



HARVARD Kennedy School

BELFER CENTER

for Science and International Affairs

A photograph of a coastal erosion site. A grassy cliff edge is crumbling, revealing a vertical face of light-colored sediment. Two people are standing on the grassy top of the cliff, looking out over the water. The water is dark and calm, reflecting the sky. The overall scene is one of environmental change and coastal vulnerability.

Arctic Initiative

2021–2022 Year in Review

**The Robert and Renée Belfer
Center for Science and
International Affairs**

Arctic Initiative

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FRONT COVER: Coastal erosion reveals the extent of ice-rich permafrost underlying active layer on the Arctic Coastal Plain in the Teshekpuk Lake Special Area of the National Petroleum Reserve - Alaska. (U.S. Geological Survey)

An abandoned building sits on the shore in Kotzebue, Alaska. A combination of permafrost and sea ice thaw is contributing to coastal erosion that is making life increasingly challenging in many Arctic communities. (Credit: Lorenzo Albala)

Welcome to the **Arctic Initiative**

In February, the Russian invasion of Ukraine upended Arctic geopolitics, challenging the longstanding tradition of cooperation in the Arctic and threatening to undermine vital collaborations on development, resource extraction, shipping, Indigenous rights, environmental protection, and climate change.

The Arctic—and by extension, the global climate system—can ill afford these disruptions. Studies indicate that the Arctic is warming about four times faster than the world average. Understanding the character of these changes is important for understanding the scope of the climate challenge globally—and critical for developing urgently needed resilience strategies in the region.

Through all this, the Arctic Initiative at Harvard Kennedy School's Belfer Center for Science and International Affairs has continued to serve both as a source of constructive analysis and as a convener of Arctic thought leaders, bringing together researchers, policymakers, Indigenous leaders, scientists, and students to address these Arctic challenges. Identifying new avenues for progress is more important than ever while government-to-government cooperation remains stalled.

From launching a major new collaboration on Arctic permafrost thaw; to working with Indigenous and other local communities to advance resilience, health, and critical infrastructure projects through research; to providing opportunities for tomorrow's Arctic leaders to learn from and network with today's; the Arctic Initiative has spent the last year elevating understanding and policy dialogue about Arctic challenges across the region and beyond.

This Year in Review provides a snapshot of the Arctic Initiative's accomplishments during the 2021/2022 academic year and highlights the many ways the Initiative has leveraged the Belfer Center's interdisciplinary science-and-policy capabilities and world-spanning networks to advance conversations about Arctic transformations and policy responses.

As the Arctic continues to “heat up,” both literally and figuratively, the Arctic Initiative will continue its scholarship, training, and policy engagement across our four major focus areas: (1) understanding the pace of permafrost thaw and its impacts in the region and worldwide; (2) Arctic ocean pollution and sustainable ocean management; (3) Arctic infrastructure, resilience, adaptation, and public health in a changing climate; and (4) Arctic governance, cooperation, and diplomacy. This report is a testimony to the dedication, insights and achievements of the many faculty, fellows, staff, students, advisors, and partners who participated in this project this year.

John Holdren • Henry Lee
Co-Director Co-Director



The Arctic Initiative Launches New Permafrost Pathways Project

Multi-Year Collaboration Aims to Better Understand, Mitigate, and Adapt to Major Arctic Threat

In April, the Arctic Initiative, in collaboration with the Woodwell Climate Research Center and the Alaska Institute for Justice, announced the launch of Permafrost Pathways: Connecting Science, People, and Policy for Arctic Justice and Global Climate. A six-year, \$41 million initiative catalyzed through The Audacious Project, this effort brings together leading experts in Arctic climate science, policy action, and environmental justice to inform and develop adaptation and mitigation strategies that address the local and global impacts of Arctic permafrost thaw.

Filling the Gaps in Permafrost Science

Greenhouse gas emissions from thawing permafrost—perennially frozen ground that covers 15% of the Northern Hemisphere land area—are one of the biggest areas of uncertainty in global climate calculations. Thawing permafrost is expected to release between 30 and 150 billion tons of carbon by 2100; by the end of this century, these emissions may be as large or larger than the emissions from the United States over the same period at its current rate.

Yet, due to uncertainties about the size and timing of these emissions, permafrost is largely overlooked in today's international climate policy. "Because we can't put a precise number

on permafrost emissions, policymakers are essentially excluding them, setting global emissions targets that are wholly insufficient to protect us from catastrophic climate change," said **Sue Natali**, Director of the Arctic Program at Woodwell.

Unless these emissions are properly accounted for in setting emissions targets, the 2° Celsius global temperature threshold established in the Paris Agreement could become unattainable.

In order to develop more complete data on permafrost emissions, the scientific team at Woodwell will coordinate a pan-Arctic carbon monitoring network and modeling initiative to improve the ability to track and forecast permafrost thaw and resulting carbon emissions.

"We're working with an international team of Arctic scientists to strategically identify and fill carbon monitoring gaps by upgrading and installing new equipment to monitor greenhouse gases across the entire Arctic," explained Natali during a public panel about the project in June. "We will then use this data to build the first ever data assimilation model for Arctic carbon cycling. This state-of-the-art modeling approach will allow us to accurately project permafrost emissions now and into the future."

JESS HOWARD/WOODWELL



Woodwell's Dr. Kyle Arndt and Patrick Murphy installing an eddy covariance flux tower in Churchill, Manitoba, Canada — the inaugural new tower of the Permafrost Pathways project.

Keeping Global Climate Goals Within Reach

Doing the science is only half the battle: the project's research must also be delivered into the hands of those poised to decide how we deal with the warming Arctic.

“Decisions are being made across the planet—about policy, investment, individual purchases, industry, energy—that are driving rapid permafrost thaw, which is subsequently worsening climate impacts and disasters around the world,” said Arctic Initiative Senior Fellow **Fran Ulmer** during the June panel. “We need to ensure policymakers are sufficiently confident about the contribution of permafrost thaw to climate change, so that they can make informed decisions about what kind of mitigation actions are necessary.”

Armed with updated data and models from Woodwell, the Arctic Initiative will help lead efforts to elevate the topic of Arctic permafrost thaw in international climate dialogues, supplying key national and international policymakers with the information necessary to accurately incorporate permafrost emissions projections into climate mitigation policy.



CHRIS LINDER

Locally, permafrost thaw results in erosion and subsidence, causing buildings to crack, roads to collapse, and pipelines to fail.

“The solution to the problem of rapid climate change in the Arctic has to be, above all, acceleration of the effort to reduce global emissions of greenhouse gases from the combustion of fossil fuels and land use change. In the region, of course, any sense of common humanity with the people who have to live with these dramatic transformations in the Arctic would also dictate that the rest of the world pay attention and do its part to diminish the fundamental driving force that is causing these problems.”

—**John Holdren**, from *“A Sleeping Giant: Why Permafrost is a Climate Threat,”* on *The Agenda* with **Steve Paikin**

Building Resilience in Arctic Communities

Even with the most ambitious climate action, a rapidly warming Arctic has already led to permafrost thaw which threatens communities. Across the Arctic, erosion and subsidence caused by melting permafrost are having devastating impacts on Northern infrastructure, landscapes, livelihoods, and traditional ways of life.

“Communities in the Arctic are already confronting impossible decisions about where and how they can live in the face of life-threatening impacts of permafrost thaw,” said **Robin Bronen**, Executive Director at the Alaska Institute for Justice (AIJ).



“Climate change in the Arctic is affecting what happens at lower latitudes. In climate journalism, it’s a truism that people think climate change is just about polar

bears. I think sometimes that makes journalists want to write about impacts that are happening in places where most people live. The Arctic is obviously not as densely populated as the mid latitudes, but what happens in the Arctic doesn’t stay there.”

—Climate journalist **Sarah Kaplan** on the global impact of Arctic warming, from *“Doomsday to Hope: Changing the Climate Crisis Narrative,”* a seminar organized by Senior Fellow **Cristine Russell**

AIJ, in collaboration with the Alaska Native Science Commission, is working on the ground in Alaska with environmentally threatened communities, to monitor the ways permafrost thaw is impacting daily lives and better understand community priorities related to policy pathways to address these climate risks. Drawing on the resilience policy expertise within the Arctic Initiative, this project will co-create equitable, community-driven adaptation strategies and advance a just governance framework to ensure Arctic residents have the resources necessary to confront hazards stemming from climate change.

Also germane to the community resilience prong of Permafrost Pathways is the Initiative’s work on Arctic infrastructure challenges in a changing climate, led by Co-Director **Henry Lee**, and on building adaptation capacity and public healthcare in Arctic communities, led by Senior Fellows **Joel Clement** and **Jennifer Spence** and Faculty Associate **Stuart Harris**.

“It’s critical that we support the communities on the frontlines of climate change,” said Arctic Initiative Senior Fellow **Joel Clement**. “Not only so they have the necessary resources, but also so they have a say in international climate policy discussions that directly affect them.”

Next Steps

In September 2022, the Arctic Initiative will host the first policy convening for the Permafrost Pathways Project at Harvard Kennedy School. The meeting will provide an opportunity for the invitees to learn about the project, to offer their thoughts about the challenges and opportunities at the intersection of permafrost science and policy, and to consider the possibilities for connecting their own Arctic projects and responsibilities with the Permafrost Pathways effort.

Learn more at permafrost.woodwell.org.

**PERMAFROST
PATHWAYS**



Workshop participants pose for a group photo. From left to right: Isaac Kim (HKS), Ksenia Acquaviva (HKS), Brittany Janis (HKS), Joel Clement (HKS), Salik Frederiksen (WRH-Greenland), Cindy Dickson (AAC-Canada), Liane Benoit (AAC-Canada), Renan Mainville (AAC-Canada), Cole Rubulak (AAC-Canada), Raylene Mitchell (ICC-Canada), John Crump (ICC-Canada), Jen Spence (HKS), Nadine Kochuten (Aleut International), Gemma Holt (HKS), John Holdren (HKS), and Justin Barnes (*Arctic Yearbook* Assistant Editor)

Discovery Workshop Continues Resilience Work Through Arctic Council Pause

On May 17, 2022, eight representatives from Arctic Indigenous Peoples' Organizations from across the North American Arctic gathered at Harvard Kennedy School for a two-day Arctic Resilience Discovery Workshop. Organized by Arctic Initiative Senior Fellows **Jennifer Spence** and **Joel Clement**, the workshop marked the initiation of a project designed to complement the Arctic Council Sustainable Development Working Group's (SDWG) Advancing Arctic Resilience Project that is currently on hold due to the crisis in Ukraine.

While Arctic Council activities remain on pause, the threats posed by accelerating Arctic warming to local communities continue to grow. The discovery workshop's aim was to explore how a truly community-driven climate resilience project focused on addressing the risks posed by permafrost thaw might be designed and implemented, including how to ensure such a project is rooted in Indigenous knowledge, language, and values, and incorporates activities and results that are relevant and valuable to Arctic communities.

The workshop participants came from the Arctic Athabaskan Council - Canada (AAC-Canada), the Aleut International Association (AIA), the Inuit Circumpolar Council - Canada (ICC-Canada), and the Association of World Reindeer Herders - Greenland (WRH-Greenland), bringing a wide range of knowledge, experiences, and perspectives to the table.

Over the course of five sessions, participants highlighted the effects of permafrost thaw and related impacts on health, food and water security, infrastructure, economy, education, and culture. The group did not shy away from thoughtful discussions about the tremendous uncertainty and risk in the region, the role of colonialism in constraining resilience, and perceptions of the term resilience itself.



Rural Utility Collaborative (ARUC), shared information on the services ARUC provides to member communities, helping shoulder the burdens of water and sewer plant operation and maintenance by pooling resources.

The key messages from this convening are clear:

- Current deficiencies in water and sanitation infrastructure in unserved and underserved communities endanger human and environmental health and lead to significant healthcare costs.
- Regulatory reforms are needed to streamline the process of accessing Infrastructure Investment and Jobs Act funding to invest in water and sanitation infrastructure.
- Additional investment and planning for operations and maintenance will be necessary to ensure the sustainability and equity of infrastructure investments.

The Arctic Initiative and Alaska Native Health Board will collaborate on a white paper that will provide a roadmap for using

the knowledge created during the roundtable to make concrete improvements in the lives of Alaskans.

[Decision-making must happen] as locally as possible, with local people having choices over what happens in their community. [To facilitate decision-making at the local level], finance will usually need to flow from central sources to local decision-making bodies and community groups. Finally, good governance which promotes resilient communities is governance which reflects the values and traditions of the community it is serving, recognising the ways in which decisions are made and conflicts resolved within each individual community."

—**Sarah Mackie** and **Rachel Westrate**, "The Role of Governance in Promoting the Resilience of Arctic Communities," *The Yearbook of Polar Law*

Arctic Frontiers Pathways

In May, Senior Fellows **Joel Clement** and **Jennifer Spence** attended Arctic Frontiers in Tromsø, Norway. At the conference, Clement and Spence met with representatives from several Arctic nations' foreign ministries to discuss climate

efforts underway during the Arctic Council pause. They also met with several Norwegian officials for an initial exploratory conversation about a Norway-led Arctic Council Chairmanship, and what that might look like in the wake of the

Ukraine crisis. Spence also participated in a panel on Arctic resilience organized by the Arctic University of Norway (UiT) and Bodo University.

The conference was preceded by a visit to Kautokeino, Norway, to meet with the World Reindeer Herders, the Initiative's long-time collaborators, and spend some time learning about daily life in the cultural center of Northern Sápmi. "We visited their mobile food kitchen, devoured a great variety of local cuisine, and visited a family's reindeer herd. We learned to lasso and work with reindeer before entering a family laavo for cultural presentations," recounted Clement. "Following the traditional herding route of our host, we then drove back toward Tromsø and crossed over the mountain pass in a snowstorm before arriving in Tromsø for Arctic Frontiers."



Joel Clement and Jennifer Spence visited the Boaššu Arctic Indigenous Peoples' Innovation FoodLab, part of the Arctic Council Sustainable Development Working Group's EALLU project.



MGH Division of Wilderness Medicine: Updates from the Field

By N. Stuart Harris, MD, MFA; Luke Apisa, MD; Lorenzo Albala, MD; and Brandon Berger, MD

Even before the COVID-19 pandemic, ensuring the health and wellbeing of Arctic residents posed unique. In 2021–2022, the Division of Wilderness Medicine at Massachusetts General Hospital and the Arctic Initiative, led by Faculty Affiliate Dr. **Stuart Harris**, deepened their clinical, research, and educational efforts in Alaska through several initiatives.

Risk Mitigation and Direct Medical Support to Climate Research Teams

Our division continues to provide pre-departure education, risk mitigation, and direct medical support for climate research teams with the Woodwell Climate Research Center. This summer, 2021–2022 Fellow Dr. **Luke Apisa** returned to the field with Sue Natali and the Polaris Project to support ongoing permafrost research in Alaska's Yukon-Kuskokwim Delta. Despite a COVID outbreak among the local Alaskan logistics team, all of the research staff were kept COVID-free and the research project was able to continue on schedule.

Alaska Native Health Partnerships

Our emergency physicians are expanding our direct patient care responsibilities with Maniilaq Health Service (MHS), a regional native medical center in the Northwest Arctic Borough. Our mission is to advance world-class care to wherever patients are in need. We will provide four physicians for a total of 5–6 months in Kotzebue during 2022.

Siamit, our collaboration with the Maniilaq Division of Social Medicine, continues to train the next generation of tribal health leaders. Together we are committed to advancing an American Indian and Alaska Native health equity agenda through responsive, equitable, and lasting community

partnerships. We continue to build on healthcare quality improvements together with local providers at Maniilaq Medical Center and seek to rapidly disseminate the latest medical advances throughout rural Arctic health centers.

Oftentimes, learning is best accomplished by doing – especially in high-stress, but infrequent medical emergencies. We have launched formal simulation initiatives to advance training in adult and pediatric critical care for local providers. 2019–2020 Fellow Dr. **Ashley Weisman** established a review of pediatric best-practice with providers at Maniilaq Medical Center. Dr. Apisa coordinated the regional EMS, fire, and hospital simulation resources to advance cardiac arrest resuscitation skills. These quality initiatives will continue this year under incoming fellows Dr. **Brandon Berger** and Dr. **Lorenzo Albala**.

Research

Our current research initiatives in Kotzebue include a project modeling COVID spread in the local population. A robust dataset has been collected by local surveillance groups, and our team is working with Maniilaq Medical Center to analyze patterns in COVID incidence and spread that might allow for better anticipation of future COVID case spikes with newer variants of the virus.

At the bedside—and using virtual care—Dr. Albala has developed ultrasound teaching classes and is seeking to assess the utility of virtual ultrasound instruction for rural providers with limited access to major academic centers. This work furthers our mission to ensure equitable access to the highest quality healthcare for all.

Arctic Ocean Governance: Cooperation with Russia After the Invasion of Ukraine



In February, Russia's invasion of Ukraine upended Arctic diplomacy and prompted the Arctic Council to pause all official meetings until further notice. Yet accelerating Arctic thaw—which is altering, perhaps irrevocably, the fragile ecosystems on which so many of the region's four million residents depend—demands collaboration with Russia, no matter the political implications.

In a May seminar organized by the Arctic Initiative, “Arctic Ocean Governance: Cooperation After Conflict?” **Andrey Todorov** and **Andreas Østhagen** tackled the thorny question of how to proceed with Arctic Ocean governance, turning to historical examples of cooperation in the Barents Sea and Bering Strait to offer possible paths forward. Arctic Initiative Senior Fellow **Fran Ulmer** moderated the talk.

Østhagen, Senior Researcher at the Fridtjof Nansen Institute and a Fulbright Scholar at the Wilson Center and Belfer Center, identified two key potential sources of geopolitical tension and conflict in the Arctic. First, because of Russia's geographically dominant position in the Arctic, as well as the Arctic's strategic importance to the Russian military, there are concerns that non-Arctic disputes could spill over into the Arctic.

Ocean governance issues represent a second potential source of tension. Certain ongoing disputes, such as the international disagreement over the legal status of the Northwest Passage and Northern Sea Route or shipping and fishery management disputes in the Bering Sea, are occurring in the same

geographic areas where there is increased military activity and tension between Russia and NATO. These issues could escalate into more serious conflicts if not addressed.

“These issues are not only about ensuring sustainable management of fish stocks. They also have an escalating, spiraling conflict potential, given the current security context,” Østhagen emphasized. “So you need to find mechanisms to alleviate that pressure . . . How do you take the tension out of small-scale incidents at sea so that they don't become outright conflict in the Arctic?”

According to Todorov, Arctic Initiative Postdoctoral Research Fellow, solving ocean governance issues will require cooperation with Russia, which alone accounts for 53% of the Arctic Ocean coastline. “[The Arctic] is a region with a lot of shared governance challenges that can only be addressed multilaterally. That doesn't mean that the Arctic Seven won't be able to proceed without Russia. But in my opinion, such cooperation—minus Russia—would have limited efficacy.”

The United States continues to conduct freedom of navigation operations (FONOPs) against Russian claims outside of (though in close proximity to) the Arctic . . . Given the significance of the Northern Sea Route and the Arctic for Russia in terms of its security and economy, coupled with growing tensions in the region, the blowback from future FONOPs could be much more frightening, with the potential to turn the Arctic into the new South China Sea.”

—Andrey Todorov, “Dire Straits of the Russian Arctic: Options and Challenges for a Potential US FONOP in the Northern Sea Route,” Marine Policy

Even during times of conflict, ample historical precedent exists for cooperation between Russia and other Arctic states on ocean governance issues. Despite the Russian annexation of Crimea in 2014, Todorov pointed out, Russia and the United

States still moved forward on a joint contingency plan for combating oil spills in the Bering and Chukchi Seas. Likewise, in the Barents Sea, Norway and Russia have successfully collaborated at the operational level on fisheries co-management, while maintaining dissenting opinions on issues like the legal status of the waters around Svalbard.

Though none of the panelists were optimistic that the Arctic Council would soon resume functioning in the same way it once did, they expressed hope that a pragmatic approach to cooperation between Russia and the Arctic Seven could be developed.

Østhagen pointed to his home country of Norway as an example: while Norway is following EU sanctions on Russia, it has safeguarded cooperation with Russia in certain areas, such as fishery management, search and rescue, and Svalbard. The current Norwegian approach is “not to expand cooperation with Russia,” said Østhagen, but to “stop the dominoes from falling—that is, to stop conditions in the Arctic from deteriorating even

further.” To this end, he recommended that Arctic states depoliticize governance structures and nip governance disputes in the bud by taking proactive measures to de-escalate and resolve them before they become major conflicts.

Ulmer acknowledged that the Ukraine crisis has had a “chilling effect” on scientific research in the Arctic, but predicted that there will be “considerable cooperation” between individual scientists “to the extent that it can avoid political entanglements.”

“People would very much like to return to the way things were at the Arctic Council table, but that’s not going to happen anytime soon,” said Ulmer. “Yet the Arctic Seven and the Permanent Participants have issues that they feel are sufficiently important to move forward with. I think there will be other ways, both multi-lateral and bilateral, to make needed progress.”

Watch a recording of the seminar at www.belfercenter.org/arctic/gov-seminar.

Interview with Andreas Østhagen, Visiting Fulbright Scholar



In May, the Arctic Initiative, in coordination with the Wilson Center’s Polar Institute, hosted Fulbright Arctic Initiative Scholar **Andreas Østhagen** for a six-week research exchange visit. An expert on Arctic security issues and ocean geopolitics with experience working on EU-Arctic affairs for the Norwegian

Government, Østhagen is a Senior Research Fellow at the Fridtjof Nansen Institute in Oslo, a Senior Fellow at the High North Center in North Norway, and a Global Fellow at the Wilson Center in Washington, D.C.

How do you view the European Union’s role in the Arctic?

When I worked for the North Norway European Office, decisionmakers in Brussels tended to picture the Arctic as ‘polar bears and ice.’ That’s not the case whatsoever in the Norwegian Arctic, where I’m from, which has half a million residents and highly modern buses and trains. The Arctic was seen as a one-dimensional place through the lens of climate change. That’s still a very important aspect of any Arctic policy, but it’s just one way of framing the region.

Since then, the EU’s Arctic interests and engagement have become more nuanced along many different dimensions.

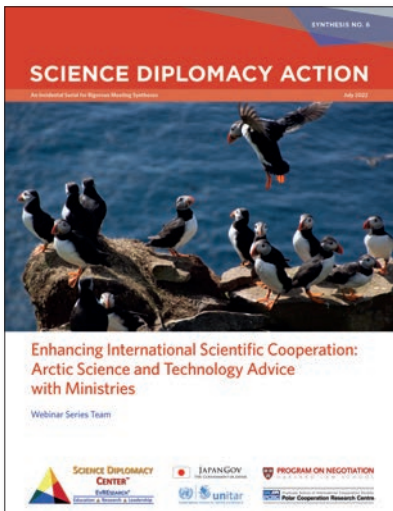
In many ways, the EU is trying to add value to its members states’ Arctic policies—to fill gaps that they can’t. So, on one hand, the EU is focusing on transborder issues, on finding ways to support northern communities across national borders. At the same time, the EU is increasingly focusing on geopolitics. Ultimately, it is part of the Arctic and has a role to play there.

What’s next for your research?

I will continue the work I was doing at the Belfer Center and the Wilson Center, focusing on differentiating the drivers of U.S. security policy across the Arctic—in Alaska, Northern Europe, and its strategic interests relating to China. Related to that, I’m also working on a book on Arctic geopolitics, writ large, after the invasion of Ukraine.

What has been the highlight of your time at the Belfer Center?

Being at the Belfer Center, I got to share corridors with scholars whose work I read as an undergrad. The purpose of Fulbright is exchanging ideas, so to be able to bring my specific Arctic knowledge and discuss it with experts from different fields and traditions—it’s been an interesting experience.



Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries

From February to March 2022, Arctic Initiative Senior Fellow **Fran Ulmer** and Research Fellow **Nadezhda Filimonova**, alongside leaders of international Arctic research organizations and Arctic Indigenous peoples' organizations, contributed to a three-part webinar series on international scientific cooperation in the Arctic. The dialogues continued despite Russia's invasion of Ukraine, underlining the importance of open science as a central interaction among great powers to both promote cooperation and prevent conflict.

The webinar series, entitled "Enhancing International Scientific Cooperation: Arctic Science and Technology Advice with Ministries," was funded by Japan's Ministry of Foreign Affairs, with logistic support from the United Nations Institute for Training and Research (UNITAR). It involved keynote speakers from both Arctic and non-Arctic states, including Finland, Germany, Japan, Norway, Russia, the United Kingdom, and the United States, with registered participants from 49 nations.

Paul Berkman, Faculty Associate with the Program on Negotiation at Harvard Law School and 2021–2022 Fulbright Arctic Chair, served as the webinar series' Chief Executive Officer. He received planning assistance for all three webinars from Filimonova, as well as Teruaki Fujii, a Master of Public Administration candidate at Harvard Kennedy School.

Ulmer delivered a keynote presentation during the third webinar, which examined how existing mechanisms to facilitate international scientific cooperation in the Arctic could be

improved and strengthened, including issues of education, scientific data integration and funding schemes. In particular, Ulmer identified a need to include more youth into Arctic research discussions and projects.

These dialogues will continue at the Arctic Circle Japan Forum in 2023. The insights from the webinar series were distilled into a Science Diplomacy Action report that will also help guide and inform the planning for the 4th Arctic Science Ministerial, with which Ulmer is involved.



"The International Arctic Science Agreement is intended to bring down barriers to access to the Arctic so that researchers, regardless of where they come from, have the opportunity to do necessary research in the region."

It's about opening up the doors and windows, it's saying we aren't going to artificially restrict the ability of the Arctic research community to do collaborative, cross-disciplinary, and cross-border research. That's different than the Arctic Science Ministerial's purpose, which is to focus the world's attention on what Arctic research is being done and where there might be potential synergies so that countries can work together."

—Fran Ulmer

Arctic Climate Week at Harvard Kennedy School

Rapid climate change in the Arctic has major, direct, and, too often, underappreciated impacts on Northern communities, economies, and ecosystems; on international economic and security relations across the region; and on the pace and patterns of global climate change. Raising public awareness of these impacts is an important part of the Arctic Initiative's mission. In November 2021, the Initiative hosted Arctic Climate Week at Harvard Kennedy School, with the aim of engaging the broader Harvard community in critical discussions about the future of the Arctic.

Day 1: COP26 Reflections and Arctic Energy Transitions

Freshly arrived from the UN Climate Change Conference (COP26) in Glasgow, Associate **Halla Hrund Logadóttir** kicked off Arctic Climate Week by sharing her reflections on COP26's unique mechanisms for climate cooperation. The Q&A, which was moderated by Initiative Co-Director **Henry Lee**, unpacked Greenland's commitment to the Paris Agreement and its relationships with Iceland, the United States, and China. Special note was also made of Iceland's participation in the COP26 and the successful negotiations to include oceans in the Glasgow Climate Pact.



Jennifer Spence and Joel Clement spoke about the work of the Arctic Council as it relates to enhancing the resilience of Arctic Indigenous communities.



Kennedy School students chat with Halla Hrund Logadóttir during Arctic Climate Week.

Day 2: Advancing Arctic Resilience Through the Arctic Council

On Tuesday, Senior Fellows **Jennifer Spence** and **Joel Clement** provided a comprehensive overview of the Arctic Council Sustainable Development Working Group's work on enhancing the resilience of Arctic Indigenous communities. They emphasized the importance of knowledge co-creation through the involvement of both scientists and Indigenous peoples in the development and implementation of Arctic Council projects.

Day 3: Arctic Ocean Challenges and Opportunities

On Wednesday, Research Fellows **Sarah Mackie** and **Nadezhda Filimonova** delved into the environmental, climatic, and economic importance of the Arctic Ocean for Arctic Indigenous communities—and even Bostonians. The conversation then turned to emerging economic opportunities and environmental threats related to the changes occurring in the Arctic Ocean, including the opening of the Northern Sea Route and the Northwest Passage, plastics in the Arctic Ocean, and the Central Arctic Ocean Fisheries Agreement.

Day 4: Arctic Film Night

In a welcome change of pace from the seminars earlier in the week, on Thursday attendees were treated to a short film about Indigenous throat singing, an animated retelling of a traditional Nunavut legend, and a brief teaser of a Russian film set in the Arctic. The evening's feature film, *Chasing Ice*, told the story of a scientific project to capture the speed of melting glaciers through photography. The stunning footage was a chilling reminder of the urgency of Arctic climate change.

Day 5: Arctic Environmental Security

During the week's final presentation, Associate **Douglas Causey** introduced the audience to the concept of Arctic environmental security, supported by concrete examples from Russia provided by Filimonova. A lively discussion about the interconnectivity of Arctic environmental security with issues of geopolitics, economics, climate change, and environmental protection ensued.

Reflecting on the week, Mackie and Filimonova were gratified to see so many HKS students excited about the Arctic and its future. "Arctic Climate Week gave us a wonderful opportunity to share what we do with a wider audience. It was fun to

engage with people both in person and online—and through academic talks, discussions and, more creatively, at the film night," said Mackie.

"Conversations at the workshop inspired students to reflect on Arctic and global interconnectedness in geopolitical, economic, and environmental aspects. It was an honor to be a part of this event, which created a friendly space for inclusive conversations on many crucial topics," added Filimonova.

Watch the seminar recordings at
www.belfercenter.org/arctic/climate-week.

Arctic Innovation Lab: Bright Ideas for the Future of the Arctic

What if we could repurpose oil and gas pipelines to supply remote Arctic communities with clean water? What if Arctic entrepreneurs could connect with investors and raise capital over an online crowdfunding platform? These were some of the novel solutions to Arctic challenges proposed by Harvard Kennedy School students during this year's Arctic Innovation Lab in January.



The event opened with remarks by Sara Olsvig, who stressed the importance of research, science, innovative solutions, and respectful and equal partnerships with Arctic Indigenous peoples: "In a world where power and influence stream south, we must all have the courage to, at times, go against the stream and make sure that Arctic development is based on the diversity and history we share in the region."

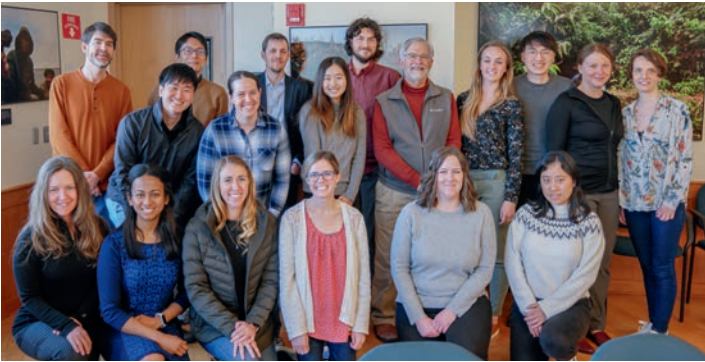
Since its launch in 2014, the Arctic Innovation Lab has given students from around the world the opportunity to pitch their solutions to challenges facing a changing Arctic. "We want to train students to think about solutions, to always have a solutions-focused mindset when approaching challenges in the Arctic or elsewhere," explained **Halla Hrund Logadóttir**,

Associate and Co-Founder of the Arctic Initiative. This year, an Arctic Innovation Lab served as the capstone to IGA-671M, "Policy and Social Innovation for the Changing Arctic," a week-long course taught by Logadóttir during the January term. Twenty-four students enrolled in this year's course, including students from Harvard Kennedy School, Harvard Medical School, the Graduate School of Arts and Sciences, and the Graduate School of Education.

Each student had just two minutes to pitch his or her idea for addressing a specific challenge facing the Arctic. The pitches were judged by a panel of Arctic experts, including **Sara Olsvig**, Member of Greenland's Human Rights Council; **Alice Rogoff**, Publisher of *ArcticToday* and Arctic Initiative Board Member; **Svend Hardenberg**, Founder and Chairman of Greenland Invest; **Marisol Maddox**, Senior Arctic Analyst at the Wilson Center's Polar Institute; **Terzah Tippin Poe**, Lecturer in Sustainability and Environmental Management at Harvard University; and **Cristine Russell**, Senior Fellow at the Belfer Center's Environment and Natural Resources Program.

Watch some of our favorite student pitches at
www.belfercenter.org/arctic/bright-ideas.

Students Build StoryMaps, Camaraderie at Arctic Data Stories Workshop



On March 29, 2022, students from Harvard and the greater Boston area traveled to Woodwell Climate Research Center for the final session of the Arctic Data Stories Workshop.

On a brisk Sunday morning in late March, nineteen students from Harvard and the greater Boston area boarded a bus to Woodwell Climate Research Center in Falmouth, Massachusetts, for the final session of the 2022 Arctic Data Stories Workshop. After weeks of lectures and group work, they were eager to present their interactive StoryMaps to an audience of experts on Arctic climate science, policy, and communication.

For the second year running, the Arctic Initiative teamed up with Woodwell Climate Research Center and Esri to host Arctic Data Stories, a workshop designed to let students explore geospatial data and policy while providing them practical training in ArcGIS software. Beginning in February, the participants devoted five Fridays to listening to renowned experts on Arctic climate science and policy, mapping, and science communication, including Woodwell's **Jennifer Watts, Darcy Peter, Stefano Potter, Greg Fiske, and Carl Churchill**; Esri's **Dawn Wright** and **Allen Carroll**; and Arctic Initiative Senior Fellow **Fran Ulmer** and Research Fellow **Nadezhda Filimonova**.

"The workshop's goal was to advance students' skills in communicating Arctic science for diverse audiences using storytelling and data visualization. My personal hope was for students to think of the ways they can apply the received

knowledge either in their studies or professional work and to become more involved with Arctic research," said Filimonova, the lead workshop organizer from HKS.

The students formed small groups to create StoryMaps, web-based narratives that contextualize geography, on an Arctic policy question of their choosing. Topics ranged from Arctic sea ice retreat to marine biodiversity conservation to the social impacts of permafrost thaw.

Equally diverse were the participants themselves: hailing from nine countries and a variety of backgrounds, this year's cohort included students from Harvard Kennedy School, the Graduate School of Arts and Sciences, the Graduate School of Education, Harvard Business School, and five other universities, as well as a high school science teacher, a children's book author, and an engineer.

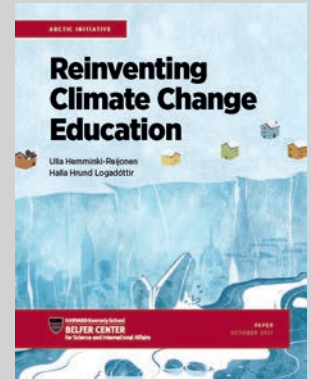
According to HKS student **Isaac Kim**, the breadth of professional experience within his group and the interdisciplinary nature of the workshop led his team to take a more holistic view of the Alaskan energy transition. "From consulting to research in rare earth minerals to innovative research technology, we each brought different perspectives to working through the issues related to a clean energy transition. These differences pushed our conversation to consider questions of justice for Alaskan Native communities, environmental impacts, feasibility of mining, and governance structures."

After two years of virtual learning and programming due to the pandemic, the workshop and visit to Woodwell's campus also represented a welcome opportunity to strengthen camaraderie between young scholars with a shared interest in the Arctic.

Brittany Janis, Arctic Initiative Associate Director and workshop co-organizer, said: "It was amazing to see the level of community and dedication that was built by the end of the workshop. It built a great community of young leaders who will hopefully keep collaborating long after their projects are done."

Reinventing Climate Change Education

After a successful Arctic Innovation Lab pitch, Research Assistant **Ulla Hemminki-Reijonen** received funding from the Arctic Initiative to develop her idea into a paper that reviews the changing world of climate change education and opportunities for adopting innovative pedagogical approaches. Below are her key recommendations:



CLIMATE CHANGE EDUCATION CHECKLIST

- ☐ Allow students to experience climate change instead of just asking them to read about it
 - ☐ Create an ecosystem of media
 - ☐ Be open for the opportunities with new technologies such as virtual reality
 - ☐ Instead of substituting old content with digital workflows, try to redefine the teaching
- ☐ Prioritize creative, cross-curricular, and participatory methods
 - ☐ Encourage cooperative relationships between faculty and students and student-led curriculum design
 - ☐ Promote exchange with scientists
 - ☐ Be open for unexpected collaboration; leave room for new innovations
 - ☐ Try flipped classroom method and encourage students' own explorations
 - ☐ Consider arts-based education as an approach
- ☐ Improve the systemic support and involve policymakers and educational institutions to collaborate

New Episodes of Northern Lights Student Podcast

The spring semester saw the release of three new episodes of *Northern Lights*, a student-produced podcast that showcases vibrant stories from and about the Arctic. The project was created by former Postdoctoral Research Fellow **Sarah Mackie** and launched in March 2021. Interview excerpts from the latest episodes are featured below.



Episode 15: Climate Change and the Arctic Food Web

Produced by Ulla Hemminki-Reijonen, Sarah Littlefield, Annick Steta, and Jenna Wu

“Arctic ecosystems systems are often described as fragile, but we’re finding

ways in which the Arctic is actually somewhat robust and malleable. It can absorb some change. However, at the higher levels of the food web, some species are very particular about what they choose to eat and will probably struggle to adapt. Other species have a much more plastic response to change.”

—Finlo Cottier, Scottish Association for Marine Science



Episode 16: Responsible Mining in the Arctic

Produced by Taylor Lam, Shashank Singh, and Nikolas Westfield

“In the Arctic, compensation [to mitigate the impacts of mining] is very difficult because of how closely natural resources are tied to the livelihoods of the people. The regeneration of these resources takes place over a very long period, and they provide a range of critical ecosystem services. So there are some specifics in the Arctic context which make us think differently than when we talk about mining in other parts of the world.”

—Jan Dusik, Sustainable Development Lead, Arctic Programme, World Wildlife Fund



Episode 17: Other Ways of Knowing

Produced by Allison Agsten, Lucy Montgomery, Emily Ostler, and Nathan Huey

“[Traditional Indigenous knowledge] is a systematic way of knowing based on close observations of and interdependence with natural systems over time.

The term ‘traditional’ may be interpreted as old, and perhaps outdated. But while much of our knowledge is indeed very old, it’s also revised continuously. In other words, what works, you keep. What doesn’t, you discard.”

—Anders Oskal, Secretary General of the Association of World Reindeer Herders

Listen to the full episodes at www.belfercenter.org/northern-lights.



HKS student Shilpa Joshi moderated a session on “Indigenous Resistance and Activism.”

Indigenous climate activists, particularly those in the Arctic, are leading the way to hold institutions of power to account even as their communities bear the brunt of climate change impacts. Yet the policy world and institutions like Harvard “have been slow to acknowledge and incorporate lessons from Indigenous climate leadership,” said **Vic Hogg**, MPP candidate and citizen of the Nottawaseppi Huron Band of the Potawatomi, in their opening remarks for “Healing Turtle Island: Indigenous Leadership Through the Climate Crisis.”

The daylong conference, hosted by Harvard Kennedy School’s Native and Indigenous Student Caucus with support

Healing Turtle Island: Indigenous Leadership Through the Climate Crisis

from the Arctic Initiative, brought together ten Indigenous leaders from across North America to speak to a hybrid audience of over 200 HKS community members. Speakers discussed how climate change uniquely affects Indigenous communities and highlighted examples of impactful activism led by Indigenous organizers.

In addition to a full day of engaging dialogue, the event also helped to build the network of young Indigenous leaders at Harvard. The Initiative was fortunate to identify several Indigenous students who are now working with us as research assistants.

Born Activists

A common theme across all three panels was how Indigenous people's lives and identities are inextricably tied to the land, often causing them to become activists by necessity.

Brook Thompson, a Yurok and Karuk engineering student and activist from California, recounted how a fish kill on the Klamath River during her early childhood created intergenerational trauma, exacerbated health problems in her community, and eventually motivated her water rights advocacy. "These aren't just some random salmon," said Thompson. "These are the salmon that my ancestors took care of and managed specifically so that me and my grandchildren could lead a healthy life."

Because environmental problems represent existential threats, "We don't have the privilege of turning our laptop off and then going and living our lives after 5:00 PM," said Darcy Peter, a Gwich'in Athabaskan citizen and Research Assistant at the Woodwell Climate Research Center's Polaris Project.

Indigenous Knowledge and Art Is Science

Throughout the day, the speakers discussed the many ways in which Western science is only just catching up with Indigenous knowledge. According to Darcy Peter, if Indigenous knowledge was "in the format of Western science, it would be the richest dataset in the world and people would utilize it."

"We see firsthand the changes happening in the Arctic," said **Alex Flaherty**, the Inuk owner and founder of Polar Outfitting. "A lot of people fly up here [to Iqalut] to do climate change research. Why can't we do it? We are the ones living here and seeing the impacts."

Seqininnguaq Poulsen, a Greenlandic Inuk artist and activist, emphasized that Indigenous art also incorporates Indigenous ways of knowing. According to Poulsen, it is a healing and accessible means of expression: "Art is an amazing way of communicating about climate change because it is so universal."



A Winning Native Rights-Based Approach

Indigenous people are on the front lines of—and winning—environmental fights all over the world. **Clayton Thomas-Müller**, Senior Campaign Specialist with 350.org and member of the Cree Nation, commented that Indigenous-led campaigns, many based on the assertion of food and subsistence rights, have helped halt major fossil fuel projects, such as the Jordan Cove Energy Project and the Northern Gateway Pipeline Project. **Donald Sampson**, Executive Director of the Confederated Tribes of Umatilla Indians, highlighted successful examples of tribal climate advocacy at the state and federal levels. **Nicholas Chischilly** and **Kevin Howard**, Wildlife Technicians with the Navajo Nation's Climate Change Program, shared how restoration techniques based on traditional knowledge led to improved ecological health in the communities they serve.

Though Columbia River Gorge Commissioner **Carina Miller**'s tribe, the Confederated Tribes of Warm Springs, reduced its reliance on natural resource extraction for revenue—practices that were both environmentally unfriendly and "not aligned with the tribe's values"—she warned that decoupling the economy and environment when tribes are constantly in "survival mode" is still challenging.

Learning Opportunities for Harvard

Multiple speakers identified ways in which Harvard could do a better job listening to and learning from Indigenous communities, including hiring more Indigenous faculty, properly crediting traditional Indigenous knowledge, and instituting classes on tribal government as part of HKS' curriculum. **Charitie Ropati**, a Yup'ik and Samoan advocate for Indigenous students' education, urged the professors in the audience to engage with Indigenous students: "Allow them to work with you, but also listen to them. You can learn a lot from Native youth."

Special thank you to Tess Kelly and Maya Pace for sharing their reflections. For additional resources, visit the event page at www.belfercenter.org/turtle-island.

Research Assistants **Spotlight**

The Arctic Initiative was honored to work with an outstanding team of Research and Course Assistants from across Harvard Kennedy School this year. Below, some of these talented students reflect on what they learned from their work with the Initiative.

RENATA KOCH ALVARENGA

Harvard Kennedy School, MPP Class of 2023

Project Focus: Impacts of Permafrost Thaw – Permafrost Pathways



“The Arctic Initiative is a big reference for me when it comes to work for ambitious climate action at the Harvard Kennedy School, and I was honored to be involved in the activities and brainstorming leading up to the launch of the Permafrost Pathways project, collaborating

with a multitude of stakeholders to address permafrost thaw in the Arctic with a special lens to climate justice.”

SARA AMISH

Harvard Kennedy School, MPP Class of 2022

Project Focus: Science Diplomacy



“Uncovering how science diplomacy has been present in the Arctic was incredibly fascinating and important work. I am grateful to the guidance of Fran Ulmer and Doug Causey in sorting out the lessons from history as well as how to take those lessons into the future. I

look forward to continuing to explore these complicated topics, only made more urgent by a warming climate.”

MIE DAHL

Harvard Kennedy School, MPA Class of 2022

Project Focus: Indigenous Youth Leadership



“I had the great opportunity of working with the Arctic Initiative on empowering and elevating the voices of Indigenous youth. I learned about the importance of intergenerational collaboration, and about the challenges and opportunities facing Indigenous youth today.”

WINDY DEWI

Harvard Kennedy School, MPP Class of 2023

Project Focus: Renewable Energy in the Arctic Region



“I had the invaluable opportunity to work alongside Professor Henry Lee and the other brilliant colleagues in the Arctic Initiative. Coming from a tropical country, Indonesia, this opportunity was my first exposure to a topic and geography that was completely outside my periphery. My

time at the Arctic Initiative has made me aware of the complex, foundational, and cross-cutting issues in the region’s energy security and sustainability, and the innovative policies required to tackle these unique challenges.”

VIC HOGG

Harvard Kennedy School, MPP Class of 2023

Project Focus: COVID-19 Impacts in the Arctic

“My work with the Arctic Initiative has involved researching the impacts of COVID-19 across the circumpolar region. I have learned so much about public health approaches across Arctic nations, particularly as they pertain to Indigenous communities. I’m grateful for the Initiative’s support in blending my research

assistant work with my personal and professional interests in Indigenous issues.”

GEMMA HOLT

Harvard Kennedy School, MPP Class of 2023

Harvard Graduate School of Design, MUP Class of 2023

Project Focus: Arctic Resilience Indicators & Monitoring

“Working with the Arctic Initiative has been an incredible opportunity to deepen my relationship with the region. Through workshops, conversations with project partners, and lively debates within the research team, the Initiative has pushed me to evolve my thinking on the complexities and challenges of the word ‘resilience.’”

CRAIG JOHNSON

Harvard Kennedy School, MPP Class of 2022

Project Focus: Arctic Security

“Working with Doug Causey and others within the Arctic Initiative has been the highlight of my time at HKS. Learning to balance the complex environmental, geopolitical, and legal dynamics was both invigorating and foundational to my future work in the area.”

ISAAC KIM

Harvard Kennedy School, MPP Class of 2023

Project Focus: Arctic Resilience Indicators & Monitoring

“This past year, I had the opportunity to work with the incredible Arctic Resilience Project team and Indigenous leaders and youth through the Arctic Resilience Discovery Workshop. I learned that co-creation with Indigenous communities is deeply layered and that this process requires challenges at each layer to be

collaboratively addressed.”

MAURO MORABITO

Harvard Kennedy School, MC/MPA Class of 2022

Project Focus: Arctic Resilience Indicators & Monitoring

“During the past few months, I got a glimpse into the inner workings of an extremely committed, respectful, inclusive, stimulating, and highly professional research community, which has been truly welcoming and steadfast in its anchoring to values I share. In my professional bridge from humanitarian work into climate

policy, I am deeply grateful to have learnt more about Indigenous resilience and research management and will continue to integrate these perspectives in my work.”

ROCK JIE TANG

Harvard Kennedy School, MPP Class of 2023

Project Focus: Impacts of Permafrost Thaw

“In this era of uncertainty, we need, more than ever, international cooperation and domestic governance frameworks to deal with permafrost thaw. It is not only a looming environmental justice crisis, but also a threat to the global carbon budget and the wellbeing of Indigenous people in the Arctic. We will continue to call for action from policymakers and mobilize global

expertise and resources to address this daunting variable in climate change.”

Arctic Initiative Contributes to COP26

The United Nations Climate Change Conference negotiations have critical significance for the Arctic—and vice versa. The Arctic is warming about four times the global average, with both regional and global consequences, and addressing these impacts guides the Arctic Initiative’s research and policy work. The Initiative was well-represented at the COP26 in Glasgow, Scotland, where our team and our collaborators participated in a variety of events and capacities.



- ◀ On November 2, during the first week of COP26, the Government of Greenland declared its intention to rejoin the Paris Agreement. Arctic Initiative Co-Founder and Associate **Halla Hrund Logadóttir** met with Greenland’s Prime Minister **Múte B. Egede**, who made Greenland’s announcement alongside Danish Prime Minister Mette Frederiksen.



- ▲ On November 8, **Fran Ulmer** participated in “Sustainable Development in the Arctic,” a panel hosted by Edinburgh University. **Viacheslav Fetisov**, UN Goodwill Ambassador, served as the moderator of the event, which focused on the challenges facing the Arctic due to rapid climate change.



- ◀ Several Harvard Kennedy School students also attended COP26, including **Samuel Gant**, a 2021 Arctic Innovator and Master in Public Administration candidate, and **Renata Koch Alvarenga**, an Initiative Research Assistant and Master in Public Policy candidate.



- ▶ On November 5, the Woodwell Climate Research Center, the Initiative’s close collaborator on permafrost thaw research and policy, and Woods Hole Oceanographic Institution hosted “Refreeze the Arctic,” a side event exploring appropriate climate ambition to keep the Arctic biophysical systems intact amid severe degradation. Logadóttir (right) is pictured with **David McGlinchey** (Woodwell), **Natalie Baillargeon** (Woodwell), **Pórdís Kolbrún R. Gylfadóttir** (Icelandic Minister of Tourism, Industry, and Innovation), and **Sue Natali** (Woodwell).

2022 Arctic Encounter Symposium



Fran Ulmer pictured with Senator Lisa Murkowski (R-AK) at the Arctic Encounter Symposium in Anchorage.

Douglas Causey, John Holdren, and Fran Ulmer all participated in the 2022 Arctic Encounter Symposium, which convened in Anchorage on April 7–8 after a two-year COVID-19 hiatus. The Symposium attracted nearly 700 participants from around the world. They included diplomats and elected officials, academics, business leaders, media figures, and Arctic-issue analysts from government agencies, research labs, and NGOs. Among them was an impressively large number of Indigenous leaders; the Ambassadors to the United States from Canada, Denmark, Iceland, Norway, and Sweden; the Permanent Secretary of Foreign Affairs of Greenland; the Premiers of Nunavut and the Northwest Territories; the Executive Director of the White House's Arctic Executive Steering Committee; the State Department's Coordinator for the Arctic Region; the Chair of the U.S. Arctic Research Commission; the U.S. Coast Guard's Commander for the Arctic Region; and many other luminaries including the Arctic Initiative's founding International Advisory Board member **Alice Rogoff**. Sessions focused on Arctic challenges and opportunities around economic development; climate change; community health, housing, and resilience; conservation; international diplomacy and collaboration; and the role of Indigenous people in Arctic governance.

John Holdren Awarded Highest Honor by National Academy of Sciences

On May 1, 2022, the National Academy of Sciences awarded Arctic Initiative Co-Director **John Holdren** the 2022 NAS Public Welfare Medal in recognition of his 50-year career in service to science, particularly his role as science advisor to former President Barack Obama. The medal, the Academy's most prestigious honor, is presented annually "to honor extraordinary use of science for the public good."

Dr. Eric Lander, President Biden's Science Advisor and White House Office of Science and Technology Policy Director, called Holdren "a fierce advocate for science-based solutions to the world's most pressing challenges," including the climate crisis, pandemics, and nuclear nonproliferation. "Few scientists alive today have contributed so much to how our nation supports and promotes the advancement of science and technology," said Lander.

Our heartfelt congratulations to Professor Holdren on this well-deserved honor.



John Holdren delivered an acceptance speech for the 2022 NAS Public Welfare Medal at the annual meeting of the National Academy of Sciences in Washington, D.C., May 1, 2022.

Leadership: Co-Directors



John P. Holdren is a Research Professor at Harvard Kennedy School and Co-Director of the Belfer Center's Science, Technology, and Public Policy Program. He retired in June 2021 from his roles as the Teresa and John Heinz Professor of Environmental Policy at HKS, Professor of Environmental Science and Policy in the Department of Earth and Planetary Sciences,

and Affiliated Professor in the John A. Paulson School of Engineering and Applied Sciences. He is also President Emeritus and Senior Adviser to the Present at the Woodwell Climate Research Center. Holdren is a member of the U.S. National Academy of Sciences, the U.S. National Academy of Engineering, the American Academy of Arts and Sciences, and the American Philosophical Society. From 2009–2017, he was President Obama's Science Advisor and the Director of the White House Office of Science and Technology Policy.



Henry Lee is the Jassim M. Jaidah Family Director of the Belfer Center's Environment and Natural Resources Program, a Senior Lecturer in Public Policy at Harvard Kennedy School, and Faculty Co-Director of HKS' Executive Education Programs on infrastructure. He also serves on the advisory board of HKS' Kuwait Program, and on the Presidential Committee on Sus-

tainability, advising Harvard University's president on the energy transition. Before joining HKS, Lee spent nine years in Massachusetts state government as Director of the State's Energy Office and Special Assistant to the Governor for environmental policy. He has served on numerous state, federal, and private boards and advisory committees on both energy and environmental issues. His recent research interests focus on China's energy policy, energy technology innovation, and public infrastructure projects in developing countries.

Brittany Janis Promoted to Arctic Initiative Associate Director



In April, **Brittany Janis** was named Associate Director of the Arctic Initiative. She will be responsible for facilitating the effective management and operations of the Initiative and building strategic relationships across Harvard and the Arctic to advance the Initiative's research and goals.

She has been part of the Initiative almost since its founding: while a student at Harvard Kennedy School (MC-MPA '19), she worked as a Research Assistant for the Initiative. In her former role as the Initiative's Research Manager, Janis was instrumental in leading the Initiative's research on advancing resilience in Arctic communities as an organizing leader of the Arctic Resilience Forum and developing policy solutions to combat plastic pollution in the Arctic Ocean, co-authoring the report "Policy and Action on Plastics in the Arctic."

In her expanded role, Janis is continuing her research focused on resilience in Arctic communities. She also leads the Initiative's student engagement efforts, giving her the opportunity to mentor the student Research Assistants who now work with the Arctic Initiative across its many projects.

"Brittany is the glue that has brought together faculty, fellows, students, and partners and forged them into one of the most effective research and convening institutions in the Arctic sphere," said Initiative Co-Director Henry Lee. "She is a leader, a mentor, and an organizer who makes everyone involved with the Initiative better."

Fellows, Affiliates, and Associates

Meet Jennifer Spence, New Senior Fellow



Jennifer Spence led an interactive mind-mapping exercise at the Arctic Initiative's "Advancing Arctic Resilience" workshop on March 30, 2022.

Jennifer Spence, one of Canada's leading Arctic experts, has joined the Arctic Initiative as a full-time resident Senior Fellow for the 2022–2023 academic year. Spence will substantially enhance the Initiative's capacity to address the future of Arctic governance—a critical issue in the wake of Russia's invasion of Ukraine.

Spence has been working with the Initiative as a non-resident Affiliate since 2021, while serving as Executive Secretary of the Sustainable Development Working Group of the Arctic Council and Adjunct Professor with Carleton University's Northern Studies Graduate Program. Prior to her work at the Arctic Council and CU, she spent eighteen years working for the Canadian government in senior positions related to resource, conflict, and change management; strategic planning; and leadership development.

Spence's expertise in sustainable development, international governance, institutional effectiveness, and public policy is complemented by a particular passion for working with Northerners to understand and respond to the opportunities and challenges facing the Arctic region. At the Belfer Center, she will help lead the Initiative's ongoing work on building Arctic communities' resilience to rapid socio-ecological changes, as well as related governance issues.

We sat down with Dr. Spence to talk about her career and her plans for the coming academic year.

Your career has taken you all over the world, including a stint as a safari lodge manager in South Africa. What sparked your interest in the Arctic?

While my life path may seem a little circuitous, there are a couple common threads—building strong relationships, empowering local peoples to take policy action that meets their needs and interests, and trying to recognize the interconnections between policy issues and advancing change. All these things brought me to the Arctic—a unique, innovative governance space where Indigenous peoples are leading the way on a wide range of big policy challenges. It's a region that really demonstrates that how policy is developed is as important (and sometimes more important) than what the policy solution is.

You have a degree in conflict management and nearly two decades of experience working on related issues for the Canadian government. How can we keep cooperation in the Arctic moving forward during a time of geopolitical crisis?

Unfortunately, recent events have demonstrated that Arctic cooperation is not immune from global geopolitics. But there is no shortage of important work to do in the Arctic. Conflict brings challenges, but it can also be an opportunity to see beyond the status quo and find new, innovative solutions. What we need to focus on now is supporting the peoples of the Arctic as they lead efforts to advance their priorities, whether that be locally, nationally or internationally. Cooperation in the region may need to change, but it should not stop.

What led you to join the Arctic Initiative as a Senior Fellow?

Over the last 25 years, I have worked on public policy in government, in academia, and in close collaboration with Arctic Indigenous peoples, who have the critical knowledge and experience to find policy solutions to the challenges facing the Arctic and the globe. However, the links between these three worlds can be weak. I am happiest as a "translator"—that is, when I have an opportunity to bridge the gaps between these worlds. I think this makes for better policy. The Arctic Initiative is committed to this bridging function and is focused on

critical policy issues that I am incredibly passionate about. I can think of no better team with which to continue this important work.

What will you be focusing your research on in the coming year?

I have specific work planned in four areas: 1) a collaborative project with Indigenous communities, NGOs, and research institutions to develop community-relevant indicators and tools that accelerate social-ecological resilience in the North American Arctic in the face of rapid climate change; 2) contributing to the Permafrost Pathways project; 3) a special journal issue dedicated to understanding the unique experiences and conditions of COVID-19 in the Arctic; and 4) the future of Arctic governance—a topic that is near and dear to my heart.

Share an interesting story or experience you have had while working in the Arctic.

It's tough to pick one. For me, it's about the people. From Dawson to Iqaluit, Akureyri to Umea, Tromsø to Salekhard, I've heard amazing stories from, shared spectacular food with, and seen the passion and dedication of so many people that live in and care deeply about this region. I am honored to call many of them dear colleagues and friends. That said, I recently had the pleasure of racing reindeer with [Initiative Senior Fellow] Joel Clement near Kautikeino, Norway. I won't mention who won.

SVEN MATHIESEN



Editor's Note: Jen totally won.



Douglas Causey is an Arctic Initiative Associate, Professor of Biological Sciences at the University of Alaska Anchorage (UAA), and Principal Investigator of the U.S. Department of Homeland Security Arctic Domain Awareness Center of Excellence. He previously served as a Belfer Center Senior Fellow and a Senior Biologist at the Harvard Museum of Comparative

Zoology. An ecologist and evolutionary biologist by training, he has authored over 200 publications on the environmental correlates of Arctic climate change.



Joel Clement is an Arctic Initiative Senior Fellow and a science and policy consultant with a background in resilience and climate adaptation, landscape-scale conservation and management, and Arctic social-ecological systems. As Director of the U.S. Interior Department's Policy Office, he led a team of policy analysts and economists, provided advice and analysis to White House

leadership and two Secretaries of Interior, and developed innovative policies to address landscape conservation needs.



N. Stuart Harris, M.D., is an Arctic Initiative Faculty Affiliate, founder and Chief of the MGH Division of Wilderness Medicine, and the Director of the MGH Wilderness Medicine Fellowship. He works as a full-time attending physician in the MGH Emergency Department and an Associate Professor of Medicine at Harvard Medical School. Working with colleagues

in Kotzebue, Alaska, he helped found Siamit to learn from and contribute expertise to community care in remote Alaska Native communities.



Halla Hrund Logadóttir is an Associate and Co-Founder of the Arctic Initiative and the Director-General of Iceland's National Energy Authority. She teaches "Policy and Social Innovation for the Changing Arctic" at Harvard Kennedy School and co-curates the World Economic Forum's Arctic Transformation Map. In her native Iceland, she serves on the advisory board to

Iceland's Minister of Industry and Commerce on Iceland's Energy Fund and chairs the Arctic Innovation Lab.



Lorenzo Albala, M.D., is an Emergency Medicine Physician at MGH. Raised in a rural mountain town in Northwest Italy, he completed a Master's degree in Biomedical Engineering before continuing on to Harvard Affiliated Emergency Medicine Residency. He has worked as an instructor for medical student courses and has developed novel resident physician wilderness

medicine curricula. His current work leverages digital media to foster safety and respect for austere environments.



Cristine Russell is a Senior Fellow at the Belfer Center's Environment and Natural Resources Program and a former Adjunct Lecturer in Public Policy at HKS. She is an award-winning freelance journalist with four decades of experience covering environment, public health, and STEM issues for news media outlets such as The Washington Post, Scientific American, and

The Atlantic. She previously served as President of the Council for the Advancement of Science Writing and the National Association of Science Writers.



Luke Apisa, M.D., is a Fellow at the MGH Division of Wilderness Medicine. He works closely with the Alaska Native Tribal Health Consortium to provide medical care to the Inupiaq people of northern Alaska, where he is leading quality initiatives to improve outcomes in critically ill patients at Maniilaq Medical Center. His current research initiatives include modeling of

COVID transmission in rural Alaskan communities and the human health effects of permafrost thaw.



Fran Ulmer is an Arctic Initiative Senior Fellow and the Chair of The Nature Conservancy's Global Board of Directors. She was appointed by President Obama as the chair of the U.S. Arctic Research Commission from 2011–2020 and served on the National Commission on the bp Deepwater Horizon Oil Spill. From 2007–2011, she was Chancellor of the University of

Alaska Anchorage (UAA). She served as an elected official for 18 years as the mayor of Juneau, a state representative and as Lieutenant Governor of Alaska.



Nadezhda Filimonova is an Arctic Initiative Research Fellow, a PhD candidate at the University of Massachusetts Boston, and an affiliated scholar at the Institute for Advanced Sustainability Studies. She holds Master's degrees in Political Science and International Relations from Uppsala University and St. Petersburg State University. The recipient of numerous fellow-

ships and awards, she has also authored several peer-reviewed publications. Her research explores urban climate change governance in the Arctic.



Sarah Mackie is a former Arctic Initiative Research Fellow. She holds a law degree from the University of Cambridge and an LLM in environmental law from Newcastle University. A qualified lawyer, she has worked as a Judicial Assistant for the Lord Chief Justice of England and Wales. Mackie recently completed a PhD on comparative environmental law in the Arctic, with a

particular focus on endangered species protection across Arctic jurisdictions.



Andrey Todorov is an Arctic Initiative Research Fellow and a Fellow at the Primakov Institute of World Economy and International Relations at the Russian Academy of Sciences. He holds a PhD in Law from the Moscow State Linguistic University and worked in the Legal Department of the Russian Ministry of Foreign Affairs. His current research focuses on identifying opportu-

nities for enhancing U.S.-Russia cooperation on shipping regulation in the Bering Strait Region.



From Noorvik to Cambridge: The Arctic Initiative Welcomes Summer Project Coordinator

Harvard College alum Wilfried Kuugaraq Zibell joined the Arctic Initiative in June as a Project Coordinator, where they will support the Initiative's research on permafrost thaw and involvement in the Permafrost Pathways project until October 2022.

Zibell earned a BA in Comparative Literature and Near Eastern Languages and Civilization from Harvard College in 2021. Having grown up in the Iñupiaq village of Noorvik, Alaska, they also bring to the Initiative a lifetime of personal and practical experience in the rural Arctic.

You graduated from Harvard College in 2021. Are you excited to return to Harvard for a little while?

Very! When I first moved to Cambridge from Noorvik, my home village, I felt like I was stepping into another world: everything from the way people talked to the speed of daily life was completely different from what I grew up with. Finding myself in an alien world, I had to carve out a home-away-from-home, so returning to Harvard really has felt like a homecoming. The realization that there are so many non-Arctic people here who care deeply about the region has filled me with a great deal of pride and hope.

Growing up in Noorvik, did you ever witness or experience the impacts of permafrost thaw?

At home, permafrost runs under pretty much everything. As it thaws, we are beginning to see changes in the landscape and in our daily lives. It has long been best practice to construct houses on the tundra on foundations of pillars driven deep enough in the ground to be resilient against ground thaw. Now that ground is no longer reliably frozen. A house that is insufficiently adapted to these changes is liable to shift with the melting ground, which causes stress to the building and can result in structural damage. In my childhood home, we had to hang blankets in front of our doors in the winter, because the shifting foundation misaligned the doors and let the cold in, a serious problem when the temperature can drop below -40°F.

What is a common misconception about Alaska you want to put to rest once and for all?

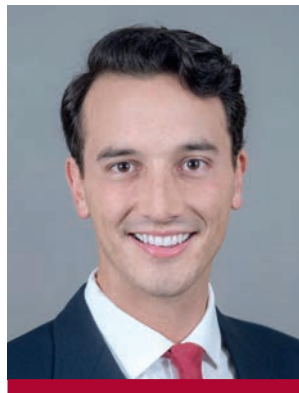
Some people I have met in the Lower 48 often have a very simplistic view of Alaska, both politically and culturally. They tend to think of it as either a wasteland or a backwater. This could not be farther from the truth! Alaska is one of the most culturally diverse places in North America. Nearly half of all Federally Recognized Tribes are located in the state, and Anchorage is, by some metrics, the most diverse school district in the country. Alaska isn't the middle of nowhere, it's the center of the universe.

Staff



Amanda Sardonis is the Associate Director of the Belfer Center's Environment and Natural Resources Program (ENRP). She oversees the program's day-to-day activities and keeps ENRP focused on its research mandate: analyzing and developing policies that are sustainable in a world constrained by climate, security, energy, and economic development concerns. She also manages

the Roy Family Award for Environmental Partnership.



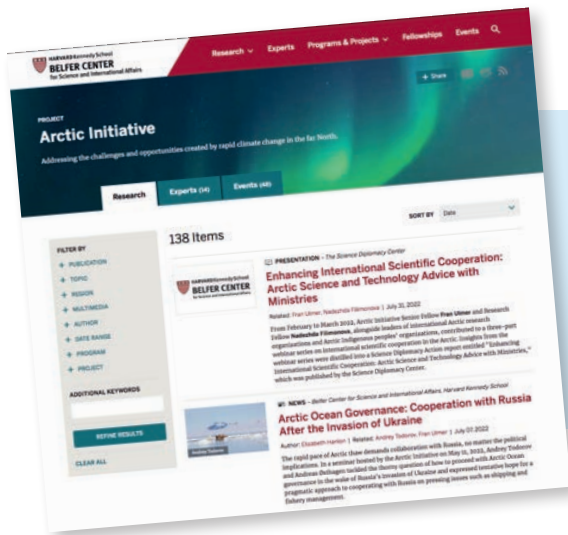
Daniel Bicknell is the former Arctic Initiative Interim Research Manager. In January 2021, he joined the Brookings Institution as a Senior Project Manager at the Center for Sustainable Development. He previously worked at Partners in Health, Peace Corps Response-Peru, the U.S. Department of Energy, and Marstel-Day LLC.



Karin Vander Schaaf is the Administrative Coordinator of the Belfer Center's Science, Technology, and Public Policy Program (STPP) and provides faculty assistance to Professors Venkatesh Narayanamurti, John Holdren, Jim Waldo, Afreen Siddiqi, Bruce Schneier, and Halla Hrund Logadóttir. She is passionate about the environment and is a member of the HKS Green Team.



Elizabeth Hanlon is the Communications and Outreach Coordinator for ENRP and STPP. She provides communications, event, and research project coordination support for both programs, including the Arctic Initiative. Prior to HKS, she worked in publishing and sustainable development, both in her home state of Massachusetts and abroad.



New Publications

This year, members of the Arctic Initiative published over a dozen papers, journal articles, analyses, and opinion pieces in outlets such as *Marine Policy*, *The Hill*, *Physics Today*, and *ArcticToday*.

Explore the full list of our publications at www.belfercenter.org/arctic/pubs.





Arctic Initiative

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