies from the University of Pittsburgh in the United States. She recently completed a master's degree in coastal and marine management from the University Centre of the Westfjords in Iceland, a university center affiliated with the University of Akureyri, where she was a Fulbright Fellow. Her master's thesis was on gender and quality of life in Arctic fishing communities, with a case study on the Westfjords of Iceland. She is also the Director of International Outreach for the Arctic and Antarctic Early Career Association (ADECA) and is the Ocean Ambassador Outreach Coordinator for SEVENSEAS Marine Conservation and Travel Magazine. Later this year, she will join Silversea Cruises to work as an expedition staff member and lecturer, with a particular interest in working in the Arctic.

Andrey N. Petrov (University of Northern Iowa, USA)

Dr. Andrey Petrov is Associate Professor of Geography and ARCTICenter Director at the University of Northern Iowa. 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 President of the International Arctic Social Sciences Association and Vice-Chair of the IASC Social and Human Sciences Working Group. He is the lead author of *Arctic Sustainability Research: Past, Present and Future (2017)*, 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).

Barbara Johnson (University of Alaska Fairbanks, USA)

Barbara graduated in 2011 with a BA in Environmental Studies from McGill University in Canada. Following graduation she worked as a research intern until November 2012 at the United Nations University Institute for Water, Environment and Health (UNU-INWEH). Her research centered on appraising the effectiveness of cost benefit analysis to evaluate the return on investment of water and sanitation projects. Since 2013 she has worked for the German Corporation for International Cooperation (GIZ) on a freelance basis. Barbara moved to Fairbanks (UAF) in 2014 to attend the University of Alaska Fairbanks to pursue Master of Science in Resource and Applied Economics. In her final master's year she also worked on a Department of Environmental Conservation (DEC) and EPA project. As part of that project she evaluated the accuracy of an affordability indicator used to determine whether rural Alaskan communities can financially sustain their water utilities. After she identified significant weaknesses in the indicator, she was tasked with developing a new affordability indicator, which became her thesis. Upon graduation in 2016 she created her own company, 907 consulting, and has been working with the DEC and EPA to implement the new affordability indicator across the state. Her PhD in Natural Resources and Management at UAF in will look at the economics of water management in rural Alaska. She hopes to quantify the costs and benefits of access to water utilities by evaluating the impact on subsistence activities and health outcomes.

Chris Southcott (Lakehead University, Canada)

Raised in Northern Canada, Dr. Southcott 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 and the first ever work on migration in the Circumpolar North. 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. 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.

Diane Hirshberg (University of Alaska Anchorage, USA)

Dr. Diane Hirshberg is Professor of Education Policy at the Institute of Social and Economic Research, University of Alaska Anchorage (UAA). 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.

Elena Guk (Saint Petersburg State University, Russia)

Elena Guk is 4th year PhD candidate in geography, Saint Petersburg State University (SPBU). She holds MSc degree (2014) cum laude in human geography from SPBU, with major in regional studies and international tourism, and Specialist in strategic management from Novosibirsk State University, one of the leading research universities in Russia. During PhD and Master studies Elena researches tourism and recreation in Norilsk Region (Sub-Arctic Siberia). In her Master's work Elena observed peculiarities of emergence and development of recreation in the region, and her PhD thesis is devoted to modeling a system of tourism and recreation for Norilsk Region. Along with tourism studies, Elena is interested in urban planning and design, architecture and transport planning. Elena has a lot of work experience in airline industry (sales analytics) and in travel planning. Along with tourism studies, Elena is interested in urban planning and design, architecture and transport planning. She completed auditorium courses on urban issues from the University of Amsterdam and Higher School of Economics (Moscow) and attended as a visitor several urban-related forums in Russia.

Emily Francis (U.S. Fish and Wildlife Service and University of Northern Iowa, USA)

Emily Francis is a biologist with the U.S. Fish and Wildlife Service and a research affiliate at the ARCTICenter, University of Northern Iowa. Emily's research is focused on migratory birds and mammals. Her master thesis was devoted to wild reindeer population in northern Russia, and focused 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. Her current work deals with migratory bird biogeography and the regulation of the Migratory Bird Treaty Act.

Jessica Graybill (Colgate University, USA)

Dr. 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. Dr. Graybill serves as the Chair of the polar Geography Specialty Group of the American Association of Geographers and the editor of *Polar Geography*.

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).

Julia Olsen (Nord University, Norway)

Julia Olsen is a PhD Candidate at Nord University in Norway. The main objective of her work is to assess the impact of increased shipping activities in the Barents Sea on local coastal communities and understand what the implications are for local adaptation and adaptive capacity. Since 2012 Julia has been working at Nordland Research Institute with a number of scientific projects on climate change adaptation in Northern Norway and Russian Arctic. Julia have been living and studying all her life in the North, in the Barents region. Originally, from North-West Russia (Komi Republic), Julia graduated from the Ukhta State Technical University before she moved to Norway in 2009 where she received her second Master degree in Science of Sustainable Management at the University of Nordland in Bodø.

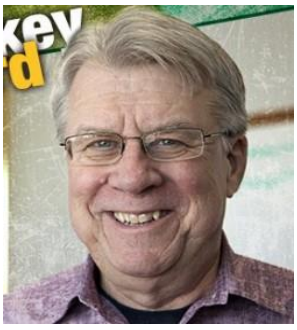
Klaus Georg Hansen (Government of Greenland)

Dr. Klaus Georg Hansen is the acting head of the Department of National Economic Planning in the Government of Greenland. He previously worked in various positions in the Government of Greenland and served as the Head of the Ilimmarfik Institute at the University of Greenland and Deputy Director of Nordregio. Dr. Hansen received his PhD from the Department of Development and Planning, Aalborg University, Denmark. His interests are in political processes and governance in Greenland, demography, economic development and sustainability. He is the Greenlandic lead in the "Arctic Sustainability: A Synthesis of Knowledge" project.

Kristeen McTavish (Trent University and Government of Nunatsiavut, Canada)

Kristeen completed her BSc at the University of Ottawa in Biomedical Sciences and Criminology. She then pursued work in the not-for-profit sector, which eventually led her to Trent University and the Indigenous Environmental Studies/Sciences Program. Under this program, Kristeen created TRACKS, a youth outreach program aimed at bringing together Indigenous and scientific perspectives that reaches over 4,000 youth each year. She joined Dr. Chris Furgal's Health Environment Indigenous Communities (HEIC) Research Group. During her 7 years within this interdisciplinary team, she worked on a variety of projects on topics including climate change impacts, risk communication and contaminants, and community perceptions of dietary fats, expanded her understanding of health, environment, education, Inuit communities, Indigenous knowledge, and how they all come together in an Arctic context. Kristeen is currently a part-time master's student in the Sustainability Studies program at Trent University. Her thesis research looks at public participation and sustainability in community planning and decision making around complex health issues. Kristeen is also the Regional Food Security Coordinator for the Department of Health and Social Development of the Nunatsiavut Government, a self-governing Inuit regional government in Newfoundland and Labrador. Within this position, she is responsible for coordinating the Nunatsiavut Government's response to food insecurity within the region and working collaboratively with all departments to plan for long-term sustainable improvements in food security. Her work includes addressing key determinants of food security through a wide range of initiatives, programs, and policies involving community, provincial, national, university, private and non-profit partners, and the creation and implementation of a Nunatsiavut Food Security Strategy.

Lee Huskey (University of Alaska Anchorage/University of Northern Iowa, USA)



Dr. Lee Huskey is Emeritus Professor of Economics at the University of Alaska Anchorage and Visiting Scholar in Geography and Arctic Studies at the University of Northern Iowa. 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.

Leneisja Jungsberg (Nordregio, Sweden)

Leneisja Jungsberg is Research Fellow at Nordregio. With MSc in Social Science and specializing in regional development, she has been involved in research projects focusing on the impacts of large-scale mining, small and medium enterprise development, socio-economic assessments, young people and education. Projects include working with six municipalities on developing local smart specialisation strategies under the Northern Periphery and Arctic Programme and, as member of the Nordic working group for Sustainable Regional Development in the Arctic, carrying out a three-step foresight analysis to assess opportunities and challenges for sustainable regional development in the Nordic Arctic and identify future development perspectives.

Marco Eimermann (Umea University, Sweden)

Marco Eimermann is a post-doctoral researcher at the Department of Geography and Economic History, Umeå University (Sweden). He has examined new mobilities and new rural economies in the FORMAS funded project Mobilising the rural. His PhD thesis (2013, Örebro University) combines insights from population geography and rural studies. Marco has published articles and book chapters about Swedish rural areas attracting new residents and lifestyle migrants' everyday practices of the good life. Previously, he studied Human Geography and European Studies in the Netherlands. His current research is based in two projects: "Mobilising the rural" (2014-2017) and "Mobilities, micro-urbanisation and changing settlement patterns in the sparsely populated North" (2017-2020). The former project combines innovation capacity of lagging rural areas with incoming entrepreneurs' contribution to rural development. The aim of the latter project is to study the ever-changing mobility patterns to and within rural Västerbotten and Norrbotten in order to understand how they have changed regional settlement patterns and functional settlement structures in northern Sweden. Marco is involved in the Lifestyle Migration Hub, an expanding network of migration scholars studying social rather than

economic reasons for voluntary movements across the globe, related to individual perceptions of 'the good life'. In particular, he is interested in transient and strategically switching populations in Europe. He is also an affiliated researcher with the Arctic Research Centre (ARCUM) at Umeå University.

Maria Tysiachniouk (Center for Independent Social Research, Russia and Wageningen University, The Netherlands)

r. Maria Tysiachniouk holds a Master of Science in Environmental Studies from Bard College, NY, a Ph.D. in Biology from the Russian Academy of Sciences, and a Ph.D. in Sociology from Wageningen University, the Netherlands. Since 2004 she has studied global resource governance and published a book *Transnational governance through private authority: the case of Forest Stewardship Council Certification in Russia.* In 2012 she started extensive research on transnational oil production chains in Russian Arctic, focusing on the interactions between oil companies and indigenous communities. Maria Tysiachniouk has written more than 180 publications on topics related to transnational environmental governance, edited several books, and has fieldwork experience in several countries and regions. She is currently Chair of the Environmental Sociology group at the Center for Independent Social Research, St. Petersburg.

Michael Brady (Rutgers University, USA)

Michael Brady is a doctoral candidate, Geography Department, Rutgers, the State University of New Jersey, USA. Brady, a former enlisted member of the U.S. Coast Guard, earned both his bachelor's and master's degrees in geography at Hunter College of the City University of New York under the GI Bill. In his doctoral research, Brady maps shoreline change risks with whaling communities that live along Alaska's northern coastline (NSF #1523191). The research is done in collaboration with the North Slope Borough. In his research Michael is working with Alaska coastal communities to develop a web-based coastline change land use geospatial decision support system. As a student researcher for the New Jersey Sea Grant Michael collaborated with an interdisciplinary team including scientists, communicators, government, and other stakeholders.

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.

Rasmus Ole Rasmussen (Municipality of Kujalleq, Greenland)

Dr. Rasmus Ole Rasmussen is a senior researcher for the Municipality of Kujalleq, Greenland, and former Senior Research Associate at Nordregio and Professor at Roskilde University, Denmark. Dr. 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).

Sonja Bickford (University of Nebraska, Kearney, USA)

Dr. Bickford is an Assistant Professor in the Department of Communication, College of Fine Arts & Humanities, University of Nebraska Kearney, USA. She received DBA, in Global Business and Leadership from California Intercontinental University (Diamond Bar, CA), MBA, Business Administration, Arkansas State University (Jonesboro, AR), and BS, Management, Appalachian State University (Boone, NC). Prior to her appointment at the University of Nebraska Kearney (UNK) Dr. Bickford served as an Assistant Professor of Business at the University of Great Falls in Montana, USA as well as the Director of Continuing Education and Study Abroad. Her current research project focuses on assessing the best practices of rural communities' corporate social responsibility (CSR) via a multidisciplinary approach. She completed a post doctorate project at the University of Lapland's Arctic Centre in Rovaniemi, Finland where she served as the project manager on a research project assessing the best practices of environmental impact assessments (EIA) in the Arctic. Her research interests include Arctic business practices, communication, environmental impact assessments, international business cultures, social impact assessments, corporate social responsibility, sustainability, community branding, and aquaponics.

Tatiana Vlasova (Institute of Geography, Russian Academy of Sciences, Russia)

Dr. 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 Geography 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 a Russian team of the Belmont forum "Arctic sustainability: synthesis of Knowledge" supported by the Russian Foundation for Basic Research (RFBR). She is a Chair of the International Geographical Union Commission on "Cold and High Altitude Regions" (CHAR), the Councilor of the International Arctic Social Science Association (IASSA) and a member of the editorial board of "Polar Geography".

Timothy E. Heleniak (Nordregio, Sweden)

Dr. Timothy E. Heleniak (Ph.D., University of Maryland) is a Senior Research Fellow at the Nordregio, a leading Nordic and European research center for regional development and planning, established by the Nordic Council of Ministers. He is human geographer and demographer with regional expertise in Russia and other countries of the former Soviet Union and the Arctic. His interested include migration and population change, regional economic development and urban Arctic. He is a former Director at the American Geographical Society and served in various capacities at the World Bank, the United Nations, U.S. Census Bureau, the George Washington University, and Georgetown University.

Selected Abstracts

Gender and Quality of Life in the Westfjords of Iceland: A Case Study for Arctic and Subarctic Fishing Communities

Alexandra Yingst (University Center of Westfjords, Iceland)

Data on women involved in fisheries and aquaculture is lacking across the world. In Iceland, women have played a significant role in fisheries throughout the centuries, but their presence in the industry today is underlooked. They have different roles and experiences than men do in the sector, and paying attention to these differences could improve management that could benefit both the company they work for and the workers themselves. In the Westfjords today, most women involved in the fisheries sector are involved in fish processing, and many of the workers are women from other countries. This study compares and contrasts the roles, perceptions, and hopes that Icelandic women and women from other countries have. Through interviews and surveys, this study both qualitatively and quantitatively describes the lives of women involved in these sectors in the northern Westfjords region. The study also puts the results of the study in context to the larger picture across the Arctic region. The results show that there are significant differences between the quality of life of women from different countries involved in the fisheries sector, with Icelandic women having a higher quality of life than women of other nationalities and with Polish women having the lowest quality of life. The results also describe why women from other countries are involved in these sectors more than Icelandic woman, as well as how women feel about having a job in the fish processing plants. In the Westfjords, women from Iceland who work in fish processing usually have leadership roles. If not, their participation in fish processing is often ridiculed in the community. Women in leadership positions from all nations have a significantly higher satisfaction in their job and in their life, as well. This study also looked at gendered differences in fish processing in the Westfjords. Women from the Philippines thought that gender segregation in the workplace was due to physical reasons and that it made sense, while Icelandic and Polish women had mixed opinions about gender segregation. Some women thought that they did jobs in fish processing, like cutting and packaging fish, better than men, while others thought that perhaps men would be better at it. When it comes to job satisfaction, Polish women are significantly less satisfied than women from the Philippines, most likely due to the language barrier between women from Poland and others. This study also looks at women who are actively involved in fishing. It shows how difficult it is to raise a family and fish at the same time and highlights the unrecognized work that women do in the community to support fisheries. Finally, this study shows what it is like for immigrant women to live in the Westfjords of Iceland where the language and climate can be completely different from what they are used to. Icelandic women surveyed in this study have a significantly higher enjoyment of community than women from other countries. Information gained from studies like this can contribute necessary and important local knowledge about the quality of life of women involved in fisheries so that socially responsible management decisions can be made.

A New Affordability Indicator for Rural Alaskan Water Utilities

Barbara Johnson (University of Alaska Fairbanks, USA)

The Alaska Department of Environmental Conservation (DEC) administers funding for the construction of new water utilities in rural parts of the state. One of the deciding factors in how funding is allocated is whether the recipient community can afford to maintain the utility. Thus the community must be able to cover the annual operation, maintenance, repair, equipment and capital replacement costs. Currently, the DEC deems a project affordable if the annual costs account for 5% or less of the community's median household income (MHI). A survey of the industry's literature found that the use of MHI as an affordability indicator is problematic as: - MHI fails to reflect the cost burden experienced by below median income households,MHI is a static snapshot of income, - MHI does not account for high costs of living, - MHI does not account for the demographic composition of a community, - Two communities with a similar MHI can have significantly different income distributions. These deficiencies are particularly acute in rural Alaskan communities. Given these shortcomings developed a new multi-faceted indicator to determine affordability. The new indicator has a matrix form and is composed of a Residential Indicator (RI) calculated for every income quintile. Hence, maintenance and operation fees are weighed at every quintile. It includes a Financial Capability Indicator (FCI) that is calculated by assigning values from 1 (weak) to 3 (strong) to various socio-economic indicators. Since the new indicator will be used by the DEC only readily available data was used in its construction. This influenced the data collection process, which was driven by interviews of water professionals to identify data bases they have access to. This resulted in using the American Community Survey, a program administered by the US Census Bureau, for socio-economic data. Given the small size of rural Alaskan communities, survey data has a large margin of error. In order to mitigate the impact of erroneous data the decision was made to use several redundant socio-economic indicators in the FCI. The new indicator was found to be more accurate than the MHI indicator. The new indicator was retroactively applied to Akiachak, a rural Alaskan village, and found to more accurately assess affordability. The new indicator was also used to assess the current situation in communities with DEC managed water utilities. The MHI indicator was found to have underestimated the price burden of user fees in numerous communities, and to have overestimated the burden in one community. We are currently performing a sensitivity analysis of the indicator to identify critical components of the indicator. Further research is being performed to identify what the relationship is, if any, between the affordability of water utilities at the household and community level, user rates, demographic composition of communities and the human capacity to manage the water utilities. This research should be completed by August 2017.

Sustainability and Population in the Canadian North

Chris Southcott (Lakehead University, USA)

Which communities in the Canadian North have proven to be the most sustainable and which have been the least sustainable? This presentation looks at population numbers as a crude indicator of sustainability. Using data from the Canadian Census from 1991 to 2016 we try and isolate which

communities in the Canadian North have populations that are either stable or growing during this period and which communities have shown declines. Using regression and other types of analysis we try and isolate the main characteristics of communities that are not in decline.

Tourism and Recreation System in Norilsk Region: Development, Current State and Modeling

Elena Guk (St. Petersburg State University, Russia)

In early 20th century, many areas of traditional land use in the Arctic were turned into new industrial areas. One of the largest mining plants in Soviet Union, built above 69°N, caused emergence of Norilsk, and now it's the second most populated city above the Northern Circle, estimated as one of the most polluted settlements in the world. Remoteness of the newly built area in combination with hazardous climate and industry triggered emergence and development of local recreational practice. Tourism and recreation are studied there in a combination because of their high interconnectivity in the region: most tourists in the system are Norilsk residents whose main purpose of travel – within the region or out of it – is to recover and improve their health. The first-stage purpose of research was to reveal peculiarities of recreation development in Norilsk Region, which is defined in this case as area of accessibility by local transport from Norilsk. The research has showed that this region includes neighborhoods of Norilsk, seaport town Dudinka and lakes of western Putorana Plateau (roughly 100-200 km from the city), and that dozens of recreational camps had been built there since 1940s. The fieldwork, done in 2013, has resulted in identifying different forms of outdoor recreational activities and facilities in the region, with same-time capacity of more than 4% of Norilsk Region population (approx. 200,000); built recreational environment is still mainly owned and operated by Norilsk Nickel, as it was during the Soviet times. It has been defined that tourism and recreation in Norilsk Region can be divided into three segments. The first is «mass-market» – recreational camps and activities near Norilsk – designed for and used by locals. The second is elite, aimed mainly at non-local tourists (which come primarily from other parts of Russia than from abroad due to legal restrictions) – visiting Putorana Plateau, area, which majority of Norilsk citizens cannot afford to visit due to travel costs. As for outgoing tourism, transport connection of Norilsk with central and southern regions of Russia is strong travel limiting factor due to insufficient capacity and expensiveness, even being partly subsidized. Consequently, local tourism and recreation are on demand in Norilsk Region, although the quality of environment, both natural and built, degrades with proximity of the certain recreational area or facility to Norilsk Nickel mines and plants. It has been concluded that in changing economic and social conditions local tourism and recreation has showed its resilience: it remains an essential part of everyday life and determinant of well-being of region inhabitants, not only due to its necessity for healthcare in ecological conditions but also because of underdevelopment of other services, including public transportation (both interregional and local), and ways of spending free time. Thus, tourism and recreation plays important role in sustainability of Norilsk Region as an activity that helps to balance economic priorities of Norilsk Nickel, ecological needs (area is almost not damaged by recreational activities) and human needs to recover. The second stage of the research is to reveal the principles how the tourism and recreation

system in Norilsk Region is built. The research showed that it consists of such elements as customers (locals and incoming tourists), tourist attractions (natural and human-made sights, National Reserve, museums etc), tourism infrastructure (accommodation, transport), subsiding organizations (Norilsk Nickel) and government. As long as tourism and recreation system in the region significantly depends on economic and legal issues, the system is highly interconnected with overall structure of regional economy, healthcare system, well-being and efficiency of human resources and thus sustainability of economy and community. The hypothesis of the research is that using methods of modeling in geography, with model testing on another regions, can show the most efficient and/or sustainable model of tourism and recreation system in Norilsk Region, which probably can be used for another regions.

Examining (In)capacity for Resilience in Teriberka, Russia: Questions, Trends, Futures

Jessica Graybill (Colgate University, USA)

Teriberka, Russia is a small coastal village in the Murmansk region that is currently experiencing an influx of visitors, primarily for tourist purposes. Simultaneously, resettlement of villagers to the town of Kola is occurring. Villagers who choose to stay in Teriberka have certain thoughts about its future development, while new touristic and economic ventures--including ruin porn tourism, industrial berry harvesting operations, and new urban planning designs--have other thoughts. How can sustainability and resilience be conceptualized in such a state of social, cultural, and economic flux? This presentation seeks to open up new space for theorizing and questioning social sustainability in and for Arctic communities.

Sustainable Shipping in the Arctic: Local Communities' Well-being and Adaptive Capacity

Julia Olsen (Nord University, Norway)

Direct and indirect impacts of changing climatic conditions may exacerbate the rapid changes in socio-economic and environmental conditions. Increasing shipping activities in the Arctic Ocean are an indirect result of changes in climatic and market conditions and at the same time a contributor to the changes in local communities. Scholars both describe this growth in Arctic navigation as a source of new opportunities for the local development and as an additional stressor for coastal communities that are already experience a number of changes in social, political, economic and environmental system. Thus, the interaction of those changes will have cascading effects on the well-being of indigenous and non-indigenous communities and will challenge local adaptive capacity (e.g. West and Hovelsrud 2010). This paper will present the preliminary findings of an explorative qualitative research study on whether the impacts of Arctic shipping strength and/or weaken the local adaptive capacity. Given the socio-economic heterogeneity of the Arctic region, I choose two coastal communities in its Barents part: Norwegian community of Longyearbyen on Svalbard and Russian community of Solovetsky. Historically, the shipping has been an important part of communities' development. Since the beginning of the 21st century both communities has experienced the increase in various types of vessel and the extension of the

navigable season. The major growth in navigation activities are associated with cruise tourism activities. Total number of calls of foreign cruise boats has increased during last decades. In addition to that, the sea ice retreat and increase in biomass of boreal fishes in the Northern part of the Barents Sea results in development of commercial fishing of cod and haddock (Misund et al. 2016). At the same time, the existing infrastructure, communication services, search-and-rescue facilities and ports are insufficient for the increasing maritime actives (Farré et al. 2014:16). A number of studies have found that local communities do not respond to the impact of climate change in isolation from other changes in socio-economic, environment and political conditions (e.g. West and Hovelsrud 2010). Thus, for this study, I choose the theoretical and analytical approach of adaptive capacity, that is an individual's or community's ability to cope with, adjust to or recover from particular changing conditions (Smit et al. 2010). The capacity to adapt to climate and other changes varies between communities and depends on subjective and objective dimensions, suggested. By applying this approaches, I will test the assumptions made by scholars that the existent infrastructure, availability of economic resources and (shipping) governance in the Arctic both enable and hinder the local adaptive capacity. Systematic analysis of adaptive capacity determinants is useful for aiding and comparing how the case study communities adapt to changes posed by multiple stressors (Keskitalo et al. 2011: 579). Given the rate and the amplitude of changes in the Arctic, the shipping development will require a sufficient local engagement in order to increase the benefits, mitigate the possible negative impacts and to strength local adaptive capacity. An existing top –down approach of shipping governance (global, regional and local) has a clear gap of local engagement (e.g. IMO frameworks, cruise industry guidelines, national laws). By applying adaptive co- management approach, I will test the assumption that the degree of local community engagement and participation in shipping governance has a direct impact on adaptive capacity. During last years, the question of sustainable communitis development has engaged both local and regional stakholders in order to find balance between securing the main sourse of income and limit possible anthropogenic impact on the environment, cultural and spiritual heritage. The preliminary findings of my work indicate the importance of flexible governance system for shipping activities that may also serve as a source of adaptive capacity. These include Polar shipping governance mechanisms presented by a set of frameworks (e.g. IMO Polar Code, Heavy Fuel Oil ban around Svalbard), institutions (e.g. Arctic Council Search and Rescue agreement), and guidelines (e.g. AECO guidelines for cruise operators in the Arctic).

Public Participation and Sustainability in a Social Planning approach to Community Food Security: Case Study of the Community-Led Food Assessment Process in Nunatsiavut and Nunavut

Kristeen McTavish , C. Furgal , S. Hill , NiKigijavut Nunatsiavutinni Project Team (Trent University, Peterborough, Canada; Food First NL, St. Johns, Canada)

Food insecurity is a persistent problem in Canada with 12.2% of households in the country reporting experiences of food insecurity in 2012. Food insecurity has been recognized as a critical and far reaching public health issue in many communities. The 2007-2008 Inuit Health Survey

however, drew particular attention to the seriousness of this issue for Inuit regions in Canada, where these rates ranged from 44.2% in Nunatsiavut to 70.2% in Nunavut. Communities in these regions face unique challenges in addressing food insecurity, such as extreme weather conditions which impact food transportation and changes in wildlife availability and accessibility which impact access to country food. Despite the importance of this issue, there is little documented evaluation of food security intervention implementation efforts or their associated impacts in communities. With the recognition that emergency food programs such as food banks do not address root causes of food insecurity and are therefore failing to make significant advances in addressing the problem, increased attention is being focused on augmenting community participation in designing community-based solutions. This type of public participation (also known as citizen participation, stakeholder engagement and popular participation) in health-related decision making is also promoted through many national and international public health policies. It is argued that greater community participation leads to more locally applicable, sustainable and appropriate responses. This thesis aims to use 3 case studies to explore this claim in the context of community food assessments and intervention planning processes in two Inuit regions in Canada's North. In an effort to apply social planning processes to address food insecurity at the community level, Community Food Assessments (CFAs) are being implemented in communities in Canada and the United States. Generally, CFAs are "participatory and collaborative processes that examine a broad range of food-related issues and resources in order to inform actions to improve community food security, that are initiated by community organizations, planners and/or researchers. Food First NL, a non-profit based in Newfoundland, has adopted this model and modified it to be a community-led process, with the goal of increasing participation in the assessment and placing increased focus on local knowledge, while striving to move away from researcher or consultant driven CFAs. These Community-Led Food Assessments (CLFAs) have been piloted in 3 Inuit communities in Nunatsiavut and one in Nunavut with the broad goal of increasing food security and creating sustainable solutions to address the issue within participating communities. These CLFAs in Nunatsiavut and Nunavut will be used as a case study to examine processes of public participation in decision-making and sustainable planning for community health in Inuit communities. Despite the ubiquitous calls for increased public participation in health-related decision-making and the assertions of its value, in practice, there is very little evidence that links public participation with improved intervention delivery or ultimately improved health outcomes. Further, where public participation is shown to have positive impacts, the mechanisms or frameworks through which it exercises its effect are unclear. Examining the role that public participation plays specifically in health planning in Indigenous communities is especially important given that: 1) Indigenous communities continue to suffer persistent health inequalities; 2) Public participation is heralded as being particularly applicable and successful in marginalized communities; and 3) There has been a rise in the promotion and adoption of community- based programs to address certain public health issues, such as food insecurity. This research followed a qualitative case study approach, informed by both postpositivist and pragmatic paradigms. Through extensive document review and interviews with key stakeholders involved in the project, this project examined the experiences of Community-Led Food Assessments conducted in Nunatsiavut and Nunavut to explore the role of public participation in effective and sustainable community decision making related to health, and to identify factors that facilitate and/or inhibit

public participation in planning and decision-making in community food security intervention planning. The evaluation of community experiences and intervention outcomes promises to provide much needed information to advance our understanding of what is, and is not working to sustainably address Inuit food insecurity in the Arctic. This research aims to produce findings which are contextually specific so as to inform action within the thesis cases (CLFA in Inuit communities), but also produce generalizable knowledge which can inform a broader understanding of public participation in planning and decision making in the field of public health.

Petroleum and Alaska's North Slope: an Arctic Development Strategy or Another Northern Example of the Resource Curse

Lee Huskey (University of Alaska, Anchorage and University of Northern Iowa, USA)

Observers of the first two decades of oil development on Alaska's North Slope concluded that it presented a positive case of the consequences of resource development on the local indigenous communities. However, the recent decline of North Slope oil production and the collapse of oil prices threaten the major driver of the local economy. This paper looks at the institutions developed on the North Slope in response to oil development with a long term perspective. The paper asks whether in the long run the North Slope will present another case of the resource curse or a strategy that provides some hope of avoiding the resource curse.

Capacity Building and Strategic Management of Resource Based Industries in the Nordic Arctic

Leneisja Jungsberg (Nordregio, Sweden)

The role of the local authorities is crucial in managing large scale industries in peripheral areas in the Nordic Arctic. This paper examines how local authorities' work to secure a sustainable development for their resource-rich territories through developing a local smart specialisation strategy (LS3). Seen from a territorial perspective there are three main challenges it is necessary for the local authorities to be aware of; 1) development trends in the dispersed settlement including a potential negative demographic structure 2) risks of land use conflicts and negative social impacts 3) to retain economic benefits of the large-scale industries locally. As part of the Northern Periphery and Arctic programme funded by the European Union five municipalities located in the Arctic regions of Finland, Sweden, Norway and Greenland have committed to work with these challenges. A main contribution is presenting empirical findings from the five municipalities going through the process of developing a LS3 by addressing local issues related to demographic change, land use planning and management of the emerging potential for green growth, and retention of local economic benefits. The LS3 builds on the concepts behind the framework provided by the European Union for Research and Innovation strategies for smart specialisation (RIS3). The notion of smart specialisation is a cornerstone in the European Union's endeavour to bring countries and regions towards success, and to guarantee territorial development opportunities for all regions. The main difference between RIS3 and a LS3 is the local dimension bringing the national or regional

scope towards a smaller administrative unit such as the municipality. Some of the benefits of the LS3 is that the starting point is the aspirations and competences of the local community and its institutions. The LS3 can improve the preparedness for large-scale investments in small communities in remote and sparsely populated areas and reduce these communities' vulnerability towards the decline or closing-down of large-scale projects. Local capacity building is a key to build competences planning for a sustainable development based on a participatory governance approach carried out locally. Key stakeholders are also part of the development process and the implementation of the LS3. Basically, the LS3 approach places less emphasis upon governance and policy, and focus more upon tangible aspects stemming from stakeholder consultations to bring their concrete local initiatives forward. The data is gathered through a cooperation between researchers and practitioners and consist of quantitative as well as qualitative studies about demographic trends including future projections, labour market challenges, social impact analysis and opportunities of local business development through a SWOT (Strength, Weaknesses, Opportunities, Threads) assessment. To secure a sustainable future development in the Arctic regions the role of local authorities is relevant to explore to share practices and local strategies that works in Arctic communities. The outcome of this research is empirical observations and learning points from the local authorities to inspire communities in the Arctic to take advantage of their natural resources while securing an economic, environmental and social sustainable development.

Mobilities, Micro-urbanisation and Changing Settlement Patterns in Northern Sweden

Marco Eimermann (Umea University, Sweden)

While Sweden as a whole, along with other countries, has urbanised rapidly over the past decades, the sparsely populated rural areas in northern Sweden have seen significant population decline. The links between urbanisation and rural depopulation have been studied and discussed in detail, but less research has looked at how urbanisation dynamics impact on migration and mobility to and within sparsely populated areas, and what this means for rural settlement patterns in Sweden's northern periphery. Mobilities to and within rural areas are diverse and are driven by different individual motives and purposes. Hence, different forms of mobility and migration are likely to affect the structure of rural settlements in different ways. For example, particular groups of migrants may be drawn from small rural villages to municipal centres due to better housing, jobs and services. At the same time lifestyle-related mobilities may be drawn from larger cities to more remote locations in search for rural amenities and isolation. Mobilities can be permanent or temporary in nature, they may be seasonal or involve long distance commuting between several residences, but whatever the case, they are likely to change local economic, demographic and settlement structures. Some areas in traditional resource peripheries are slowly transformed into recreational peripheries for a growing number of counter-urban lifestyle seekers, leading to renewed growth in certain attractive destinations. Yet, also less voluntary mobilities, such as the steady stream of asylum seekers and refugees, are flowing into rural areas but often concentrate in places that have surplus housing and service capabilities. We ask how important these different mobile populations have been for communities in Sweden's northernmost parts, and how they have affected rural population distribution and small-scale urbanisation within rural municipalities, a

process which is called 'microurbanisation'. This paper reports from the initial stages of a research project and its contribution to this field by studying and comparing the characteristics, motivations, mobility patterns and local impacts of these different types of mobile populations that collectively affect the population and settlement structures in northern Sweden. The aim of the project is to study the ever-changing mobility patterns to and within rural Västerbotten and Norrbotten in order to understand how they have changed regional settlement patterns and functional settlement structures in northern Sweden. The focus is particularly on understanding the extent to which new mobility patterns have contributed to processes of micro-urbanisation. The project approaches these issues from two perspectives: a broader regional perspective focused on statistical analysis and spatial mapping, and a more detailed local perspective focused on local community case studies and interviews with individual migrants and community stakeholders. This will contribute to a more integrated analysis of the extent and nature of mobilities and settlement change at a regional level, as well as a better understanding of the underlying mobility drivers and settlement impacts at a local level. The theoretical framework of the project integrates perspectives from the growing literature on rural mobilities, with spatial models of rural population concentration, and includes relational and functional perspectives on rural settlement structures. How do these different mobile populations impact on population distribution, development, and micro-urbanisation in Sweden's sparsely populated north? The project contributes to a holistic and integrated analysis of the extent, nature and local implications of mobilities and settlement change at both regional and local levels. The report will increase awareness and knowledge of these mobilities among academics, municipality officials, NGOs and communities.

Between Oil Development, Nature Conservation and Traditional Way of Life in Kaktovik, North Slope of Alaska: Is Sustainability Possible?

Maria Tysiachniouk (Centre for Independent Social Research, Russia and Wageningen University, the Netherlands)

Kaktovik is a village in Alaska with total 262 inhabitants, from which 136 are working. Eighthly eight percent of residents are Inupiat. Two thirds of villagers work in the North Slope Borough, around 25% in a school district, some work for Exxon Mobil and several are involved in polar bear tourism. The village is neighboring with the Arctic National Wildlife Refuge (ANWAR), which is managed and administered by the Fish and Wildlife Service. Community is involved in hunting bowhead whale, caribou, Dall sheep and in fishing. Exxon Mobil is involved in off-shore oil development 60 miles from the village at Point Thompson. Community benefits from Exxon Mobil operation as they sponsor the school, and community events and celebrations. Whaling activity is well coordinated with the company and the company employs several local residents. However, many locals feel that Exxon Mobil machinery and helicopters scare caribou in their hunting grounds.

Community is pressed by the complex set of circumstances, such as possible opening of ANWAR to oil drilling, polar bear tourism, which benefit only few families, relationships with federal and state agencies, differences in attitudes and interests within the village governance institutions, e.g. Kaktovik Inupiat Corporation, the Tribe and the City of Kaktovik. The village is threatened by the influx of outsiders, such as representatives of federal agencies, including Fish and Wildlife

Service, Senators and their representatives, biologists, social scientists, polar bear tourists, hikers, television crows. Most of the community members feel that both land and decision making is taken from them by the outsiders. While US Congress decides about ANWAR opening, the community is evenly divided in its attitudes about oil drilling in ANWAR. The Kaktovik Inupiat Corporation is in favor of oil development: it owns around 92,000 acres of surface lands in and around the village, but it cannot explore this land as it is within ANWAR. Arctic Slope Regional Corporation is also interested in opening ANWAR as it owns sub-surface deposits, but cannot touch them. Tribal government, which holds some political power, is environmentally oriented and is concerned about food safety and subsistence hunting. Most of polar bear guides are strongly against oil development in ANWAR. The City is working effectively with the North Slope Borough, but has difficulties in coordinating community interests with other governing institutions, e.g. native corporations and the tribe. Therefore, multilevel governance arrangements and their complexity reduce their overall efficiency. Can sustainable development be fostered in such complex situation, in which institutions and individuals have opposite views on future development paths? How can we conceptualize sustainability, vulnerability and resilience in such communities?

A Road Home or a "Road to resources"? Indigenous and State Visions of Canada's First Highway to the Arctic Ocean

Mia M. Bennett (UCLA, USA)

Nearly sixty years after Canadian Prime Minister John Diefenbaker announced his vision for opening Canada's North via the development of a network of so-called "roads to resources," an important part of his plan is being realized. The Governments of Canada and the Northwest Territories are spending CAN $300 million to fund the construction of a 137-kilometer all-weather road across the indigenous Inuvialuit Settlement Region that will link the settlements of Inuvik (pop. 3,451) and Tuktoyaktuk (pop. 854), on the Arctic Ocean. During fieldwork I conducted in summer 2016 and winter 2017, many individuals in Tuktoyaktuk explained in interviews that the road, which will be North America's first public highway to the Arctic Ocean, is being built in order to enhance access to offshore oil and gas resources and strengthen Canada's Arctic sovereignty. Such narratives invite assumptions that the highway exemplifies the state's ceaseless spread across the landscape in search of capital accumulation. However, closer examination reveals that many benefits from the highway project are accruing locally rather than nationally. Two Inuvialuit-owned corporations won the contract to build the highway, and representatives of both had expressed a need for a type of "make-work project" due to persistent regional economic malaise. This paper argues that local stakeholders who sought a highway strategically leveraged state interests in Northern nation-building through Arctic resource extraction under former Prime Minister Harper to achieve their road-building agenda. The highway should thus perhaps be viewed as an example of indigenous actors marshaling state interests for their own goals rather than a state incursion onto native territory. From this point of departure, the paper demonstrates first, how indigenous organizations and corporations in Inuvik and Tuktoyaktuk managed to successfully mobilize and lobby the government to obtain the necessary funding for local highway development. Second, it addresses how although indigenous organizations may be able to advocate

strongly for local needs, these local needs still tend to be met more often when they coincide with national or global demands like enhancing Arctic sovereignty or improving access to oil and gas resources. Third, the paper considers the scenarios in which indigenous land rights and land tenure support sustainable development, and when they actually may help further the advancement of infrastructure that may serve to amplify carbon-intensive industries such as oil and gas production. This has relevance for the wider Arctic and to the many other parts of the world with significant indigenous populations and resources in high global demand, such as the Amazon, Australia, and Southeast Asia. While indigenous and local, rather than national or global, control over development is typically imagined as fostering sustainable development, more work needs to be done to consider the cases in which a strengthening of indigenous and local rights can actually exacerbate unsustainable, overly resource-dependent economies. With this understanding, the goal is to inform policy making that allows for indigenous rights and sustainable development to be mutually supportive, whether in the Arctic or beyond in places like Amazon. As the Arctic continues to be a world region where indigenous rights are strongest and where sustainable development is widely advocated yet challenging to attain, reflection on the relationship between these issues is crucial.

Local Views of Shoreline Change Risk along Alaska's Northern Coastline

Michael Brady (Rutgers University, USA)

In instructional design terms, this question serves as a needs assessment to identify coastal places to monitor change based on local community perspectives. Data collection for ISD Step 1 (Figure 1) consisted of field visits to three North Slope communities in summer 2014 and spring 2016 to conduct semi-directive interviews using map instruments and coded stickers to document local perceptions of shoreline change risks. In 2016, the door was open to all community members in Utqiaġvik (formerly Barrow), the largest community, and purposive snowball sampling was used in two smaller villages Wainwright and Kaktovik to target subsistence hunters who have knowledge about remote stretches of the coastline. Sticker location results and verbal and written responses were digitized for geographical analysis (Figure 2). Fifty participated in the map workshops, providing close to 300 coastal places impacted (Figure 2). The semi-directive interview is an accepted method for collecting local information and knowledge in an open-ended format (Briggs 1986; Pretty et al. 1995), and is common in collaborative Arctic research (cf. Huntington 1998). This open-ended format is also established in community-based investigations of climate vulnerability in the Arctic (cf. Ford et al. 2006). Figure 2. ~300 Shoreline "Problems Places" Digitized from Paper Maps FINDINGS Subsistence sector impacts emerged as a primary concern. Data analysis revealed three main subsistence impact pathways: indirect through loss of industry access to infrastructure at Department of Defense (DoD) early warning radar sites that mitigate development impact, changing risk and access to subsisting hunting camps and hunting grounds, and direct loss of important hunting grounds and cultural sites that support subsistence. Local concern for eroding DoD sites include threatened infrastructure used to centralize hydrocarbon development to mitigate impacts. One example is the eroding Alaskan Native-controlled Cape Simpson Industrial Port used to centralize industry activity within the National

Petroleum Reserve - Alaska (Figure 3). Figure 3. Threatened Cape Simpson Industrial Port CONCLUSIONS Local risk verification revealed important subsistence impacts across the coastline, not just within villages usually focused on in the literature (e.g. Sakakibara 2008, 2017; Brunner and Lynch 2010; Marino 2012). This finding based on subsistence suggests broader relevance for communities across the Arctic. Revealing these impacts illustrates the importance of collaborative vulnerability assessments, and focusing on local decision support presents a pathway for systematic collaborative vulnerability research. Decision support requires stakeholder engagement for research product usability (Cash et al. 2003) and other benefits during research such as adaptive capacity (Preston et al. 2011). Decision support grounds assessment in values and priorities of stakeholders to identify needs such as usable information. Decision support usability is part of a larger transformation in sustainability science toward coproduction observed in Arctic sustainability research (cf. Andrey et al. 2016). Study findings are timely given the recent interest of formal vulnerability assessments to expand their reach to address local decision support (cf. Moss et al. 2014; AMAP 2017).

Impacts of Socioeconomic and Climatic Changes on Urban Infrastructure in the Russian Arctic

Nikolay Shiklomanov (The George Washington University, USA)

Planned socio-economic development during the Soviet period promoted migration into the Arctic and work force consolidation in urbanized settlements to support mineral resources extraction and transportation industries. The strong Soviet focus on developing Arctic regions, despite the cost and difficulty, has left a problematic legacy for modern Russia. As the Soviet political and economic systems crumbled, so did the support for vulnerable industries and cities. Deteriorated socioeconomic conditions negatively impacted demographic processes in the Arctic and most northern regions depopulated. The political, economic and demographic changes in the Russian Arctic have coincided with climatic changes. One of the most significant impacts of climate change on arctic urban landscapes is the warming and degradation of permafrost, which negatively affects the structural integrity of buildings. There are numerous reports indicating an increase in urban infrastructure damage throughout Russian permafrost regions over the last two decades. This presentation is focused on the role of permafrost in the urban development in the Russian Arctic, specific human- and climate-induced geotechnical problems related to permafrost, and innovative economically viable solutions to maintain city infrastructure.

Sustainable Futures for Arctic Rural Communities: using stakeholder engagement and multidisciplinary assessment of CSR best practices for modeling rural community transformation

Sonja Bickford (University of Nebraska, Kearney, USA)

Rural communities strive to retain and attract talented people and new businesses to provide better opportunities, yet they desire to sustain their resources, traditions, and ways of life. This project's

aim will be to assess community-wide corporate social responsibility (CSR) in rural Arctic communities based on the communities' identified needs and cultural values. The study's results will provide rural Arctic communities with examples of cost-effective, benefit-maximizing recommendations for implementation by multiple types of stakeholders; such as companies, public agencies, and organizational decision makers. In addition, the innovative, multidisciplinary, and bold international stakeholder engagement and networking methodology combined with semi-structured surveys and interviews will add value to Arctic rural communities so that more informed and collaborative decisions regarding development and sustainability can be made. During the past year a pilot CSR steering committee (SC) in a rural community in the United States: Kearney, Nebraska was assembled and met with the project team twice, which provided the project team with direct insight and real time feedback about their organizational and community needs. The analyzed results of the first two stakeholder meetings have resulted in this study's aims to answer the following questions in regards to sustainable development and growth for rural communities: 1) What are the current needs of organization's and the community and the how is and can CSR be measured? 2) What are the best corporate social responsibilities (CSR) / practices for rural Arctic communities- from both the social and economic points of view? 3) How do these values and experiences compare across rural communities to provide best practices in CSR efforts for stakeholders? The primary data collection will be initiated with a gap and needs analysis of current CSR practices in the targeted rural Arctic areas followed by the collection of benchmarked examples and cases from other similar locations in the region and beyond. This study will thus collect and identify the best practices and examples from rural communities in various stages of development. By thoroughly understanding the impacts and benefits of CSR efforts from a 360-degree perspective involving representatives from all community stakeholders (public, private, research, and NGO), specifically in rural communities; more informed, collaborative, and sustainable rural communities can be created. Rural areas in other parts of the world where companies have become a contributing and visible part of the local community have proven to not only provide benefits to the company but to the community, as well. Some communities located in the Arctic have already seen these positive impacts and New Zealand has shown that without a positive SLO and CSR companies and the country are unable to attract new people. The rural areas in the other parts of the Arctic and the world are very similar in terms of the community's goals for sustaining the community size, close knit societal way of life, and strong ties to land and culture and balancing those with the goals for sustainable development, economic development. The need for this collaborative, multidisciplinary CSR research for rural Arctic communities is driven by the collective community goals and needs to sustain a thriving and sustainable future. In order to accomplish the sustainable community of the future, a foundational framework is needed. The Triple-Helix theory of university-industry-government relations is a framework used for analyzing innovation and innovation policy. This methodology was used to create and analyze the CSR project's steering committee's (SC) answers to questions regarding their organizations' operational needs for sustainable development and growth as tested in the pilot SC meetings. This unique and innovative study methodology of stakeholder collaboration and engagement in hands-on research will benefit the rural communities in the Arctic and beyond by creating an innovative model for conducting CSR to support each of the community's sustainable development initiatives.

Thoroughly understanding CSR efforts on a community level will aid in creating a more informed and collaborative rural community.

Community Sustainability Monitoring: Main Approaches

Tatiana Vlasova (Institute of Geography, Russian Academy of Sciences, Russia)

The level and the character of community sustainability influences the sustainability of the entire Arctic socio-ecological system (SES) as it impacts and can regulate from the bottom (local scale) such important domains as the state of the environment, material well-being, local employment, equality, level of education and traditional knowledge, cultural values performance, access to food, energy and medical services, traditional land and natural resources. Being observed at local or regional scales it has important implications at the upper scales – national, zonal, pan-arctic and global. Community sustainability monitoring involving local people in observing and assessing their quality of life is very important activity not only from the scientific point of view. It enables effective participation of local/indigenous people in decision-making process and governance institutions. As it was demonstrated by the Arctic Council Arctic Social Indicators report, the performance of such local people participation and governance at local or regional scales could be measured by fate control index, that incorporates four measures: a measure of political control (percentage of local people in the governing body of the jurisdiction), a measure of economic control (% of public expenses from locally generated funds), cultural control (% of people speaking their "mother tongue"), and control over land. Community sustainability depends upon not only individual Human Capacities (fate control, education, mental and physical health, material well-being) but social capacities, social connectedness and organization. Social capital can be defined as "a state of being with others within the SES , where local human needs are met, where individuals and groups can act meaningfully to pursue their (sustainability) goals, and where they are satisfied with their way of life". Social connectedness can be defined as the strength, extension and quality of community networks. Here several types of indicators could be mentioned: indicators linked to social cohesion, for example the number of arts and sports organizations/10000, the number of civic organization/10000, voting participation. In terms of social organization, equity constitutes an important theme. It could be assessed with indicators such as the diversity of community members engaged in governance, the autonomy in relation to land and resource management and the gender dimension in decision-making. Other types of indicators assess trust and satisfaction with the government, the extent to which methods for governance are culturally appropriate, or whether community decision-making and planning processes engage diverse perspectives and reflect cultural differences. An interesting indicator that brings together social organization and the physical environment is the number of effective laws governing natural resources development. Social participation and leadership also could appear in sustainability indicators frameworks, notably through volunteering or social self-organization. Examples of operational indicators showing performance of social participation may include the percentage of community members who actively manage their natural resources, the number of active community organizations, and the percentage of community members who are members of two or more community organizations. It is underlined that different communities, depending upon

their peculiarities and problems they tackle, can have diverse set of sustainability indicators. Although there exists common principles for a set of community sustainability Indicators development: I. Putting Human and Social Capital and Capacities (HSCC) development, as a basic concern for all community sustainability indicators identification and monitoring; II. Process of community sustainability indicators definition should be "Problems-Solutions focused"; III. Community sustainability Indicators should reflect level and changes in diversity (complexity) of ecosystems, social systems and the entire socio-ecological systems; IY. Indicators should tightly interconnect different scales and establish views and values on this interconnectedness (from global to local and vice a versa); Y. The process of community sustainability indicators development should be based upon negotiations (consultations) between all concerned diverse agents (stakeholders), scientists and decision makers, local/indigenous people through transdisciplinary participatory approaches. Such community's sustainability monitoring activity is creating a tansdisciplinary space (s) which is viewed as one of sources of learning and transformations towards Arctic sustainability making possible to shape rapid changes happening in the Arctic based on sustainability knowledge co-production. The construction of continuous community's sustainability monitoring network in key Arctic communities enables to define adaptation and transformation pathways in the Arctic as communities in the Arctic and their sustainability play a considerable role in the total sustainability of Arctic SES.

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