

The UArctic Magazine

Shared Voices

2025



UArctic



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THE UARCTIC MAGAZINE
Shared Voices 2025

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Letter from the President

We created the University of the Arctic in the early days of peace and cooperation in the Arctic, in the first decade after the end of the Cold War.

Since the early concept notes of 1997, the idea of UArctic has been to promote international collaboration in academia and promote the full integration of Indigenous Peoples' perspectives in knowledge creation and sharing. In other words, since its inception, UArctic has been a strong value-based structure that speaks up for openness, international collaboration, respect, and inclusiveness.

UArctic's ultimate vision is that of "a strong, engaged, informed, and dynamic North, creating better lives and environments for all northerners." Equally importantly, UArctic is its members. All UArctic activities are implemented by and at our member institutions through international collaboration. Our strategy has been to avoid becoming an organization for its own purposes, and rather remain a strong tool for our members to work together.

UArctic has become the ultimate collaboration tool for Arctic knowledge creation and sharing. We are now increasing our focus on transforming this to concrete relevance, to be used in and for the North to serve its populations as well as the world. The newly launched UArctic activity clusters are a selection of time-critical major challenges where the collective competency and capacity of the UArctic network really can make a difference. The UArctic Board

has now agreed to focus on four specific challenges. In the future, the set of selected topics will change, while UArctic's values, mission, and the fundamental principles of how UArctic operates remain the same.

In fact, it is with pride that we can say that our values, motto, mission, and operating principles have remained the same (with some small differences in wording) for decades. The stability of what UArctic is, why UArctic exists, and how UArctic operates depicts this network.

UArctic represents a rock-solid and predictable fundament in an otherwise changing and unpredictable world. Let's keep UArctic that way.

Lars Kullerud

UArctic President (once trained as a geologist)



Editorial

By OUTI SNELLMAN
Secretary General, UArctic



The need for capacity building in the North has never been more urgent. Climate change continues to reshape northern environments and ways of life, while global political shifts impact Arctic cooperation and even the very sovereignty of regions. At the same time, new opportunities emerge. Advances in renewable energy, digital connectivity, and sustainable economies can provide new pathways for Arctic resilience – if we invest in the people who will create these solutions. People and Peoples in the Arctic will need to have the capacity and skill sets to form their own futures.

For the 2025 issue of Shared Voices, we invited UArctic Thematic Networks and Institutes, Chairs, and our nearly 200 member institutions to share stories about their efforts in capacity building through education and knowledge sharing. We were overwhelmed by the number of excellent suggestions for articles, and only some of them in the end could be included in this edition.

As we celebrate this year's Shared Voices theme of capacity building, let us reaffirm our commitment to enhancing human capacity in the North. The future of the Arctic will be shaped by those who call it home, and by those who support them in learning, growing, and leading – one learner at a time.

Faroe

Host of UArctic
Congress 2026



PHOTO: PAUL & SYBILLE BRÉCHU, VISIT FAROE ISLANDS

Islands

By JOHANNA FISCHER,
tmf dialogue marketing
(for Visit Faroe Islands Meetings)

The Faroe Islands will host the UArctic Congress 2026, welcoming 600–1,000 international participants with an Arctic focus from universities, organizations, and businesses. Organized by the University of the Faroe Islands (Setur), in collaboration with the Faroese Government and the Faroe Marine Research Institute, the event marks a major milestone for the country's academic and research community.

Anna Sofia Lava, head of the local organizing committee at Setur, states: "Despite our small size, we are fully capable of arranging a meeting of this scale, contributing relevant research, and showcasing the unique aspects of remote communities."

Why the Faroe Islands?

Hosting this event is a game-changer for the islands, elevating their academic visibility, attracting research funding, and strengthening global partnerships. It positions the Faroe Islands as a living example of Arctic challenges and solutions, reinforcing their relevance in international research.

Bergur Djurhuus Hansen, Dean of the Faculty of Faroese Language and Literature at Setur, emphasizes: "The Congress will prove that we are engaged in Arctic research at an international level, bridging research and politics in today's critical climate." The event also creates new networking opportunities for local researchers, connecting them with global experts.

Important Takeaways for Setur

Magni Mohr, Pro-Rector for Research & Enterprise at Setur, highlights the overall significance of the event for the university.

"The Congress is a boost for Faroese academia as it strengthens Setur's global recognition and partnerships. It also offers increased Arctic research visibility, establishing the Faroe Islands as a key contributor to international discussions. Additionally, the Congress helps foster career growth and new collaborations for our young researchers."

Tórshavn: A City Embracing Innovation and Sustainability

For host city Tórshavn, the event reinforces its role as a university city and strengthens its place in the global academic network. The municipality actively invests in sustainable development and innovation, attracting international conferences that align with its long-term vision.

Mayor Elsa Berg shares her views:

"Hosting the UArctic Congress strengthens Tórshavn's role as a hub for Arctic sustainability and innovation, fostering collaboration between local and international experts. It drives progress in climate resilience, renewable energy, and environmental protection, while ensuring a lasting impact by engaging local schools, businesses, and innovators."

Tórshavn is evolving into a knowledge-driven city, welcoming global partnerships. Local institutions like Setur provide deep Arctic expertise, and as a remote island society, we understand the significance of innovative and sustainable solutions. Given its unique geographical challenges, Tórshavn is an ideal partner for research and innovation.

We are absolutely ready to host a meeting of this scale. The new multi-arena Við

Tjarnir offers state-of-the-art facilities in a stunning natural setting. Tórshavn combines high-quality dining, cultural attractions, and excellent infrastructure with its distinctive charm. Backed by experienced professionals, the city is well prepared to host this event with precision and Faroese hospitality."

The Faroe Islands stand ready to welcome researchers, policymakers, local experts, Indigenous representatives, students, and institutions in shaping the future of Arctic knowledge.



UArctic Congress 2026

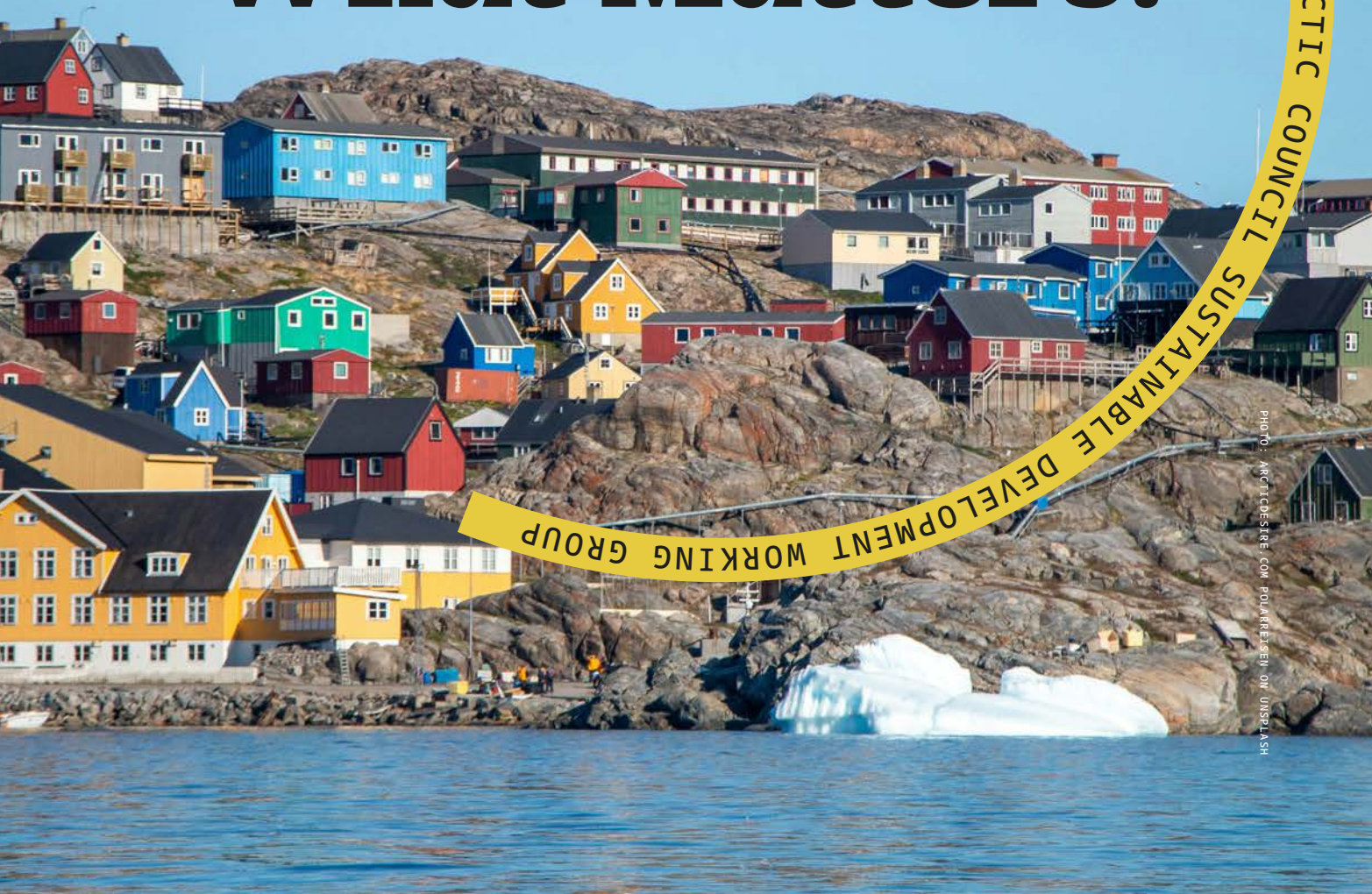
26–29 May
Tórshavn,
Faroe Islands

The UArctic Congress brings together a science conference and key UArctic meetings into a single gathering, including the UArctic Assembly and Rectors meetings. The biennial event aims to foster contacts and create and strengthen collaborations that produce new findings and solutions for the future of the Arctic.

The 2026 Congress themes will align with the Kingdom of Denmark's Arctic Council Chairship priorities. As a unique element, the Congress will also integrate the Ocean Conference, planned to be held in the Faroe Islands in 2026, to boost collaboration in this field.

PEOPLE AND COMMUNITIES | CLIMATE AND ENERGY | CULTURE AND LANGUAGE WITH THE ARCTIC COUNCIL SUSTAINABLE DEVELOPMENT WORKING GROUP

Prioritizing What Matters!



By INGA NYHAMAR,
Chair, Arctic Council Sustainable
Development Working Group

What do energy innovation, an Indigenous-led mental health program, and efforts in cultural and linguistic preservation have in common? They are all initiatives endorsed by the Arctic Council Sustainable Development Working Group (SDWG).

The SDWG's multifaceted projects aim to address some of the most pressing challenges facing the Arctic, while celebrating its diverse cultures and ecosystems. Established in 1998, the SDWG has long been at the forefront of initiatives rooted in collaborative frameworks, culturally relevant and sustainable solutions, and empowerment of young people and communities. Under the Norwegian Chairship of the Arctic Council (2023-2025), these priorities have taken center stage.

Our work must ensure Arctic communities are not just resilient but vibrant, empowered, and future focused. The following SDWG projects are just a few examples of how our efforts are making a tangible difference in the lives of Arctic residents.

Advancing Mental Health and Well-Being

Local 2 Global is a testament to how knowledge sharing and education can directly address community wellbeing. This project facilitates international collaboration and connections between circumpolar communities supporting mental health, suicide prevention, and positive childhood experiences in Arctic communities, including among Indigenous Peoples who have the highest rates of suicide in the Arctic. By fostering intergenerational dialogue and offering culturally rooted solutions, *Local 2 Global* has inspired actionable outcomes, such as the development of community-driven policy recommendations for suicide prevention.

Local 2 Global builds on the success of its predecessor *Project CREATEs* (Circumpolar Resilience, Engagement, and Action Through Education for Sustainability) which built on circumpolar efforts to facilitate the power of healing through digital storytelling. Although completed in 2019, the life of *Project CREATEs* lives on. The Arctic Youth Conference in January

2025, organized by youth for youth and a focal point of the Arctic Council Norwegian Chairship, invited young people from across the circumpolar Arctic to participate in a *Project CREATEs* special digital storytelling workshop.

These two projects have offered young people space to be vulnerable and give meaning to their intimate stories. Both have directly led to enhanced youth leadership in mental health advocacy and culturally relevant recommendations for projects going forward. Their success is an embodiment of how the work of the Arctic Council can have an impact at the community level.

Education and Innovation for Sustainability

The SDWG has prioritized projects that leverage innovation and education to address Arctic-specific challenges. The *ARENA* (Arctic Remote Energy Networks Academy) program, for instance, supports a cohort of Arctic innovators in developing sustainable energy solutions for rural and remote Arctic communities.

ARENA provides remote energy champions with the knowledge base, skills, and collaborative networks necessary to help develop clean energy projects. The *ARENA III* cohort will expand their educational opportunities, including mentorship engagement, with past cohort participants. As one *ARENA III* cohort participant put it, "[it's] been really important for my personal development. I feel like I suddenly have 15 or 20 new people that I can connect with and say, 'I have this problem. Have you dealt with this before? Do you have any suggestions? Do you have any ideas?' It's a game-changer."

Preserving Culture and Language in a Digital Age

The SDWG's work in cultural preservation has also seen groundbreaking advances. The *EALLU Indigenous Youth, Arctic Change and Food Systems* project, an initiative by and for Indigenous youth, focuses on the preservation and sharing of traditional food knowledge. *EALLU* involves a series of community-based youth workshops about food

Our work must ensure Arctic communities are not just resilient but vibrant, empowered, and future focused.

as well as traditional and local knowledge. By documenting traditional practices and connecting youth with elders, *EALLU* fosters a deeper understanding of the cultural and environmental importance of Arctic foods.

Expanding into the digital realm, the *Digitalization of Linguistics and Cultural Heritage of Indigenous Peoples of the Arctic* project uses digital tools to document and revitalize endangered Arctic languages. This project underlines the importance of education in maintaining Arctic Indigenous identities.

By creating interactive repositories and educational platforms, these projects help bridge traditional and modern methods of cultural preservation, allowing younger generations to engage with their heritage in innovative ways.

A Framework for Impact

From empowering youth and preserving cultural heritage to Indigenous food labs and advancing remote energy networks, the SDWG projects highlight the transformative power of collaborative action. The impact of these projects also extends beyond Arctic borders.

The priorities of the Kingdom of Denmark's Arctic Council Chairship (2025-2027) will build on the foundation laid by the Norwegian Chairship. This continuity ensures that the Arctic's unique challenges are met with innovative, inclusive, and sustainable solutions – a vision that the SDWG will continue to champion in its work.

A Student Story from Sámi Education Institute

Revitalizing Traditional Knowledge and Language Communities

“ People don’t really know much about the Sámi. They don’t know that the Sámi languages are different languages and that we are working so hard to revitalize them,” Ulpu Mattus-Kumpunen, an Inari Sámi student at the Sámi Education Institute (SAKK), said during an online interview.

SAKK is a secondary education institution located in Inari, Finland, providing vocational training with specialization in Sámi handicrafts, reindeer herding, and Sámi languages, among other programs. Skolt, Inari, and Northern Sámi are all taught through the SAKK Sámi language and culture program. According to SAKK’s website, there are only 300–400 speakers of Inari Sámi.

Mattus-Kumpunen’s grandfather was born in Inari, and she grew up just 40 kilometers south, in Ivalo. “When I was in high school, my father tried to convince me to study there. He would have liked to see me stay in the area and study something related to

the Sámi culture, but at that time I was so uncertain of my Sámi-ness,” Mattus-Kumpunen said.

Growing up, Mattus-Kumpunen spent a lot of time with her grandparents, who she described as being “as Sámi as they come.” Yet Sámi languages remained absent. She was never taught Inari Sámi but occasionally learned Northern Sámi language and culture at school or from her grandparents. “But I never felt a strong connection to Northern Sámi,” she said. “It was more like a foreign language for me.”

Even after learning some Northern Sámi, Mattus-Kumpunen seldom had a place to speak it. If it was not for the lack of other Sámi speakers, then it was a discomfort around not being able to speak the language “well enough.”

She moved to Turku, Finland after high school, and it was there, away from her family home, that she began to rekindle the connection to her Sámi culture.

By LAURA DITTO,
Freelance Journalist,
Former Intern, University
of Lapland / UArctic





What she said had a huge impact on me. Like, if I don't take the language back, if I don't pass it to my children, who will do it?

PHOTO: LAURA DITTO

"When I was far enough from home, I didn't feel the pressure of having to speak perfectly," Mattus-Kumpunen said. Sometimes she would even joik – a type of Sámi folk singing – for friends or events. It was through one of these events that she met a young Udmurt woman who encouraged her to embrace the language and take it back.

"What she said had a huge impact on me. Like, if I don't take the language back, if I don't pass it to my children, who will do it?"

This was how, after her second daughter was born, Mattus-Kumpunen found herself with a baby in one arm and a Northern Sámi dictionary in her hand, teaching herself and her children at the same time.

After moving back to Ivalo, Mattus-Kumpunen worked at the Siida Sámi Museum and Nature Center. Here she learned more about her heritage and formed a list of goals for herself. She wanted to use her traditional language, Inari Sámi, to write children's stories, or do radio or voice acting, but she had only been able to study the language on her own by this time. At a local Indigenous film festival, Skábmagovat, Mattus-Kumpunen watched a documentary on the Inari Sámi course at SAKK. As part of the program, students were able to meet elders of the community and practice speaking in mundane settings – fishing, baking, having coffee by an open fire. It was a chance to learn Inari Sámi in natural surroundings.

PHOTO: ULPU MATTUS-KUMPUNEN

"That film kind of opened my eyes. It felt like a physical wound – like I have a hole in my heart – that I really need this language to fill that hole," Mattus-Kumpunen said. In 2021, a little under a week before classes were to begin, she secured a spot in the SAKK class and began the intensive one-year course for Inari Sámi language and culture.

"I've learned many languages, but learning Inari Sámi didn't feel the same. I had the kind of feeling that it is already somewhere in me, and I needed to pull it out, get it out, or open the doors and let the language out," Mattus-Kumpunen said. Once she had started, the language came out in force. She began to translate songs, perform them, and officially changed her mother tongue in the Finnish register to Inari Sámi.

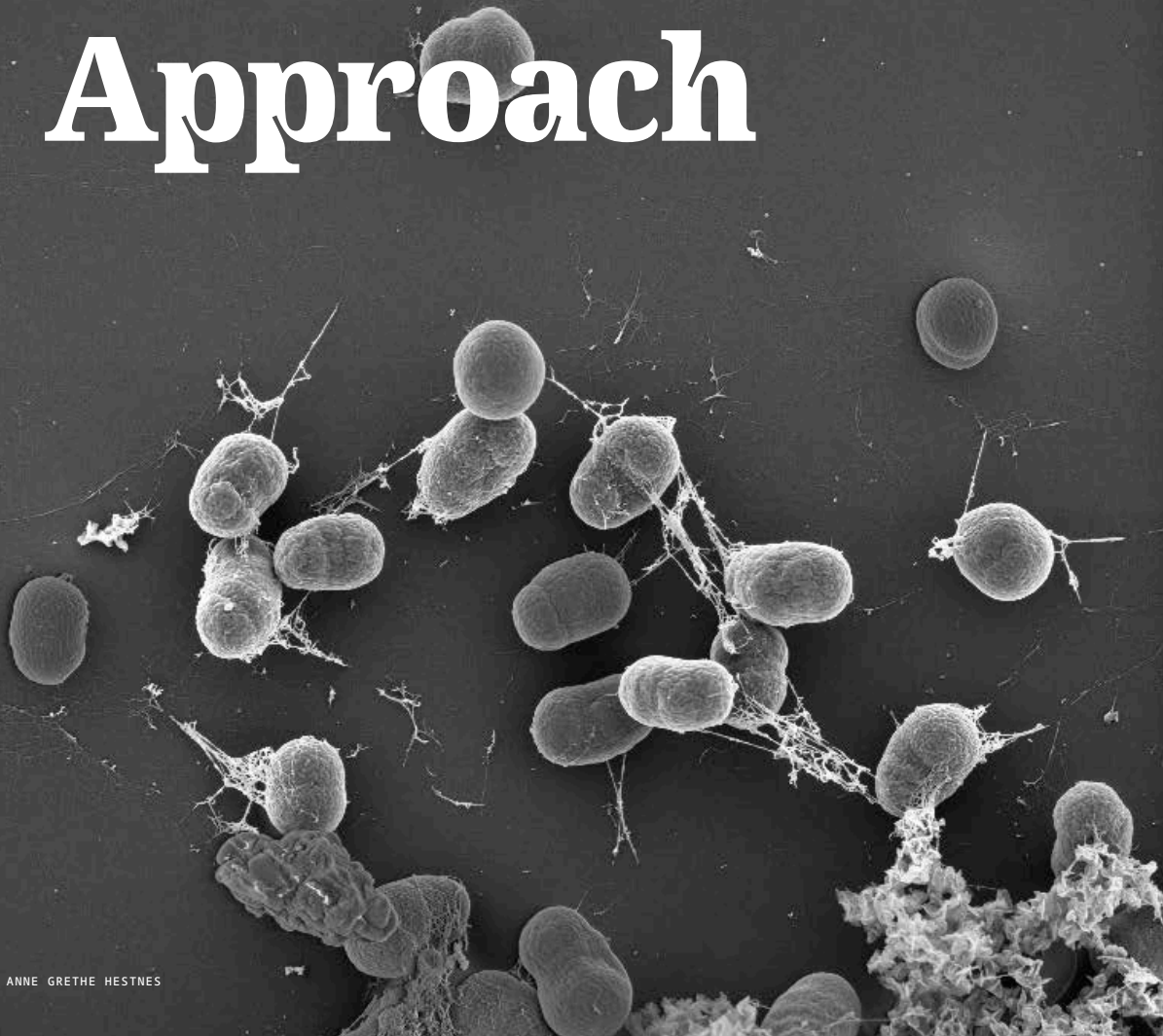
"Learning the language alone was really hard, especially because I craved to use the language with other people. What [SAKK] gave me most is that I became part of the united Sámi language community," Mattus-Kumpunen explained.

SAKK helps foster a community of mutual growth and knowledge sharing. The school prepares students with education and training in traditional practices while considering how these skills can be implemented into local enterprises such as the tourism industry, restaurant catering, reindeer herding, or nursing. Lessons consider sustainability, hands-on learning, and cultural importance and background.

"The point of the school is to give a chance to get the tradition back when it wasn't passed from the previous generation," Mattus-Kumpunen said. "This is the way for us to learn and strengthen our roots."

Tackling Methane:

The BIOSINK Project's Innovative Approach



By ALEXANDER TØSDAL TVEIT,
Associate Professor, UiT The
Arctic University of Norway

Methane, a potent greenhouse gas, has been on the rise since the industrial revolution, significantly contributing to global warming. The impact is evident with 2024 marking the warmest year in recorded history.

Among the natural processes that help mitigate methane emissions are atmospheric methane-oxidizing bacteria. These micro-organisms, found in soils and vegetation worldwide, consume methane directly from the air. However, their efforts, along with the chemical oxidation of methane that occurs in the atmosphere, are insufficient to halt the increasing methane levels.

In response, the BIOSINK project was launched in 2024 to harness the methane-capturing abilities of atmospheric methane-oxidizing bacteria. This initiative exemplifies the power of interdisciplinary collaboration, bringing together scientists from various fields to develop solutions.

In Tromsø, my team and I have cultivated a unique collection of methane-oxidizing bacteria from Arctic ecosystems. They are not only efficient at consuming methane but also adapted to the Arctic's low temperatures. Meanwhile, at the Lawrence Livermore National Laboratory (LLNL) near San Francisco, Fang Qian and her team have created a new bioreactor design to enhance the methane consumption of these bacteria. At the University of Alberta in Canada, Lisa Y. Stein and her colleagues are developing engineering techniques to accelerate the growth of these bacteria and boost their methane consumption further.

Our collaboration began when Lisa contacted us in early 2024. She recognized the potential of the material developed by Fang's team and knew about our Arctic methane-consuming bacteria. The BIOSINK project aims to translate this knowledge into practical applications through several steps. Initially, the focus is on optimizing the conversion of methane into biomass under the conditions that the bacteria experience inside our bioreac-

tors. This involves cultivating the bacteria to ensure high rates of growth and methane consumption. Next, the bacteria will be encapsulated in laboratory versions of the LLNL-developed methane removal reactors. Finally, if initial tests are promising, larger-scale versions of these reactors will be produced and tested in real-world conditions. This might be the most critical phase. Transitioning from controlled laboratory conditions to large-scale applications presents numerous challenges, often for the bacteria which may stop growing and consuming methane due to contamination with different types of micro-organisms or other reasons. Additionally, the solution must be cost-effective, necessitating the use of inexpensive, recycled materials instead of the refined, costly ones typically used in research.

While microbial methane oxidation is promising, it is not the sole solution to reducing methane emissions. A multifaceted approach is essential to address this global problem. Other methods include improving agricultural practices and reducing the use of fossil fuels. Each approach has its potential and challenges, and a combination of strategies will likely be necessary to achieve significant results.

Reducing emissions from cattle farming, a substantial global source of methane, is one of the major challenges. This is also one of the areas in which our technology could be useful. Cow barns typically contain methane concentrations of 10-50 ppm (parts per million), and our bacteria excel at consuming these levels. If we can develop methane removal reactors that are easy to operate and maintain and that can be integrated into barn ventilation systems, we could significantly cut down emissions from the industry.

The BIOSINK project demonstrates how interdisciplinary collaboration can lead to innovative solutions. By leveraging the unique capabilities of Arctic bacteria and combining expertise from microbiology and engineering, BIOSINK aims to create a sustainable and effective method for reducing methane emissions.

The 2024 Frederik Paulsen Arctic Academic Action Award winner was chosen from a shortlist of three nominees. In addition to the winning BIOSINK team,

Louise Chavarie, Ellie Ward, Darren Gröcke and Guttorm Christensen were nominated for the Ecological Gold Rush project: *mechanisms driving boreal marine fishes into a warming Arctic and the impacts for Arctic communities and coastal ecosystems.*

Allison A. Fong and Amy Lauren were nominated for the Studio Impact project which designs innovative approaches to science outreach efforts, combining climate research, communication, action and education through cross-pollination between Art & Storytelling, Science & Research and Industry & Technology.



Read more:
www.uarctic.org/actionaward

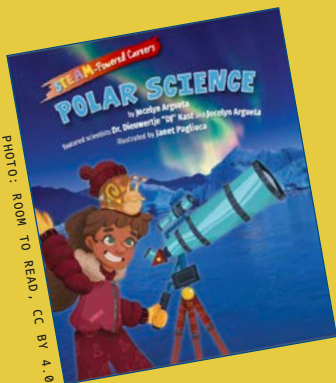
The Frederik Paulsen Arctic Academic Action Award

provides high-level recognition for innovative ideas that transform knowledge into action to help address the impacts of climate change in the Arctic. It comes with a 100,000 euro unrestricted prize, intended to help develop the idea through outreach, engagement and communication. The award is a joint activity of UArctic and the Arctic Circle.



THE FREDERIK PAULSEN
ARCTIC ACADEMIC ACTION AWARD

Broadening Participation in Polar Science Through Informal STEM Education



By Dr DIEUWERTJE KAST,
PolarTREC Alumni, Director of STEM
Education Programs, Joint Educational
Project, University of Southern
California

JOCELYN ARGUETA,
PolarTREC Alumni & Educator,
Science Communicator



When young learners see themselves and their communities reflected in scientific narratives, they are more likely to envision a future in these fields.

The polar regions are inherently challenging to access, both physically and metaphorically. This presents a unique obstacle for polar scientists when developing outreach strategies for funding agencies, requiring innovative approaches to share their research with the public. Informal educators – those working outside traditional classroom settings – are particularly valuable in this effort. They engage diverse and expansive audiences and offer unique opportunities to share scientific knowledge widely, reaching diverse audiences in museums, science centers, and public events beyond the traditional classroom setting.

In 2016 and 2019, Dr Dieuwertje Kast and Jocelyn Argueta, two informal educators, participated in the ARCUS PolarTREC program, a collaborative research experience for teachers and researchers. Dr Kast assisted the research team of Dr Byron Crump from Oregon State University. Dr Crump is a researcher specializing in microbial biogeography with fieldwork at Toolik Field Station, Alaska. Argueta was deployed to Antarctica, where she worked with the “IceCube team” at the Amundsen-Scott South Pole Station, focusing on particle physics. As part of their research experience, both educators were expected to share their research with a broad audience.

Dr Kast, from California, focused on after-school programs and engaged over 3,000 low-income youth. Student activities included writing postcards with research questions and creating classroom flags to be taken to research stations.

Argueta's outreach activities targeted elementary students and Spanish-speaking audiences in California. Using social media, live presentations, and a live theater show, she reached over 19,000 people with photos, videos, and fieldwork insights from the South Pole.

After the expeditions, both Dr Kast and Argueta wanted to take their experiences fur-

ther and focus on inspiring the next generation of polar scientists in their communities. To do so, they worked with Room to Read, a non-profit, to create *STEAM-Powered Careers*, a 10-book series on Science, Technology, Engineering, Arts, and Math. The series aims to inspire children from groups underrepresented in STEAM fields to explore careers while addressing a critical need for greater diversity in children's literature.

Designed for young readers, each book features a trio of child characters and their animal companions alongside a scientist from the University of Southern California. Each book has a fictional story and a biographical section highlighting the work of a real-life scientist. Many of these scientists represent historically underrepresented groups, including Black, Latinx, and Asian communities. The series covers diverse science topics including polar sciences.

In the *Polar Science* book, authored by Argueta, readers follow Mia, a young girl, and her curious companion, Sunny the snail, as they embark on an adventure to the North and South Poles. Their journey integrates elements of real-world polar expeditions, blending captivating storytelling with authentic scientific exploration. Special considerations were taken in the book to promote diversity in STEAM and empower students' curiosity about science. First, by centering Mia, a Latina girl, as the protagonist, Argueta's goal was to help young readers easily relate to and see themselves in the science that was happening on the page. Second, Mia's sidekick Sunny acts as a foil to highlight emotions that can come up during a field expedition, from uncertainty and confusion to excitement. Through the pair's dialogue, the story models that it is okay for young readers to ask questions and meet feelings of uncertainty toward science with curiosity.

The second half of the book highlights real-life polar scientists and their research projects. Dr Kast is featured as the North Pole scientist, while Argueta represents the

South Pole. These pages offer readers an inside look at the realities of fieldwork, providing a glimpse into the daily lives and experiences of polar scientists.

All *STEAM-Powered Careers* books are available in both English and Spanish and available digitally for free. The *Polar Science* book includes a Next Generation Science Standard aligned lesson plan and multimedia videos interviewing authors by the animated characters.

This effort to integrate polar science into educational outreach highlights the transformative power of science communication. When young learners see themselves and their communities reflected in scientific narratives, they are more likely to envision a future in these fields. Dr Kast and Argueta have demonstrated how science can resonate with all students, and their work emphasizes the importance of representation in STEAM, inspiring the next generation of polar scientists.

Polar Science books in English and Spanish:

<https://literacycloud.org/stories/4997-steam-powered-series-polar-science/>

<https://literacycloud.org/stories/5577-polar-science/>

Polar Science lesson plans in English and Spanish:

https://www.roomtoread.org/media/3jwfk10d/polar_science_lesson_plan.pdf

https://www.roomtoread.org/media/z54lqprs/ciencia_polar-plan-de-estudio.pdf

Environmental Change and Resilience:

Collaborative Approaches to Circumpolar Education

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How can we make Arctic education more meaningful or engaging? The complexity of environmental change is driving the need for greater collaborative approaches in education to increase resilience and foster community adaptation.

The Arctic Circumpolar Education Panel and Workshop on Environmental Change and Resilience – which took place in Bodø, Norway during Arctic Congress 2024 – aimed to foster and strengthen new and existing partnerships to collaboratively form a student-centered and locally-tailored circumpolar education program. The panel showcased diverse educational case studies from UArctic Thematic Networks (TN), offering perspectives on creating inclusive, place-based educational programs that effectively engage UArctic TNs, graduate students, and community partners.

During the panel, we heard from a diversity of scholars from various Arctic countries and disciplines. S. Jeff Birchall, for instance, shared his experience with Arctic Communities, a collaborative education program which brought together Inuit youth and graduate students to feature climate stories of adaptation and resilience. The bilin-

gual program is hosted by the education organization Live It Earth and is distributed to K-12 schools across Canada.

Diane Hirshberg, Director and Professor of Education Policy at the University of Alaska Anchorage Institute of Social and Economic Research and member of the UArctic TN on Teacher Education for Social Justice and Diversity in Education, discussed the importance of policies to transform education in rural Alaska, the need to make education more relevant, and the importance of locally contextualized education and land-based programs to support community resilience.

Anna Sinisalo, from GRID-Arendal and the UArctic TN on Arctic Plastic Pollution, shared the importance of education programs tailored to graduate students and community members to support awareness about the issue of plastics pollution and monitoring protocols.

Sean Asiqluq Topkok, from the University of Alaska Fairbanks and the UArctic TN on Verdde Indigenous Education, spoke on the Indigenous studies graduate program at the University of Alaska Fairbanks, as well as the Alaska Native Knowledge Network which serves as a resource for com-

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The complexity of environmental change is driving the need for greater collaborative approaches in education.

piling and exchanging information related to Alaska Native knowledge systems and ways of knowing. His contributions highlighted the need for more contextualized and tailored education content that includes local context and culture.

Finally, Anthony Specca, who was representing the UArctic Læra Institute, highlighted the Circumpolar Studies curriculum development guide and pedagogical resources available to support undergraduate teaching and learning. He also emphasized the importance of a curriculum framework that can be locally adaptable and relevant to community resilience. Additionally, Specca spoke about the model Arctic Council he facilitates through Polar Aspect. Here, students take on governance roles and gain insight into decision-making processes. This participatory approach has been shown to build critical thinking skills and confidence while promoting an understanding of different perspectives related to complex issues.

Following the panel, the audience joined the panelists for a facilitated group discussion where they were able to contribute their perspectives on the panel's themes. While a full report has not yet been re-

leased, here are some highlights from the event related to elements necessary for supporting collaborative education:

- Include diverse voices (youth, community members, elders, educators, researchers) in the process of creating education programs.
- Encourage your educational institutions to look critically at their policies and practices in order to shift power dynamics.
- Invest in developing capacity and resources to support participatory approaches, training educators as facilitators, and compensating community knowledge holders fairly.
- Advocate for community-led education initiatives; with a diversity of perspectives, including traditional and scientific knowledge, these approaches support relevant local solutions and empower communities to address their specific challenges.
- Support land-based or experiential learning programs and explore the integration with current education programs.

- Strengthen Arctic education networks (cross-disciplines amongst networks, not only education-related) to facilitate knowledge exchange, share successful program examples, and collaborative research across the circumpolar regions; these could include webinar series, workshops, and panels to continue the dialogue and create clear calls to action.

We are keen to engage and discuss further with the UArctic community and to work together on the next steps to co-create a collaborative and inclusive framework for future Arctic education programs on environmental change and resilience. You can reach out to us via email at maeva@uvic.ca or jeff.birchall@ualberta.ca. With a more collaborative approach, education can support resilience and community transformation.

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The Role of Language in Place-Attentiveness

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In Scotland, practitioner enquiry is established within teachers' professional standards as an integral component of our professional learning. It is not unreasonable, then, to find that within Initial Teacher Education (ITE), we also make use of this methodological approach to explore and enhance our practice. It was on this basis that we reviewed part of our Professional Graduate Diploma in Education (PGDE) programmes – one-year, full-time graduate

courses for qualification as a teacher – to better meet our learners' needs.

Place-attentiveness had already been identified as a strength of our PGDE programs, as is acknowledged in Redford and Nicol's *Knowing Myself as a Teacher: Transforming the Place of Rurality in Scottish Initial Teacher Education*. Our online seminars bring students together from across our campuses – from the sub-Arctic Shetland Islands to the central belt of Scotland – with local part-



By understanding, respecting, and promoting the active use of these languages, we can give value within the cultures and communities we are working in.

ners, such as Aberdeen City Council and the Scottish Borders Council. A student teacher in a city school learns from a student teacher on one of our more remote islands, and vice versa. We wanted to build on this strength and to help our student teachers develop familiarity with their placement schools. Over the year, they spend a total of nineteen weeks in schools, broken down into three blocks of six or seven weeks.

At staff professional learning days, we encountered the UArctic Thematic Network of Teacher Education's five pillars of Arctic pedagogy: community, culture, language, digitalization, and elders. These resonated with our own teaching team, and we were keen to incorporate them into our programs. We make use of digital technologies to overcome the challenges of distance and of our diverse land- and seascapes. Our different communities have their own cultural heritage and traditions, some shared and some unique to certain places. We depend on elders for the transmission of our cultural knowledge, who act as guardians of the legacy of our forebears. We have a linguistic diversity, though it can be masked by the dominance of the English language.

These factors, and others, had us realize that there are synergies between our contexts and those of the Circumpolar North. We then embraced the pillars of Arctic pedagogy as a tool for student teachers to understand their placement settings and conceptualizations of place.

The University of the Highlands and Islands (UHI) is spread broadly across the north and west of Scotland. Across this area, three languages dominate: English, Gaelic, and Scots. UHI offers ITE in Gaelic or English. While English remains the professional language of the north of Scotland, Gaelic is not the indigenous language across the entire north of the country. Along the north coast of Caithness and on the northern isles of Orkney and Shetland, the Scots spoken is derived from Norn, displaying many similarities with the language of our Nordic neighbours. The language of Scots is rich, alive and regionally varied, with geographically close areas expressing vastly different approaches to the language. Like Gaelic, Scots is a predominantly domestic language, where usage is passed on orally across generations and written Scots is minimal.

Place-attentiveness for ITE students has been based on Arctic pedagogy's five pillars: community, culture, digitalization, elders, and language. Understanding the language of Scots sits firmly within all these pillars. Schools have been demonstrating an increasing awareness of promoting Scots within the classroom, recognizing the importance of valuing the children's domestic, cultural language. For our ITE students, we want them to be equipped with the skills to embrace the domestic languages and to have an awareness of the cultural importance this has for our children. One way that we achieve this for the Gaelic language is to have a Gaelic-medium pathway, for which assessments are written in Gaelic and school placements take place in the language. In respect of Scots, within our lectures on professional reflection and enquiry, we promote the pillars of Arctic pedagogy and refer to Scots to illustrate the language pillar.

Having attended the Sustainable Teacher Education conference at the University of Lapland, it is clear that the duality of domestic and professional languages is mirrored across the Circumpolar North. Where indigenous languages are present, they are often considered the domestic or less valued languages by government, education, and policy makers. By understanding, respecting, and promoting the active use of these languages, we can give value within the cultures and communities we are working in. For teachers, it is important to have an awareness of the cultural sensitivity around the language and where there is a political impact. For children, it is important to have the way they speak and communicate recognized and celebrated.

Building Resilient Futures:

Lessons from the CliCNord Project in

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Small and remote communities in the Nordic countries face unique challenges in terms of climate change and local disaster risk management. For Iceland, adapting to natural hazards such as avalanches has become a pressing concern. The *Climate Change Resilience in Small Communities in the Nordic Countries* (CliCNord) project has played an important role in addressing these challenges, offering a model for capacity building that blends academic research, community engagement, and cross-cultural learning.

Through collaboration with communities, universities, and government institutions, CliCNord facilitated knowledge exchange at local and international levels. Our Master-level courses benefited directly from the project, incorporating real-world case studies and innovative methods into the curriculum. The developed teaching materials enriched students' learning experiences and helped future researchers and planners understand the complex dynamics of climate resilience in small communities. Visiting schools from outside Iceland also engaged with the project, which provided international students with valuable insights into climate change adaptation and resilience strategies.

In our Icelandic case studies, we engaged local communities through innovative and inclusive methods. We used tools like scenario building workshops, photo-voice exercises, and digital walking interviews to ensure broad participation. These methods allowed us to capture the voices of the residents by blending their lived experiences with academic insights to answer the overall research question: "How can capacity building in small rural communities be increased to meet the effects of climate change, involving the competencies and resources among the citizens, and by new ways of organizing support and assistance from authorities, civil society organizations, politicians, and the public?" Importantly, we also integrated students in the research process, giving them hands-on experience and a meaningful way to contribute to local disaster risk management.

We focused on two communities that had faced devastating avalanches in 1983, 1995 and 2020. Our research revealed that memory – whether communicative, collective, or cultural – plays a critical role in how communities perceive and respond to natural hazards. The stories passed down through generations helped keep memories of past avalanches alive, but they also highlighted the need to include newcomers in emergen-

**Effective
climate
adaptation is
not just about
policies and
infrastructure.
It is also about
people.**



Iceland



PHOTO: JOHANNA GISLADOTTIR

cy planning, with emphasis on those with a foreign background.

Residents' strong place attachment – their deep emotional connection to their home – proved to be both a strength and a challenge. On one hand, it fostered community engagement and willingness to volunteer during emergencies. On the other hand, it sometimes led people to underestimate the risks they faced.

Communities can also face stigmatization when the identity of their community is tied to a single tragic event. This narrow perception can overshadow their strengths and resilience and further accelerate outmigration processes. Overcoming this requires emphasizing a broader, more diverse narrative of community identities.

Drawing from our findings, we outlined several key recommendations for enhancing climate resilience and disaster risk manage-

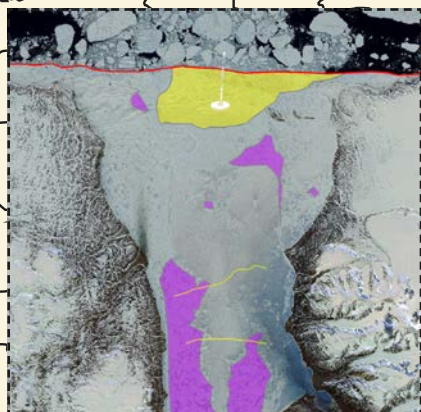
ment in small and remote Icelandic communities. First and foremost, Iceland needs to review its heavy and unsustainable reliance on volunteer emergency responders to ensure that volunteer resources do not experience burnout. Small villages often lack sufficient funding or personnel for essential services, leading to an increased reliance on volunteer labor. In addition, many villages experience “forced volunteerism” where community members, especially in close-knit communities, feel obligated to participate in volunteer activities or contribute to local initiatives – not out of genuine desire but due to social pressure or cultural expectations. This pressure can lead to stress, resentment, and a sense of loss of personal agency among community members.

Raising awareness and better integration is another key aspect. Clear communication about potential risks is essential, especially for newcomers and foreign visitors who may be unaware of local hazards. Iceland

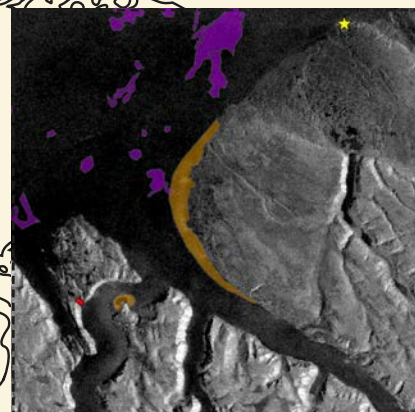
should also improve its early warning systems and develop more reliable and proactive alert systems to warn residents of imminent danger. To avoid delays in building protective infrastructure, the national government should fully fund avalanche barriers rather than rely partly on local municipalities with limited budgets.

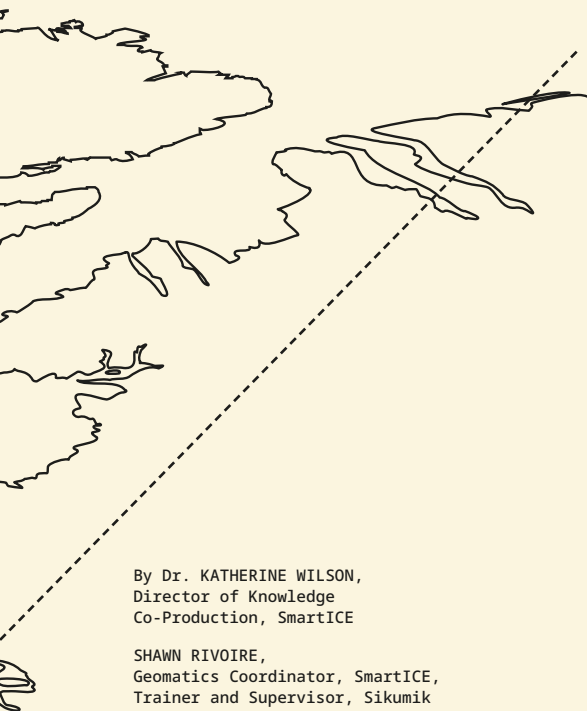
By bridging the gap between academic research and community action, CliCNord has demonstrated that effective climate adaptation is not just about policies and infrastructure. It is also about people: their memories, their connections to places, and their willingness to learn and adapt together. With the findings from this project, we can not only support the communities involved but also educate the next generation of researchers and community developers.

The Sikumik Qaujimagjuti Program



- ★ Mittimatalik
- Ice Cracks
- Floe Edge
- Caution
- Rough Ice
- Dangerous Area
- Polynia

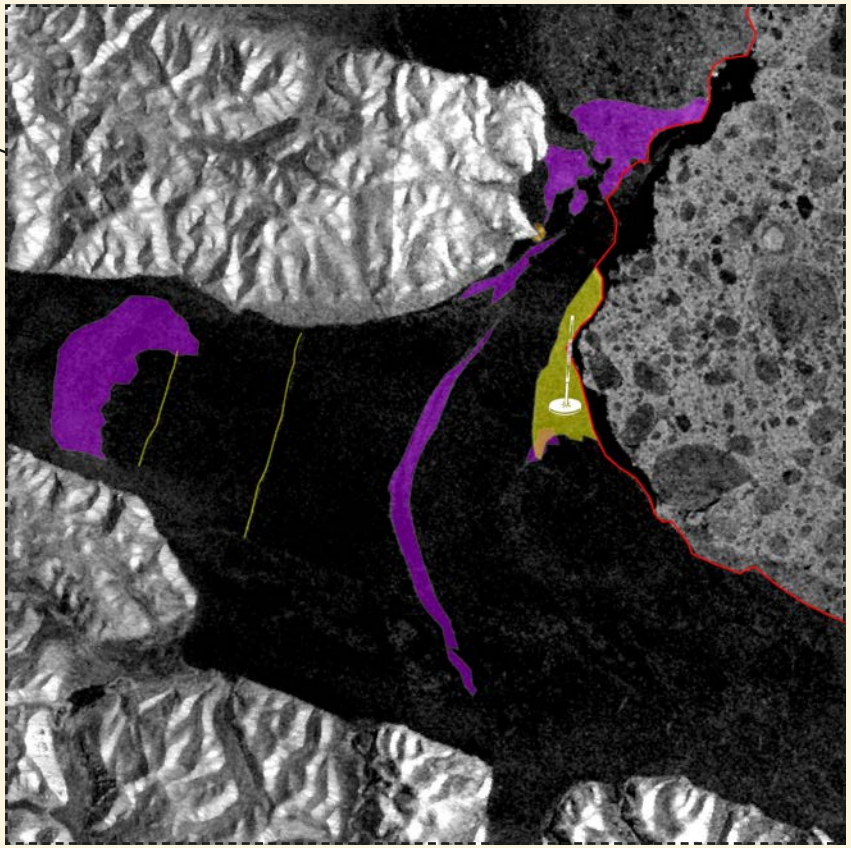




By Dr. KATHERINE WILSON,
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MAPS: SMARTICE

Sea ice maintains a crucial role in Inuit culture and lifestyle, acting as a platform for hunting and travel. Over the course of many generations, Inuit have accumulated a wealth of knowledge about sea ice conditions. This knowledge, or Inuit Qaujimaajjuti (IQ), about sea ice is part of how Inuit travel safely on the ice. However, as the climate shifts, sea ice is more unpredictable, and conditions become less reliable. The usual patterns of freezing in November/December and breakup in June/July are changing. The accumulated experience of ice experts is important to share and apply in new ways with inexperienced travelers to maintain safety while traveling on the ice.

SmartICE was transformed into a northern social enterprise in 2017 to deliver an operational service for coastal communities across the Arctic after receiving the Arctic Inspiration Prize. SmartICE provides community members and local Community Management Committees (CMCs) with tools and technology to monitor ice conditions in near real-time. CMCs, made up of local leadership and experienced ice users, implement their IQ and make decisions on where SmartICE deploys its technology.

In 2019, SmartICE co-developed the Sikumik Qaujimaajjuti training program (which translates to “a tool to know how the ice is”). This hybrid program hires local Inuit youth as community knowledge coordinators and provides a four-stage training process to document and mobilize sea ice IQ into ice travel safety tools. The four stages are 1) Employment Readiness and Digital Skills, 2) Learning Community IQ, 3) Computer Mapping, and 4) Earth Observations. The program takes two to three years to complete.

The first stage is to complete employment readiness training. For some Coordinators, this is their first position working with a computer in an office setting. Employment readiness training introduces Coordinators with what to expect while working in an office, how to write an email, and word processor training. This is followed by more advanced topics such as file management, document versioning, and time management. After completion of the employment readiness training, coordinators feel more confident in the workplace and comfortable using a computer to complete tasks.

Coordinators then learn how to facilitate meetings and workshops with CMCs. The coordinators take on a leadership role by

creating and sharing the agenda, taking meeting minutes, moderating the discussions, and distributing any action items. They also learn how to organize participatory mapping workshops to gather knowledge from experienced ice users within their community, guiding them through a series of questions to find and map their IQ on paper maps and charts. To date, participatory ice IQ mapping workshops have been held in eight communities across Inuit Nunangat.

Twice a year, coordinators of Sikumik Qaujimaajjuti get together for a workshop in a northern community. At the first workshop, coordinators are trained to use Geographic Information Systems to map IQ. Both first- and second-year coordinators attend the workshops, providing an opportunity for mentorship between cohorts. After the workshop, first-year coordinators know how to digitize IQ collected from expert ice users during mapping workshops and to create seasonal sea ice safety maps for their communities. These IQ maps contain information on ice areas that are dangerous due to thin ice or open water, too rough for travel, that break up first during the spring, or are wind shelter areas. Some communities map cabin locations for emergency shelters.



PHOTO: SMARTICE

“The accumulated experience of ice experts is important to share and apply in new ways.

The second workshop trains coordinators to monitor ice conditions using earth observations or satellite images. Coordinators are trained to acquire satellite imagery of their communities and other important areas. They learn to interpret ice conditions using both optical and remote sensing imagery. After the earth observation workshop, coordinators can map weekly ice conditions during ice freeze up and break up seasons. The coordinators use collected IQ to interpret ice conditions in satellite imagery and generate weekly ice travel safety maps that are shared in the community and on social media. Over the past two years, 156 weekly maps have been shared online and posted on news boards.

At the request of CMCs, Coordinators have also collected and compiled local sea ice terminology. Terminology books contain terms, definitions, and pictures of ice features. There are currently three completed

terminology books for Mittimatalik, Gjoa Haven, and Nain, and there are four more near completion for Arviat, Qikiqtaaluk, Taloyoak, and Tuktoyaktuk. In addition, four communities developed posters for preparing to travel and traveling on the ice. The posters are catered to each community and its local conditions.

Now in its fifth year, the Sikumik Qaujimajjuti program continues to train Community Coordinators to work with CMCs and produce ice travel safety products. Fourteen Inuit from nine communities across Inuit Nunangat completed or are completing the program. Some graduates are now working with SmartICE in expanded leadership roles. Looking forward, Coordinators and CMCs will continue to work together to find new ways to integrate IQ, SmartICE monitoring technology, and satellite imagery to maintain safety while traveling on sea ice.

Building

Capacity



PHOTO: THOMAS INGEMAN-NIELSEN

Through

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Education

Build

Establishing, maintaining, and operating infrastructure in Arctic communities presents unique challenges and requires special skills rarely possessed by southern engineers. The extreme climate and geographical factors, such as the prevalence of permafrost and lack of road connections, necessitate specialized approaches to foundations, material selection, construction methods, and planning. Such adaptation is essential to ensure the success and sustainability of infrastructure projects in these demanding environments.

However, Arctic communities often face a shortage of locally trained and qualified workers, leading to a dependence on external labor with a high turnover rate. Outsourcing to southern companies also results in errors due to their unfamiliarity with local Arctic conditions.

Some universities offer specialized Arctic engineering education, aimed at equipping professionals with the necessary knowledge and skills needed in these unique settings. But participation in such programs requires that young people from Arctic communities leave their homes, families, and familiar environments, and adapt to challenging academic pursuits often located in large urban centers with vastly different cultural settings. In Greenland, this transition has discouraged some from seeking education abroad, and among those who do begin an education – most often in Denmark – dropout rates have typically been high. Moreover, those who successfully complete their degree must spend a considerable part of their early adult life in Denmark, potentially starting families there. This reduces their likelihood of returning to and contributing to the Greenlandic society.

To address these challenges and encourage capacity building in Greenland, about twenty years ago the Greenland Government entered into a partnership with the Technical University of Denmark (DTU) and the Kalaallit Nunaanni Teknikimik Ilinniarfik (Tech College Greenland, KTI) to establish and run engineering education with a focus on Arctic building and construction, designed specifically to accommodate Greenlandic students.

The program is a four-year Bachelor of Engineering degree with courses on site investigations, geotechnical engineering and foundation design, building design and indoor climate, as well as general engineer-



More than 85% of our Greenlandic alumni live and work in Greenland.



PHOTO: THOMAS INGEMAN-NIELSEN



ing practices and logistics. The first three semesters take place in Greenland, so students can stay relatively close to family and friends in familiar settings. The courses are taught by a mix of visiting professors and local professionals, ensuring a high level of teaching and valuable interaction with local businesses and institutions. After the third semester, students move to Denmark for two semesters to attend the more advanced engineering courses at DTU.

Their studies also include a half-year internship in the industry, most often at an engineering consultancy, a construction company, or a public institution such as a municipal technical department. The internships typically take place in Greenland. Students also have the option to take a semester abroad, for example in Norway (Svalbard), Canada or Alaska, where they can familiarize themselves with construction practices in other parts of the Arctic.

Finally, students conduct a three-month thesis project on a practical, Arctic engineering-related topic. Many are done in collaboration with Greenlandic companies or institutions, with the possibility of the student being hosted in Greenland during the thesis work. Our students can therefore spend as little as one year of their education in Denmark, with the rest of the time spent in Greenland or in other Arctic regions.

The program is taught primarily in Danish and is open to Greenlandic, Danish and Nordic students. The first intake of students was in 2001, and by December 2024 the program had produced 187 graduates of whom 75 are Greenlanders. The program is considered a great success. More than 85% of our Greenlandic alumni live and work

in Greenland. As several Danish graduates have also ended up staying in Greenland, the education has resulted in more alumni working in Greenland than the number of Greenlandic students taken in. This has contributed to capacity building and increased qualified workforce in Greenland.

The collaborative educational model of our program has proven effective and is now adopted in other programs as well. In 2019, DTU established a similar program in fisheries technology, and recently the model has been implemented between KTI and the Danish institution Teknika to provide marine engineering education.

International Arctic researchers increasingly struggle with the wish and requirement to contribute to local capacity building and anchoring of research results in Arctic communities which in turn are increasingly overwhelmed by the research interest and resulting research fatigue. We believe that one effective pathway to address this issue is to partner with established formal educational programs in the Arctic, rather than (or in addition to) conveying new knowledge in isolated seminars with (few) local participants.

For the past two decades, we have successfully integrated domain-specific research knowledge into the curriculum of our engineering program in Greenland and provided students with opportunities to be involved in and contribute to ongoing research efforts. We find that this practice helps us create an active and stimulating study environment. It also ensures that research knowledge is transferred to new generations of engineers who are ideally positioned to put this knowledge into practice.

PHOTO: THOMAS INGEMAN-NIELSEN



Retaining Teachers in Rural Schools

A Partnership in Alaska's
Bristol Bay Region

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The program blends traditional graduate courses and experiential learning grounded in teachers' experiences in rural communities.

Rural Alaska offers remarkable opportunities for teachers – most of whom originate from outside the state – to establish relationships with unique communities, connect to land cared for by Indigenous peoples for thousands of years, and engage in efforts to align schools with Indigenous peoples' aspirations for their children's education. Despite these benefits, teacher turnover is almost twice as high in rural schools than elsewhere in Alaska: 36% compared to 19% in urban schools. These high rates of turnover disrupt classrooms and communities and put a costly strain on school districts' budgets.

Amid this challenge, an innovative partnership program is working to rewrite the story of teacher retention in the Bristol Bay Region of Alaska. The partners include the University of Alaska Anchorage (UAA), the Bristol Bay Foundation, and four rural school districts: Bristol Bay, Dillingham City, Lake and Peninsula, and Southwest Region.

The Bristol Bay Region is home to three Indigenous groups: Alutiiq/Sugpiaq, Dena'ina, and Yup'ik. The schools, which serve predominantly Alaska Native students (80%), are accessible only by plane, boat, snow machine, or dog sled. Student enrollment in the districts ranges from 113 to 574. The average teacher turnover rate is 32%, comparable to neighboring school districts.

In 2020, two visionary superintendents from the Bristol Bay Region shared a plan to improve teacher retention and enhance educators' connections to students and communities. They proposed designing a Master's degree program that recognizes the value of educators' experiences living and teaching in rural communities, emphasizing place-based education tailored to the region's Indigenous communities.

This vision found fertile ground at UAA's School of Education, where the faculty and the dean immediately saw connections to the MEd in Teaching and Learning program, a flexible 30-credit online program for practicing educators. Leaders at the Bristol Bay Foundation also recognized the potential for enhancing Indigenous students' educational experiences through improved teacher continuity and deepened place-based knowledge. A partnership was formed in the fall of 2020 to pilot this innovative initiative.

Between 2020 and 2023, the partners designed a program that blends traditional graduate courses and experiential learning grounded in teachers' experiences in rural communities. Teachers complete the MEd program in three years through experiential learning (15 credits) and online coursework (15 credits). The experiential curriculum culminates in a portfolio showcasing teachers' place-based practices.

The retention rates are encouraging. Participants remained in their schools at notably higher rates than other teachers in the Bristol Bay Region. By 2023, participating teachers' average retention rate was 95% compared to 66% of non-participating teachers. In the 2021–2022 school year alone, 100% of MEd participants returned to their schools, surpassing the 65% rate of other teachers in the Bristol Bay Region.

The program also shows promising results in teachers' place-based practices. For instance, 88% of participants rated themselves as competent or advanced in incorporating local ways of knowing and teaching and connecting the local environment and resources in their teaching, compared to 44% of non-participants. Furthermore, 100% of MEd participants identified themselves as competent or advanced in participating in local community events and activities compared to 78% of non-participants.

The success of the teacher retention initiative in the Bristol Bay Region is a testament to the power of collaboration and innovative thinking. The first cohort of ten teachers graduated in 2023, and additional teachers have enrolled each year. The program's reputation is growing across the state as rural districts outside the Bristol Bay Region have adopted the model, including the state's largest district, and discussions are underway to extend its reach beyond Alaska's borders.

Bringing Permafrost Students to the Workplace



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Working with PermaIntern has provided us with insights about the educational needs and their status in relation to permafrost.

I imagine this: A German geography student examining cores of saline permafrost in Svalbard. Or a Swedish student simulating soil freezing processes in a cold lab in Canada. Or a Hungarian PhD student measuring permafrost high up in the Andes in Chile. Each of them learning about permafrost – the rapidly changing foundation of many Arctic landscapes – by hands-on work in a professional setting.

Changes in permafrost directly impact societies across the Arctic in several ways, including threats to infrastructure and cultural heritage sites, geohazards, and potential contamination of water resources. While research on permafrost is carried out at many universities worldwide, students often have limited insight into how knowledge of permafrost can be applied in professional life. This may at least partly be due to the lack of courses focusing on permafrost at many universities, and it motivates initiatives to find alternative ways to prepare future professionals for permafrost-related work in the Arctic region.

In 2022, the UArctic Thematic Network on Permafrost launched the PermaIntern project with the help of the Danish UArctic funding to bridge the gap between universities and real-world permafrost work. We used the Nordic region as our pilot area and gathered colleagues from twelve universities to develop a model for promoting permafrost internships. Through discussions within our group and with students, professionals, and pedagogics experts, we identified the needs and challenges for students, university supervisors, and internship hosts regarding internships in the Arctic and other permafrost areas. Based on what we learned, we formulated a flexible model for working with internships across disciplines, countries, and educational levels.

One of the bigger challenges was the diversity in how educational programs deal with internships. Most have requirements for duration, timing, and focus area, and some have requirements for potential hosts (e.g. excluding universities) or remuneration (demanding or prohibiting salary). Understanding how these differences would impact our envisioned internship service required more time for discussions than we had anticipated. However, these prolonged discussions also helped us understand the value that our service could bring and how to avoid unnecessary administration.

Our PermaIntern program focuses on three main actors: students, hosts, and university supervisors, all of which are required for internships by most universities. With PermaIntern, students can apply for an internship advertised by a certified host in any country and match this with a certified supervisor at either their home university or, if not possible, at another university. PermaIntern-certified hosts and supervisors have the expertise needed to guide the student through their internship focusing on permafrost, and they know the regulations associated with interns at their respective organizations.

Internships are advertised on our online platform permaintern.org. The website also includes information about the program and the certification process. So far, we have six hosts and six supervisors certified for the program. Seven pilot interns also share their experiences in blog posts on our website. Most of the internships so far have been at universities, as setting up intern-

ships at private companies and research institutes has proven more challenging. This is mainly due to administrative issues when students cross country borders or the EU border.

While primarily targeting the Nordic region at the start of the project, we quickly found interest in other regions as well. Two of our pilot interns did their projects in Canada and one in Chile. Going forward, we aim to include students, hosts, and universities from more countries, and we are looking forward to seeing more interns find and make use of PermaIntern. We have also teamed up with the Permafrost Young Researchers Network for the continued development and maintenance of the platform within the newly funded Canadian UArctic networking project SEDNA.

Working with PermaIntern has provided us with insights about the educational needs and their status in relation to permafrost. As a rather niche topic in Earth sciences and engineering, educational opportunities are rare for students especially at the Bachelor level in most universities. Permafrost is also often perceived as a research topic rather than something useful to study for a career outside academia. Internships offer students at all educational levels hands-on educational experiences and also provides the option for universities that do not have specialized courses on permafrost. And since it is possible for permafrost, it could also be beneficial for other disciplines with educational needs in the Arctic region. Imagine a full-scale UArctic internship service covering all topics!

Etxé

Studies have shown that language is linked to mental health and wellbeing. Between the world's mental health crisis and global efforts to revitalize Indigenous languages, it is more important than ever to work collaboratively to preserve the teachings of Indigenous cultures and worldviews. Collège Nordique, a francophone post-secondary institution in Yellowknife, Northwest Territories (NWT), is committed to this cause, collaborating with Indigenous Elders and local organizations, as well as Indigenous, territorial, and federal governments to make learning Indigenous languages and cultures accessible, engaging, and relevant for all community members.

Since 2016, Collège Nordique has offered courses to teach Tłıchq Yatı̨, one of the nine official Indigenous languages of the NWT. The initiative began after a small group of community members expressed interest in learning the language, particularly because they worked with fluent Tłıchq speakers. Over the years, through the collective efforts of our dedicated team, the Tłıchq Government, and other collaborators such as the Yellowknife Education District No. 1 and Bushkids, enrollment in Tłıchq Yatı̨ classes has grown significantly. From 19 student registrations in the 2015-2016 academic year, enrollment increased to over 250 in the 2023-2024 year. In the span of eight years, over 500 adult learners have taken our classes to gain the confidence to speak, listen, read, and write in Tłıchq to community members, family, Elders, and colleagues.

Innovative and Collaborative Approaches to Indigenous Language Revitalization

BY ROSIE BENNING,
Director of Education
and Training, Collège
Nordique

eghàlats'e

PHOTO: COLLÈGE NORDIQUE



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Students often share their appreciation for how we weave different teaching methods to provide a holistic learning experience.

This success can be attributed to a collaborative approach that blends traditional and Western knowledge. Tłıchq Yatı instructors Georgina Franki and Camilia Zoe Chocolate, both fluent in the language and raised on the land, have provided important cultural knowledge to learners studying in person and online. As the Director of Education and Training at Collège Nordique, the program has also benefitted from my background in language pedagogy and my experience in teaching French as an additional language. Together, we have developed and delivered the curriculum in consultation with Elders and knowledge holders. From a training, mentorship, and professional development perspective, we have learned so much from each other. While Georgina and Camilia have taught me how to use storytelling and immersion techniques to teach language and culture, I have shared with them second language acquisition strategies like Total Physical Response, visual aids, and scaffolded games to help students develop their language skills. Students often share their appreciation for how we weave different teaching methods to provide a holistic learning experience.

Jacynthia Rabesca, Manager of Language Revitalization at the Tłıchq Government, emphasizes the importance of collaboration. “Our greatest resources are our people. We learn from each other, bringing together different teachings and skills acquired through life experiences, education, and the wisdom of our Elders. It’s amazing what we can do when we bring everyone together.”

The Tłıchq Yatı Immersion Camps, organized by the Tłıchq Government and Collège Nordique, funded in part by the Government of Canada, are an excellent example of how working together can promote local capacity and resilience. These camps aim to increase accessibility for remote communities where internet access may be unreliable. Offering immersion classes in the communities of Behchokq, Whatı, Gametı, and Wekweetı has been transformative. As Georgina shared, it was uplifting to witness grandparents and grandchildren learning together, sharing joy and laughter. One participant expressed, “We love this! We are going to continue doing this even after the camp is over. It’s so much fun!”

Dylan Nitsiza, a camp participant from December 2024, echoed these sentiments,

describing the classes as “heartwarming.” He shared how hearing and reading the language revitalized him, noting how his grandparents and relatives responded with joy when they heard the younger generation speaking and reading Tłıchq. Nitsiza, who is learning the language as an adult after losing it, views this process as part of his healing journey, especially in recovering from addictions. He hopes to inspire youth by showing that “no matter what age you are or where you are in life, you can make an effort to revitalize your language.”

Looking forward, Indigenous knowledge and culture will continue to shape our post-secondary and continuing education programs. Thanks to our strong relationships with language advocates at the Government of the NWT, we have also recently met with other Indigenous governments of the NWT to explore potential future collaborations. Impressed by the quality of our language learning resource, *Tłıchq Yatı eyıts’q Dq Nàowò*, the language leaders wish to work with Collège Nordique to improve their own language revitalization efforts. We are excited for the opportunity to share our model with others to build capacity and ensure the vitality of Indigenous languages in the North.

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Impact

of International Cooperation and Knowledge Exchange on Arctic Tourism Education



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I imagine yourself as a Master's student. You have decided to study tourism in the Arctic, an area you may not be familiar with; you may be moving to the Arctic for the first time. You may be the only student in the entire department studying the topic.

This is the scenario the UArctic Thematic Network for Northern Tourism foresaw in 2015, when we decided to develop a curriculum and design a "value added" set of three courses, two online and one in the field, across seven universities in five countries. We saw students looking to build relationships with peers, virtually and in person, and discuss their unique regional perspectives with like-minded individuals and the authors they were reading, many of them UArctic researchers.

Fast forward ten years. We now have more than 300 individual course graduates and over 60 students who have completed the entire three-course certificate endorsed by UArctic. Our approach to training and mentorship has always been relational: put people together in a room, whether that is at a National Park Visitor Centre or on Zoom, and good things will happen.

In 2016 and 2017 our work was supported by the Norwegian Centre for International Cooperation in Education. Once that funding ended, we were able to sustainably manage the continued training and mentorship within the network through in-kind contributions to teaching and hosting. From 2018 to 2020, the field courses were aligned to research meetings of various Nordregio funding cycles for the *Arctic Tourism in Times of Change* project, allowing movement from Finland to Sweden to Iceland. Courses are hosted by three institutions, so no one university or instructor shoulders the entire load; however, instructors from all seven institutions teach into each course. Nordplus has always helped with the mobility of Nordic students.

Although we had online courses from the outset, the need to adjust to this reality in 2020 due to COVID-19 allowed us to collaborate on a virtual field course to Iceland in 2021. From 2022 onwards we have built back better. With assistance from an Arctic 5 Chair in Tourism and the Climate Emergency, we have been able to develop strong community and industry relationships in Pyhä, Finland and grow a Master's field course to include a PhD cohort for a writing retreat.



PHOTO: PIOTR DAMSKI

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We cannot rest on our laurels of ten great years.



PHOTO: PIOTR DAMSKI

But what do our students think? Following discussion at our most recent field course in October 2024, the Master's students are inspired: "Being surrounded by people with different backgrounds, with so many interesting experiences and knowledge... It is very enlightening to be immersed in the destination and sharing all these new experiences together." Another said, "it was good to understand how my studies can be related to other areas. I was inspired by the tourism scholarship perspective (multidisciplinarity), the opportunity to share knowledge with several generations..."

They perceive PhD students and UArctic researchers as an under-utilized resource: "[I hoped for] more time, more collaboration with PhD students and senior researchers, perhaps in a sense that we would do research together", and "that [experience] inspired me to think [of] academia as a very natural, but somehow publicly unseen/too little respected stakeholder in tourism."

Perhaps more changes are afoot. We cannot rest on our laurels of ten great years. How might we adapt and change? Even the newly added PhD students see this in a positive light: "It is inspiring to spend time with

the Master's students, to see that people still believe. Great to see their enthusiasm." One remarked, "it made me more conscious about the progress and process I've been through", while another said, "it reminded me of why I went into a PhD. Why I chose this path." There was consensus that the ability to meet with senior researchers and spend time with them was important. All the students also found it valuable to get comments from "the outside", e.g. community members and industry.

With recent funding success, we are primed for even more forward momentum. We are keen to see continued international cooperation, now with dedicated funding from Canada (Global Arctic Leadership Initiative, 2024-2026) in addition to a three-year cycle of aligned research in Iceland, Sweden and Finland (Nordic Arctic Co-operation Programme, 2025-2027).

Just as our innovative educational programming has seen a bright past, we believe the Thematic Network and our programming has an even brighter future as we continue to achieve additional knowledge exchange and a widening of the conversation – not just between our institutions, but also with communities and industry.

Searching for Good Business Ideas for People and the Planet

By KIM BREDESEN,
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The exploration for metals needed for the green transition and the versatile use of artificial intelligence presents numerous opportunities for businesses and the Arctic population. However, what specific advantages and disadvantages can we anticipate from this emerging industry?

Industry and business can play a crucial role in developing new and sustainable solutions for an Arctic that is changing on many levels. What this looks like in practice has been highlighted by students from four universities in Europe and the USA who participated in the International Graduate Student Research Cohort (IGSRC) in 2024.

The IGSRC (currently in its fifth year) brings together students and faculty from a variety

of fields to work together while pursuing research related to the Arctic and North Atlantic. The students focus on innovative best practices and present their research during the annual Arctic Circle Assembly in Reykjavík, Iceland. A fundamental pillar for the IGSRC is the UN's Sustainable Development Goal No. 14. This involves preserving the world's oceans by facilitating approaches related to the concept of the blue economy. A basic prerequisite is that business activities should be based on the triple bottom line: people, planet, and profit.

Tools for Rapid Changes

One of the IGSRC participants, Joan Alza Santos, a scientific assistant and PhD candidate at the National Subsea Centre of Robert Gordon University, provides insight into

how AI can create new advancements in a blue economy. Santos emphasizes that AI can be used to identify dangers and risks associated with extreme weather conditions and climate in the Arctic. This is a significant benefit for building roads, buildings, energy production, or communication networks. Other AI applications include resource planning for mass tourism and calculating safe, affordable, and environmentally friendly shipping routes in the Arctic.

"The most important application of AI in the Arctic so far has been environmental monitoring. AI can be used to analyze weather and ice data in real time, model landscapes, or simulate potential natural hazards. This allows us to detect and track changes in sea ice levels in the Arctic or on Icelandic glaciers," Santos said.



Industry and business can play a crucial role in developing new and sustainable solutions for an Arctic that is changing on many levels.

For him, AI is a very promising field of research that can have positive ripple effects for governance in the Arctic. “I expect that AI-driven tools in the future will be beneficial for protecting the environment and ensuring that decision-makers and researchers have a level of knowledge that prepares them to respond to the rapid changes occurring in the Arctic,” Santos concluded.

Additionally, he noted that cold climate is advantageous for energy-efficient data centers. “This could be an opportunity to create new jobs for local communities and promote knowledge-driven economies,” he said.

A Last Measure with Unknown Impact

Yara Nieuwenhuis, who is pursuing a Master’s degree in both freshwater ecology and political science at UiT The Arctic University of Norway, has examined a contentious

issue: What are the potential consequences of seabed mining between Norway, Greenland, and Svalbard? This is an area along the Mid-Atlantic Ridge that has large deposits of highly sought-after metals.

“I believe that seabed mining is difficult to reconcile with ideals of sustainable solutions, given the technology and knowledge we have today,” Nieuwenhuis said. “For seabed mining to become sustainable, the extraction must cause as little harm as possible to ecosystems. At the same time, it must be guaranteed that the metals and minerals are used for purposes beneficial to the green transition.”

Nieuwenhuis warns of the permanent loss of biodiversity if slow-growing species in the Arctic are subjected to industrial interventions. Several of the species may also be of great value for medical research. “Sustainability also means preserving the nature we

have. Initiating seabed mining now should be among the last measures or solutions we choose to support a sustainable society,” Nieuwenhuis concluded.

Attitudes, Knowledge, and Awareness

Cohort participants Brooke Camire and Victoria Forkus from the University of Southern Maine and Sydney Fox from Reykjavik University have also made significant efforts to highlight how the Arctic blue economy can be further developed.

These participants have researched the extent to which secondary school curricula in Europe highlights the opportunities the blue economy encompasses, how and why microplastic particles spread in the Arctic, and how more food security can be facilitated in the Arctic. Individually, they have presented these solutions: that a new generation can be made aware of the blue economy with new curricula; that biodegradable textiles and plastic recycling are adopted on a larger scale; and that there should be a greater focus on local food production.

Added with the research on AI and deep-sea mining, all cohort participants have collaborated to create analyses on development trends that will shape the Arctic in the coming decades.

Partner institutions for this project include UiT The Arctic University of Norway, University of Southern Maine, Robert Gordon University, Reykjavik University, and the New England Ocean Cluster (NEOC) in Portland, Maine.



Read more:
<https://mnai.org/opportunities/student-opportunities/international-graduate-student-research-cohort/>





PHOTO: TIMO JOKELA

Nomadic Hub of New Genre Arctic Art Education

By MARIJA GRINIUK,
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Siunissaq, Community Psychologist,
Professor Emeritus

The *New Genre Arctic Art Education* (AAE) initiative seeks to enhance contemporary art and interdisciplinary collaboration, engage northern and Arctic residents in art-based activities, and connect academic research with Indigenous and multi-ethnic communities. AAE is led by two UArctic Thematic Networks, Arctic Sustainable Arts and Design (ASAD) and Children of the Arctic, with participation from the University of Lapland, Nord University, Umeå University, and Ilisimatusarfik / University of Greenland, replaced in 2024 by the Community Art and Psychosocial Association, Siunissaq.

Central to the initiative is the Nomadic Hub of AAE which provides a framework for engaging with Arctic communities. It emphasizes an intra-action approach where learners, teachers, content, and methods interconnect and co-create knowledge and art. This mirrors a nomadic camp that adapts to the material, social, and cultural aspects of the Arctic. The Nomadic Hub serves as a platform for researchers, artists, and educators from circumpolar universities to develop sustainable and socially engaged methods. For students, the international course combines distance learning with immersive, field-based art activities. Contributions from cross-sectoral partners further enrich the initiative. So far, the Nomadic Hub has been hosted in Nuuk, Greenland in spring 2023 and Karasjok, Sápmi, Norway in spring 2024.

In Nuuk, AAE activities aligned with the conference “Art, Community, and Identities in the Arctic – Best Practices for Children, Young People, and Families”. Participants engaged in Nuuk’s urban environment through storytelling with Arctic objects, visual learning cafés, and city photo walks. These art-based methods encouraged exploration of the city’s unique character and connections with its residents. The event culminated in a pop-up exhibition, fostering collective reflection and dialogue.

In Karasjok, the activities were organized with the Sámi Centre for Contemporary Art (Sámi Dáiddaguovddáš) and Karasjok

School, along with other partners including the multidisciplinary arts association Piste from Finland and Siunissaq from Greenland. Scholars and art teacher education students explored Karasjok through local art and cultural intra-actions and participated in activities integrating Sámi art, storytelling, and outdoor learning. An outdoor seminar provided space for reflection and evaluation, emphasizing local collaboration. In the Sámi Symbols workshop, artist Laila Labba shared her pedagogy for addressing sensitive topics with children and youth, offering insights from her perspective as a Sámi artist. Art historian Randi Olstad facilitated an art walk, combining storytelling about public art with immersive experiences in Karasjok’s natural surroundings.

Working with Karasjok School, university students also learned about the cultural significance of the Karasjok River for fishing, recreation, and community activities. Their participation culminated in collaborative painting together with schoolchildren about river experiences. The ribbon-like paintings were then carried by pupils and moved by a snowmobile over the frozen river, symbolizing the connection between culture and nature within the northern ecoculture.

The Nomadic Hub included diverse activities in Karasjok. Pupils’ sustainability portraits were photographed in personally meaningful locations. Traditional materials and handicraft techniques were used; for example, pupils carved their thoughts on climate change into reindeer antlers. Finally, all the works were assembled into a pop-up exhibition presented to the pupils’ parents and grandparents. Some elements, such as the reindeer antlers, also became part of a public installation in front of the Sámi Parliament building in Inari.

The Nomadic Hub of AAE highlights the importance of integrating pedagogy, culture, and Indigenous perspectives through sensitivity to local communication, traditions, and environments. Intra-action – interweaving participants, methods, and materials – is central to designing meaningful learning sessions. Close dialogue with local partners is also essential to ensure workshops and activities honor and reflect community knowledge and values.

The third Nomadic Hub is to take place in Narsaq, Greenland in April 2025, based on lessons learned in Nuuk and Karasjok.



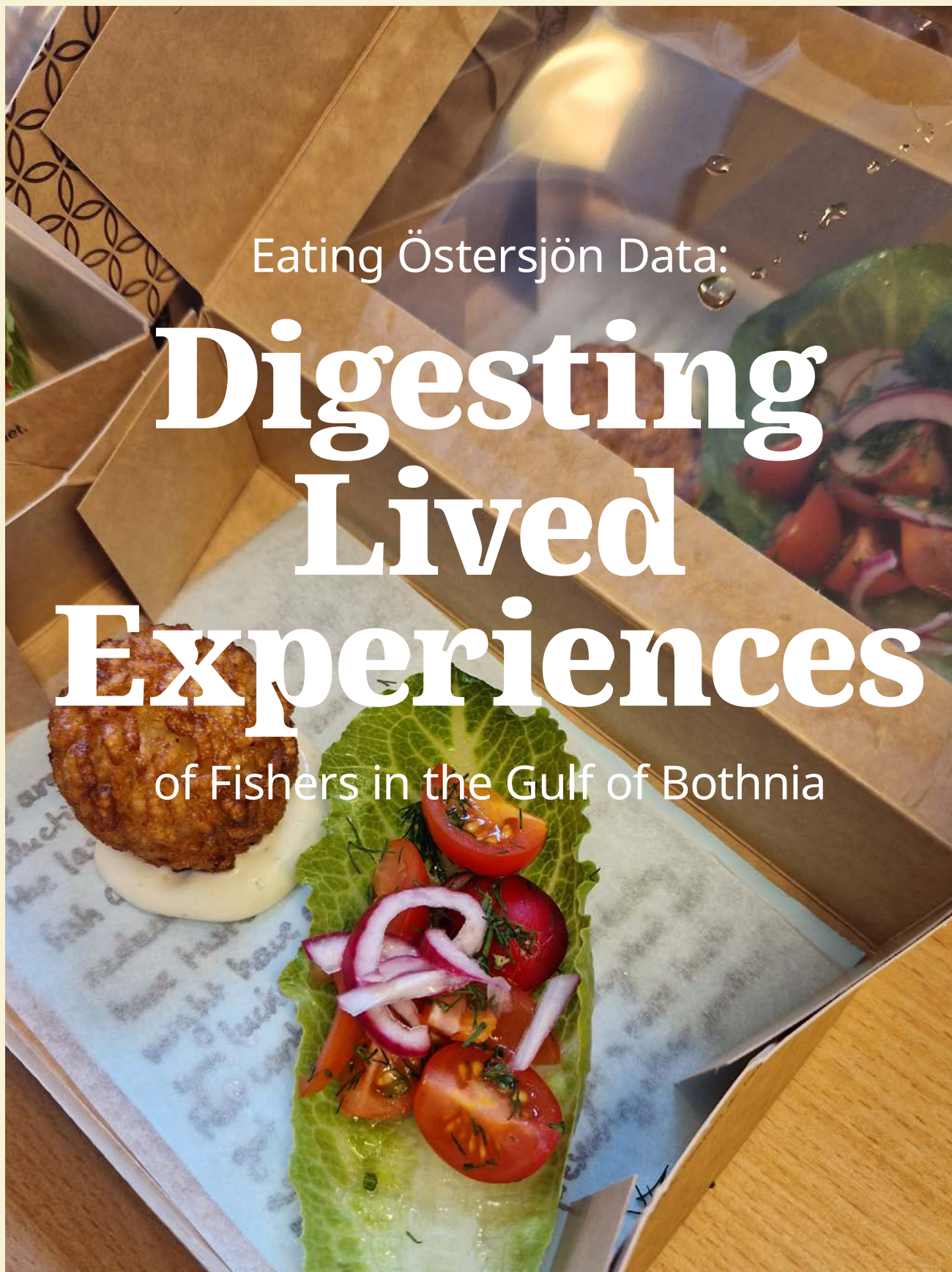
PHOTO: TIMO JOKELA

Intra-action - interweaving participants, methods, and materials - is central to designing meaningful learning sessions.

Eating Östersjön Data:

Digesting Lived Experiences

of Fishers in the Gulf of Bothnia





Traditional policymaking often relies on static data and top-down processes, which fails to capture the richness of affected communities' lived experiences.

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PHOTO: MATTIAS PETTERSSON

Digesting Data is a collaboration between Umeå University Institute of Design's Sympoietic Research Collaboratory in Sweden and the Ecology & Action Lab of Moholy-Nagy University of Art and Design in Hungary. In May 2024, we held a pilot workshop called Eating Östersjön Data, uniting fishers, public authorities, chefs, and researchers to explore the disconnect between policy and the lived experiences of professional fishers in the Gulf of Bothnia. Over two days, the participants co-created and shared meals to represent fishers' realities, using food to introduce new perspectives into the policy discussion.

Designing Data Narratives Through Food

The workshop was held at Umeå University School of Food, Nutrition and Culinary Sciences. Participants worked in mixed

groups of fishers, public officials, chefs, and researchers. To begin, we introduced the notion of representing data in three-dimensional forms, using food to represent data, and the meal as an unfolding series of rituals and connections between diners and with food. Within the groups, the fishers then shared their perspectives on policy challenges, and participants co-created a tapas plate to communicate the fishers' narratives. The tapas served as a "taster" for the method. Following a critically engaged tapas break, each group designed a meal to be prepared and shared the next day, leveraging food's cultural and sensory dimensions to spark dialogue around the fishers' challenges.

Fish or No-Fish Arancini

The first group addressed an 80% decline in fish catch over 40 years and dwindling consumer knowledge about seafood. To il-

lustrate the challenge, they created arancini – 20% filled with fish, and 80% filled with umami mushrooms – served with salads in takeaway boxes featuring stories accessed after eating. Despite extensive culinary experience, the attendees struggled to identify the fish-filled arancini, highlighting the loss of knowledge about seafood qualities. Unfortunately, the take-away format limited deeper discussion on the fishers' challenges, emphasizing the need for immersive dining to maximize impact.

Fine Dining with Grey Seals

The second group tackled growing conflicts with grey seals. The Gulf of Bothnia grey seal population has surged by 5% annually since the 2009 implementation of a European law that prohibits marketing seal products, except under limited cultural exceptions. For the Swedish fishers, this means damaged equipment, depleting stocks,



PHOTOS: MATTIAS PETTERSSON

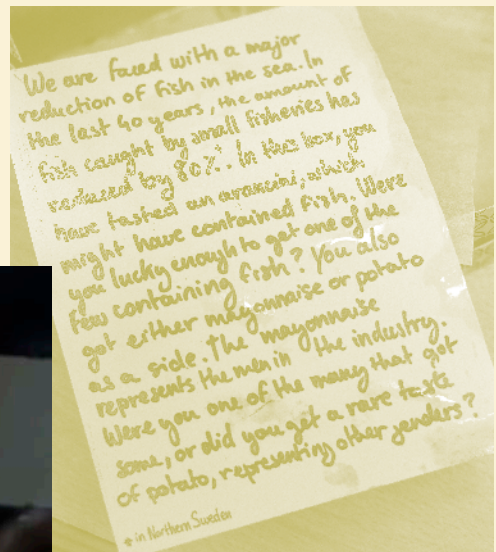
and economic strain. In Finland, hunters are compensated for seal culling. With this example, rather than change the law, the Swedish fisher seek to change how it is interpreted at the national level.

This group designed a fine-dining experience for Västerbottensveckorna, an annual cultural event in Stockholm that highlights the North to regional, national, and international decision-makers. Supported by Susanne Jonsson, Sámi chef and editor of a fine-dining seal recipe book, the group created two mock seal dishes: tuna cooked in blood to mimic seal meat, served with tuna ceviche; and ice cream enriched to replicate seal milk's high fat content. Dramatic elements, such as pouring beef blood at the table to symbolize fish massacres and sour cloudberry sauce on the ice cream to highlight seal pups' deaths, elicited strong emotions. The performance sparked deep dialogue, with one official saying they learned more in one afternoon than in a decade of workshops. All participants expressed interest in future experiments.

Insights and Future Directions

Traditional policymaking often relies on static data and top-down processes, which fails to capture the richness of affected communities' lived experiences. In contrast, meals bridge divides, translating fishers' experiences into sensory, performative expressions. Public officials gained fresh insights, as the dynamic shifted from confrontation to collaboration. While the takeaway meal lacked depth, the fine-dining experience used familiar rituals to make data emotionally impactful and spark meaningful conversations.

Using food as a proxy for data enables us to redefine data beyond scientific evidence, evoke experiential narratives, and create powerful interventions in sustainability and policy. By combining storytelling, performance, and sensory engagement, the meals illuminated fishers' realities and inspired new connections. This approach opens new avenues for policy dialogue, offering an alternative to traditional process-



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es that often fail to resonate with communities. It reimagines fishing as a web of connections and eating as a social, environmental, and political act, grounding policymaking in real-life experiences to co-construct new paths forward.

Through our collaboration, we explore data's impact on futures. We want to know: Can we tell other stories to move forward differently? Can eating together better connect public authorities with food system actors' lived experiences for more effective outcomes? To address these questions in ways that speak to and through the diverse stakeholders' lived experiences, this work must be co-created.

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