The UArctic Magazine

SHARED VOICES

2020

UArctic

UArctic

The UArctic Magazine
Shared Voices 2020

UArctic International Secretariat
University of Lapland
Box 122, 96101 Rovaniemi, Finland

secretariat@uarctic.org
www.uarctic.org

Printed on Munken Pure by Arctic Paper
Cover 170g/m², contents 100g/m²

Editorial Team
Outi Snellman, Lars Kullerud, Hannele Palviainen

Editor in Chief
Outi Snellman

Managing Editor
Hannele Palviainen

Graphic Design & Layout
Puisto Design & Advertising,
www.puistonpenkki.fi

Cover Photo
Dustin Patar/Nunatsiaq News
Climate striker in Iqaluit in September 2019

Print Run
1000

Printer
Erweko Oy, 2020

This magazine has been made possible with financial support from the Danish Agency for Science and Higher Education.

Ministry of Higher Education and Science Denmark

Read all articles online at
uarctic.org/sharedvoices

Letter from the President

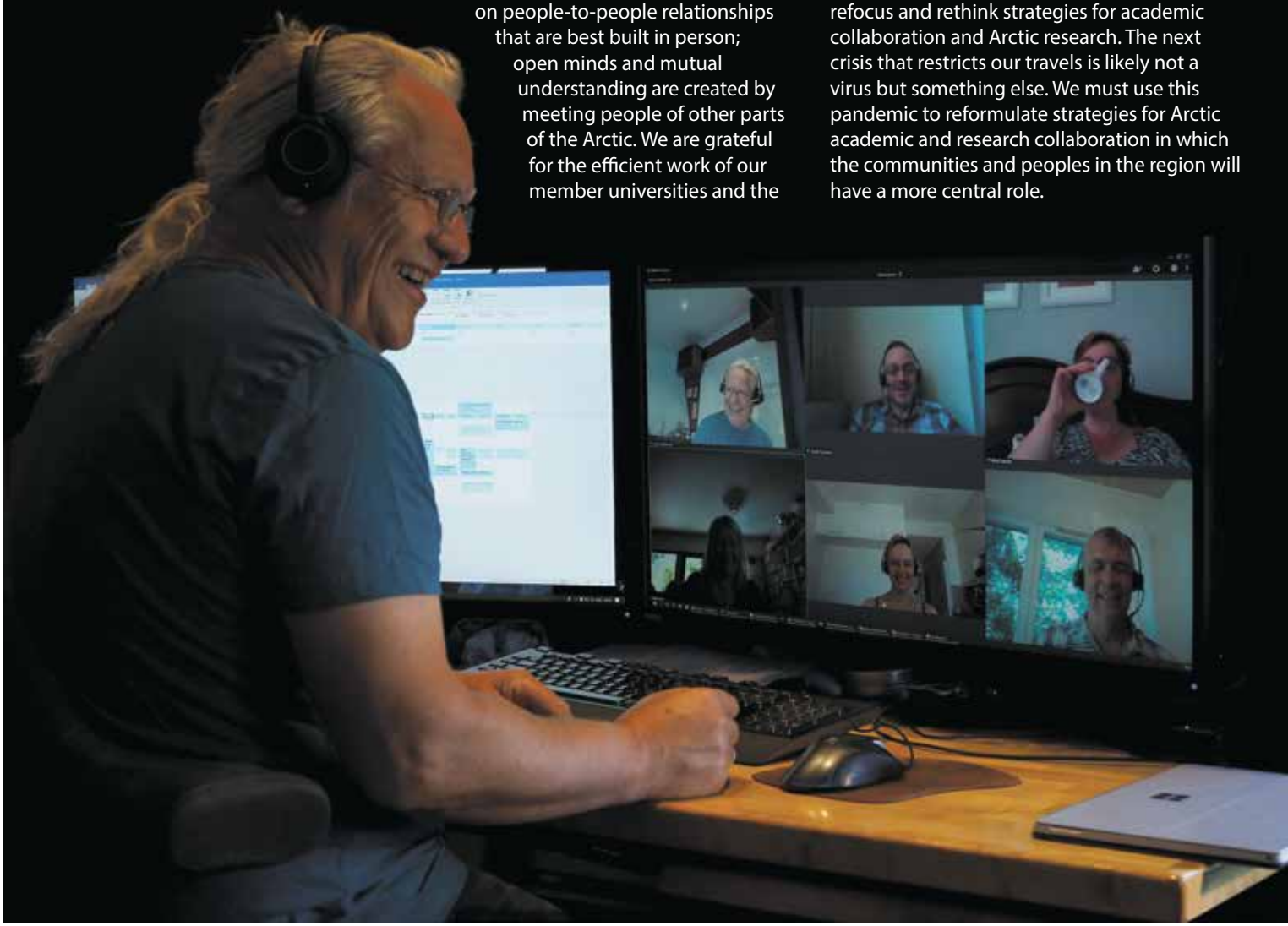
By **LARS KULLERUD**
President, UArctic

Spring 2020 became a crash course in working from home, remote collaboration, and distance learning and teaching. Rather unexpectedly, the COVID-19 pandemic made the UArctic way of working into everyday reality for many of us. This push towards digital collaboration has revealed its strengths and weaknesses, and it is clear that we still have much to learn before remote learning and collaboration become perfect.

Another consequence of the pandemic is the abrupt stop in student and faculty mobility. Distance collaboration is dependent on people-to-people relationships that are best built in person; open minds and mutual understanding are created by meeting people of other parts of the Arctic. We are grateful for the efficient work of our member universities and the flexibility of the funders which have made it possible to cope with this dramatic change in international mobility.

Traveling to do research in northern communities would be irresponsible at a time like this. Therefore, for the summer and fall 2020, we face a near-total stop in field-based research and learning. We also do not know if the pandemic will influence upcoming field seasons. This has severe consequences on planned research, the continuity of data series, and not least the training of next generations of researchers.

COVID-19 also provides an opportunity to refocus and rethink strategies for academic collaboration and Arctic research. The next crisis that restricts our travels is likely not a virus but something else. We must use this pandemic to reformulate strategies for Arctic academic and research collaboration in which the communities and peoples in the region will have a more central role.



We already see cases where local faculty and community experts have been able to carry out observations and research in collaboration with researchers who are unable to travel. Remote teaching brings its own challenges, but carried out in collaboration with a local mentor, it does provide a model for academic delivery in the Arctic that should be used more. To support the faculty who had to move their teaching online this spring, UArctic launched a platform for open sharing of online Arctic teaching materials which has already gained a lot of content.

While dealing with the crisis, UArctic's leadership has been united at our computers, planning how the network might look like in the next decade. In the spirit of rethinking Arctic science collaboration, UArctic is taking the initiative to work for a new International Polar Year (IPY) as a process culminating in 2032–33. In collaboration with our partners IASC and IASSA, we invite local actors to build new movements for polar science collaboration that also engage the residents of the Arctic in new ways.

2020 marks the first year of the UArctic Association registered under Finnish law. Our new legal basis increases our ability to handle matters as an independent organization. It also complements the trust and purpose stemming from the initiative of the Arctic Council to create UArctic more than twenty years ago.

By the end of this year, UArctic will launch our strategy for the next 10 years. It is our ambition to work with our members and the peoples of the Arctic to build a strong, engaged, informed and dynamic North, creating better lives and environments for all northerners.

EDITORIAL

By **OUTI SNELLMAN**
Vice-President Organization, UArctic

When we were deciding on the theme of this magazine in late 2019, the choice of climate action seemed obvious. The whole world was uniting behind a 15-year-old school girl from Sweden, and the message from the youth through the school strikes on Fridays was very clear. "There is no planet B – let's act now." "Let's listen to the science – and act now." The call for action was like a massive wave. Amidst the despair there was also light: perhaps there is hope for the world after all, if we all unite in action, right now.

We sent the call for submissions to UArctic's entire membership, asking them to propose articles of their own around the theme. Their response was overwhelming both in amount and variety. Each piece speaks of climate action but there is diversity in their perspectives, ranging from member institutions' internal actions to those of education and research programs and projects, without forgetting how each of us as individuals can make a difference.

In spring 2020 the world was taken by surprise by another very immediate challenge, COVID-19. While we are desperately fighting the pandemic, I hope that we are also able to learn from the ways in which we coped during the crisis. Issues like digital mobility and online collaborative classrooms got an unprecedented push; some call it a giant digital leap. We need to keep building on those opportunities, so that we can make international collaboration less harmful to the environment and also possible in times of such crises. Just like the world united under the slogan "Stronger Together" to combat the pandemic, we can, through collaboration, tackle one of the biggest challenges the globe has faced: climate change. In that, strong international collaboration on all levels of society is a prerequisite.

By His Serene Highness
PRINCE ALBERT II OF MONACO
Monaco, April 29, 2020

Action to combat climate change is a primary commitment in my life.

However, rather than talking about the policies implemented in Monaco or the projects initiated or supported by my Foundation in regard to the climate, I will instead try to summarize the ways in which I believe the fight against climate change is intrinsically linked to the preservation of the Arctic region – the region at the heart of many climate change issues.

First and foremost, the Arctic, with its vast landscapes, is where one feels more than anywhere else the Earth's beauty and force, as well as its fragility in the face of human actions.

It is also a universal region, whose future, each of us understands, is vital for the entire world; a region, therefore, that enables us to make the link between local problems and global issues.

It is also an area of economic tension, in particular since global warming has opened

"Action against climate change means reconciling the needs of nature with the aspirations of humankind."

up new maritime routes, giving access to natural resources which up until now were out of reach, thus attracting a great deal of economic and not always well-intentioned interest.

It is also a region for scientific exploration, made up of ecosystems, often still obscure, of which we need to gain a better understanding.

And above all, it is inhabited land, whose people are only very rarely responsible for the ills befalling them and who live with the terrible uncertainty of a future over which they have little control.

Consequently, the Arctic is a microcosm of our world and the challenges it faces due to climate change.

In the Arctic, as elsewhere, we can only combat climate change by basing ourselves on specific scientific knowledge, which alone is capable of indicating the threats to us and the ways to prevent them.

We can only take action by involving humankind as a whole in an effort which concerns us all. We can only be effective by reconciling economic issues with environmental imperatives. And we can only find a sustainable solution with the populations concerned, by giving them the opportunity to take control of their own destiny, between respect for their ancestral traditions and ambitions for a better future.

There, as well as elsewhere, action against climate change means committing to a development paradigm which is able to reconcile the needs of nature with the aspirations of humankind.

That is the reason why for many years I have been committed to protecting this region. That is why my Foundation implements and supports many actions in the polar regions.

And that is why, for many years, I have enthusiastically supported UArctic, who is a key player in the conservation of the Arctic, and beyond that, of our climate and our planet.

To save the Earth, we need to save the Arctic.

Photo: **Palais Princier de Monaco**

CLIMATE ACTION

A Need for Policy

By **PEKKA HAAVISTO**
Minister for Foreign Affairs, Finland

We are witnessing the rapid spread of the coronavirus pandemic around the world. Unfortunately, this is not such a surprise – scientists have been warning for some time that epidemics will become more common as the climate changes. It is only one of the numerous negative impacts of global warming.

The accelerating speed of climate change is nowhere as visible as it is in our polar regions. Therefore, the Arctic and the Antarctic are at the center of international attention. Scientists are sparing no effort in trying to understand the changes and their impacts, as well as the interaction of the various processes underway. We already know a lot, but much remains uncertain.

The danger is, however, that in our quest for perfect knowledge, we may pass several tipping points after which action would be too late. We need urgent climate action immediately to meet the Intergovernmental Panel on Climate Change (IPCC) target of limiting global warming to 1.5 degrees. According to both the IPCC report and the Global Sustainable Development Report, humanity has about ten years for a complete paradigm shift. In the Arctic, the speed of climate change is even faster, and the consequences are already visible today.

As one of the eight Arctic states, and as one of the five countries in the world who are members of both the Arctic Council and the Antarctic Treaty, Finland works actively on the national and international levels in order to tackle climate change.

The aim of our new government program, guided by the United Nations' 2030 Agenda for Sustainable Development and the Paris Agreement, is to transform Finland into a socially, economically and ecologically sustainable society by 2030. Our goal is to be the world's first fossil-free welfare society. We are working to ensure that Finland is carbon neutral already by 2035 and carbon negative soon after that. We will achieve this by accelerating emissions reduction measures and by strengthening carbon sinks. We have already banned the use of coal for energy by 2029. We will also halve the domestic use of imported mineral oil, and phase out the use of fossil fuel oil in heating by 2030.

In my ministry, the Ministry for Foreign Affairs of Finland, we have tackled the challenge by mainstreaming climate considerations in all our policies – foreign and security, trade and development. Our climate-smart foreign policy promotes and supports the transition to low emissions and, in the long run, to carbon-neutral and climate-resilient societies globally.

Through our own ambitious climate targets, we try to spur other countries to do the same. We use climate diplomacy tools to spread the message and share our experiences. We promote positive climate, environmental and circular economy solutions, as well as carbon pricing and the phaseout of fossil fuel subsidies globally. Finland contributes to the European Union's (EU) climate diplomacy which aims to persuade major emitters to adopt more ambitious climate policies. It is indispensable to encourage the world's major economies to commit to more ambitious climate targets.

Similar to the global ravages of the coronavirus, the impacts of climate change do not recognize state borders. What happens somewhere else on the planet has especially strong effects on the polar regions and on the sensitive Arctic biosystem and environment. According to scientists, in some parts of the Arctic the temperature has risen 6.3 degrees Celsius during the past 30 years – twice as much as elsewhere on the planet. This has severe consequences not only for the Arctic countries but also for the entire planet. Therefore, international cooperation and joint solutions are needed also with non-Arctic actors.

In the Arctic region, the Arctic Council remains at the core of Arctic cooperation and at the heart of our efforts in curbing the effects of climate change. The Arctic Council working groups conduct expert work on many climate-related aspects deserving all our support and encouragement. In addition to focusing on the environment and climate change, the Arctic Council also does valuable work with regard to sustainable development.

The Arctic region is not a wilderness uninhabited but a home for people

Photo: **Finnish Government**

who hope for prosperity and a realistic chance of building a better future for themselves and their children. Bearing this in mind, encouraging businesses with environmentally friendly approaches is crucial for ensuring sustainable economic activity in the region. All our efforts in Arctic cooperation must be in respect of and in cooperation with indigenous and local communities.

Climate change is high on the agenda in the preparation of Finland's new Arctic Strategy set to be completed in early 2021. In addition, during the Finnish Presidency of the EU in 2019, the European Council agreed to invite the High Representative and the Commission to continue to actively implement the EU's Arctic policy and to initiate a process to update the EU's 2016 Arctic Communication. We strongly support the EU in this work.

We need robust policies in order to make change happen. We need political choices in order to make sure we can create the changes we envision in a socially just way. In Finland, I believe our strongest suit is that our ambitious climate policies are based on academic research, and that the majority of Finns – including our industries, businesses, civil society and political parties – supports them. Acting together, it is possible to make the shift that provides people and our planet with a safe future.

UArctic plays an important role in bringing together knowledge, science and experience in the Arctic region. It is knowledge that we need, and knowledge can only be obtained through scientific methods. As Hippocrates famously put it: "There are, in effect, two things: to know and to believe one knows. To know is science; to believe one knows is ignorance." Let us not remain ignorant. Let us act, and let us act now. The world cannot wait.

RUSSIA'S 10 PRIORITIES IN THE ARCTIC

By **ALEXANDER VIKTOROVICH KRUTIKOV**
Deputy Minister for the Development of the Far East and Arctic, Russian Federation

On March 5, 2020, President Vladimir Putin approved the Basic Principles of Russian Federation State Policy in the Arctic to 2035. This document, prepared by the Ministry for the Development of the Russian Far East and Arctic, defines Russia's national interests in the Arctic, as well as its long-term goals and main areas of activity in the region for the next fifteen years.

THE BASIC PRINCIPLES DEFINE RUSSIA'S TEN PRIORITIES IN THE ARCTIC.

1. The first is to stimulate economic development and create new high-paying jobs in the Arctic for Russian citizens. To date, economic activity in the Arctic is hindered by high natural costs and risks, and lack of infrastructure. Large-scale projects, such as Yamal LNG for liquefied natural gas, are developing only due to state support. To make this support universal, the Russian government has prepared a package of bills on state support for entrepreneurial activities in the Arctic. One of them was already approved and signed by the Head of State on March 18: investors who plan new projects in the field of extraction and processing of hydrocarbons in the Arctic zone of Russia will be able to benefit from preferential tax treatment. The bill defines five categories of projects, each with its own tax remissions from twelve to seventeen years. As estimated by the Ministry of Energy, these benefits alone will provide an inflow of $200 billion in private investment in the Russian Arctic.

Three more bills from the package are currently under consideration at the lower house of parliament. They propose that any legal entity or individual entrepreneur starting a new business in the Arctic will be able to apply for a status of the Arctic zone resident. This includes any kind of economic activity not prohibited in Russia. In the initial version of the bill, the minimum threshold for investment in a new project was set at $130,000, but in a later version the sum was lowered to $13,000 to support small and medium-sized enterprises. The Arctic zone residents will be able to rely on both tax and non-tax benefits. According

to plans, the measures proposed in the package of bills to support business in the Arctic should be launched in 2020.

2. The second direction is the intensification of research and development of the Arctic shelf. To do this, we need to develop competitive environment and technology. The Ministry for the Development of the Russian Far East and Arctic stands out for making unallocated shelf areas more accessible to private companies. We have already prepared a corresponding bill, and we believe it will create a competitive model in line with the best international practices for implementation of shelf projects.

3. Due to the active development of mineral resource centers, freight traffic along the Northern Sea Route will grow rapidly. This will stimulate the development of its infrastructure and shipbuilding. The freight volume along the Northern Sea Route is estimated to reach 80 million tons in 2024, and 150 million tons by 2035. Moreover, in the next decade this volume will be almost completely formed by Russian shippers. Meeting their needs for icebreakers, navigation, communications and security will help create the basis for year-round passage of vessels at an operational speed. Our goal is to make the Northern Sea Route a globally competitive transport corridor and, starting in the 2030s, to increase the volume of international traffic.

4. An increase in demand for the Northern Sea Route will lead to the development of other infrastructure in the Arctic zone, in particular rail mainlines which can be used to deliver goods to ports along the Northern Sea Route. Special focus will be placed on rivers. Over the course of fifteen years, the river fleet will have to be renewed completely for navigation on northern rivers. In addition, in the coming years we should successfully close the issue of access to high-speed cheap Internet in the Arctic zone, and solve the energy supply problem by 2035, giving up old diesel power.

5. The growth of economic activity in the Arctic and the ongoing global climate change create a special demand for the development of science and technology. Together with the Russian Academy of Sciences, we will prepare a separate program for the development of fundamental and applied research in the interests of the development of the Arctic. We will also increase the number of international expeditions. Equally important is the focus on preserving human health in harsh Arctic conditions. Together with the Ministry of Health of the Russian Federation, we agreed to establish a federal centre for health in the Arctic at the premises of the Northern State Medical University.

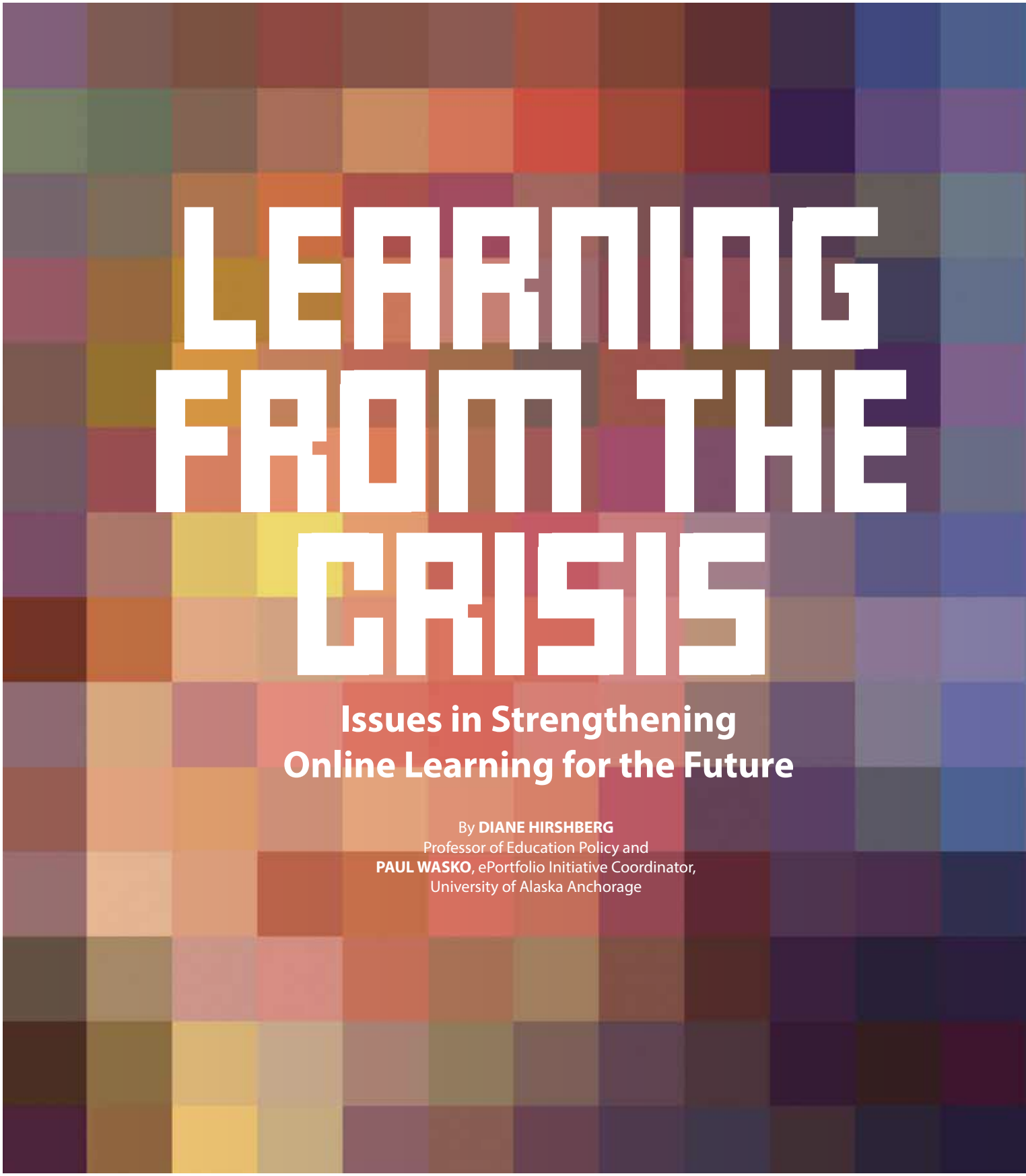
6. We expect the launch of several hundred small, medium and large-scale projects in the Arctic, which will create up to 200,000 jobs for Russian citizens. In order to provide new enterprises with personnel, we must again make working in the North popular among the young, and attract people from all over the country to the Arctic. This will be the duty of the Agency for Human Capital Development in the Far East and the Arctic. It will analyze the staffing needs in the Arctic territories and adjust the education system to these needs.

7. We will improve the quality of life in the Arctic zone of Russia. It is primarily determined by the availability of quality health care, education, sports and recreation, inexpensive and comfortable housing, cheap food, pharmaceuticals, and air travel. We intend to formalize all these provisions in the Development Strategy for the Arctic zone of the Russian Federation until 2035. The work on this document is in its final stage.

8. We will launch a program of state support for indigenous peoples' economic projects. We will increase the availability of health care, education, public services, and sports for indigenous population. Together with the Federal Agency for Ethnic Affairs, we are resuming the "Children of the Arctic" international project. It is aimed at creating conditions for comprehensive development of the young generation of the indigenous peoples of the North. This project will be one of our key initiatives in the Arctic Council.

9. Our absolute priority is the preservation of the Arctic natural environment. The increase in economic activities in our Arctic zone will be accompanied by strict environmental controls, as well as by introduction of modern standards of rational nature management. We will continue to develop the network of protected natural areas, the full-scale cleaning of the Arctic, the clean-up of past environmental damage, and we will support the initiatives of eco-activists.

10. The Arctic in our opinion is a territory of dialogue, peaceful and mutually beneficial cooperation. We will uphold this value everywhere and always. We will continue to consider the Arctic Council as the key regional format for cooperation in the Arctic. The chairmanship will pass to Russia in 2021, and already, we are intensifying our work. We intend to offer the Arctic a very substantive agenda related to sustainable development and implementation of large international economic and social projects.



LEARNING FROM THE CRISIS

Issues in Strengthening Online Learning for the Future

By **DIANE HIRSHBERG**
Professor of Education Policy and
PAUL WASKO, ePortfolio Initiative Coordinator,
University of Alaska Anchorage

The sudden onset of the COVID-19 pandemic has led to educational institutions worldwide shutting down in-person teaching and quickly moving classes online. These have highlighted both the possibilities for transforming online learning, and the lack of preparation and resources facing faculty, students, institutions and communities. Institutions in the Arctic have engaged in teaching and learning activities across distances and in remote and rural places for decades, and yet, the sudden rush to put everyone online or in distance-delivered programs has proved challenging.

In Alaska, we have students who not only lack internet access at home or have limited bandwidth in their community, but who also live without running water and rely on propane or wood to heat their homes. They face challenges in staying safe as they "hunker down" that are far more pressing than keeping on top of homework. Some faculty have responded by using teleconferences rather than online software to teach, so students only need access to their phones. However, to submit assignments and take tests, students still need to find a way to go online. Some have resorted to sitting in their cars to access campus Wi-Fi, even in sub-zero temperatures.

We know that a class switched from in-person to distance delivery in just a few days will not be the same quality or experience. We should be accommodating, accepting and forgiving of mistakes as we muddle through. Our goal should be to share as best we can the intended content and understandings, and not to overburden faculty and students as we contend with an exceptionally stressful situation. There is much we can learn from what is happening, and we also need to remember what we knew before the current crisis: teaching and learning via distance is feasible, but it is not easy, and to do it well requires significant thought and planning.

Some issues to consider:

Synchronous, asynchronous and blended courses: Synchronous e-learning courses (i.e. taught live using web-based software or teleconferencing) allow for real-time interaction between faculty and students, and can be effective for building interpersonal relationships that enhance learning experiences. They can also be easier to teach when you need to shift at the last minute in response to current events or changes in conditions. That said, technology can fail, and students can disengage or be distracted. Moreover, scheduling synchronous online learning can be difficult, particularly if you are trying to teach across time zones as we do

"To do online learning right, there needs to be a significant investment in time and resources."

in UArctic courses, or if you serve working adults who need to schedule their studies around job and family obligations.

Asynchronous classes bring their own challenges. Putting together a really effective and engaging asynchronous course is hard and requires a lot of planning. Many people tape lectures to replicate in-person classroom-based experiences, but that is based on old ways of thinking about how people acquire knowledge. Hands-on inquiry-based approaches, where students are active participants in co-constructing knowledge, are often more engaging experiences. In addition, it is much harder to foster collaboration and interaction among students in asynchronous courses. Peer learning is an important and valuable tool and should not be forgotten in the push for e-learning. There are many different tools for creating active participation and collaborative projects in online courses, but faculty need support to learn how to use these.

Bandwidth, equipment and software limitations: One of the most significant issues for distance education in the North is bandwidth limitations. While some Arctic regions have strong broadband access, others have far less, especially in the Russian Arctic. The cost can also be quite high even in urban areas. In Alaska, some students complain that watching a 30-minute video lecture can take several hours due to low bandwidth. Moreover, the sudden move to online learning has exacerbated inequities. Not all students have access to laptops, printers and other equipment that facilitate online learning. Schools and universities have been loaning out gear to help students temporarily, but this issue will not disappear after the current crisis ends. Finally, not every piece of software used for online learning is compatible across all devices and platforms.

Professional development and support for instructors: Postsecondary instructors need extensive and ongoing professional development to be successful in teaching online for the long haul. They need training in designing effective courses, ongoing support that is available within a reasonable amount of time, and access to immediate troubleshooting assistance when a platform is not working. To do online learning right, there needs to be a significant investment in time and resources including assistance for faculty as they transition their courses.

Support for students: Students need both academic and technical support around learning in online settings. There are a lot of assumptions about students being "digital natives" who grew up with technology, but talent with smartphones or online gaming does not necessarily translate to success in online learning environments. This is particularly true for first generation students served by many Arctic universities. Online learning environments are often least successful for the most vulnerable students, so we need to find new ways in order to not lose them. Finally, we should not assume we know best the needs of students – we need to ask students how we can best help them.

We all are uncertain about when we will to return to "business as usual". Also, this is likely not the last pandemic we will face. E-learning and distance education offer many opportunities to students in the Arctic regardless of global crises. Now is the time to learn from the problems, failures and successes we have seen in working online, and put ourselves on the road to strengthening online learning into the future.

STEP UP

and Take Climate Leadership

By **EIRIK SIVERTSEN** Chair, Standing Committee of the Parliamentarians of the Arctic Region

Among the first and hardest hit by the consequences of global warming are those of us who live in the North. If we reach the Paris Agreement goals of a two-degree increase in temperature, in the North it will mean six to eight degrees. A 3.2-degree increase could possibly mean an average rise of over ten degrees in the North.

It is therefore essential that we step up our efforts. We need dramatic cuts in the emissions of greenhouse gases, and we need them fast. Time is of the essence, and our climate commitments must be of fundamental importance when we plan for the future.

As a total percentage of the seven billion people on the planet, only few of us live in the High North – in total, we number just over four million. We may not be so many, but we are no less important than anyone else, with the same needs, responsibilities and rights as people elsewhere. Global warming is a global problem. It was not created in the Arctic alone; therefore it cannot be solved in the Arctic alone.

That said, the eight member states of the Arctic Council together with its thirteen observer countries and the European Union are responsible for 80 percent of global emissions. Maybe it is easier for 21 countries to agree to cut emissions than for 200 countries.

For me, it is obvious that science plays a central role in how we are going to face and tackle this crisis. People do not understand well enough what this is about – we need education. We do not know enough about what is happening – we need research. We do not know enough about the consequences, either for people or for nature. And we do not know enough about how to adapt to the changes.

Let me end with the good news: we know what the problem is, we have the technology to fix it, we can afford it, and there is still time. All we need is the political leadership.

COP26, the United Nations Climate Change Conference, will be held in Glasgow in November 2021. It is paramount that the countries reach an agreement to fulfil the goals from the Paris Agreement. I dare the Arctic Council members, the observer states and the European Union to take a leading role. I expect you to show the rest of the world how to solve the challenge – for the best of the people in the Arctic and elsewhere.

Adapted from Eirik Sivertsen's speech at the meeting of the Council of UArctic in Stockholm, Sweden in September 2019

MULTIDISCIPLINARY RESEARCH

as Climate Action

By **ANNIKA GRANEBECK**, Coordinator and **NINA KIRCHNER**, Director, Bolin Centre for Climate Research, Stockholm University

Without a multidisciplinary research strategy, there is limited hope of meeting the global challenges of a changing climate. Academia can be more efficient, deliver better results and get more science done if we provide our scientists with infrastructure and arenas for multidisciplinary research.

The Bolin Centre for Climate Research, the Arctic Avenue, and the Arctic Science IntegrAtion Quest (ASIAQ) at Stockholm University represent such arenas. Benefiting from the support they provide, participating scientists can concentrate on what they do best – research – and thereby create the knowledge needed to tackle climate challenges and help society make decisions based on scientific facts.

Scientific material, results and methods must be openly accessible for society and decision makers. But science communication is a fragmented area, not only in terms of where research is published, but also regarding the communicative methods used. A lack of coordination between different departments, centers of expertise and special initiatives can also hamper effective communication of project outcomes and research results. Universities thus need to provide individual scientists with coordination help and communication support: activities which are at the core of Bolin Centre, Arctic Avenue and ASIAQ. By creating and maintaining these arenas, we lift the responsibility of scientific communication from enthusiastic individuals to an organizational level from which we can provide continuous support.

Through our outreach initiatives, we also provide society with a comprehensive understanding of the factors and processes that are involved in a changing climate and a changing Arctic. Our arenas create opportunities for academia to interact with society, and invite stakeholders as participants in producing, shaping and sharing research issues. An example is the Bolin Centre Climate Arena which supports cross-sector work aimed at "bending the curve" of climate change. We do so by developing long-lasting relationships between academic, public, business and policy sectors. Interacting with society and paying attention to how socio-economic issues interact with science, politics and technology is important for the evolution of climate research.

Platforms for multidisciplinary research are needed to ease the challenges of working across disciplinary boundaries – a must when it comes to climate research. Scientific practices, even fundamental things such as terminology, can be highly domain specific, which makes multidisciplinary research a challenge. Furthermore, some knowledge is so detailed, specific and advanced that it "ceases to exist" when it tries to move beyond its own discipline: a non-expert simply cannot understand and make use of it. Our arenas strive to break down institutional, disciplinary and technical barriers to allow for a more comprehensive understanding of the factors and processes involved in a changing climate. From this, knowledge can emerge and be jointly fostered in a way that would not be possible if scientists worked independently, lacking formal and structured collaboration support. In this way, the arenas provide us with something new, yet unexplored: a dynamic, learning-from-experience atmosphere from which significant contributions to the international knowledge in climate science and Arctic research can materialize.

"Working across disciplinary boundaries is a must when it comes to climate research."

Photo: **Nina Kirchner**

Bolin Centre for Climate Research is a multi-disciplinary consortium of over 350 scientists in Sweden that conducts research and graduate education related to the Earth´s climate. The centre was formed in 2006 by Stockholm University and subsequently partnered with the Swedish Royal Institute of Technology (KTH) and the Swedish Meteorological and Hydrological Institute (SMHI).

Arctic Avenue is a spearhead research project between the University of Helsinki and Stockholm University. To boost already existing excellent cooperation, the two universities have decided to join forces trough Arctic Avenue during 2019–2021.

ASIAQ unites six universities from three continents and four countries (Russia, Japan, USA and Sweden) in an endeavor to jointly advance research and education for a sustainable Arctic during 2018-2020.

Photo: **Clarice Perryman**

IT TAKES A VILLAGE

University of New Hampshire Students Spur Climate Change Research to Action

By **COLLEEN FLAHERTY**, Communications & Information Coordinator
and **REBECCA IRELAN**, Communications Manager
and **CAMERON WAKE,** Research Professor, University of New Hampshiree

If you told 18-year-old Kendall Gray she would present her research on her university's energy infrastructure alongside University of New Hampshire (UNH) president James Dean, she would not have believed you. But that is exactly where 21-year-old Kendall found herself in October 2019 at the announcement of a partnership between the university and local electric utility, Eversource, to increase energy efficiency and reduce carbon emissions. "It was wild," said Gray. "I was the only woman on stage, discussing UNH's leadership in sustainability and our goal to become carbon neutral before 2050."

Gray is a great example of how the University of New Hampshire envisions an integrated approach to sustainability education, research, and practice. As a summer 2019 Sustainability Fellow, she worked with university faculty and staff to update the university's climate action plan. UNH has already reduced its greenhouse gas emissions by 51% below its 2001 baseline. The main campus is also powered by 100% renewable electricity, the majority of which is generated on-campus using local landfill gas. Now, carbon neutrality is the goal, and the hope is to achieve it before 2050. In order to do so, UNH will need to engage a broad range of community members, including students.

"UNH has done amazing work to reduce its emissions. I was inspired by just how much has been done and how dedicated faculty and staff are to sustainability", said Gray. "My fellowship focused on the largest emissions producer for campus – buildings." Due to higher technological needs, new buildings at UNH consume 33–38% more energy compared to older buildings. Gray's findings recommend updated planning, design, and construction guidelines that incorporate the cost of carbon into planning, budgeting, and operations. The university is working to implement Gray's findings.

Kendall Gray is not the only UNH student whose research supports a resilient community in the face of the climate crisis. Clarice Perryman, a PhD student in UNH's Natural Resources and Earth System Science PhD program, investigates greenhouse gas emissions from thawing permafrost in the Arctic and from peatland bogs in New Hampshire. "In a few decades, those Arctic, boreal peatlands may look pretty similar to the New Hampshire peatland bogs due to climate change," Perryman explains. More specifically, she studies the role that bacteria called methanotrophs play. These bacteria can consume methane, potentially prevent a fraction of the gas from entering the atmosphere, and thus reduce the contribution to climate change.

Like Gray, Perryman knows the value of her research lies in the action it spurs. She is passionate about discussing her research and climate change with state and national lawmakers. After the 2016 US presidential election, scientists were concerned that federal websites would be scrubbed of any mention of climate change. Perryman facilitated a "data rescue" event at UNH where volunteers helped archive websites that held climate-related content and data. In the lead-up to the presidential primary elections in 2020, Perryman was selected to participate in the NH Youth Climate and Clean Energy Town Hall, where she asked one of the Democratic candidates about her plan to help the nation transition from fossil fuels to renewable energy sources, and how to help people adapt to new job prospects. "I do believe we need to get off fossil fuels as quickly as possible, but I want to see that happen in a way that's just for everyone," Perryman says.

Perryman feels a call to share what she considers the privilege of her educational opportunities, and to help connect the dots on climate change for people who may not think about it on a routine basis.

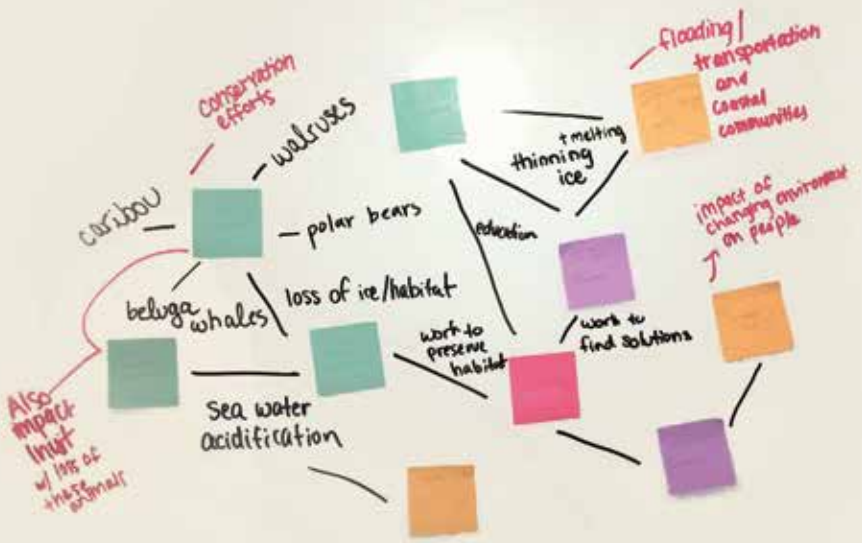
"Sense of responsibility fuels research and gives university practices a backbone of purpose."

"People have different priorities, so they don't always make decisions based on climate change," she says. "But as someone who very much understands the science behind what is happening, I feel I have an obligation to share what I know, and help people understand the science and what that means for their everyday lives and for the future of their children and families."

Many university students, faculty and staff echo Perryman's sense of responsibility. It fuels research and gives university practices a backbone of purpose. Students like Gray and Perryman have taken advantage of an institution that encourages them to apply their education and research to better understand systems and to cooperate with stakeholders to make impactful changes. This nuanced approach to the global climate crisis gives students a sense of hope.

"My parents were concerned that my field of study would be too depressing," said Gray. "But after working with my mentors, fellows, and other universities, I feel so hopeful. I think we might be able to adapt to and mitigate climate change so everyone can thrive."

Photo: **Henry M. Jackson School of International Studies, University of Washington**



Exploring Arctic Policy

FROM AN INUIT PERSPECTIVE

By **NADINE C. FABBI**, Managing Director, Canadian Studies Center, Henry M. Jackson School of International Studies and **MICHELLE KOUTNIK**, Research Assistant Professor in Glaciology and **ELLEN AHLNESS**, Graduate Student in Political Science and **ELIZABETH WESSELLS**, Graduate Student in Anthropology, University of Washington

During the fall of 2019 we led a new course on how Arctic policy could incorporate a more Inuit-centered perspective. The course was one of the capstone offerings for International Studies majors in the Henry M. Jackson School of International Studies at the University of Washington (UW). Within just ten weeks, the nine undergraduate students of this "Task Force" were to tackle a major international policy issue, produce a final report, and present that report to an outside expert.

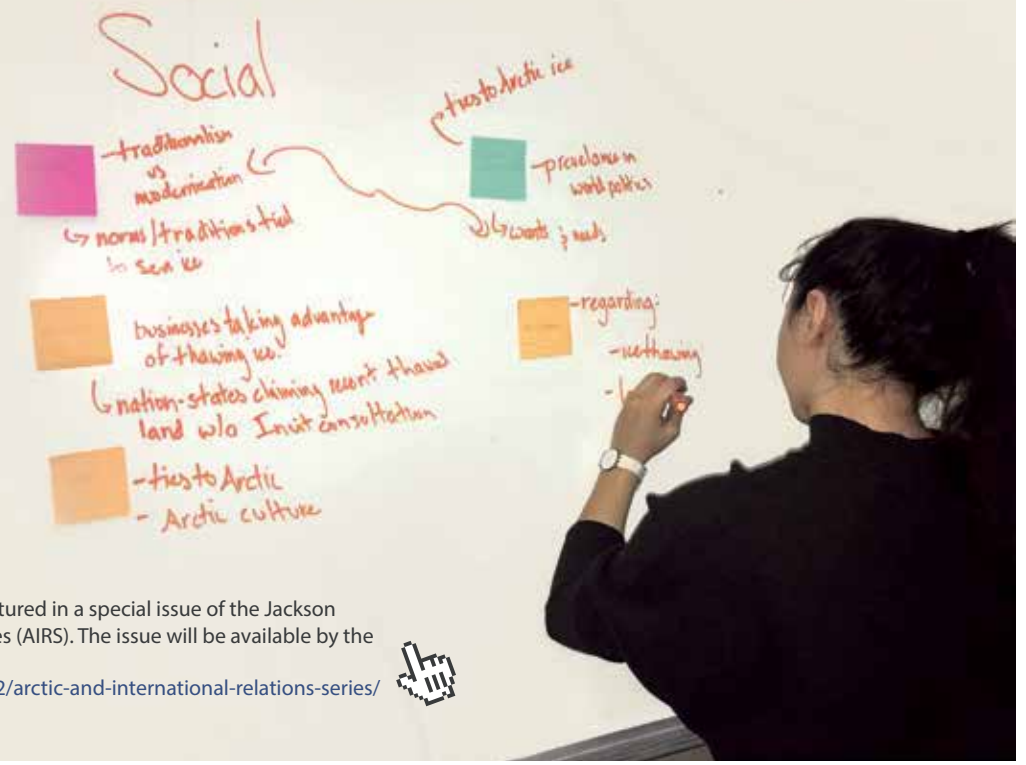
We were inspired by Canada's recent Arctic and Northern Policy Framework (2019), which is unique in international Arctic policy. It was co-developed with the Inuit Tapiriit Kanatami (ITK), the national Inuit association in Canada, and includes chapters from ITK and also from Nunavut. If policy is the lingua franca of international relations, as well as a tool for activism by non-governmental organizations, then this policy was surely a model for our students.

Arctic environmental change, especially Arctic sea ice loss, is critically impacting people living in the Arctic, and the implications must be addressed by Arctic policy. We encouraged the students to think creatively about ice – to think about ice as a living thing, as having memory, as constituting territory, and as a human right – and to explore it through the lenses of science, culture, history, law, and art. We also encouraged them to incorporate the science of ice into their policy reports.

A key learning goal of the course was to understand some of the major issues occurring in Inuit communities as a result of sea ice change, and more importantly how Inuit organizations are influencing Arctic policy in Canada and internationally. During a week-long research trip to Ottawa, the students got to meet with colleagues at Nunavut Sivuniksavut, the Inuit post-secondary school; staff from ITK and the Inuit Circumpolar Council Canada; scientists at Canadian Ice Services; and senior policy analysts at Crown Indigenous Relations and Northern Affairs. We also visited four Embassies of Arctic nation states. All these meetings facilitated the students' understanding of how the Government of Canada co-developed its Arctic policy with the ITK, and what this means in terms of effective policy development.

The students had just few weeks to research and write their papers. Their research spanned how ice changes affect Arctic communities – in particular shipping, mining, and waste – and Arctic wildlife; explored the relationship between permafrost and building infrastructure; investigated Inuit legal theory and Western law, Inuit rights and the environment, self-governance and environmental change; and considered how art bridges experience with policy. In the words of one student, "Before this experience, I felt overwhelmed about writing policy. However, I now feel like I have a grasp on how to complete this assignment [and] also to consider a possible career in policy after graduation."

Canada's current Arctic policy was an inspiration for our class to explore what policy could look like to address changes in Arctic ice as felt by Inuit communities. Making ice central to our study of policy we hoped to give it a voice that may have at least a modest influence on its future.



The final drafts of the students' research are featured in a special issue of the Jackson School's Arctic and International Relations Series (AIRS). The issue will be available by the end of July on the AIRS website at https://jsis.washington.edu/canada/programs-2/arctic-and-international-relations-series/

Stories from the Ice

A HISTORY OF ARCTIC CLIMATE AND ENVIRONMENTAL CHANGE TOLD IN ICE CORES

By **KARL KREUTZ**, Professor, University of Maine
and **CAMERON WAKE**,Research Professor, University of New Hampshire
and **ERICH OSTERBERG**, Associate Professor, Dartmouth College
and **ALISON CRISCITIELLO**, Director, Canadian Ice Core Lab, University of Alberta

We have all seen or heard of the evidence of ice melting across the Arctic. The clear retreat of glaciers and loss of sea ice provide stark and iconic examples of climate change that are impossible to ignore. The implications are profound for Earth's climate, ecosystems, socioeconomics, security, northern communities, as well as the unique beauty of Arctic landscapes.

There remains a vast amount of land ice across the Arctic – the Greenland Ice Sheet, the ice caps of the Canadian Archipelago, and the icefields and glaciers in Alaska and the Yukon. In the cold upper reaches of these glaciers, snowfall accumulates a record of chemical changes in the atmosphere and physical changes in our climate system. The snow is eventually compressed into glacier ice with layers that are analogous to rings in a tree. The deeper you go, the older the ice is, sometimes older than 100,000 years at the bottom of the Greenland Ice Sheet.

Accessing the climate history contained in Arctic ice is a considerable challenge – the best locations are remote and cold, and the oldest ice is hundreds to thousands of meters deep. To confront this challenge, international scientific cooperation has been essential. For example, North American and European scientists have collaborated for over half a century on ice core projects on the Greenland Ice Sheet. Ice drilling, where cylinders of ice are recovered in 1–3 meter sections beginning at the surface and continuing to the bedrock, has improved dramatically in terms of speed and quality of ice recovered. The careful and detailed study of these ice cores has revealed a number of fundamental insights into the Arctic system that are critical to our climate action decisions.

A widely recognized aspect of the Arctic ice core record is the clear evidence for abrupt climate changes. These large re-organizations of the climate system occurred many times during the last glacial period (roughly 60,000 to 10,000 years ago). What makes them particularly important is the rapid nature of the transitions – large changes in temperature, precipitation, and dustiness in less than ten years – and that they had global impacts. The North Atlantic region and Antarctica were tightly connected within decades via atmospheric and ocean circulation during each of these abrupt climate changes. The ice core record clearly illustrates that over the course of recent Earth history, there is a direct and important connection between the Arctic and global climate.

This Arctic-global connection is also apparent in the ice core record in terms of recent human impacts on the Arctic atmosphere. The emissions history of a range of pollutants with health and environmental impacts – lead, mercury, sulfate, nitrate, persistent organic pollutants from industrial activity, mining and smelting, and fossil fuel use – can be precisely reconstructed

and evaluated in the ice core record. While there is abundant reason to be concerned about the ongoing impact of these pollutants on northern communities, the ice core record also offers an important positive message. When the use of leaded gasoline was phased out in the 1970s, and clean air legislation reduced the emission of sulfates in the 1980s, the levels of lead and sulfate in Greenland dramatically decreased. Focused effort through prudent emissions reductions and political action can make a difference. However, we see that there are still high levels of transpacific pollutant transport that are reflected in Alaska/Yukon ice cores. These results illustrate that many of the issues facing the Arctic as a whole still retain a very regional character.

What is on the horizon in Arctic ice core science? Sea ice is a dynamic component of the Arctic system that has been notoriously difficult to reconstruct in the ice core record. Much effort is being directed at new sea ice proxy records using innovative chemical approaches. Because sea ice extent and thickness have such high regional and seasonal variability, new ice core sites are being targeted in specific areas that are sensitive to sea ice change and where seasonally-resolved records can be developed.

As the Arctic continues to warm and lose its sea ice cover, there will likely be associated changes in the Arctic water cycle, ocean circulation, and other climate parameters that will have global reverberations. The ice core record can provide context for what the future may hold – by looking at previous warm intervals in the Arctic. One such interval, known as the Holocene Thermal Maximum (9,000 to 5,000 years ago) provides a valuable test case. Ice core records covering this interval can be recovered from several locations across the Arctic and provide a valuable spatial perspective. Another warm interval of great interest is the last interglacial period (roughly 130,000 years ago) when sea levels were several meters higher than they are today.

As we move forward, an important frontier for the Arctic ice core community to explore is the co-production of knowledge with northern communities. Thus far, there has been little inclusion of northern communities in the development of scientific research questions that can be pursued through ice core research, or the use of a co-produced paleoclimate perspective that could be useful for regional decision-making by northern communities. A new approach, with a detailed understanding of Arctic climate based on state-of-the-art observations, models, and traditional environmental knowledge of northern communities, can guide ice core research to directly address northern needs and priorities.

Photo: **Dorota Medrzycka**

Student story: Anna-Katri Kulmala

The importance of dialogue in Arctic issues can't be overestimated, as the problems and solutions have global consequences, and they have the power to sustain or destroy entire cultures and landscapes. Often decisions that are significant to the region's future are made far away from the Arctic, with economic or other short-sighted interests as a priority.

Youth and indigenous peoples are not enough involved in these decision-making processes. They are often heard but not listened to. In the Arctic, physical and social isolation, and lack of information, resources and communication between regions make it challenging for people to unite, get their voices heard and make a change. Times are tough, and instead of feeling paralyzed or excluded, the youth of the Arctic should be engaged and supported. After all, they are the future leaders of the region.

FINDING AGENCY

I personally started to feel a burning urge to change the world during my university studies. I felt a strong pull toward Arctic issues as a Finnish citizen, but I wasn't sure what I could do, as I didn't live in the Arctic parts of Finland. I wasn't sure what to say and where for it to have any positive impact. What I learnt though was that my need wasn't so much to bring my views to the front – I didn't feel legitimate to do that – but more to understand why the region is so important and what the dynamics are in the decision-making processes. Why did making a change feel so hard? Why was there a lot of talk but little action?

In 2018 I had the opportunity as a member of WWF Youth to participate in the Arctic Youth Summit held in Rovaniemi, Finland. Over ten days, youth from the circumpolar and Arctic Council observer countries discussed Arctic issues and formed a declaration for the Arctic Council ministerial meeting happening simultaneously in Rovaniemi.

I was blown away. Here was this diverse group of people all the way from India to Greenland who shared a passion for making a change in the Arctic. They came together, shared, wrote a declaration and absolutely rocked at the biodiversity conference as they handed it out to the ministers. The process touched me deeply, and I was left with two thoughts after the summit: I wanted to be a part of the community and the dialogue, and I wanted to learn what made this form of collaboration so impactful.

CONNECTING AND COLLABORATING

I had never really had the chance to deeply engage with citizens of the Arctic before the summit, let alone hear stories of their relationship to the land or about the challenges climate change is causing in their areas. Sharing experiences, world views, knowledge systems, fears and hopes with the youth at the summit was incredibly uniting and empowering. We all came from such different regions and cultures but shared the same fire to change destructive and unjust structures. The challenges in our homes were surprisingly similar as well.

The things I learnt were so powerful because of their experienced nature. It's very different to interact with something than to read about it. We benefit and grow hugely when we connect with people outside of our bubbles and listen to even the most opposite perspectives with an open heart. We need to mix things up – bring youth, other age groups, politicians, corporate chiefs and environmentalists to the same table with equal and genuine attention. Empathy is an universal superpower and we need it to reach our goals and grow. The biggest challenges of our time obey no borders and cannot be solved within them. By collaborating and combining the strengths of different knowledge systems, such as western science and traditional knowledge, we have a more holistic set for long-lasting problem solving. The right to be heard, to participate and to care is universal, and diversity a strength.

ARCTIC YOUTH NETWORK

I didn't know it back then, but many of these passionate people at the summit would become my friends and colleagues in the Arctic Youth Network (AYN), a youth-founded and youth-led non-profit organization connecting and supporting youth making change in the Arctic. My journey with AYN started from Rovaniemi in 2018, and it has been an amazing community during my search for agency. It has taken me to the Arctic to learn about local environmental issues in the field. I have ended up in conferences, panel discussions and summits. I got to visit Unalaska, Alaska and live with the local Qawalangin Tribe through a diplomatic exchange to learn about their culture and environmental challenges. It has also allowed me to pursue a life-long dream of producing a documentary film series in the Arctic.

This journey has made me feel like I can get my voice heard, I can make a change and that we are all one. That has been a humbling, life-changing experience that I am deeply grateful for. The uncertainty of the future and everything that is happening around us, from the urgent COVID-19 pandemic to the underlying biodiversity loss and other environmental crises, can be a heavy burden and too big of a challenge to tackle alone. Youth globally have already gotten more united and demand action from politicians and companies, and I want to encourage all youth interested in Arctic issues to get engaged, share and join the AYN or other communities connecting individuals in the Arctic. We truly are stronger together.

If the youth are not just heard but also listened to – we will have action and not just talk. We will change the world.

UArctic Annual Report for 2019

The **University of the Arctic** (UArctic) is a cooperative network of universities, colleges, research institutes and other organizations concerned with education and research in and about the North. UArctic builds and strengthens collective resources and collaborative infrastructure that enables member institutions to better serve their constituents and their regions. Through cooperation in education, research and outreach we enhance human capacity in the North, promote viable communities and sustainable economies, and forge global partnerships.

UArctic
uarctic.org

UArctic: **Moving Forward into a New Chapter**

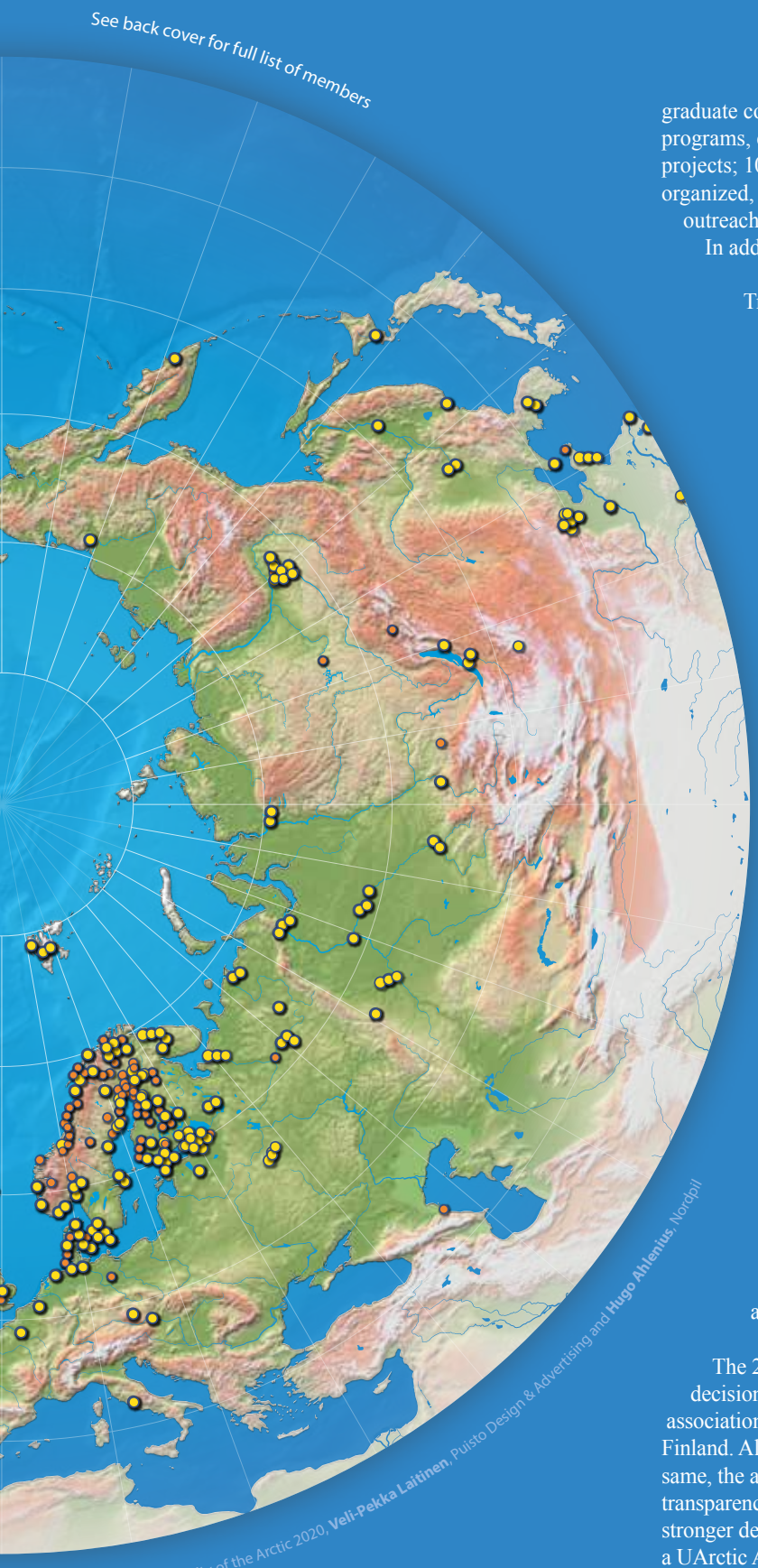
In 2019, UArctic further developed our role in supporting knowledge-based decision making, in close collaboration with the Arctic Council and its working groups, national governments and agencies, and other regional and national partners. UArctic as an organization also embarked on a new phase bringing together our members under a new association.

The Arctic Council Ministerial meeting in May concluded Finland's chairmanship period. As one of the key partners in implementing the Education priority, UArctic was also recognized in the Statement from the Chair. The Ministers welcomed the strengthened cooperation with UArctic, noting especially "the role of teachers and educators in fostering sustainable development in the Arctic and for providing positive future perspectives for its inhabitants." The Thematic Network on Teacher Education for Social Justice and Diversity in Education was recognized for their contributions and conclusions on their Arctic Council project of the same name.

As an outcome of our partnerships with Arctic governments, two new collaboration frameworks were announced with Canada and Norway that help UArctic support those nation's Arctic policies and strategies. The Canadian federal government's investment of $4.5 million focuses on re-engagement and support on various initiatives to increase northern and indigenous capacity-building, especially related to circumpolar education and research cooperation. Likewise, the Norwegian Ministry of Education and Research proposed a four million NOK increase in their annual funding. The increase followed the inclusion of southern Norwegian universities in UArctic's north2north program and project funding, with the aim to engage the whole country in finding solutions for northern challenges and to boost circumpolar knowledge exchange.

As an additional part of our efforts to promote member engagement in different countries and regions, UArctic and the Harbin Institute of Technology established the UArctic HIT Training Centre as a regional centre to support UArctic members in China.

Over the year, UArctic Thematic Networks continued their active collaboration in Arctic research and education. In total, their activities amounted to 28



graduate courses, including field and summer schools; 2 joint graduate programs, either being developed or with enrolled students; 37 ongoing research projects; 104 peer-reviewed publications and scientific articles; 98 events organized, including workshops, science sessions, and art exhibitions; and 127 outreach efforts, such as scientific talks, webinars, blog posts and newsletters. In addition, three Thematic Networks had staff or student mobility.

Trent University hosted the 2019 UArctic Rectors Forum in August around the theme “Made in the Arctic”. The panel discussions drew on the experience of UArctic members and cooperation through Thematic Networks to address the challenges of incorporating multidisciplinarity and traditional knowledge in higher education, and the key question of how to make research more responsive to the needs of northerners and northern communities. The Forum concluded with a meeting in Ottawa with government agencies and other Canadian partners working in Arctic research and education. This was the last Rectors Forum as a standalone meeting; future meetings will be included in the UArctic Congress or organized in conjunction with other events.

Over 130 participants from UArctic's member institutions attended the Council meeting in Stockholm, Sweden in September 2019, hosted by Stockholm University and KTH Royal Institute of Technology. The Council voted in eleven new members to join UArctic. Six of the new members are based in the United States, and the network also welcomed its first member from India. The new member institutions are Agricultural University of Iceland, Alaska Pacific University, Hólar University College, Norwegian University of Life Sciences, University College Copenhagen, University of New Hampshire, University of Southern Maine, Anchorage Museum, ARCTICenter - University of Northern Iowa, Battelle Memorial Institute, National Centre for Polar and Ocean Research.

The Council also welcomed three new Thematic Networks to UArctic, bringing the total number to 50. The new networks are Collaborative Resource Management, led by Nordisk Fond for Miljø og Udvikling; Local-scale Planning, Climate Change and Resilience, led by the University of Alberta; and The Arctic in Asia and Asia in the Arctic, led by UiT The Arctic University of Norway.

The 22nd Council meeting was also the last of its kind, as one of the main decisions was to establish UArctic as a non-profit association. The new association was formally registered on November 1, 2019 under the laws of Finland. Although UArctic’s core operations, values and membership remain the same, the association status will help UArctic function more efficiently, increase transparency, and open doors for future development. Members now have a stronger decision-making role in the network, and they will convene annually at a UArctic Assembly. The new status will also help UArctic undertake fundraising initiatives for the development of existing activities as well as the creation of new ones, as we move forward in this new chapter.

UArctic Thematic Networks and Institutes

TOTAL

28 Graduate courses (incl. summer and field schools)

2 Joint graduate programs (under development/with enrollment)

Ageing and Gender in the Arctic *

Arctic and Northern Governance

Arctic Boreal Hub

Arctic Economic Science

Arctic Engineering

Arctic Extractive Industries

Arctic Geology

Arctic Indigenous Skills

Arctic Law

Arctic Lingua

Arctic Migration

Arctic Plastic Pollution

Arctic Safety and Security

Arctic Sustainable Arts and Design

Arctic Sustainable Resources and Social Responsibility

Arctic Telecommunications and networking

Arctic Transport and Logistics *

Arctic WASH

Arthropods of the Tundra

BEBO – for the Future of Reindeer Husbandry *

Circumpolar Archives, Folklore and Ethnography (CAFE)

Climate Justice in the Arctic *

Commercialization of Science and Technology for the North

Collaborative Resource Management

Communicating Arctic Research

Distance Education and Learning

EALAT Institute

Gender in the Arctic Knowledge Production *

Geopolitics and Security

Global Ecological and Economic Connections in Arctic and Sub-Arctic Crab Fisheries

37 Research projects

104 Publications, scientific articles (peer reviewed)

98 Events, science sessions, workshops, art exhibitions

127 Outreach (incl. scientific talks, webinars, blogs, newsletters)

3 Mobility activities

Health and Well-being in the Arctic

Herbivory *

Human Adaptation in the Changing Arctic *

Institute for Arctic Policy

Language Documentation and Language Technologies for Circumpolar Region

Local-Scale Planning, Climate Change and Resilience

Managing Small and Medium Sized Enterprises in the Arctic

Model Arctic Council

Natural Hazards

Northern Food Security

Northern Nursing Education

Northern Research Forum

Ocean Food Systems

Northern Tourism

Permafrost

POPs and Chemicals of Emerging Concern in the Asian Arctic *

Renewable Energy

Science and Research Analytics Institute

Science Diplomacy

Smart Societies in the High North

Social Work

Sustainable Production and Foraging of Natural Products in the North

Teacher Education for Social Justice and Diversity in Education

The Arctic in Asia and Asia in the Arctic

UArctic World Ensemble

Verdde Program

Working in the Arctic

World Images of Indigenous Peoples of the North

* Endorsed by the Assembly of UArctic in 2020

At a Glance Statistics
2019

Membership

212
Total

151
Higher education institutions

61
Other organizations

1.9m
Students

393k
Staff

Online presence

153,094
Website visitors

657,564
Page views

368
News stories

6,841
Twitter followers

2,790
Facebook followers

1,716
Newsletter subscribers

Distribution of members

35 Canada

16 Finland

10 Iceland

13 Kingdom of Denmark

15 Norway

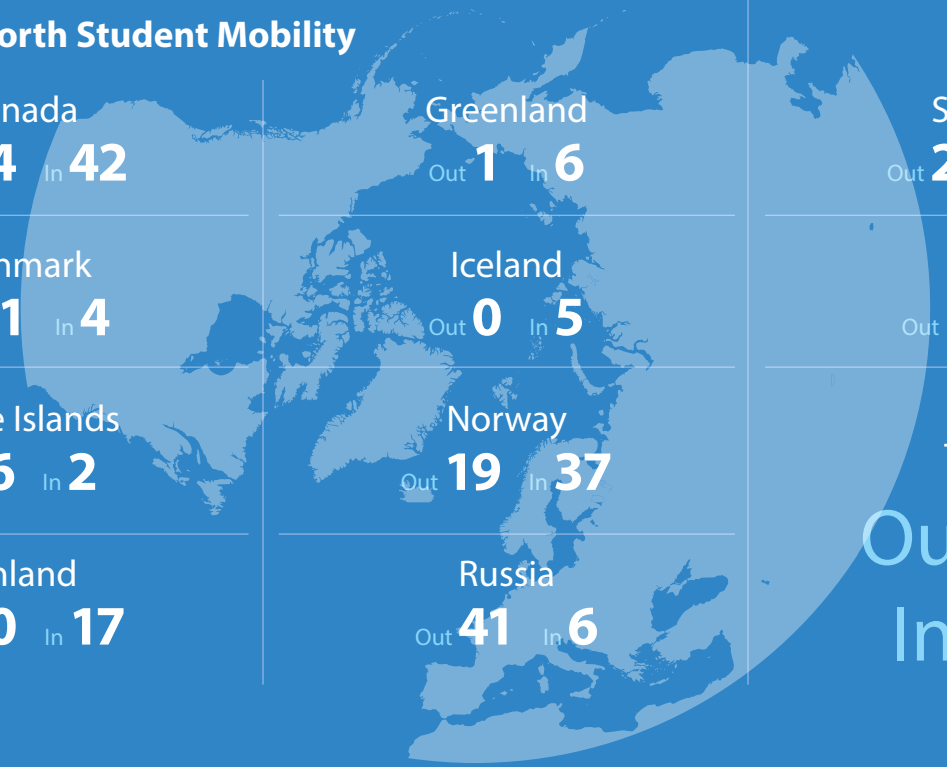
52 Russia

7 Sweden

30 USA

34 Non-Arctic

north2north Student Mobility



	Out	In
Canada	24	42
Denmark	11	4
Faroe Islands	6	2
Finland	20	17
Greenland	1	6
Iceland	0	5
Norway	19	37
Russia	41	6
Sweden	22	16
USA	1	10
TOTAL	145	145

Promote your northern expertise through UArctic! **members.uarctic.org/update**

BUILDING RELATIONSHIPS WITH LAND

Bushkids Initiative

By **CHLOE DRAGON SMITH**, Land Relationships Specialist, Bushkids

Bushkids is an outdoor learning initiative based in Yellowknife, Northwest Territories (NWT), Canada. It was co-founded by myself and Wendy Lahey. Bushkids is fundamental to building relationships with Land, which we see as a cultural shift needed to address the broken relationships with Land that have led to the symptom of climate change.

For me, the initiative came from my own upbringing. *Sézi Chloe Dragon Smith súlyé. Dënendeh ts'į?ást'į. Sé ts'í ?amá Brenda Dragon hulyé, Sé ts'í ?abá Leonard Smith hulyé.* My journey of connection with Nature began long ago with respect for those who came before me. My Dënesųłiné ancestors lived seasonally and travelled: north of Great Slave Lake up to the tundra, and south of Fort Smith into northern Alberta and Saskatchewan. They are my maternal lineage and the two closest are my own mother, Brenda Dragon, and her mother, Jane Dragon. Within my memory, this story begins with them. My mother and grandmother placed value on raising me with a connection to our culture and to Land, just as their mothers did before them. For me, Bushkids is an expression of my life journey to share my gratitude with others. I believe that connecting children with the Land is central to healthy societies, and all the work we do needs to be underpinned by this basic essential foundation.

At Bushkids, we have two guiding principles. The first is Land-based learning, meaning we recognize that the Land is our greatest teacher. Land in the NWT has shaped Peoples, cultures, languages and knowledge since time immemorial. Building relationships with Land is essential to learning and always has been. Land, Peoples and relationships always come first at Bushkids.

"Building relationships with Land is essential to learning and always has been."

The second principle is embodied by a term called ethical space. Ethical space is a way of saying we practice balancing Indigenous worldviews with the mainstream system in the NWT, which due to colonization is largely based in Euro-Western philosophies today. When working within a balanced frame, we can discover the best of both systems, and how they can work together in true balance for optimal and appropriate place-based learning – for everyone.

Our vision is for all educators in the NWT to spend time connecting with Nature, family and community as an integrated part of their practice. This way of being supports healthy relationships with ourselves, each other and the Land. In the future, we would like to see other communities thriving with their own initiatives that are true to local contexts, and see regular outdoor learning in public education everywhere that is self-determined by Lands and Peoples.

UNDERSTANDING CLIMATE CHANGE THROUGH

STORYTELLING, CULTURE, AND ART

In October 2019, the Native American Program (NAP) of Dartmouth College hosted a conversation about climate called "Understanding Climate Change through Storytelling, Policy, Culture, and Art" as part of Indigenous Peoples' Month.

The panel was organized by Aaluk Edwardson and NAP Assistant Director Shelbi Fitzpatrick, a Blackfeet woman from Browning, Montana, USA. Melody Brown Burkins, born in Alaska and a Senior Fellow in the UArctic Institute of Arctic Policy, helped moderate.

The panel featured three young women from Alaska who were current or recently-graduated Dartmouth students:

Photos: **Courtesy of the authors**

Iñupiaq/Norwegian artist who also teaches creative writing and performance at Ilisaġvik College

Tlingit from southeastern Alaska, and Raven moiety from the Ganaxteidi clan (Tlingit name: Andaxjoon)

Alaska Native student from Wrangell, Alaska, who is Kiks.ádi yádi from the Tlingit and Sámi nations

What does climate change mean to you?

Climate change threatens the loss of my culture and primary cultural food source. My people are ice people – we have been playing, fishing and hunting on the Arctic Ocean for thousands of years. The loss of sea ice has affected our ability to hunt and catch the bowhead whale in the spring, which is an activity that we rely on for food throughout the year and that defines us as Alaskan Iñupiat. We are whalers. We also hunt walrus and seal, which have been seriously impacted by climate change too. The erosion of the coastline due to sea level rise has meant the loss of millennia-old traditional homes and the remains of our ancient ancestors, and countless artifacts have washed out to the sea. Climate change has also opened up the Northwest Passage, bringing new security challenges, entrepreneurial opportunities, development interests and more marine research activities.

Climate change means not being able to rely on the old stories. We used to say, "salmonberries mean spring," or use fireweed to keep track of summer. Dozens of plants would tell us how to know what was coming throughout the year. Now we cannot do that. For those for whom harvesting these plants is the only way of feeding themselves during poverty, climate change is yet another step in our genocide.

In my current research, I define climate change as a "breaking of ties." This encapsulates many different aspects of culture, such as relationships to land, subsistence, language, and material culture. As a result of colonialism, these respectful relations have been replaced by capitalist extraction, forcing indigenous people into complicity.

How has climate change directly affected your home communities?

Climate change in my community is a myth. But the river ice that breaks earlier and earlier every year, the snow that never comes, and the heat that kills our salmon – they are very real. Climate change and ocean acidification is killing our salmon and our shellfish, and with them, everything that relies on them. That is almost every living thing. Our bears are starving because of lack of fish, our blueberries aren't getting as fertilized by the salmon bodies left by spawning, and our otters will soon start dying as the shellfish die. Traditional living and commercial ventures have butt heads as resources have become more scarce. Climate change is taking away our food, and it is making my community choose between our native way of life and the economy which has been supporting us for decades.

It is important to remember that the effects and impacts of climate change are not isolated to issues of pollution and warming temperatures, though both have impacted my community in southeast Alaska. We also need to think about the connections between climate change and the increased loss of resilience in fish stocks due to overfishing – an issue that has been detrimental to subsistence in my community. Climate change exacerbates issues caused by resource extraction, and both have their roots in colonialism. For example, there is currently a lawsuit against the State of Alaska, brought forward by the Sitka Tribe of Alaska, over the management of herring stocks. The tribe claims that the State is not managing the fish stocks, which may be impacted by a changing climate and ocean ecosystem, so that there are enough herring left for subsistence use. The lack of state protections and lack of mind paid to indigenous knowledge creates climate change and worsens the damage already done.

Growing up, climate change was never talked about. It wasn't until I went to Dartmouth College that I even learned about climate change. Today, everyone knows about it. The shoreline in my community has changed drastically. In my grandfather's time, the shoreline was huge, and by my time it was moderately wide, maybe thirty feet. Now, we have a shoreline of less than ten feet – it is no longer there. We have also seen whaling seasons with no whales because the sea ice was too thin, or because the whales no longer migrate near our shore. People are getting more skin diseases, which some attribute to changing air conditions due to shifts in climate. As our shorelines and lands erode, our ancient archeology sites and remains are lost to the sea. Our community ice cellars, dug into the permafrost, are also being affected, and whaling crews have nowhere to store the hundreds of pounds of whale, caribou, seal, walrus and other food we accrue throughout the year to enjoy during the winter. Climate change is having a massive impact in my community, Utqiagvik, which is probably why some have dubbed it "ground zero" for climate change.

How can someone take action to mitigate the effect of climate change in their communities and around the world?

We as humans need to rethink our relationships with the non-human world. The podcast *All My Relations* demonstrates this very well in an exploration of how the American Dream is actually extremely human-centric, ignoring all non-human relations, and losing our human connection to non-human landscapes and beings. We must all challenge the hierarchical nature of this world view, and always remember how we stand in relation to and as a part of the Earth.

There are many ways we can adapt and take action. We can live more sustainably within the complex web of life of which we are only a part. This means looking at what we eat, what we wear, how we travel, what we use, what we throw away and what we kill in order to live in the homes, drive the cars, eat the food and live the lives we are living.

I am an artist, and I think art has a unique place in helping us adapt to our ever-evolving "normal." Art allows people to experience, interpret, and grapple with life's greatest challenges – including climate change – in a deeply individual way. Art can influence a person's understanding or perspective on something just by experiencing it. We need to talk about climate change and how to mitigate its impacts. We also need to do things that help people see, feel and experience its effects and impacts so they too feel motivated. Art can do that. The creation of art, the experience of engaging with art and the discussion of art creates space for people to wrestle with and make sense of challenges in life. It's not just for entertainment or beauty. The creation, experience and discussion of art is a tool for character-building, self-reflection, community engagement and personal transformation.

Everyone creates and experiences art differently. This gives people an opportunity to separate their own understanding and perspective from that of the others. Collaborative community art, such as theater, has the ability to transform the understandings and perspectives of the community of people working on the art project as well as the community of people who witness and engage with it. This allows for more civil conversations about shared challenges that can lead to shared community action. We need art more than ever right now, for climate change and for our society.

Learn who your indigenous people are and listen to them; bring them into the conversation. We are not always right, but we have thousands of years of memories with the land that others do not. When we say something is wrong, like the changing climate, it is because we remember how things are supposed to be: lands and plants, water and ice, all that sustained us. And when we ask for people to live more sustainably, it is not because we hate the economy – it is because we want the global economy to be strong for years to come. We appreciate a good economy too! And when we say it is not too late to act on climate, it's because we have lived through significant changes to our lands before. Our Alaskan communities have lived off the land for over 10,000 years, and we want to live off of those lands for 10,000 more. I ask that the world guide their actions with this logic. And I ask that you get involved in local politics and make change – even when you are scared your next door neighbor might yell at you. This is the action you should take.

Photo: University Centre of the Westfjords

Many a Little Makes a Mickle

Coastal Studies Students and Staff Take Action Against Marine Litter

By **CATHERINE CHAMBERS**, Research Manager and **ASTRID FEHLING**, Project Manager, University Centre of the Westfjords

Plastics and other marine litter are becoming an increasingly upsetting problem for the world's oceans and marine life. Students and staff at the University Centre of the Westfjords (UW) in Iceland engage in the fight against plastic on many different levels. Through individual and community actions they hope to inspire and motivate collective actions, moving towards the necessary changes to tackle marine plastics and related larger issues of climate change.

The two-week course "Pollution in the Coastal Arctic" deals with the source, transport and effects of major pollutants, including plastics. To put prevailing challenges into a real-world context, as part of their coursework students conduct beach debris research in the Strandir region of Iceland, a hotspot for marine litter due to ocean currents. One aspect in effectively addressing marine litter is the identification of the origin and the pathways that lead to litter entering the marine environment. UW also has a formal collaboration with the Icelandic Environmental Agency where students volunteer on an OSPAR project (protection of the marine environment of the North-East Atlantic) in the Hornstrandir nature reserve.

The University Centre regularly attracts researchers and scientists to this remote corner of the world. Recently, researchers Wouter Jan Strietman (Wageningen Economic Research) and Martine van den Heuvel-Greve (Wageningen Marine Research) stopped by in Ísafjörður for a one-week workshop as a part of their project on Arctic marine litter. UW students volunteered to collect beach litter, and helped sort and identify the findings. Among them was Amy O'Rourke whose master thesis in collaboration with the Icelandic Marine and Freshwater Research Institute focused on the occurrence, prevalence, and classification of fishing-related marine debris in the Westfjords.

Students at UW embrace the fact that individual actions matter. As the latest contribution to their coastal community of Ísafjörður, they raised 300,000 ISK to buy a Seabin for the harbour. A Seabin is a floating rubbish can with a pump that creates a flow of water and brings garbage into the bin from the sea. While the ultimate goal is to stop plastics and other manmade litter from entering the water in the first place, Seabins can make an impact in a localized area. Students themselves came up with the idea, handled the practicalities with the order and the municipality, and ultimately will also see to the installation of the Seabin.

Beyond education, UW is part of the UArctic Thematic Network on Arctic Plastic Pollution, contributing to exchange of knowledge. Another project led by Catherine Chambers called "Plastics in Commercial Fish Stocks of Norway, Iceland and Faroe Islands" aims to move science to policy by creating best practices and protocols for the standardization of the analysis of plastic in fish stomachs, specifically taking into account small laboratory resources in rural areas. Results from this project will provide important information for maritime industries in all three countries that heavily rely on fisheries and the image of pristine and clean North Atlantic waters. This project will also engage the public and empower the community with the knowledge they gain.

Art as a Catalyst to Build Understanding

Our Plastic Ocean, Our Clean Ocean

By **HERMINIA DIN,** Professor of Art Education, University of Alaska Anchorage

It was soon after I moved to Alaska to take a position at the University of Alaska Anchorage (UAA) that I had a chance to fly over the Bering Sea between the United States and Russia. It supports some of the richest biological populations of mammals and fish, and it took my breath away. But little did I know that many years later I would become part of a team of art educators with a passion to address the emerging problem of plastics pollution in this and other areas of the Arctic, and the world. This would lead to the creation of a novel pop-up booklet to bring the ocean into the classroom.

UAA Art Department is one of twenty founding members of the UArctic Thematic Network on Arctic Sustainable Arts & Design (ASAD), and we have long collaborated across the region on different projects. Inspired by *Gyre: The Plastic Ocean* exhibit at the Anchorage Museum, in 2014 my colleagues from Nord University and I formed a new research collaboration to develop teaching and learning materials addressing plastic pollution in our respective environments.

We began to research the problem and develop workshop materials for K-6 teachers and students. In 2016, I took advantage of my sabbatical leave to join my Norwegian colleagues for three teacher-training workshops in Lurøy, Nesna, and Brønnøysund. Subsequently, we received numerous requests from other schools and communities for the same workshops in their regions. To best meet the demand, we began to conceptualize the type of tool we could develop. Keeping the target age group in mind, we concluded that a storybook approach was ideal to engage students in a participatory and hands-on learning experience.

In 2018, I worked with the Kenai Peninsula Borough School District in Alaska to organize hands-on workshops using art and science-integrated methods to study plastic pollution in Alaska. We visited two village schools in Port Graham and Nanwalek, and held 14 workshop sessions with a total of 95 students ranging from kindergarten to 12th grade. During each workshop, we discussed current issues on the plastic pollution in our oceans, and students learned how to make either a pop-up card or a small pop-up book to express their concerns.

Later that fall, I landed on St. Paul Island in the middle of the Bering Sea. I was there to collaborate with the Aleut Community during their annual Bering Sea Days and lead a week-long art workshop focusing on plastic pollution. St. Paul Island is small; it has a total area of 295 square miles of which 40 square miles is land and 255 square miles is water. The population is approximately 480 people, over 100,000 northern fur seals, and more than 280 species of birds and seabirds. There are also other marine and land mammals on the island, including harbor seals, sea lions, walrus, whales, reindeer, fox, and shrew.

On field trips to different beaches during the week, I was stunned to witness the large amounts of plastic waste washed up on shore. Fishing nets, ropes, containers, bottles. This was a sobering view, considering we were on a very small remote island, far away from major populated areas. At the end of the week, working with more than 40 students from kindergarten to middle school, we co-created a large-scale art installation titled *Our Plastic Ocean vs. Our Happy Ocean.*

"Along with the air we breathe, the ocean is the most necessary element required to sustain life on our planet."

After three years of research and gathering first-hand information about plastic pollution in the Arctic, in August 2019 we finally published *Our Plastic Ocean, Our Clean Ocean*, an interactive pop-up book. The book explains to young readers not only how our ocean pollution problem came to be, but also why we must find solutions as

Photo: **Herminia Din**

quickly as possible. It also shows them what they can do right now to be part of those solutions. In part 1, "Our Plastic Ocean: What's Wrong and How We Can Fix It", the illustrations and pop-ups make clear the connection between a polluting act and the widespread harm it causes. In part 2, "Our Clean Ocean: How We Can Keep It Clean for All of Us", the reader learns ways to reduce pollution and keep the ocean clean and healthy. The reader's guide outlines simple steps we can take in our own daily life for reducing sources of ocean pollution. It seeks to inspire readers to use their own artistic talents to express the adverse impact our contemporary culture of consumption wreaks upon the ocean and our entire natural environment.

Conventional wisdom might indicate the Arctic would be immune from the excesses of modern society. Sadly, images of pristine waters and untouched coastlines could not be more false. From St. Paul Island, Alaska to the beaches of northern Norway, plastic waste or marine debris can be seen washed up on shorelines and floating offshore. Present and future generations have a responsibility to recognize this global crisis and take small but significant steps to make a difference.

Art is a universal medium that can serve as a catalyst to build an understanding of difficult issues. This project represents a true collaborative effort among the ASAD network members to identify and share innovative practices in teaching, learning, research, and to enhance knowledge of the North.

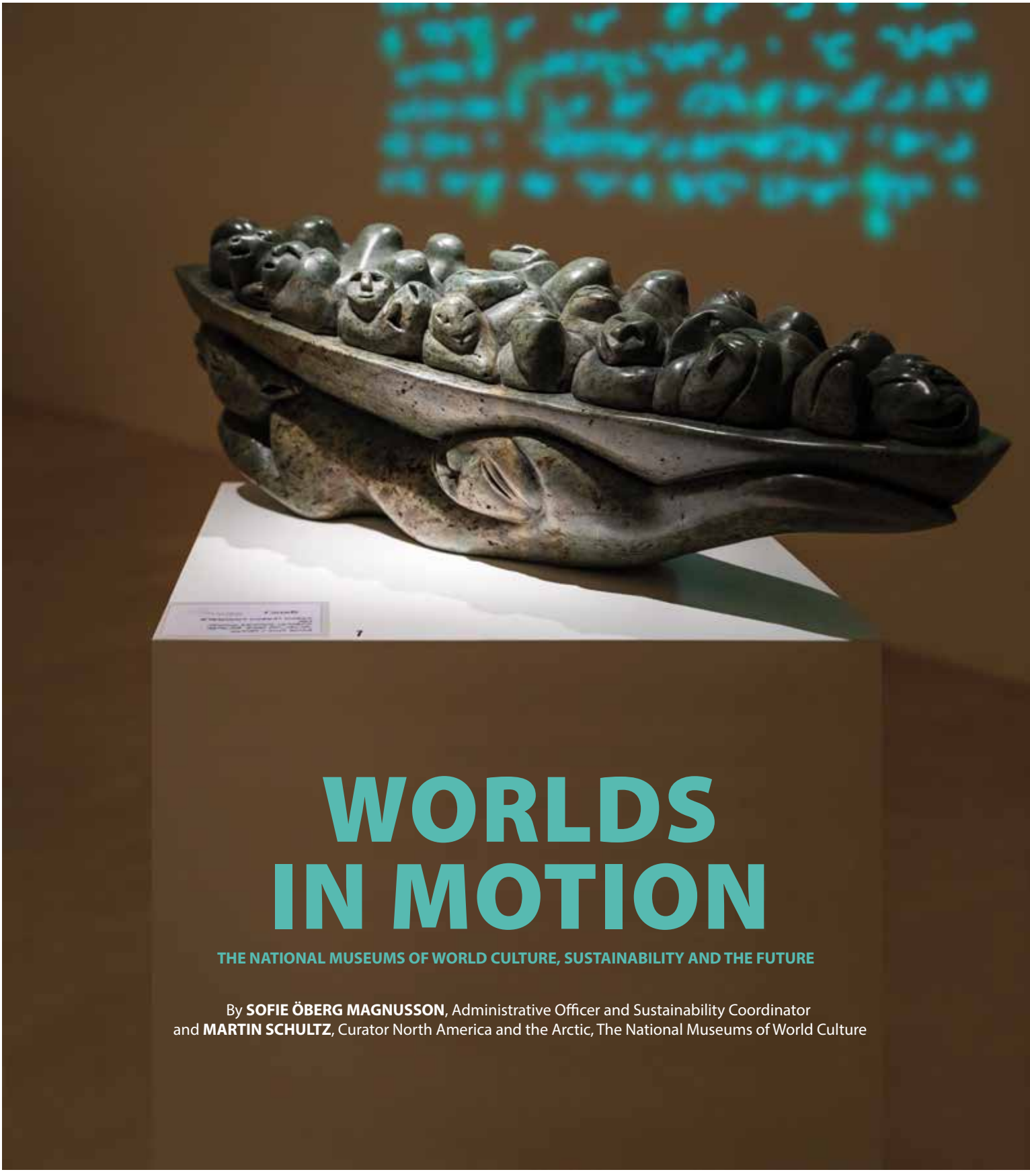


Photo: **Beatrice Törnros**

WORLDS IN MOTION

THE NATIONAL MUSEUMS OF WORLD CULTURE, SUSTAINABILITY AND THE FUTURE

By **SOFIE ÖBERG MAGNUSSON**, Administrative Officer and Sustainability Coordinator
and **MARTIN SCHULTZ**, Curator North America and the Arctic, The National Museums of World Culture

In the public mind, museums are sometimes narrowed down to object-filled exhibition spaces and guided tours. Yet, museums have always had a more profound significance for society and have the potential to be essential resources in the transmission to a sustainable future. To shoulder such a role, however, museums need to be climate smart. The Swedish national museum agency National Museums of World Culture (Statens museer för världskultur, SMVK) strives for a wholistic approach, in which all aspects of museum work are addressed, from energy use to public outreach.

OUTER WORLDS

The mission of the National Museums of World Culture is to showcase and bring to life the cultures of the world, particularly those originating outside of Sweden. The agency documents and illuminates the conditions and forms of expressions of other cultures as well as interaction between cultures and cultural variation – historical and modern, national and international. SMVK also promotes interdisciplinary knowledge enhancement and various forms of public activities.

With their exhibitions, museums all over the world draw attention to sometimes pressing topics of the time. The aim of the current *Human Nature* exhibition at Världskulturmuseet in Gothenburg is to encourage action in protecting our planet for future generations. The exhibition discusses the impact humans have on the Earth's ecosystems, and specifically mass consumption and its various effects on the planet. A platform for educators connected to it, Human Nature Skola, has been shortlisted by the Swedish Museums Association for their annual pedagogical price.

As another example, SMVK addresses climate change and in particular the situation in the Arctic through the exhibition *Voices from the Arctic*. Showcased at Världskulturmuseet in 2019, it was developed in collaboration with the Museum Cerny Inuit Collection in Bern, a museum with a focus on contemporary Inuit art reflecting climate change.

INNER WORLDS

The production of exhibitions and many programs for a wider audience are energy-intense and produce waste. In the past, this has not been a topic addressed by museums. Awareness was rising for the first time with increasing energy costs that forced museums to think about saving electricity and water.

At SMVK, the focus on sustainability is accessible to our visitors through exhibitions, public events and program activities. But we also work actively behind the scenes to continuously evaluate and improve the social, environmental and economic accountability in our purchase and procurement processes, energy efficiency, transports, travel, and how we handle our material resources and dispose of our waste. We are committed to the UN Sustainable Development Goals and aim to incorporate them in all parts of SMVK. To reach out through the organization and carry out strategies and actions, we have set up a task force consisting of representatives from the different departments. These representatives act as a link between the operations of their departments and the decision-making. Sustainability coordinators incorporate the viewpoints of the departments in the recommended goals and activities to the management, which makes the process transparent and anchored.

Future tasks will include rethinking pest management and introducing more energy efficient ways to store collections. Less than 10% of our collections are currently visible in exhibitions, and to remain relevant, collecting is crucial. New materials might also need new ways of storing and perhaps treatment. The field of collections management is undergoing quick and enormous changes, and implementing sustainability is one of the key tasks.

FUTURE WORLDS

What can climate-friendly museum work look like? How can the use of energy, packaging material and the like be reduced? The museums are answering these questions through cooperation with other museums and international experts. For example, in the Museums and Sustainability conference in September 2019, we explored different approaches such as using collections as a "climate archive", and how to implement routines for reusing materials, thus prolonging the life of the resources and decreasing waste. The need for further development and a will to exchange experiences and collaborate was unanimously agreed on. We need to act, and we need to learn and develop expertise.

Sustainability has become an integral part of education and reached our everyday life in many visible and invisible ways. We need to turn our concern about the environment and the future of our planet into a new form of intangible cultural heritage – for a bigger, more humane and more inclusive world.

Voluntourism in the Faroe Islands

A Sustainable Nordic Tourism Model

By **JONATHAN WOOD**,
LLM Candidate in Polar Law,
MA Candidate in West Nordic Studies,
University of Akureyri

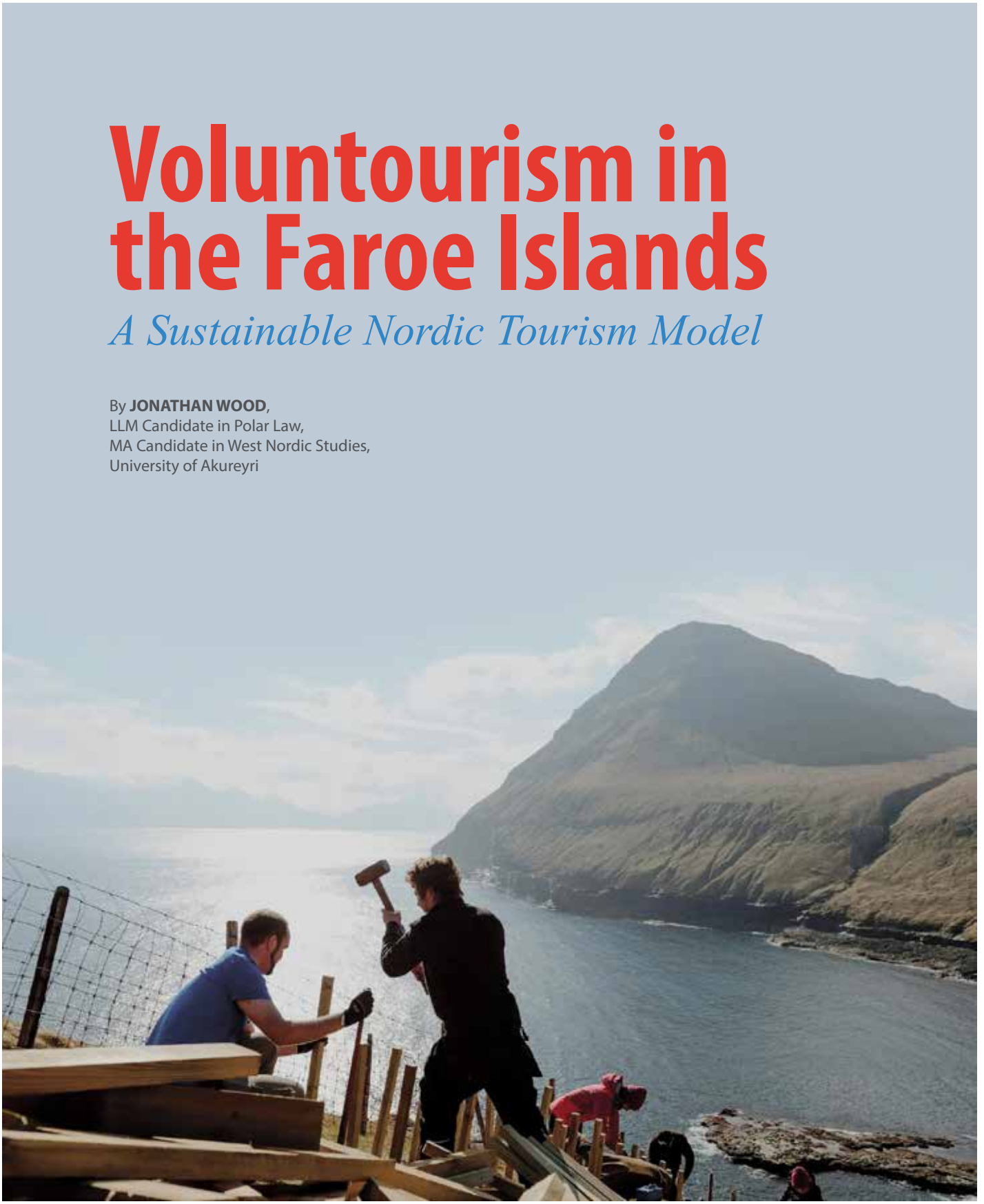


Photo: **Tróndur Dalsgarð**

"How I wish that somewhere there existed an island for those who are wise and of good will."

- Albert Einstein -

It appears that the Faroe Islands are attempting to make Einstein's dream a reality. Within 24 hours of the registration opening for the 2020 "Closed for Maintenance, Open for Voluntourism" initiative, 5,886 voluntourists applied to help regrow the natural environment of the Faroe Islands through a series of distinct projects.

With only 100 slots initially opened by the Faroese Government, the process is more selective than being accepted into some of the most prestigious universities. Despite its success in 2019 with around 2,500 applications, an increase of over 2,000 applicants is extraordinary for the North Atlantic archipelago with a population hovering just above 50,000. Applications came from 95 different countries, from volunteers as young as 18 to as old as 77 with a diverse range of occupations – accountants, architects, lawyers, horse-riding coaches, diplomats, film directors. Yet they all applied with one common goal: to help maintain and preserve the Faroe Islands' beautiful landscapes and precious natural environment.

Fourteen projects all around the archipelago were to take place this spring, but due to COVID-19 have now been postponed to 2021. They include signpost erection and cairn restoration on the old village path leading from the village of Vatnsoyrar to Mið and Sandavágur to finish a 2019 project; and completing a proper hiking path to the top of Klakkur, one of the tallest mountains surrounding Klaksvík, the second-largest town in the Faroe Islands.

The synergy between the good will of the volunteers and the Faroese Government has led both parties to find a mutually beneficial arrangement: the voluntourists get a unique experience and sense of accomplishment, while the Faroe Islands are made more accessible and promote sustainable tourism. Yet good will was only one part of Einstein's dream island as he also wished for wisdom. The Faroese Government's "Closed for Maintenance" program has shown that wisdom. Not only do they make the Faroe Islands an even more unique destination by limiting the number of spots – therefore increasing media attention – but they are also making the necessary infrastructure improvements for long-term sustainable tourism at a low cost by seeking volunteers.

Sustainable tourism and overtourism have become buzzwords in recent years regarding the Nordic countries, especially Iceland. The necessity to protect fragile Arctic and sub-Arctic environments while heavily relying on tourism as an industry have started to conflict. While I do not believe Iceland could enact such a plan wholesale, or that it would be an economically feasible idea for a larger country, countries should look to this initiative on the smaller scale: take some of the most at-risk tourist locales and have the infrastructure and nature restored through similar volunteer initiatives. Not only have the Faroese Islands given the voluntourists a once-in-a-lifetime experience, the news coverage the Faroes have received in doing so sets them up to increase tourism revenue when the projects are completed and they can handle the influx of regular tourists. In a sense, the Faroe Islands have adopted the precautionary principle, a tenet of international law, and applied it to their tourism industry: if there is a strong suspicion that a certain activity may have environmentally harmful consequences, it is better to control that activity now rather than wait for incontrovertible scientific evidence. Such forward thinking sets the Faroe Islands up well in the long run as a tourist destination.

One place that could adopt this model is Greenland. With a similarly sized population and lack of infrastructure in many areas, Greenland is looking to diversify its economy from extractive resources to include more tourism. As Kjellfrid Totland Hesthamar noted in their thesis, "Iceland's experience from the rapid development of tourism the last decade can serve as an inspiration for nations who seeks growth in tourism in general, and for Greenland in particular, as they look towards Iceland when developing their tourism industry. The lessons learned from Iceland can support Greenland with initiating preventive measures in order to avoid meeting the same challenges as Iceland when developing their tourism industry." In addition to looking at Iceland as a model for sustainable tourism, Greenland and other Arctic communities who are looking to bolster their tourism should also consider the precautionary model as shown by the Faroese.

With their creative wisdom and the good will of eco-tourists as capital, the Faroe Islands have successfully created a series of islands that would make Albert Einstein proud.

Northern Nursing Students Raising Awareness and Spreading Knowledge on Climate Actions

By **KATHIE PENDER**, Vice-lead of the UArctic Thematic Network on Northern Nursing Education, Instructor, Aurora College and **DONALD LEIDL**, Lead of the UArctic Thematic Network on Northern Nursing Education, Assistant Professor, University of Saskatchewan and **BENTE NORBYE**, Vice-lead of the UArctic Thematic Network on Northern Nursing Education, Professor, UiT The Arctic University of Norway

In collaboration with **G. KEELER**, Academic Lead Clinical Placements, University of Northern British Columbia School of Nursing and **A. BROOKHART**, Terrace Nursing Coordinator, University of Northern British Columbia School of Nursing and **P. JUUSO**, Assistant Professor, Luleå University of Technology and **N. DIACHKOVSKI**, Head of the Department for Higher Education in Nursing, North-Eastern Federal University Institute of Medicine

Nurses are the backbone of health services in the Circumpolar North, and as such well positioned to positively impact population health and the environment. The impact of climate change on population health and healthcare systems has also been integrated into the undergraduate curricula at the partner institutions of the UArctic Thematic Network on Northern Nursing Education (NNEN). Nursing students are provided with opportunities in the clinical learning environment to engage with patients and communities to advocate for change through experiential and didactic learning. In this article, we present some of the student-led climate action initiatives in the North – actions that are raising awareness and spreading knowledge for improving and preserving the environments in which people live.

Aurora College in Yellowknife, Canada offers a community and leadership practicum which connects nursing students with organizations outside of the program. Practicums focus on building environmental capacity in the college through a student-led composting and recycling project. Currently, students and a local environmental organization are leveraging the quality of clean Arctic lakes and promoting the use of water bottles. They collaborate with elementary schools to pilot a project focused on increasing the consumption of local water while decreasing the uptake of single-use disposables. Another project involves the annual traditional knowledge day, during which first-year nursing students attend a day camp to learn about Indigenous ways of living that positively impact climate change. The effects of climate change on the natural environment is highlighted through the decrease in fish caught, polluted lands, altered animal migratory patterns, and disease patterns in wildlife and humans. The impact on Indigenous subsistence is demonstrated through theoretical preparation and experiential learning at the camp. As future leaders in healthcare, these experiences connect the environment with health and demands of future educators.

In Finland and Sweden, a new joint project "Green Care" focuses on nature-based services as rehabilitation to augment treatment for illness. The idea is to use designated natural environments like parks, gardens, farms and animal therapy as components of healing, with services based on the restorative and rehabilitative effects of nature as an adjunct to conventional care. This new and innovative approach to treatment was included in the curriculum for the NNEN international field school in August 2019. The goal of this initiative is to implement the concept of Green Care in nursing curricula across Sweden and Finland, and to expand on its efficacy through research and dissemination.

At the University of Northern British Columbia, Canada, students are required to complete a module related to sustainability and environmental protection prior to their third year consolidation practicum. In this module, students learn to recognize ways that the environment contributes to an individual's negative health outcomes; assess clients for harmful environmental exposures; identify groups at risk for harmful environmental exposures; identify ways in which the health care system can prevent further harm to the environment; and understand how nurses can improve the health of environments and those who live and work in them. Attention to environmental health continues into their final year of study. Students also engage in a community health nursing course including environmental health as a topic. Determinants of health and health inequities are discussed in the context of environmental and global health, and students are encouraged to extend this learning into their class assignments. Recently their assignment topics focused on the effects of climate change-related events such as forest fires on health and nursing practices. During the leadership course, students investigated the impacts of healthcare on the environment as a contributor to waste and pollution. The aim of this is to imagine ways in which environmental health could be a consideration in their own everyday practice as leaders in the healthcare field. Students become acutely aware of the connections between environmental and population health and are encouraged to act as leaders and educators as they transition into professional practice.

In the Russian territory of Yakutia, student-led climate action involves the preservation of clean water sources. With more than 723,000 natural lakes covered with ice for an extended period, this is a very ambitious undertaking. Indigenous inhabitants of Lake Yakutia use the lake for their water supply, fishing, and agriculture needs. Agricultural waste is the number one pollution of internal waterways in Yakutia, with the main sources of pollution to the sea being mineral fertilizers and cattle excrement. This leads to the intensive development of plant life and algae, along with an increase in oxygen consumption from the fresh water. As a result, there is a massive reduction in fish populations and decrease in water bodies' ability to self-clean. The end result contributes to the destruction of this delicate fresh water ecosystem. Nursing students participate in regular clean-up and prevention work with residents who live in rural areas. In public places, there are sanitary-hygienic educational posters warning of the impact of harmful organic waste on the fresh water lakes. Particular emphasis is placed on the timely clean-up of excrement from farm animals. Together with practicing nurses, students conduct water purity testing and monitor the cleanliness of the yards and ponds. These audits are completed to ensure that environmental regulations are met. Through direct participation in monitoring, nursing students are able to link the effects of pollution to the impact on the environment.

Smart Societies and Arctic Sustainability

OPPORTUNITIES AND CHALLENGES

By **NADEZDA NAZAROVA**, Vice-lead of the UArctic Thematic Network on Smart Societies in the High North, Associate Professor and **EVGENII ALEKSANDROV**, Postdoctoral Researcher and **ANATOLI BOURMISTROV**, Lead of the UArctic Thematic Network on Smart Societies in the High North, Professor, Nord University

There is an increasing discussion in northern countries on the smart concept and how it can help to solve the problems of the Arctic, including climate change. Being highly innovative, it has the potential to contribute to sustainable development efforts by means of modern technologies and social innovations. Holistic initiatives are still rather uncommon in the High North, but interest in the concept is growing. Smart transportation, smart governance, smart waste, and smart education crowd the top of the climate action lists of national and regional governments.

The partners of the UArctic Thematic Network on Smart Societies in the High North share the belief that smart initiatives can be a solution to sustainable growth and urban development in the High North. In this article, we present a more critical perspective and highlight the current opportunities and challenges of the smart concept implementation, based on our experiences within the Thematic Network.

First, there are differences in what "smart" means across the Arctic regions. At the establishment stage of our network, different perspectives on the appropriate unit of smart analysis resulted in long discussions on "too big vs. too small". Smart city, smart community, or smart ecosystems? In this respect, the idea of smart society works in its integrating and overarching power that welcomes multiple perspectives. In addition, it allows further cooperation even when it comes to such competing dimensions as technological development and indigenous issues.

Second, there is a constant trade-off between fancy and sustainable solutions in the smartification of the Arctic. With the growing level of digitalization, the discussion between scholars and practitioners increases on the sustainability of the smart city concept in the High North. Many smart city initiatives originally developed in southern regions hardly pass the Arctic stress test. Therefore, they must be properly translated into the High North context in order to represent a solution and not a burden for Arctic sustainability.

Third, there is an essential missing element in everything that relates to smart Arctic development: the dialogue component. Smart solutions should be driven and framed by participatory governance initiatives, such as CitizensLab, participatory budgeting, or e-government. These initiatives demand time to address and realize existing variations of local stakeholders' perspectives on smart Arctic development. The dialogue can help ensure that suggested smart initiatives get translated for the High North context, and not vice versa, as it often seems to be the case.

To sum up, we agree that smart societies can improve the attractiveness of Arctic cities and regions and foster a sustainable future. However, it is important to address not only the opportunities the concept offers but also the challenges it implies. In this respect, the partners of our Thematic Network are dedicated to develop a joint online course on relevant aspects of smart societies formation in the High North. The course will combine their unique competences and various perspectives on the topic, and the digital format will unite partners across geographical and time zones and make knowledge on smart societies in the High North available beyond the borders of the region. In the long term, this contributes to the sustainability of our Thematic Network as well as the Arctic.

SHORTENING THE TIME FROM OBSERVING TO DECISION-MAKING IN THE ARCTIC

By **OLIVIA LEE**, Assistant Professor, International Arctic Research Center, University of Alaska Fairbanks and **FINN DANIELSEN**, Lead of the UArctic Thematic Network on Collaborative Resource Management, Dr.Scient., Nordisk Fond for Miljø og Udvikling

In collaboration with **HIROYUKI ENOMOTO**, **LENE K. HOLM**, **MARK NUTTALL, MARTIN ENGHOFF**, and **NATSUHIKO OTSUKA**

The distribution of life on Earth is experiencing dramatic effects from the most rapid climate-driven change in 25,000 years. As local environments face the effects of climate change, we see many species move up mountains, deeper into seas, and towards the poles. This impacts economies, human well-being, governance, ecosystems, and even the climate itself.

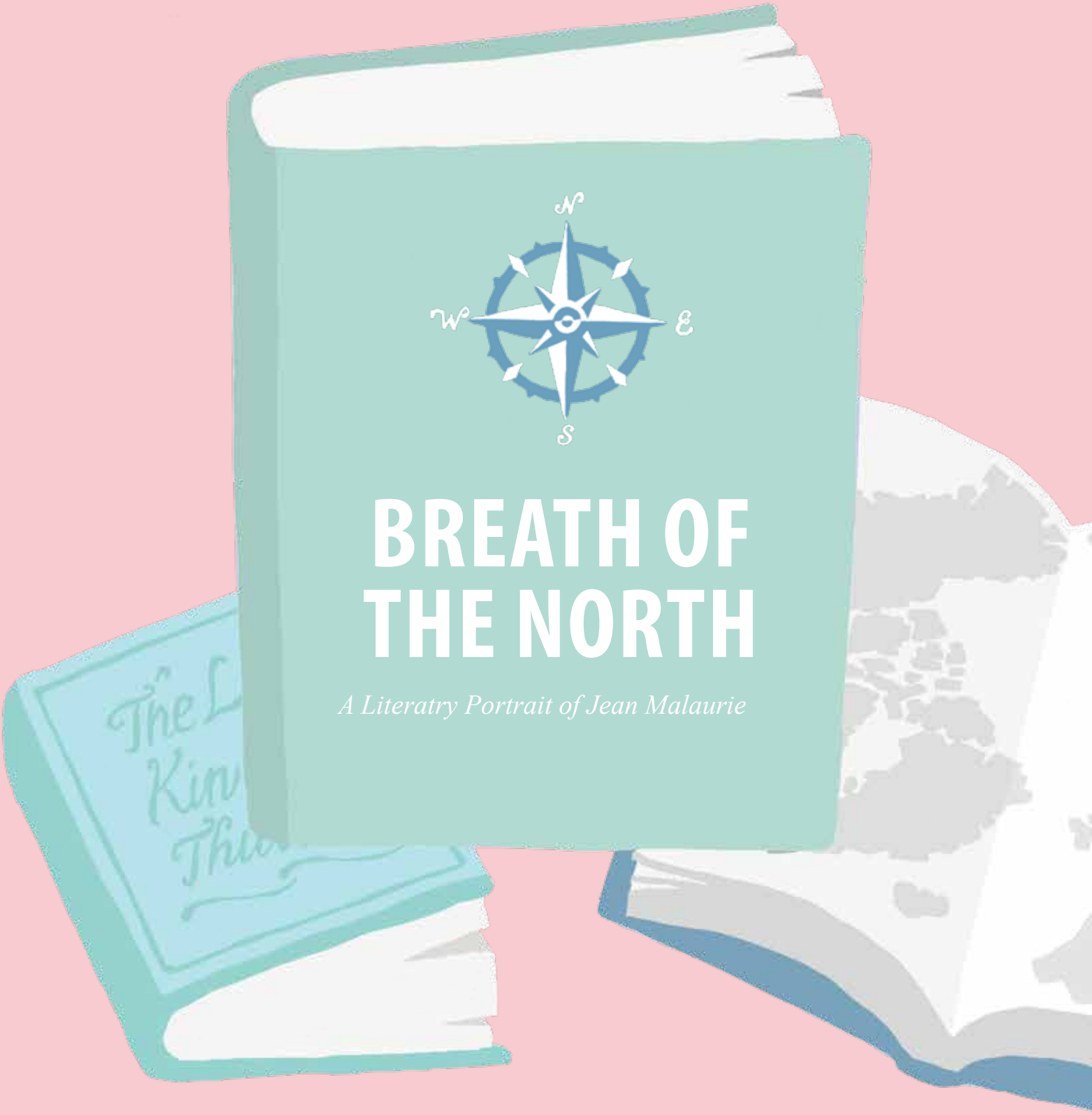
We need a shorter response time from observing to action to keep up with the rapid redistribution of species in the Arctic. One solution is adaptive governance of the natural resources. This requires cross-weaving of knowledge and sharing experiences from indigenous, industry, community-based, and academic perspectives. The recently established UArctic Thematic Network on Collaborative Resource Management mobilizes education and research institutions to increase the number of Arctic resource managers and scientists who can use participatory approaches to natural resource management and monitoring in practice.

Our efforts build on what we learned from an experience exchange workshop at Hokkaido University in June 2019 that brought together community-based monitoring practitioners, researchers, and natural resource managers. The diverse perspectives from experiences across the Arctic and sub-Arctic, including USA, Canada, Russia, Greenland and Japan, revealed a shared appreciation: we need to improve the capacity of resource users, scientists and government resource managers in co-producing knowledge for adaptive management.

One example of an important approach was the model from the Nunavut Wildlife Management Board (NWMB). In addition to supporting training for local participation in community-based monitoring networks, the NWMB uses information from community-based monitoring and scientific studies to make decisions on how to manage harvested species. Participants of the workshop shared other examples of co-producing indigenous, local and scientific knowledge to enhance the common pool of knowledge and improve management of resources. However, it was evident that in many Arctic regions community-based monitoring information did not always translate into local involvement in making decisions for resource management.

To begin addressing the shortage of resource managers and scientists who can use participatory tools, and to transform community-based monitoring information into decision-making, we developed a course curriculum in collaborative resource management. We held an in-service course for government resource managers and scientists in Greenland in October 2019. The interest in attending the course was much larger than expected, and we only had capacity for 25 participants. They came from local government agencies in all five municipalities of Greenland as well as from three ministries, civil society organizations, and a research institute. The exercises in PISUNA-net, a searchable web-based database with fishers' and hunters' observations of living resources and their proposals for management actions, were considered especially helpful. The participants also supported offering the course again so their colleagues could attend.

As our Thematic Network continues to develop, we will seek partnerships across UArctic and beyond to support education and capacity development in participatory approaches that have real-world applications for managing natural resources in the rapidly changing climate – shortening the time from observing to decision-making in the Arctic.



BREATH OF THE NORTH

A Literatry Portrait of Jean Malaurie

By **JAN BORM**, Full Professor,
University of Versailles Saint-Quentin-en-Yvelines

"Cultural diversity is a scientific reality which we must protect as much as possible, just like biodiversity."

In times of doubt and instability, it is wise to listen to the reassuring voice of those who can look back on a long life of extraordinary experience. Professor Jean Malaurie's voice is definitely one of those.

Born in Germany in 1922, Malaurie is a trained geomorphologist; author of the 1955 classic account *The Last Kings of Thule*, the most widely distributed book about Greenland in the world; founder of *Terre Humaine*, the prestigious French book series which includes one of the most influential texts in social sciences of the second half of the 20th century, *Tristes Tropiques* by Claude Lévi-Strauss; co-founder of the State Polar Academy in Saint-Petersburg (now part of Russian State Hydrometeorological University); UNESCO Goodwill Ambassador for the Arctic; and recipient of the gold Nersornaat, the Greenland Medal for Meritorious Service awarded by the Greenlandic parliament.

In the preface to *The Last Kings of Thule*, Malaurie looks back on the decisive impact the Inughuit of Thule in North-West Greenland had on him when he was staying with them in 1950-51: "I owe much to these exemplary men, who obliged me to discover in depth my own identity. They reminded me that a man's life should be a constant challenge that enables him to become what he truly is. They were my second – and more important – university, and I shall be indebted to them all my life." Among Jean Malaurie's many achievements, his insistence on considering Inuit knowledge and wisdom on par with other schools of thought is certainly one of the foremost and a lesson to be meditated by all of us. This premise is also reflected by the choices he has made as an editor for the over one hundred life stories and narratives published in *Terre Humaine,* aligning well-known scholars with indigenous authors such as Don Talayesva or Davi Kopenawa as well as men and women from all walks of life.

Jean Malaurie's history of the "discovery" and exploration of North-West Greenland, *Ultima Thule*, is a model of reflexive ethno-history, and his gripping account of his own 31 expeditions to the Arctic, the four-part *Hummocks*, is fascinating reading from both a scientific and literary point of view. And he continues to publish: the monumental second volume of his collected writings *Arctica* (about his expedition to Chukotka in 1990) came out last year, with two more volumes to follow in 2020 and 2021.

But let us listen to him again. His powerful 2013 call of Strasbourg "Le souffle du Nord" (Breath of the North) has been published in his recent collection *Oser, résister* (*To Dare, To Resist*). As a take-away message, here is one of his most urgent appeals to human reason: "Cultural diversity is a scientific reality which we must protect as much as possible, just like biodiversity. Otherwise, all of us in those megacities that keep on growing will become a people of ants, manipulated by words and images."

We need to return, time and time again, to those exceptional voices. As Prince Albert II of Monaco observes in his homage to be published in a special volume of the prestigious French review *Les Cahiers de l'Herne*, "Jean Malaurie is a model, a reference for those, like myself, engaging themselves in favour of our planet and the poles, and who always know how to find a precious example in all that he does."

CLIMATE CHANGE

Key Challenge of Arctic Herders' Livelihoods and Cultures

By **ALENA GERASIMOVA**, Project Manager at International Centre for Reindeer Husbandry, Researcher at UArctic EALÁT Institute and **SVETLANA AVELOVA**, Project Manager at International Centre for Reindeer Husbandry, Principal Specialist at UNESCO International Department, North-Eastern Federal University and **MIKHAIL POGODAEV**, Deputy Minister, Ministry for Development of the Arctic and the Peoples of the North of the Republic of Sakha (Yakutia) and **ANATOLY ZHOZHIKOV**, Head, UNESCO International Department, North-Eastern Federal University and **ANDERS OSKAL**, Lead of the UArctic EALÁT Institute, Executive Director, International Centre for Reindeer Husbandry and **SVEIN DISCH MATHIESEN**, Lead of the UArctic EALÁT Institute, Professor, International Centre for Reindeer Husbandry

Six times the size of France, the Republic of Sakha (Yakutia) stretches from the Henrietta Islands in the far north to the Stanovoi mountain range in the south. It is a land of contrasts: it has some of the coldest climates and extremes of temperature on the planet with permanent human settlements, a rich and diverse biodiversity with large undisturbed habitats, and indigenous traditional livelihoods practiced for centuries.

Yakutia is home to several small-numbered indigenous peoples who practice reindeer husbandry, including the Evens, Evenks, Dolgans, Yukagirs and Chukchi. With more than 152,000 reindeer, Yakutia has the second largest number of reindeer in Russia. Reindeer herding in Yakutia is practiced in different climate zones and ecosystems ranging from Arctic tundra to mountain and boreal taiga. Taiga reindeer husbandry consists of small-sized herds. These communities combine herding with hunting of wild game in areas of extensive industrial development, which represents a profound challenge for taiga reindeer herders in addition to climate change and globalization.

Extreme temperatures are typical to Yakutia, from -65°C in winter to +35°C in summer. Nevertheless, air temperature in spring in Northern Yakutia has for the last thirty years increased with more than 6°C, effecting the economy of reindeer herders' communities. In summer, fires are one of the major threats to biodiversity and reindeer herding, and a major contributor to land degradation in Yakutia.

Indigenous reindeer herders in the Circumpolar North are facing profound changes in their societies. Both climate change and socio-economic change are already impacting the economies and cultures of reindeer husbandry. Adaptation to climate change demands training of Arctic peoples in long-term sustainable thinking based on the best available adaptation knowledge, that is, both scientific and experience-based traditional knowledge.

The UArctic Institute for Circumpolar Reindeer Husbandry (UArctic EALÁT Institute) seeks to strengthen the resilience of herding societies through capacity building of indigenous youth – the Arctic leaders of tomorrow.

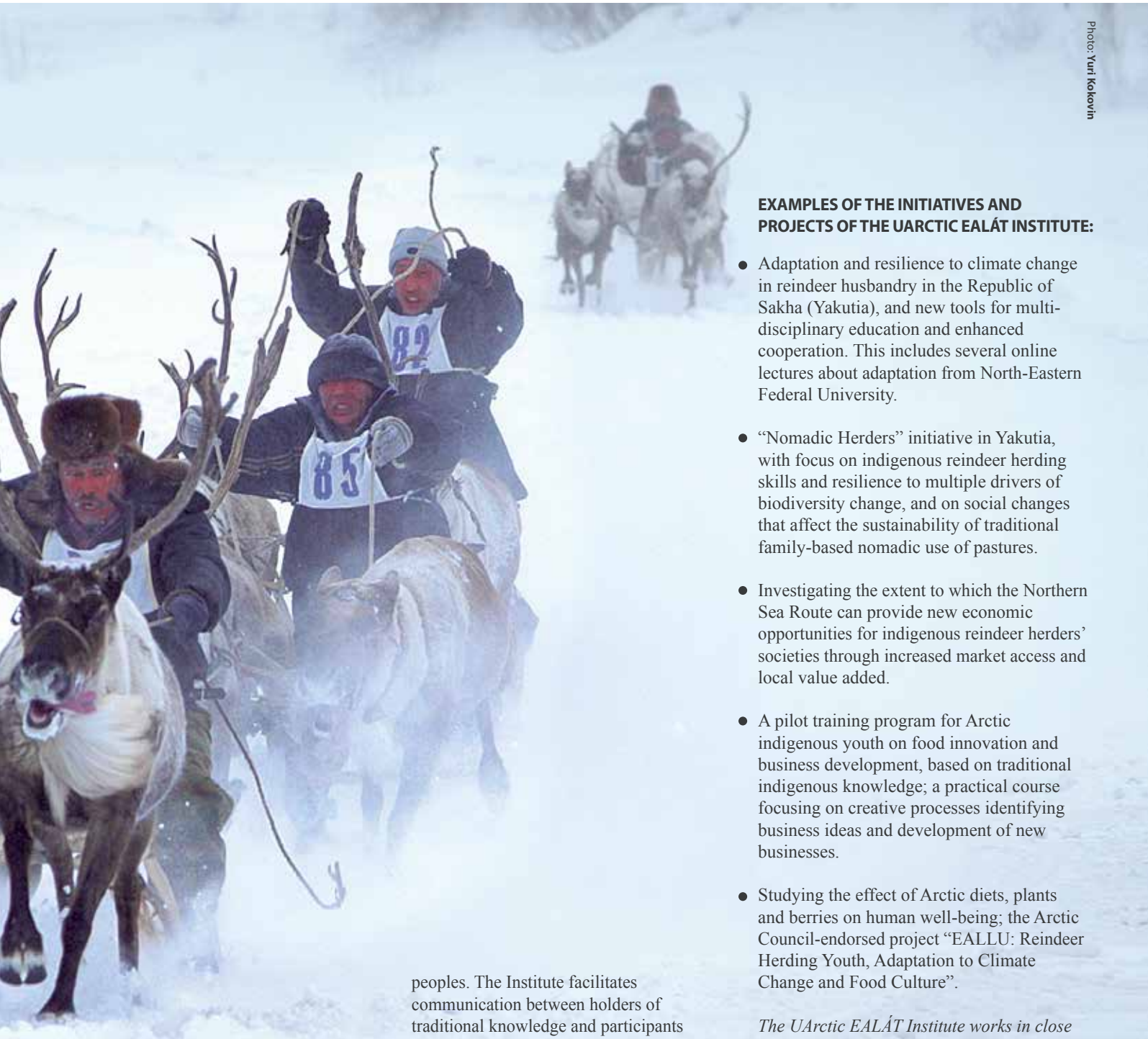


Photo: **Yuri Kokovin**

The EALÁT Institute aims for excellence by including reindeer herders' traditional knowledge as well as science-based knowledge in research, training and educational programs, and in the planning of scientific activities for Arctic indigenous peoples. The Institute facilitates communication between holders of traditional knowledge and participants conducting scientific activities, and facilitates the participation of indigenous youth in these activities. Since 2009, more than 260 indigenous youth have participated in courses and training in Yakutia and in Norway related to leadership, adaptation to climate change, traditional knowledge, biodiversity and reindeer herders' traditional food systems.

EXAMPLES OF THE INITIATIVES AND PROJECTS OF THE UARCTIC EALÁT INSTITUTE:

- Adaptation and resilience to climate change in reindeer husbandry in the Republic of Sakha (Yakutia), and new tools for multi-disciplinary education and enhanced cooperation. This includes several online lectures about adaptation from North-Eastern Federal University.
- "Nomadic Herders" initiative in Yakutia, with focus on indigenous reindeer herding skills and resilience to multiple drivers of biodiversity change, and on social changes that affect the sustainability of traditional family-based nomadic use of pastures.
- Investigating the extent to which the Northern Sea Route can provide new economic opportunities for indigenous reindeer herders' societies through increased market access and local value added.
- A pilot training program for Arctic indigenous youth on food innovation and business development, based on traditional indigenous knowledge; a practical course focusing on creative processes identifying business ideas and development of new businesses.
- Studying the effect of Arctic diets, plants and berries on human well-being; the Arctic Council-endorsed project "EALLU: Reindeer Herding Youth, Adaptation to Climate Change and Food Culture".

The UArctic EALÁT Institute works in close cooperation with North-Eastern Federal University (NEFU) in Yakutsk, Russia, and the international UNESCO Chair on Social and Human Adaptation of the Arctic Regions to Climate Change, located at NEFU. The Republic of Sakha (Yakutia) has strongly contributed to the Institute's activities since its establishment in 2011.

Alumni Testimonials from the Model Arctic Council

The first fully developed Model Arctic Council (MAC) was organized in 2016, and the program has since seen dozens of students participate in the week-long learning exercise in several countries. In the Model Arctic Council, graduate and advanced undergraduate students from universities across the Arctic countries and beyond convene to represent and simulate the work of the member states, permanent participants, and observers of the Arctic Council. The goal is to host a Model Arctic Council in the country that is currently chairing the Arctic Council. Brandon Boylan, the lead of the UArctic Thematic Network on Model Arctic Council, reached out to alumni of the program, asking how they benefited from their participation. Here are some of their experiences.

SYDNEY KAMEN

Senior at Dartmouth College. Will be pursuing an MPP at the Harvard Kennedy School as a Pickering Foreign Affairs Fellow in the fall

Participated in MAC 2016 at University of Alaska Fairbanks, and MAC 2017 at Dartmouth College

"My experiences gave me valuable perspectives and exposures to public policy, diplomacy, and their intersections with science. I developed vital collaboration and negotiation skills through practice with peers from around the globe and developed relationships that have spanned years. These experiences and training have helped me identify and start developing some of the skills required for public service and have continued to inspire me to pursue a career in public service."

MANA TUGEND

Recently completed an LLM in polar law from the University of Akureyri. Currently an intern at the North Atlantic Marine Mammal Commission (NAMMCO)

Participated in the 2018 MAC at University of Lapland

"The MAC enabled me to strengthen my communication skills, as the language used to communicate about various Arctic issues must be precise and concise. It has been great to create friendships and connections as well. The MAC is a rewarding experience that I would recommend to anyone."

APOSTOLOS TSIOVALAS

Research intern at the Center for Circumpolar Security Studies at the Arctic Institute

Participated in MAC 2018 at University of Lapland, and virtual MAC 2020

"During my participation, I had the opportunity to delve into the world of Arctic politics and, through teamwork and collaboration, improve my rhetoric and negotiating skills."

KEVIN HUO

Undergraduate student at University of Alaska Fairbanks, studying political science and anthropology

Participated in MAC 2018 at University of Lapland

"The Model Arctic Council is the vitality of the next generation of leaders in the Arctic. I was inspired by fellow participants from across the Arctic and around the world. In the week of deliberation, we simulated the Arctic Council taking our roles with passion and deliberating true solutions to current issues."

TUULI KUUSAMA

Working as a lead collections specialist at the Social Insurance Institution of Finland

Participated in and helped organize MAC 2018 at University of Lapland

"The MAC was an empowering experience, and it gave me the boost to finalize my Master's thesis. It inspired me more than words can tell, and I wrote a briefing note for the Arctic Yearbook 2019 about the MAC held in Rovaniemi. It was a great opportunity to practice organizing skills and take responsibility for local practicalities. The MAC encouraged me to achieve a specialist position in working life."

ERINN DRAGE

Graduate student at Penn State University, pursuing a dual degree in Human Dimensions of Natural Resources and the Environment & Recreation, Park, and Tourism Management

Participated in MAC 2016 at University of Alaska Fairbanks

"Attending the 2016 Model Arctic Council in Fairbanks absolutely changed the course of my career, helping lead me to my job as an outdoor guide on ships throughout the circumpolar Arctic. The experience also fueled my passion for Alaska, directly contributing to current research on the social dimensions of glacier tourism in Denali National Park and Preserve."

SAPPHO GILBERT

PhD student at the Yale School of Public Health

Participated in MAC 2016 at University of Alaska Fairbanks, and MAC 2018 at University of Lapland. Also helped run a MAC in Nuuk in 2017

"The Model Arctic Council is a fun experiential learning exercise that has significantly aided my understanding of the multinational Arctic policy landscape. In tandem with my graduate studies in public health, MAC has helped me hone my public policy, communication, and diplomacy skills (both as a two-time participant and as one of the organizers). My experiences proved especially fruitful in February 2019, when I attended a conference co-sponsored by one of the Arctic Council's working groups; thanks to MAC, I was already fluent in key themes and issues!"

ARSENII KIRGIZOV-BARSKII

Fourth-year BA student, studying international relations and energy diplomacy at Moscow State Institute of International Relations (MGIMO). Will be pursuing an MA in Russian foreign policy and diplomatic service at MGIMO in the fall

Participated in MAC 2018 at University of Lapland, and virtual MAC 2020. Also participated in MGIMO's MACs for four years, and co-organized the Moscow Youth International MAC for three years. Currently partners with the Norwegian University of Science and Tecnology to offer a MAC in Trondheim

"I really appreciate that the program is arranged at such a great level and in cooperation with the real Arctic Council's representatives, scientists, and specialists. My participation, to some extent, helped me obtain a pre-term traineeship at the Ministry of Foreign Affairs of Russia in 2019, and prepared me to take up the organization of the Moscow Youth International Model Arctic Council, MGIMO Arctic Club's international project initiated in 2015. Since then, I have already arranged two MACs in Moscow and the 3rd and 4th Moscow Youth International Model Arctic Council, and now I am working on the 5th as the head of its Secretariat. As for my academic performance, I have already published several articles about international affairs, Sustainable Development Goals (SDGs), and development in the Arctic, and I'm writing my Bachelor's thesis on the development of the international sea routes in the Arctic. I assume all this could not have been possible without my MAC participation."

Photos: **Courtesy of the authors**

KERSTIN SCHLEY

PhD student at the University of Hamburg, studying German polar history. Also a commercial airline pilot

Participated in MAC 2018 at University of Lapland

"Having been an online student in my MA program, the MAC gave me the opportunity to get in touch, communicate, and exchange ideas with students from all over the world, including indigenous people, who are interested in one common topic – the Arctic."

SHARON HILDEBRAND

Completed an MPA at University of Alaska Southeast. Serving as a village outreach liaison for Doyon, Limited, which involves working with federal, state, and tribal entities and staying apprised on relevant issues

Participated in MAC 2016 at University of Alaska Fairbanks

"The MAC helped me see that various entities could work together towards a common goal."

UArctic members

CANADA
Algoma University
Arctic Athabaskan Council
Arctic Institute of North America
Association of Canadian Universities for Northern Studies
Aurora College
Cape Breton University
Center for Northern Studies / Centre d'Etudes Nordiques
Coast Mountain College
Dechinta Bush University Centre for Research and Learning
Gwich'in Council International
Lakehead University
Makivik Corporation
Memorial University of Newfoundland
Nipissing University
Northlands College
Nunavut Arctic College
Nunavut Sivuniksavut
Polar Libraries Colloquy
Qaujigiartiit Health Research Centre
Royal Military College of Canada
Royal Roads University
Saint Mary's University
Simon Fraser University
TELUS World of Science - Edmonton
Trent University
Université du Québec à Montréal
Université du Québec à Rimouski
Université Laval
University College of the North
University of Alberta
University of Northern British Columbia
University of Saskatchewan
Vancouver Island University
Wilp Wilxo'oskwhl Nisga'a Institute
Yukon University

DENMARK/FAROE ISLANDS/ GREENLAND
Aalborg University
Aarhus University
Copenhagen Business School
Department of Sociology, Environmental and Business Economics - University of Southern Denmark
Greenland Institute of Natural Resources
Ilisimatusarfik / University of Greenland
Nordisk Fond for Miljø og Udvikling
Perorsaanermik Ilinniarfik / College of Social Education
Roskilde University
Technical University of Denmark
University College Copenhagen
University of Copenhagen
University of the Faroe Islands

FINLAND
Diaconia University of Applied Sciences
Finnish Institute of Occupational Health
Finnish Meteorological Institute
Kajaani University of Applied Sciences
LAB University of Applied Sciences
Lapland University of Applied Sciences
Laurea University of Applied Sciences
Oulu University of Applied Sciences
Sámi Education Institute
Savonia University of Applied Sciences
Tampere University
University of Eastern Finland
University of Helsinki
University of Lapland
University of Oulu
University of Turku

ICELAND
Agricultural University of Iceland
Arctic Portal
Bifröst University
Hólar University
Iceland University of the Arts
Reykjavik University
Stefansson Arctic Institute
University Centre of the Westfjords
University of Akureyri
University of Iceland

NORWAY
Faculty of Science and Technology - University of Stavanger
GRID-Arendal
International Centre for Reindeer Husbandry
International Sámi Film Institute
Kings Bay AS
Nord University
Norwegian Scientific Academy for Polar Research
Norwegian University of Life Sciences
Sámi High School and Reindeer Husbandry School
Sámi University of Applied Sciences
UiT The Arctic University of Norway
University Centre in Svalbard
University of Agder
University of Bergen
University of Oslo

RUSSIAN FEDERATION
Arctic College of the Peoples of the North
Arctic Research Center of the Yamal-Nenets Autonomous District
Arctic State Agrotechnological University
Arctic State Institute of Culture and Art
Baltic State Technical University
Banzarov Buryat State University
Barguzinsky State Nature Biosphere Reserve and Zabaikalsky National Park
Centre for Support of Indigenous Peoples of the North / Russian Indigenous Training Centre
Churapcha State Institute of Physical Education and Sports
East-Siberian Institute of Economics and Management
European University at St Petersburg
Far Eastern Federal University
Far Eastern State Transportation University
Federal Research Center - Kola Science Center of the Russian Academy of Sciences
Herzen State Pedagogical University of Russia
Higher School of Innovation Management
Industrial University of Tyumen
Institute for Humanities Research and Indigenous Studies of the North - Siberian Branch RAS
Kamchatka State Technical University
Karelian Research Centre of the Russian Academy of Sciences
Komi Republican Academy of State Service and Administration
Murmansk Arctic State University
Murmansk State Technical University
Naryan-Mar Social Humanitarian College
National Research Tomsk State University
Nenets Agrarian Economic Technical School
Nizhnevartovsk State University
Norilsk State Industrial Institute
North-Eastern Federal University
Northern (Arctic) Federal University
Northern National College
Northern State Medical University
Petrozavodsk State University
Pskov State University
RAIPON
Russian State Hydrometeorological University
Scientific Research Institute of National Schools of the Republic of Sakha (Yakutia)
Siberian Federal University
St. Petersburg State University of Film and Television
St. Petersburg University
Surgut State Pedagogical University
Surgut State University
Syktyvkar Forest Institute
Syktyvkar State University
Taymyr College
Tomsk Polytechnic University
Tyumen State University
Ukhta State Technical University
Ural Federal University
Yamal Multidisciplinary College
Yamal Polar Agroeconomic Technical School
Yugra State University

SWEDEN
KTH Royal Institute of Technology
Luleå University of Technology
Lund University
Mid Sweden University
Sámi Educational Centre
Stockholm University
Umeå University

UNITED STATES
Alaska Pacific University
Aleut International Association
Anchorage Museum
Antioch University New England
Arctic Research Consortium of the United States
ARCTICenter - University of Northern Iowa
Association for Canadian Studies in the United States
Battelle Memorial Institute
Center for Circumpolar Studies
Climate Change Institute - University of Maine
Cold Climate Housing Research Center
Dartmouth College
Fletcher School of Law and Diplomacy - Tufts University
Florida SouthWestern State College
Ilisagvik College
Institute of the North
New Jersey City University
Scandinavian Seminar Group
The Yellow Tulip Project
University of Alaska Anchorage
University of Alaska Fairbanks
University of Colorado
University of Nebraska-Lincoln
University of New England
University of New Hampshire
University of North Dakota
University of Southern Maine
University of Washington
Western Kentucky University
Wilson Center - Polar Initiative

NON-ARCTIC
Alfred Wegener Institut (Germany)
Arctic Centre - University of Groningen (Netherlands)
Austrian Polar Research Institute (Austria)
Centre for Polar Ecology - University of South Bohemia (Czechia)
Chinese Academy of Meteorological Sciences (China)
Chinese Research Academy of Environmental Sciences (China)
Dalian Maritime University (China)
Durham University (UK)
Environmental Development Centre - Ministry of Environmental Protection (China)
First Institute of Oceanography, Ministry of Natural Resources (China)
Glasgow Caledonian University (UK)
Harbin Engineering University (China)
Harbin Institute of Technology (China)
Hokkaido University (Japan)
International Polar Foundation (Belgium)
Italian Society for International Organization (Italy)
Korea Maritime Institute (Korea)
Korea Polar Research Institute (Korea)
Leeds Beckett University (UK)
Liaocheng University (China)
Mongolian National University of Education (Mongolia)
National Centre for Polar and Ocean Research (India)
National Marine Environmental Forecasting Center (China)
Ocean University of China (China)
Polar Research Institute of China (China)
Scott Polar Research Institute (UK)
Second Institute of Oceanography, Ministry of Natural Resources (China)
Southern University of Science and Technology - Department of Ocean Science and Engineering (China)
Trinity Centre for the Environment (Ireland)
University of Aberdeen (UK)
University of the Highlands and Islands (UK)
University of Versailles Saint-Quentin-en-Yvelines (France)
Universität Hamburg (Germany)
Wuhan University (China)

UArctic

UArctic International Secretariat
University of Lapland
Box 122, 96101 Rovaniemi, FINLAND
secretariat@uarctic.org

uarctic.org