**Science communication about Arctic Research**

***Lesson 1***

# Wallenstein, M., Live from the thawing Arctic tundra: The challenge of communicating complex science to the public, <https://www.nrel.colostate.edu/live-from-the-thawing-arctic-tundra-the-challenge-of-communicating-complex-science-to-the-public/>

As a scientist, I spend most of my time talking to other expert scientists about complexities and details in a language that only a handful of people can understand. It’s easy to lose sight of the big picture.

To have a successful career in science, one needs first to synthesize the accumulated knowledge of mankind on a specific topic in order to find the edge of the frontier- the unanswered questions that demand exploration. Our success depends on our ability to communicate new ideas at the frontier of science to our peers. That’s what gets our proposals funded and our papers published. In turn, publications and grants lead to good jobs, promotions, accolades, and the respect of our peers.

While individual success is dependent on one’s ability to communicate to other scientists, the success of the scientific endeavor largely depends on our ability to communicate with the public- with the students in our classes, the person sitting next to us on the plane, policymakers, and to those that can commercialize our discoveries into products and services that benefit humanity.

[](http://nrelecopress1.files.wordpress.com/2014/06/happy-lab-rats.jpg)

Today, I’m am writing from [Toolik Field Station](http://toolik.alaska.edu/" \t "_blank) in Arctic Alaska, where my research team is studying how soil carbon storage is likely to respond to rapid environmental change. This is important because soils in the Arctic have banked more carbon over thousands of years than the carbon contained in all of the world’s vegetation and our atmosphere combined! As Arctic plants breathe in the invisible gas carbon dioxide and grow leaves, roots and stems, microbes eat dead plant materials, breathe out carbon dioxide back to the atmosphere, and poop out what then becomes carbon-rich soil. But in the Arctic, the microbes that decompose dead plants do so slowly because it is cold and because the soggy soils don’t hold much oxygen. As a result, the Arctic has been taking carbon out of our atmosphere and storing it away in the soil lockbox for tens of thousands of years. Till now.

The climate is changing rapidly in the Arctic. [Warming is occurring twice as fast here as in the rest of the world](http://news.sciencemag.org/2013/08/scienceshot-arctic-warming-twice-fast-rest-world). And the results are [visible from space](http://www.nature.com/nclimate/journal/v3/n6/full/nclimate1914.html?). The short growing season is getting longer, and the plants are [getting bigger and greener](http://www.arctic.noaa.gov/reportcard/vegetation.html). What you can’t see from space is that the microbes and other critters that live beneath the surface are [waking up too](http://www.nature.com/nature/journal/v497/n7451/full/nature12129.html). This “biotic awakening” sounds like a good thing, and it probably is if you are a microbe, but could be bad for us. That’s because these microbes could open this carbon lockbox, releasing some of that banked soil carbon back to the atmosphere as carbon dioxide and methane. Because both of these are greenhouse gasses, [that could further accelerate climate warming](http://www.nytimes.com/2011/12/17/science/earth/warming-arctic-permafrost-fuels-climate-change-worries.html?_r=0). There is some evidence that this is [already happening](http://news.sciencemag.org/earth/2012/12/ticking-arctic-carbon-bomb-may-be-bigger-thought). But there is a lot we don’t know, and we can’t really predict how this will play out in the future. That is why we are here.

[](http://nrelecopress1.files.wordpress.com/2014/06/laurel-core-show-off.jpg)

Earlier this week, we were joined by [Miles O’Brien](http://milesobrien.com/), one of very few television reporters that produces in-depth stories on important science issues. Along with producer [Kate Tobin](http://katetobin.com/), they filmed our team for a story to appear later this summer on the National Science Foundation online magazine [Science Nation](http://www.nsf.gov/news/special_reports/science_nation/), and later on the [PBS News Hour](http://www.pbs.org/newshour/topic/science/). My challenge was to explain our cutting edge science in a way that most people can understand. That means not just explaining what we are studying, but why they should care, why what happens in the Arctic matters to them wherever they live, and why taxpayer dollars should be spent on this. That means avoiding the details of our work, like sophisticated mass spectrometry analyses of soil chemistry or genomic analyses of the microbes in our soils. It means avoiding confusing terminology like “feedbacks”, “sinks”, or “molecular structure”. Remember that this research was funded because we were able to convince other scientists that we had novel ideas and sophisticated approaches to test these ideas, not because we had a simple message that the public could easily understand.

Unfortunately, like most other scientists, I have almost no training in communicating to the public. Teaching has given me some experience, but I have a lot to learn. Fortunately, Miles and Kate were here for several days, providing a chance for me to evolve and refine the story I wanted to tell. And, ultimately, they will be telling our science story, filling in with narration and animation to complement the clips of me explaining the science. As hard as I tried to channel my inner [David Attenborough](http://www.davidattenborough.co.uk/) (I did not attempt a British accent, I promise) or [Neil deGrasse Tyson](http://www.haydenplanetarium.org/tyson/), I tend to be too deliberate and think too hard about what I’m saying, lacking the oozing enthusiasm of these great communicators. But, I think I did a decent job of clearly describing our science and the big picture. Fortunately, my student Laurel Lynch and postdoc Megan Machmuller had no shortage of enthusiasm and gave them some great clips to use.

[](http://nrelecopress1.files.wordpress.com/2014/06/show-time.jpg)

I’m excited to see the final production of this story, and hope that I was able to convey why this science is important, interesting, and imperative. I hope I have more opportunities to get communication training, and to communicate with the public in the future. While I don’t think that every scientist needs to be good at everything, including public communication, more of us need to do this, and do it well. While it’s still possible to be a successful scientist without being an effective public communicator, the success of the scientific endeavor depends on more of us doing more communication, more effectively.

[](http://nrelecopress1.files.wordpress.com/2014/06/toolik-team-photo.jpg)

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* Video available at: <https://www.pbs.org/newshour/science/alaskan-tundra-scientists-dig-dirt-future-climate-change>

***Lesson 2***

Science communication of some major Arctic institutional stakeholders:

Arctic Council

IASC

University of the Arctic

Arctic Council

<https://arctic-council.org/explore/work/arctic-knowledge/>

GENERATING DATA AND KNOWLEDGE

At any given time the Council’s subsidiary bodies – the Working and Expert Groups – are engaged in close to 100 projects and initiatives.

Current projects focus on preventing pollution, fostering mental health, averting oil pollution risks, manage biodiversity and marine ecosystems, and monitoring Arctic climate change – to name just a few. With this substantial body of knowledge, the Council continues to produce the most comprehensive circumpolar assessments and reports of issues and trends that impact the Arctic environment and Arctic inhabitants.

The inclusion of traditional knowledge and local knowledge is vital for exploring solutions to emerging challenges in the Arctic and to provide the best available knowledge as a basis for decision-making. The active participation of the Permanent Participants is one of the key features of the Arctic Council. Continuous efforts are made to enhance capacities within Arctic Indigenous communities, to enable them to contribute to the work of the Arctic Council.

### FEATURED PROJECTS

e.g.:

# CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM (CBMP)

An international network of scientists, governments, Indigenous organizations and conservation groups working to harmonize and integrate efforts to monitor the Arctic's living resources.

[Website](https://www.caff.is/monitoring)

### OBJECTIVE

 This is a foundational program implementing CAFF’s mandate and ABA recommendations which is working to harmonize and integrate efforts to monitor the Arctic’s biodiversity.

### ACTIVITIES

* Standardize and integrate efforts to monitor, collect and harmonize data and report on the status and condition of Arctic biodiversity, ecosystems and living resources
* Implementation of the [CBMP Strategic Plan for 2021-2025](https://oaarchive.arctic-council.org/handle/11374/2628)
* Implementation of the Arctic [Coastal](https://oaarchive.arctic-council.org/handle/11374/2356), [Marine](http://hdl.handle.net/11374/203), [Freshwater](http://hdl.handle.net/11374/394), [Terrestrial](http://hdl.handle.net/11374/396)Biodiversity Monitoring Plans
* Follow-up on the State of Arctic [Freshwater](https://oaarchive.arctic-council.org/handle/11374/2423), [Terrestrial](https://oaarchive.arctic-council.org/handle/11374/2627)and, [Marine](https://oaarchive.arctic-council.org/handle/11374/1955)State of the Arctic Biodiversity reports
* Development of the Coastal Biodiversity Report
* Ongoing development of the CBMP suite of headline indicators

### RELATED NEWS

#### [Snapshot of an ever-changing Arctic: The state of Arctic terrestrial biodiversity](https://arctic-council.org/news/snapshot-of-an-ever-changing-arctic-the-state-of-arctic-terrestrial-biodiversity/)

Climate change is driving significant changes that could lead to ecological catastrophes in the Arctic

10 May 2021

#### [“I think it is important for research to have meaningful impact “](https://arctic-council.org/news/i-think-it-is-important-for-research-to-have-meaningful-impact/)

Interview with Dr Nicholas Huffeldt, 2020-2021 CAFF-IASC Fellow with the Circumpolar Biodiversity Monitoring Programme

05 Jun 2020

[See all](https://arctic-council.org/news/)

2021

[Une image contenant texte, herbe, personne

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[Strategic Plan for the Circumpolar Biodiversity Monitoring Program (2021-2025)](https://oaarchive.arctic-council.org/handle/11374/2628)

<https://www.caff.is/monitoring>:

e.g.:

## Arctic Marine Biodiversity Monitoring

[](https://www.caff.is/marine/marine-monitoring-publications/3-arctic-marine-biodiversity-monitoring-plan)The [CBMP](https://www.caff.is/monitoring) is working with [partners](https://www.caff.is/pinpublications/385-caff-is/monitoring/about-the-cbmp/481-our-partners) across the Arctic to harmonize and enhance long-term marine monitoring efforts, and to facilitate more powerful and cost-effective assessments through the generation of, and access to, improved circumpolar datasets.

These efforts are led by a [Marine Steering Group](https://www.caff.is/marine/marine-steering-group) with expertise from six [Marine Expert Networks](https://www.caff.is/marine/marine-expert-networks) (Sea ice biota, Plankton, Benthos, Marine fishes, Seabirds and Marine mammals). who are working to implement  the Arctic Marine Biodiversity Monitoring Plan. This is an agreement across Arctic nations to compile, harmonize and compare results from existing Arctic marine biodiversity and ecosystem monitoring efforts, across nations and oceans.

The CBMP Marine group has identified key elements, called Focal Ecosystem Components (FECs), of the Arctic marine ecosystem, where changes in FEC status likely indicate changes in the overall marine environment. For the purposes of reporting and comparison, eight physically and bio-geochemically distinct Arctic Marine Areas (AMAs) were identified.

In 2017, CBMP Marine released the [State of the Arctic Marine Biodiversity Report](https://www.arcticbiodiversity.is/marine), and provided updates on seabirds and [marine mammals](https://youtu.be/N_OH1EdznZc) in 2020.

### + video State of the Arctic Marine Biodiversity

### + publications: https://www.caff.is/marine/marine-monitoring-publications

IASC

<https://iasc.info/about>

About IASC

The International Arctic Science Committee (IASC) is a non-governmental, international scientific organization. The [Founding Articles](https://iasc.info/about/publications-documents/organisational-and-strategic/702-iasc-handbook) committed IASC to pursue a mission of encouraging and facilitating cooperation in all aspects of Arctic research, in all countries engaged in Arctic research and in all areas of the Arctic region. Overall, IASC promotes and supports leading-edge interdisciplinary research in order to foster a greater scientific understanding of the Arctic region and its role in the Earth system.

Rather than defining human and environmental boundaries, IASC tries to bridge those boundaries. IASC is also committed to recognizing that Traditional Knowledge, Indigenous Knowledge, and “Western” scientific knowledge are coequal and complementary knowledge systems, all of which can and should inform the work of IASC.

To achieve this mission IASC:

* Initiates, coordinates and promotes scientific activities at a circumarctic or international level;
* Provides mechanisms and instruments to support science development;
* Provides objective and independent scientific advice on issues of science in the Arctic and communicates scientific information to the public;
* Seeks to ensure that scientific data and information from the Arctic are safeguarded, freely exchangeable and accessible;
* Promotes international access to all geographic areas and the sharing of knowledge, logistics and other resources;
* Provides for the freedom and ethical conduct of science;
* Promotes and involves the next generation of scientists working in the Arctic; and
* Promotes polar cooperation through interaction with relevant science organizations.

## [IASC History](https://iasc.info/about/626-iasc-history)

IASC was founded in 1990 by representatives of national scientific organizations of the eight Arctic countries - Canada, Denmark, Finland, Iceland, Norway, Russia (at that time Union of Soviet Socialist Republics), Sweden and the United States of America. The Founding Articles of IASC were signed in Resolute Bay, Canada.

Over the years, IASC has evolved into the leading international science organization of the North and its membership today includes 23 countries involved in all aspects of Arctic research, including 15 non-Arctic countries (Austria, China, the Czech Republic, France, Germany, India, Italy, Japan, the Netherlands, Poland, Portugal, South Korea, Spain, Switzerland and the UK).

In the context of its 25th anniversary in 2015, IASC published a comprehensive history spanning the first planning meetings in the late 1980s until today:

Rogne, O., Rachold, V., Hacquebord, L., Corell, R. (2015) IASC after 25 year - A Quarter of a Century of International Arctic Research Cooperation. International Arctic Science Committee. 125 pp.

### IASC State of Arctic Science Report

Since 2020, IASC publishes its annual **IASC State of Arctic Science Report**. It aims to be a cohesive synthesis of international Arctic research activities and priorities, as gathered from the Arctic research community itself. Arctic science is moving faster than ever, and so this report is aimed at Arctic science agencies, Arctic science managers, and Arctic science users including a wide range of decisionmakers and policymakers, to help all Arctic science stakeholders stay up to date on Arctic research.

IASC State of Arctic Science Report 2021 - English Version

[IASC\_2021\_SAS\_English.pdf](https://iasc.info/about/publications-documents/state-of-arctic-science?download=1992:iasc-state-of-arctic-science-report-2021-english-version)

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IASC State of Arctic Science Report 2020 - Korean Version

[IASCStateofArcticScienceReport2020\_Korean.pdf](https://iasc.info/about/publications-documents/state-of-arctic-science?download=1779:iasc-state-of-arctic-science-report-2020-korean-version)

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University of the Arctic

<https://www.uarctic.org/thematic-networks/>

# Thematic Networks and Institutes

UArctic's Thematic Networks foster issues-based cooperation within networks that are focused but flexible enough to respond quickly to topical Arctic issues. They form a natural framework for development of UArctic education and research providing an optimal structure for increasing the knowledge generation and sharing across the North.

UArctic Institutes are self-governing units devoted to research, monitoring and education throughout the Arctic. Empowered by local knowledge and international level academic expertise, they facilitate development of multidisciplinary solutions for challenges in the Arctic.

[Thematic Networks Activity Table 2020](https://www.uarctic.org/media/1601955/thematic-networks-activity-table-2020.pdf)

[Thematic Networks video interviews](https://www.uarctic.org/about-uarctic/video-interviews/thematic-network-interviews/)

Click the categories below to see the Thematic Networks and Institutes associated with each field.

### Business, Politics & Law

### Culture & Social Sciences

### Engineering & Technology

### Health & Education

### Humanities & Arts

### Natural Sciences

### UArctic Institutes

[Thematic Networks and Institutes](https://www.uarctic.org/organization/thematic-networks/)

* [Ageing and Gender in the Arctic](https://www.uarctic.org/organization/thematic-networks/ageing-and-gender-in-the-arctic/)
* [Arctic and Northern Governance](https://www.uarctic.org/organization/thematic-networks/arctic-and-northern-governance/)
* [Arctic Boreal Hub](https://www.uarctic.org/organization/thematic-networks/arctic-boreal-hub/)
* [Arctic Economic Science](https://www.uarctic.org/organization/thematic-networks/arctic-economic-science/)
* [Arctic Engineering](https://www.uarctic.org/organization/thematic-networks/arctic-engineering/)
* [Arctic Extractive Industries](https://www.uarctic.org/organization/thematic-networks/arctic-extractive-industries/)
* [Arctic Geology](https://www.uarctic.org/organization/thematic-networks/arctic-geology/)
* [Arctic in Asia and Asia in the Arctic](https://www.uarctic.org/organization/thematic-networks/arctic-in-asia-and-asia-in-the-arctic/)
* [Arctic Indigenous Film](https://www.uarctic.org/organization/thematic-networks/arctic-indigenous-film/)
* [Arctic Indigenous Skills](https://www.uarctic.org/organization/thematic-networks/arctic-indigenous-skills/)
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* [Arctic Plastic Pollution](https://www.uarctic.org/organization/thematic-networks/arctic-plastic-pollution/)
* [Arctic Safety and Security](https://www.uarctic.org/organization/thematic-networks/arctic-safety-and-security/)
* [Arctic Space Hub](https://www.uarctic.org/organization/thematic-networks/arctic-space-hub/)
* [Arctic Sustainable Arts and Design (ASAD)](https://www.uarctic.org/organization/thematic-networks/arctic-sustainable-arts-and-design-asad/)
* [Arctic Sustainable Resources and Social Responsibility](https://www.uarctic.org/organization/thematic-networks/arctic-sustainable-resources-and-social-responsibility/)
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* [Bioregional Planning for Resilient Rural Communities](https://www.uarctic.org/organization/thematic-networks/bioregional-planning-for-resilient-rural-communities/)
* [Children of the Arctic](https://www.uarctic.org/organization/thematic-networks/children-of-the-arctic/)
* [Circular Economy](https://www.uarctic.org/organization/thematic-networks/circular-economy/)
* [Circumpolar Archives, Folklore and Ethnography (CAFE)](https://www.uarctic.org/organization/thematic-networks/circumpolar-archives-folklore-and-ethnography-cafe/)
* [Climate Justice in the Arctic](https://www.uarctic.org/organization/thematic-networks/climate-justice-in-the-arctic/)
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* [Global Ecological and Economic Connections in Arctic and Sub-Arctic Crab Fisheries](https://www.uarctic.org/organization/thematic-networks/global-ecological-and-economic-connections-in-arctic-and-sub-arctic-crab-fisheries/)
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* [Herbivory](https://www.uarctic.org/organization/thematic-networks/herbivory/)
* [Human Adaptation in the Changing Arctic](https://www.uarctic.org/organization/thematic-networks/human-adaptation-in-the-changing-arctic/)
* [Institute for Arctic Policy](https://www.uarctic.org/organization/thematic-networks/institute-for-arctic-policy/)
* [Language Documentation and Language Technologies for Circumpolar Region](https://www.uarctic.org/organization/thematic-networks/language-documentation-and-language-technologies-for-circumpolar-region/)
* [Local-Scale Planning, Climate Change and Resilience](https://www.uarctic.org/organization/thematic-networks/local-scale-planning-climate-change-and-resilience/)
* [Læra Institute for Circumpolar Education](https://www.uarctic.org/organization/thematic-networks/laera-institute-for-circumpolar-education/)
* [Managing Small and Medium Sized Enterprises in the North](https://www.uarctic.org/organization/thematic-networks/managing-small-and-medium-sized-enterprises-in-the-north/)
* [Model Arctic Council](https://www.uarctic.org/organization/thematic-networks/model-arctic-council/)
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* [Verdde Program](https://www.uarctic.org/organization/thematic-networks/verdde-program/)
* [Working in the Arctic](https://www.uarctic.org/organization/thematic-networks/working-in-the-arctic/)
* [World Images of Indigenous Peoples of the North](https://www.uarctic.org/organization/thematic-networks/world-images-of-indigenous-peoples-of-the-north/)

### Natural Sciences

The effects of climate change and globalization are in many respects most pronounced in the Arctic, affecting both nature and environment, and the people living in this area. The Thematic Networks within the natural sciences focus on several topical issues in Arctic research ranging from permafrost, polar ice, climate and land dynamics to natural hazards and livelihoods utilizing the Arctic environment and natural resources. The common feature to all these Thematic Networks is that they take a look on the underlying factors and effects of changes, adaptation to them, and education of the next generation of scientists and managers familiar with these issues. The approaches to the topical questions and problems may, however, vary from theoretical perspectives and use of models and proxies for future predictions to encouraging concrete, comparative dialogue between indigenous people and the local economies in sustainable utilization of natural resources.

[Arctic – Boreal Hub](https://www.uarctic.org/../../organization/thematic-networks/arctic-boreal-hub/)

[Arctic Geology](https://www.uarctic.org/../../organization/thematic-networks/arctic-geology/)

[Arctic Plastic Pollution](https://www.uarctic.org/../../organization/thematic-networks/arctic-plastic-pollution/)

[Arctic Space Hub](https://www.uarctic.org/organization/thematic-networks/arctic-space-hub/)

[Arctic Sustainable Resources and Social Responsibility](https://www.uarctic.org/../../organization/thematic-networks/arctic-sustainable-resources-and-social-responsibility/)

[Arthropods of the Tundra / NeAT](https://www.uarctic.org/../../organization/thematic-networks/arthropods-of-the-tundra-neat/)

[Collaborative Resource Management](https://www.uarctic.org/../../organization/thematic-networks/collaborative-resource-management/)

[Gender in the Arctic Knowledge Production](https://www.uarctic.org/../../organization/thematic-networks/gender-in-the-arctic-knowledge-production/)

[Global Ecological and Economic Connections in Arctic and Sub-Arctic Crab Fisheries](https://www.uarctic.org/../../organization/thematic-networks/global-ecological-and-economic-connections-in-arctic-and-sub-arctic-crab-fisheries/)

[Herbivory](https://www.uarctic.org/../../organization/thematic-networks/herbivory/)

[Local-Scale Planning, Climate Change and Resilience](https://www.uarctic.org/../../organization/thematic-networks/local-scale-planning-climate-change-and-resilience/)

[Disasters and Natural Hazards](https://www.uarctic.org/organization/thematic-networks/disasters-and-natural-hazards/)

[Ocean Food Systems](https://www.uarctic.org/../../organization/thematic-networks/ocean-food-systems/)

[POPs and Chemicals of Emerging Concern in the Asian Arctic](https://www.uarctic.org/../../organization/thematic-networks/pops-and-chemicals-of-emerging-concern-in-the-asian-arctic/)

[Permafrost](https://www.uarctic.org/../../organization/thematic-networks/permafrost/)

[Science Diplomacy](https://www.uarctic.org/../../organization/thematic-networks/science-diplomacy/)

[Sustainable Production and Foraging of Natural Products in the North](https://www.uarctic.org/../../organization/thematic-networks/sustainable-production-and-foraging-of-natural-products-in-the-north/)

# Thematic Network on Permafrost



## Overall Goal

The primary goal is to establish, sustain and strengthen a network of university institutions that give permafrost research based education. This network will promote research, education collaboration and joint projects in the area of permafrost, its impact on environment and adaptation to climate change.

## Main Activities

1. Research cooperation

* Joint research workshops/publications
* Internship of master students, support for Master theses
* Internship of PhD students and researchers at other partner UArctic universities

2. Knowledge sharing in education

* Sharing existing courses
* Collaboration/ sharing data archives

3. International workgroups

* Collaboration with PYRN, APECS

4. Curriculum development

* Development of new joint courses

5. Joint education programs

* International Master/PhD programs on Permafrost
* Exchange program: undergraduate and graduate school program
* Summer school organization

## Activities 2019

Our network meetings:

* International Permafrost Association Education and outreach committee 1st Southern Hemisphere Conference on Permafrost -- SouthCOP --  in Queenstown, New Zealand 4-14 December 2019
* Belmont Forum: Arctic Research Center of Hokkaido University, Ammosov North-Eastern Federal University, University of Alaska Fairbanks,Carbon Budget of Ecosystems, Cities and Villages on Permafrost (COPERA Project) final stakeholder meeting Yakutsk Russia, September 24, 2019
* COPERA project final meeting Sapporo, Japan Oct 6, 2019    
  Thermal state of permafrost in Eastern Siberia: Kenji Yoshikawa    
  Collaborative Research Action for COPERA: Atsuko Sugimoto

Panel discussion:

* NORTHERN SUSTAINABLE DEVELOPMENT( Northern Forum): Network Cooperation in the University of the Arctic, September 24, 2019    
  Thematic networks are interdisciplinary associations of scientists and specialists for joint research work and/or development of online educational programs. Thematic networks form the natural basis for the development of education and scientific research, providing them with an optimal structure for the accumulation and dissemination of knowledge throughout the North. Each network is international and includes representatives from the main Arctic regions – Russia, Northern Europe and North America. To date, more than 50 thematic networks have been created in various areas, for example, on permafrost, local and regional development in the North, Arctic Lingua, and industrial development in the Arctic. Co-organizers: Ammosov North-Eastern Federal University, Panel for thematic Network on Permafrost Kenji Yoshikawa

Seminars and summer courses:

* COLD Lands Seminar (September 23-27)Ammosov North-Eastern Federal University   
  The international interdisciplinary seminar COLD LANDS, attended by the leading Russian and international experts onthe Arctic and the North, has been held by NEFU Northern Studies Dept since 2008. Total over 20 sessions of the seminar were held, attendedby the leading researchers from research centers and universities in Russia, Canada, Finland, Norway, the USA and other countries.
* AG-218 International Bachelor Permafrost Summer Field School (10ECTS) the University Centre in Svalbard June-July 2019
* RJE3 Program Summer School, Hokkaido University, Ammosov North-Eastern Federal University August 2019
* Nitobe Colleage Summer Course Hokkaido University, University of Alaska Fairbanks

## Current and Planned Activities

* Joint research workshops/publications
* Internship of master students, support for Master theses
* Internship of PhD students and researchers at other partner UArctic universities
* Sharing existing courses
* Collaboration/ sharing data archives
* Collaboration with PYRN, APECS
* Exchange program: undergraduate and graduate school program
* Summer school organization

## Educational Activities

Our network involved installing permafrost temperature monitoring systems over 450 public schools across Alaska (USA), Canada, Russia, Norway, Greenland, Mongolia, China and Japan. Installation consisted of a small borehole (approximately 2 inches in diameter) drilled near the school. The borehole was lined with plastic pipe, and thermistor temperature sensors were installed. Both K-K12 teachers and students participated in the drilling and instrument installation process and project personnel visited classrooms to discuss permafrost science and engineering at each site. The data loggers are designed to operate automatically and are able to store data for long periods. The teachers and students made periodic measurements of snow thickness above the measurement site and helped with downloading the data. Project personnel used the data in subsequent classroom activities. Also the resulting permafrost temperature data will make important contributions to studies related to long-term permafrost conditions in various areas; this data could help provide relevant information regarding potential climate warming.

Also for college level, the Thematic Network on Permafrost offered an international permafrost summer field school in Svalbard (UNIS) in 2014, 2015, Yakutsk (NEFU) in 2016 and Fairbanks (UAF) in 2017 and we are planning another in Western Greenland (hosted by Stockholm University) in 2018. We welcome students who are interested in obtaining an overall knowledge about permafrost. The course will offer insights into:

* Permafrost history and its distribution globally.
* Permafrost temperatures in various parts of the World – climatic and other controls.
* Methods of permafrost observations, focusing on drilling, coring and instrumentation.
* Permafrost databases and their use in permafrost analyses.
* How does permafrost affect local community infrastructure and cultural life?
* Interaction between carbon and water in permafrost landscapes.
* How sensitive are permafrost landforms towards climate change?

## Follow us

**Blogs**  
[Permafrost Outreach](http://ine.uaf.edu/werc/projects/permafrost/) (English)  
[Permafrost Outreach](http://permafrost.edublogs.org/) (Russian)  
[Frost Tube Outreach Program](http://www.myu.ac.jp/~haradak/frost_tube.html) (Japanese)

**Data book**  
[Permafrost in Our Time](https://issuu.com/permafrostbook/docs/piots) (in English) Mainly focused on Arctic communities in North America  
[Мерзлота в наше время](https://issuu.com/permafrostbook/docs/95) (Permafrost in Our Time in Russian) Mainly focused on Arctic communities in Siberia

**Facebook**

Tags: [permafrost](https://www.uarctic.org/tag/permafrost)[cryosphere](https://www.uarctic.org/tag/cryosphere)

Permafrost network on youtube:

<https://www.youtube.com/watch?v=d0B77IuGbsY&t=1s>

UARCTIC research highlights;

<https://research.uarctic.org/highlights/>

# Highlights from UArctic Research

Highlights, the UArctic Research platform, creates a space for sharing with the broader UArctic community, policymakers, and general public. The research projects and initiatives, written by scientists from different [Thematic Networks and UArctic Institutes](https://www.uarctic.org/organization/thematic-networks/) as well as [UArctic Chairs](https://research.uarctic.org/highlights/uarctic-chairs/" \t "_blank), will particularly focus on multidisciplinary studies that have a high academic impact and contribute to the wellbeing of Arctic communities and ecosystems. In addition to the research conducted at the Thematic Networks and Institutes, all members of UArctic are welcomed to contribute. For more information please [contact us](https://research.uarctic.org/highlights/).

### [UArctic Research Chair leads Arctic expedition using the US Coast Guard’s Healy Icebreaker](https://research.uarctic.org/news/2021/8/uarctic-research-chair-leads-arctic-expedition-using-the-us-coast-guard-s-healy-icebreaker/)

Mon, Aug 23, 2021

[](https://research.uarctic.org/news/2021/8/uarctic-research-chair-leads-arctic-expedition-using-the-us-coast-guard-s-healy-icebreaker/)

“In the wake of the Erubus, Terror and Gjoa” Leaving from Seward, Alaska, on 25 August, University of Oulu (UOulu) & University of Alaska Anchorage’s (UAA) Professor Jeff Welker and colleagues (Drs. Klein, Causey, Kopec, Pedron, Marttila, Bailey, and Czimczik) are about to embark on an icebreaker based investigation into...

### [UArctic Chair's update: An Arctic Crystal Ball - Long-term Experiments as a Window into the New Arctic](https://research.uarctic.org/news/2020/11/uarctic-chair-s-update-an-arctic-crystal-ball-long-term-experiments-as-a-window-into-the-new-arctic/)

Tue, Nov 03, 2020

[](https://research.uarctic.org/news/2020/11/uarctic-chair-s-update-an-arctic-crystal-ball-long-term-experiments-as-a-window-into-the-new-arctic/)

Professor Jeffrey Welker\* and Colleagues \*UArctic Research Chair, University of Oulu, Finland & University of Alaska Anchorage The Snowier, New Arctic may lead to major increases in C capture and storage: A negative climate change feedback.

### [UArctic Research Chair Postdoctoral Fellow Maria Väisänen awarded Maa- ja vesitekniikan tuki ry grant](https://research.uarctic.org/news/2020/9/uarctic-research-chair-postdoctoral-fellow-maria-vaisanen-awarded-maa-ja-vesitekniikan-tuki-ry-grant/)

Wed, Sep 30, 2020

[](https://research.uarctic.org/news/2020/9/uarctic-research-chair-postdoctoral-fellow-maria-vaisanen-awarded-maa-ja-vesitekniikan-tuki-ry-grant/)

Dr. Maria Väisänen, a UArctic Postdoctoral fellow with Professor Jeff Welker, has been awarded a research grant from Maa- ja vesitekniikan tuki ry grant. Her research project will focus on Understanding the interactions between plant root dynamics and coupled biogeochemical cycles in response to global changes in peatlands. H...

### [UArctic Chair Jeff Welker co-authored research on the cover of Journal of Glaciology](https://research.uarctic.org/news/2020/8/uarctic-chair-jeff-welker-co-authored-research-on-the-cover-of-journal-of-glaciology/)

Mon, Aug 31, 2020

[](https://research.uarctic.org/news/2020/8/uarctic-chair-jeff-welker-co-authored-research-on-the-cover-of-journal-of-glaciology/)

The UArctic Research Chair, Professor Jeff Welker, University of Oulu, Finland and University of Alaska Anchorage, has co-authored a new set of discoveries regarding thinning and melting of the Greenland Ice Sheet.

### [UArctic Chair in the Arctic at Toolik Lake-Ancient C story](https://research.uarctic.org/news/2020/3/uarctic-chair-in-the-arctic-at-toolik-lake-ancient-c-story/)

Fri, Mar 27, 2020

[](https://research.uarctic.org/news/2020/3/uarctic-chair-in-the-arctic-at-toolik-lake-ancient-c-story/)

Here is on-site video from Arctic Alaska in a very snowy March 2020, shared by UArctic Research Chair, Professor Jeff Welker (University of Oulu & University of Alaska Anchorage)

### [Large loss of CO2 in winter observed across the northern permafrost region](https://research.uarctic.org/news/2019/10/large-loss-of-co2-in-winter-observed-across-the-northern-permafrost-region/)

Mon, Oct 28, 2019

[](https://research.uarctic.org/news/2019/10/large-loss-of-co2-in-winter-observed-across-the-northern-permafrost-region/)

Professor Jeffrey Welker from the University of Oulu and the University of Alaska Anchorage alongside with 30 co-authors from UArctic affiliated institutions and research groups just published a paper on the large loss of CO2 in winter observed across the northern permafrost region.

### [Greenland, Island of change: Ice sheet sourced rivers deliver ancient C and nutrients to the Arctic Ocean](https://research.uarctic.org/news/2019/10/greenland-island-of-change-ice-sheet-sourced-rivers-deliver-ancient-c-and-nutrients-to-the-arctic-ocean/)

Wed, Oct 09, 2019

[](https://research.uarctic.org/news/2019/10/greenland-island-of-change-ice-sheet-sourced-rivers-deliver-ancient-c-and-nutrients-to-the-arctic-ocean/)

UArctic Research Chair, Professor Jeff Welker (University of Oulu and University of Alaska Anchorage) has been one of the few terrestrial ecologists studying the periglacial landscapes in the High Arctic of NW Greenland over the past 20 years. His program in High Arctic Biocomplexity began a multi-decade program addressing th...

### [MOSAiC, The largest Arctic scientific expedition starting now](https://research.uarctic.org/news/2019/6/mosaic-the-largest-arctic-scientific-expedition-starting-now/)

Thu, Jun 06, 2019

[](https://research.uarctic.org/news/2019/6/mosaic-the-largest-arctic-scientific-expedition-starting-now/)

UArctic Research Chair, Professor Jeff Welker (University of Oulu & University of Alaska Anchorage) and colleagues from across the Arctic will be contributing to this monumental effort with their studies of the Arctic Water Isotope Cycle.

### [Arctic coastal vegetation effected by delayed geese arrival: Changes in trophic processes](https://research.uarctic.org/news/2019/5/arctic-coastal-vegetation-effected-by-delayed-geese-arrival-changes-in-trophic-processes/)

Mon, May 13, 2019

[](https://research.uarctic.org/news/2019/5/arctic-coastal-vegetation-effected-by-delayed-geese-arrival-changes-in-trophic-processes/)

Many migratory waterfowl have evolved to synchronize periods of peak nutrient demand, often breeding, with periods of high resource availability. Climate change is creating phenological mismatches between herbivores and their plant resources throughout the Arctic.

### [Arctic Council SDWG project "Teacher Education for Diversity and Equality in the Arctic" concludes with great achievements](https://research.uarctic.org/news/2019/5/arctic-council-sdwg-project-teacher-education-for-diversity-and-equality-in-the-arctic-concludes-with-great-achievements/)

Wed, May 08, 2019

The Arctic Council Sustainable Development Working Group (SDWG) project "Teacher Education for Diversity and Equality in the Arctic", coordinated by UArctic Thematic Network on Teacher Education, was concluded in the ministerial meeting of Arctic Council on 7th May, 2019 in Rovaniemi.

### ["Food (in)Security in the Arctic: Contribution of Traditional and Local Food to promote Food Security with Particular Reference to the European High North" - Project Update](https://research.uarctic.org/news/2019/4/food-in-security-in-the-arctic-contribution-of-traditional-and-local-food-to-promote-food-security-with-particular-reference-to-the-european-high-north/)

Tue, Apr 30, 2019

[](https://research.uarctic.org/news/2019/4/food-in-security-in-the-arctic-contribution-of-traditional-and-local-food-to-promote-food-security-with-particular-reference-to-the-european-high-north/)

The Northern Institute for Environmental and Minority Law at the Arctic Centre of the University of Lapland is pleased to announce that the project "Food (in)Security in the Arctic: Contribution of Traditional and Local Food to promote Food Security with Particular Reference to the European High North" has been successfully s...

### [UArctic Thematic Network on Teacher Education launched a new publication](https://research.uarctic.org/news/2019/4/uarctic-thematic-network-on-teacher-education-launched-a-new-publication/)

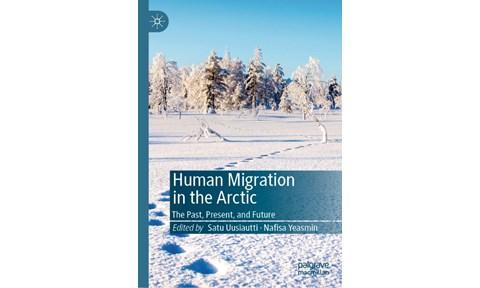
Mon, Apr 01, 2019

[](https://research.uarctic.org/news/2019/4/uarctic-thematic-network-on-teacher-education-launched-a-new-publication/)

UArctic Thematic Network on Teacher Education launched an online version of the book "Including the North: a Comparative Study of the Policies on Inclusion and Equity in the Circumpolar North" on March 26, 2019 in Rovaniemi, as part of the conference "Developing an Inclusive School".

### [New Publication: Human Migration in the Arctic. The Past, Present, and Future](https://research.uarctic.org/news/2019/3/new-publication-human-migration-in-the-arctic-the-past-present-and-future/)

Fri, Mar 22, 2019

[](https://research.uarctic.org/news/2019/3/new-publication-human-migration-in-the-arctic-the-past-present-and-future/)

Professor Satu Uusiautti and project manager, leader of the UArctic Thematic Network on Arctic Migration, Dr. Nafisa Yeasmin have edited a book on top research on the past, present, and future of Arctic (im)migration.

### [Comparative Reindeer & Caribou Ecology in the Arctic; UArctic Research Chair and colleagues in Finland, Alaska & Norway](https://research.uarctic.org/news/2019/3/comparative-reindeer-caribou-ecology-in-the-arctic-uarctic-research-chair-and-colleagues-in-finland-alaska-norway/)

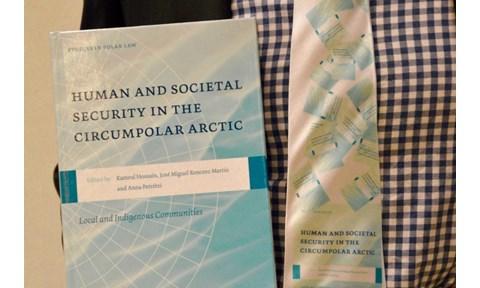
Wed, Mar 13, 2019

[](https://research.uarctic.org/news/2019/3/comparative-reindeer-caribou-ecology-in-the-arctic-uarctic-research-chair-and-colleagues-in-finland-alaska-norway/)

Caribou and reindeer are central to the ecology, cultural and economic sustainability of the Arctic and northern regions.  As part of Professor Welker's UArctic Chairship,  Dr. Welker, students and colleagues are undertaking studies of ungulate ecology with a focus on herbivore landscape use patters, diets, vegetation traits,...

### [HuSArctic launched its final publication - Human and Societal Security in the Circumpolar Arctic Local and Indigenous Communities](https://research.uarctic.org/news/2018/11/husarctic-launched-its-final-publication-human-and-societal-security-in-the-circumpolar-arctic-local-and-indigenous-communities/)

Thu, Nov 22, 2018

[](https://research.uarctic.org/news/2018/11/husarctic-launched-its-final-publication-human-and-societal-security-in-the-circumpolar-arctic-local-and-indigenous-communities/)

On 26 October 2018, during its closing conference, HuSArctic has presented its final publication Human and Societal Security in the Circumpolar Arctic – a book published by Brill. The attendees in the event included: series editor of the Studies in Polar Law from Brill, editors of the book, contributing authors and participan...

### [The new publication highlights the human security challenges in the Barents region](https://research.uarctic.org/news/2018/9/the-new-publication-highlights-the-human-security-challenges-in-the-barents-region/)

Thu, Sep 20, 2018

[Une image contenant texte

Description générée automatiquement](https://research.uarctic.org/news/2018/9/the-new-publication-highlights-the-human-security-challenges-in-the-barents-region/)

The book - Society, Environment and Human Security in the Arctic Barents Region – edited by Kamrul Hossain (lead of the UArctic Thematic Network on Law) and Dorothée Cambou, gives a comprehensive analysis of vulnerabilities, challenges and needs that the Barents population experiences today or may encounter in the future. In...

### [UArctic Chair's Polar Bear collaborative research featured in Arctic Today](https://research.uarctic.org/news/2018/8/uarctic-chair-s-polar-bear-collaborative-research-featured-in-arctic-today/)

Wed, Aug 01, 2018

[](https://research.uarctic.org/news/2018/8/uarctic-chair-s-polar-bear-collaborative-research-featured-in-arctic-today/)

The UArctic Chair Jeff Welker's food web program on Polar Bears is featured in Arctic Today, sharing that high PFAS levels found in Barents Sea polar bears. This collaborative program lead by Jeff's Norwegian colleagues has been underway for many years and it reflects the breadth of the Chairship & research program.  In a...

### [Human rights and multiple discrimination of minorities within the Sámi minority](https://research.uarctic.org/news/2018/5/human-rights-and-multiple-discrimination-of-minorities-within-the-sami-minority/)

Wed, May 09, 2018

[](https://research.uarctic.org/news/2018/5/human-rights-and-multiple-discrimination-of-minorities-within-the-sami-minority/)

Dr. Leena Heinämäki, PhD Candidate Laura Olsén and research assistant Assi Harkoma from the University of Lapland, Arctic Centre finished their interdisciplinary research project regarding the human rights and multiple discrimination of Sámi persons with disabilities and Sámi who identify themselves as sexual and/or gender mi...

### [UArctic Chair Update - Reindeer-climate interactions and the consequences of husbandry practices on reindeer diets and subsequent meat quality](https://research.uarctic.org/news/2018/2/uarctic-chair-update-reindeer-climate-interactions-and-the-consequences-of-husbandry-practices-on-reindeer-diets-and-subsequent-meat-quality/)

Mon, Feb 26, 2018

As part of his UArctic Chairship, Professor Jeff Welker has completed establishing his first core set of collaborative, interdisciplinary research projects in Finland at the University of Oulu. This article will cover the second of two projects.

### [UArctic Chair Update - The Arctic Water Isotope Cycle](https://research.uarctic.org/news/2018/2/uarctic-chair-update-the-arctic-water-isotope-cycle/)

Mon, Feb 26, 2018

[](https://research.uarctic.org/news/2018/2/uarctic-chair-update-the-arctic-water-isotope-cycle/)

As part of his UArctic Chairship, Professor Jeff Welker has completed establishing his first core set of collaborative, interdisciplinary research projects in Finland at the University of Oulu. This article will explain the first of two projects.

UARCTIC resources

<https://research.uarctic.org/resources/>

# Resources



The following resources are aimed to facilitate research activities and collaboration within UArctic members. These are also designed as an open access service for the general public, to benefit from the research outputs of our network.

## [Arctic Learning Resources](https://research.uarctic.org/resources/arctic-learning-resources/)

At a time when the COVID-19 outbreak means considerable disruptions to the educational operations of our members and more and more teaching moves online, UArctic and its partners are working to collect openly available learning resources to be used as needed by the circumpolar higher education community.

See [current listings](https://research.uarctic.org/resources/arctic-learning-resources/catalogue/) or [submit](https://research.uarctic.org/resources/arctic-learning-resources/) a new resource.

[Research Infrastructure Catalogue](https://research.uarctic.org/resources/research-infrastructure-catalogue/)

The UArctic Research Infrastructure Catalogue is an free on-line database for searching and identifying research infrastructures and facilities located at and operated by the UArctic member institutions, available for external users.

The UArctic Research Infrastructure Catalogue features include:

* Worldwide search and identification of research infrastructures and facilities located at and operated by UArctic member institutions
* Increased awareness of the international research community and other stakeholders about research infrastructures
* Research collaboration possibilities
* Efficient use of research infrastructures and facilities

For a list of similar research infrastructure catalogues, databases or listings maintained by other organizations, see [this page](https://research.uarctic.org/resources/research-infrastructure-catalogue/other-infrastructure-databases/).

[Research Analytics Reports](https://research.uarctic.org/about-research/research-analytics-task-force/)

The Research Analytics Task Force has produced four publications, together with leading partners from the scientific publishing industry including [Digital Science](http://www.digital-science.com/), [ÜberResearch](http://www.uberresearch.com/" \t "_blank), Altmetric, and Elsevier's [Research Intelligence](https://www.elsevier.com/research-intelligence)).

* [International Arctic Research - Analyzing Global Funding Trends (A Pilot Report)](https://dx.doi.org/10.6084/m9.figshare.3811224)
* [Arctic Altmetrics: Alternative Perspectives on the Impact of Arctic Research](https://dx.doi.org/10.6084/m9.figshare.3811233)
* [Arctic Research Publications: Scholarly Output Trends Using the Russian Index of Scientific Citations](https://dx.doi.org/10.6084/m9.figshare.3811242)
* [Arctic Research Publication Trends: A Pilot Study](https://www.elsevier.com/__data/assets/pdf_file/0017/204353/Arctic-Research-Publication-Trends-August-2016.pdf)

[Snowy OWL Talks](https://research.uarctic.org/resources/snowy-owl-talks/)

UArctic Snowy OWL Talks, videos based on public presentations by inspirational leaders, expect to serve as general information as well as supplementary course material for students studying in or about the North.

### [Report on Understanding the Bottlenecks in Cross-Border Research](https://research.uarctic.org/media/1600266/scientificcooperationinthearcticnov27.pdf)

The report "Scientific Cooperation within the Arctic: Understanding the Bottlenecks in Cross-Border Research" highlights some of the bottlenecks that researchers face when conducting cross-border research around the Arctic.

[High North Research Documents](http://highnorth.uit.no/)

[UiT - The Arctic University of Norway](https://www.uarctic.org/member-profiles/norway/8922/uit-the-arctic-university-of-norway) partners with UArctic to host an open access library, based on their [High North Research Documents](http://highnorth.uit.no) archive.