



HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

44th PARLIAMENT, 1st SESSION

Standing Committee on Science and Research

EVIDENCE

NUMBER 088

Tuesday, May 28, 2024

Chair: Ms. Valerie Bradford



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• (1135)

[English]

The Chair (Ms. Valerie Bradford (Kitchener South—Hespeler, Lib.)): I call this meeting to order.

Welcome to meeting number 88 of the House of Commons Standing Committee on Science and Research.

We have some concerns about audio feedback. Before I begin, I'd like all members and other in-person participants to consult the cards on the table for guidelines to prevent audio feedback incidents. We have to protect the hearing of interpreters. Only use an approved black earpiece. When you're not using your earpiece, please put it on the sticker provided on your table.

Thank you for your co-operation.

Today's meeting is in a hybrid format.

Before speaking, please wait until I recognize you by name.

For members in the room, please raise your hand if you wish to speak. For members on Zoom, please use the “raise hand” function. The clerk and I will manage the speaking order as best we can, and we appreciate your understanding in this regard.

As a reminder, all comments should be addressed through the chair.

Before we start with the opening speeches—

Go ahead, Monsieur Blanchette-Joncas.

[Translation]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Madam Chair, if you seek it, you will find that there is unanimous consent to change the deadline for the submission of briefs in the context of our most recent study of the distribution of funding among Canada's postsecondary institutions.

It was supposed to be 5 p.m. on Friday, May 24, but there was a miscommunication and some members of the committee thought it was 5 p.m. on Monday, May 27. I therefore consulted my colleagues, and they gave me their support.

[English]

The Chair: Do we have unanimous consent to allow those additional ones who were misinformed to submit documents that will be accepted?

Some hon. members: Agreed.

The Chair: That's great. Thank you very much.

Now we'll move on to opening statements.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Tuesday, January 31, 2023, the committee resumes its study of science and research in Canada's Arctic in relation to climate change.

It's now my pleasure to welcome to the committee, from the National Research Council of Canada, Anne Barker, director, Arctic and northern challenge program, and Dr. Shannon Quinn, secretary-general.

From the Social Sciences and Humanities Research Council, we have Dr. Ted Hewitt, president, and Dr. Sylvie Lamoureux, vice-president, research.

You have up to five minutes for your opening remarks, after which we will proceed with rounds of questions.

Ms. Barker, I invite you to make an opening statement of up to five minutes.

[Translation]

Dr. Shannon Quinn (Secretary General, National Research Council of Canada): Madam Chair, thank you for inviting me to speak with you today about the National Research Council of Canada, or NRC, as part of this committee's study on science and research in Canada's Arctic in relation to climate change.

[English]

We would like to begin by acknowledging that the research activities of the National Research Council take place on the traditional unceded territories of many first nations, Inuit and Métis people. Today we are appearing here in Ottawa on unceded Algonquin Anishinabe territory.

We are inspired by the relationship that the Algonquin Anishinabe have with water, which is critically impacted by climate change. We look to the water as a means of understanding climate change, as its changes in state inform us in that regard.

[Translation]

We recognize our privilege to be able to conduct research and drive innovation on these lands. That is why we want to pay respect to Canada's indigenous peoples.

[English]

My name is Shannon Quinn. I'm the secretary-general of the National Research Council. In this capacity, I am responsible for advancing the Government of Canada's science, research and innovation agenda.

I'll tell you a few things about the NRC as a whole.

[Translation]

The NRC is one of the largest federal research organizations. It advances scientific and technical knowledge, supports business innovation and provides science-based policy solutions. The NRC's work is undertaken at facilities nationwide, and collaborations occur at other locations across Canada.

The NRC's scientists, engineers and business experts partner with a broad range of organizations, including governments, universities, colleges and Canadian industry. That way, scientific and technical achievements are not just confined to a lab; they find an application on the market.

[English]

The NRC's current strategic priorities, as reflected in our recently released strategic plan, are to advance research and innovation for the benefit of Canada. These areas—importantly, for the purposes of this committee—include climate change and sustainability, health and biomanufacturing, digital and quantum technologies and foundational research, primarily in the areas of astronomy and metrology.

I now turn to my colleague Dr. Anne Barker, director of the Arctic and northern challenge program, who will use the remainder of our opening remarks to speak specifically about Arctic research.

• (1140)

Ms. Anne Barker (Director, Arctic and Northern Challenge Program, National Research Council of Canada): Thank you for the opportunity to participate.

The creation of the NRC's Arctic and northern challenge program stemmed from a ministerial direction in 2018 to create a research program on the north.

Through extensive northern engagement, this program has been aligned with the needs of northerners—and endorsed by them—throughout its design, launch and delivery.

Now in year three, the program's vision, guided by northerners, is that the daily lives of Arctic and northern peoples are improved through applied technology and innovation.

Its objectives are that Arctic and northern peoples participate in the design, governance, delivery and dissemination of applied research to address challenges identified by them; and that northern research and development capacity is built and increased to solve pressing issues confronting northerners.

[Translation]

The NRC is investing over \$22 million over seven years in its Collaborative Science, Technology and Innovation Program, as part of the Challenge Program. NRC researchers and research facilities

will therefore be able to partner with northern territorial and indigenous governments, research institutions and industry. These projects will enable a sustainable economy and support a healthy future for Arctic and northern peoples within thematic research areas of housing, health, food and water.

[English]

We recognize that having more diverse teams leads to better research results, with complementary competencies coming together for added value in research. NRC recognized early on that funding alone was not sufficient to enable these research partnerships. Rather, we needed to also consider broad eligibility instead of a narrow definition of who can conduct research; changes to support northerners' participation in research development; flexibility in funding approaches; and adapting to the realities of undertaking research in the north, such as high travel costs, the need for honoraria for elders, translation and Wi-Fi costs, data storage capabilities, and development of local training opportunities.

In addition, in alignment with the Truth and Reconciliation Commission's call to action 57—

The Chair: I'm sorry. That's our time, Ms. Barker. You can bring forward some of those remarks in further testimony.

Dr. Hewitt, I now invite you to make an opening statement of five minutes.

Mr. Ted Hewitt (President, Social Sciences and Humanities Research Council): Thank you for the opportunity to address the committee, Madam Chair, as president of the Social Sciences and Humanities Research Council—or SSHRC, as we call it—and as chair of the steering committee for the tri-agency institutional programs secretariat, both of which work closely with the other federal research funding agencies on various Arctic-related research initiatives.

[Translation]

As you know, communities across northern Canada, many of which are indigenous, are among the most vulnerable to climate change. They are witnessing first-hand the devastating impacts a changing climate is having across Arctic ecosystems, livelihoods, health, indigenous culture and a traditional way of life that goes back several generations.

This reality reinforces the importance of research, including interdisciplinary work, to address the complex challenges faced in the Arctic. It also underscores the necessity for indigenous-led research to respond to locally defined research priorities.

[English]

SSHRC's current Arctic research initiatives build on the success of our past investments, such as those in ArcticNet and Sentinel North. These projects bring together scientists from various disciplines, with partners from northern communities, government agencies and the private sector, as well as international partners, to study the impacts of climate change in the Canadian north.

Through the tri-agency new frontiers in research fund, we are also aligned with the Scandinavian research councils' collective NordForsk's international research initiative on sustainable development of the Arctic to further promote large-scale interdisciplinary and collaborative research in the region. This international partnership includes Canada, the United States and several Nordic European countries.

[Translation]

Furthermore, through the New Frontiers and Research Fund, SSHRC will administer \$20 million over four years to create new knowledge for sustainable development in the Arctic. It will expand our understanding of how best to address complex climate change impacting Canada's north.

As a condition of joining the program, SSHRC stipulated that indigenous communities must be invited to participate in the design, development and leadership of any project deemed eligible for funding.

• (1145)

[English]

SSHRC also supports Arctic-related research through its core funding on such topics as climate change adaptation and mitigation, energy and resources, sustainable development, geopolitics, food security and many other areas. Between 2018 and mid-2023, SSHRC awarded over \$67 million in funding to support northern research, including on Arctic-related topics. These grants are administered at post-secondary research institutions across Canada, but notably at Yukon University, Nunavut Arctic College and Aurora College in the Northwest Territories.

[Translation]

As I mentioned, SSHRC understands that indigenous rights to self-determination, as they relate Arctic research, include leadership of, and governance over, research conducted in their communities. This commitment is reinforced through the Strengthening Indigenous Research Capacity initiative, a priority of the Canada Research Coordinating Committee. It affirms indigenous knowledge systems, approaches to learning and means of sharing knowledge.

We developed a new category of funding eligibility for indigenous not-for-profit organizations as part of our response to Call to Action 65 of the Truth and Reconciliation Commission Report.

[English]

There are currently 18 eligible indigenous institutions in this category. These include the Dechinta Centre for Research and Learning, the Inuvialuit Regional Corporation in the Northwest Territories and the Qaujigiartiit Health Research Centre in Nunavut.

Madam Chair, we're determined that northern researchers and communities, and the institutions that serve them, will play a central role in Arctic research, given the direct impacts climate change has on them.

[Translation]

I would be pleased to provide further insights into our Arctic-related research activities during the question and answer period.

Thank you.

[English]

The Chair: Thank you, Dr. Hewitt. We look forward to your testimony.

We'll now begin our first round of questions from the floor. Please be sure to indicate to whom your questions are directed.

We'll start with MP Lobb for six minutes.

Mr. Ben Lobb (Huron—Bruce, CPC): Thank you, Madam Chair.

I wanted to ask Ms. Quinn or Ms. Barker a question.

I was just looking at one grant that was received from Queen's University. You don't have to talk specifically about that one, but how do these work, generally?

Polar Knowledge Canada is the organization. The program name is the northern science and technology program. The location is Kingston, Ontario. That grant is \$450,000 for three years.

How does that work? You don't have to speak specifically about the one I just mentioned, but do the researchers do the research from Kingston? Do they work with the POLAR group? How does that work? How do the mechanics of all this work?

Ms. Anne Barker: I can take that question. I can't speak to Polar Knowledge Canada's funding, but for the program—

Mr. Ben Lobb: It's funded through the Government of Canada, though. It's a grant through the Government of Canada.

Ms. Anne Barker: Yes. However, grants and contributions have many different types of terms and conditions.

Within the National Research Council and our Arctic and northern challenge program, the direction really comes from northerners. You could have an organization, like Queen's or another university, that may be the project lead. Generally, that is often due to capacity limitations in the north, so a northern organization may choose to have a university partner, for example, within our programs that helps administer the research, moves the funds and advances the research.

In other cases, it could be a northern-led organization. We have a number of projects, for example, with the NNC, the Nunavut Nukkiqsautiit Corporation, which is a Nunavut renewable energy company in the north. It is the lead applicant, but it has partnered with a southern-based university to support it in its research.

It's really on a case-by-case basis, depending on the capabilities, competencies and capacity.

Mr. Ben Lobb: For the granting councils, how many dollars per year are allocated to the Arctic?

Ms. Anne Barker: I can't comment on that. We're not a granting council in that respect. NRC's grants and contributions are there to enable NRC researchers in our facilities to come together with northerners in this particular program to advance research. We also have our industrial research assistance program, which provides funds for small and medium-sized enterprises.

I think maybe you can clarify if you're looking for the tri-councils in terms of funding, in which case I would need to defer to colleagues.

• (1150)

Mr. Ben Lobb: I just have one other question, and anybody can grab it.

We've heard from a lot of people who have talked about the coordination of efforts in the Arctic, and I think that's a fair question, a fair request.

If you go through the dollars that have been allocated up there, there are a lot of dollars spent studying caribou, which is important, and there are a lot of dollars spent in different regions studying shorelines, water and ice, and not just in one spot; obviously, it's a massive area. How's all that coordinated? How do you prevent duplication? How do we do that?

Is there one person you can go to, one place, and they say, yes, we have it? Is there a machine behind the scenes that's making all this work?

Ms. Anne Barker: I'd say at this point that we do not have that level of coordination, in my opinion. Our funds tend to help with some of that coordination, so we tend to be coordinated around funding sources.

However, there are networks of excellence that we've had in the past that help with some of that coordination to see who is doing what research. Across the north, all of our northern regions have research licensing approaches, and to perform research in these regions, you need to obtain a research licence. That also assists with coordination, because those who are seeing the research that's happening in their regions are being informed ahead of time about what may be coming and have the opportunity to comment.

Mr. Ben Lobb: Do I have any time left, Madam Chair?

The Chair: Yes, you have a minute and a half.

Mr. Ben Lobb: Thank you.

I know there are definitely limited relations at this point in time with Russia, which is a key contributor to all the pollution that takes place up there. In spite of that, is there contact with Russian Arctic researchers at all, or is there no relationship? Does anybody

know of the research that they're doing up there? Is there coordination with them or with anybody else, or is that completely off the table?

Ms. Anne Barker: Since the invasion of Ukraine, the National Research Council has not had any coordinated research with Russia. That has been stopped at this point.

Mr. Ben Lobb: Mr. Hewitt, do you have anything you want to add on all the questions that have been asked there?

Mr. Ted Hewitt: Yes. One thing that we would encourage as funders is the development of research programs, ideas and projects locally in the north. That may give an appearance of a lack of coordination, but we tend to emphasize very strongly that those projects be developed there and be undertaken there and led by communities in the north or institutions in the north, sometimes with the support of other institutions from southern Canada. That's increasingly the direction we're moving in.

We're also engaged in coordinated international efforts like our climate change mitigation call, with eight other countries and funding agencies and the NordForsk initiative, which is basically Canada and the U.S., I believe, and the Scandinavian countries. That would be a more coordinated approach internationally.

The Chair: Thank you. That's the time. You're bang on.

We'll turn to MP Jaczek for six minutes.

Hon. Helena Jaczek (Markham—Stouffville, Lib.): Thank you so much, Chair.

Thank you to all our witnesses for your testimony so far.

Ms. Barker, you talked about the vision specifically that you have in terms of the Arctic and northern challenge program, and you referenced that it would be guided by northerners, the daily lives of Arctic and northern people, and it would be to ensure that their lives were improved through applied technology and innovation. You mentioned some specific areas you were looking at, such as housing, health, food and water.

Could you give us some practical examples of some research that's been funded that has shown some practical recommendations for improvement and perhaps where these have actually been implemented?

Ms. Anne Barker: Certainly.

I will say that, as mentioned, this is only year three of a seven-year-long research program, so our projects are still under way. Our first suite of projects is shortly coming to an end.

These are projects that were developed under the Canada-Inuit Nunangat-United Kingdom research programme, which is a collaboration with United Kingdom Research and Innovation, Polar Knowledge Canada, Parks Canada, Fonds de recherche du Québec and Inuit Tapiriit Kanatami.

Some of those projects... For example, there's the Sikuttiaq project. Some of you may be aware of SmartICE. This project is looking at the effects of climate change on hunting routes over sea ice. It's partnering remote sensing with drone technology as well as on-ice evaluation of ice conditions to create safer ice conditions and safe passage for northerners as they are getting out onto the ice and onto the land. Again, all of this comes back into an application, with the data being owned and operated by SmartICE offices.

We have other projects. I mentioned working with NNC, the Nunavut renewable energy corporation. That is a project looking at very small-scale renewable energy technologies specifically for hunting cabins. Hunting cabins in the north are an essential part of livelihoods and a way of life, but they are often exempt from funding availability because they're not a primary residence. This project is looking at very small-scale hydrokinetic opportunities—wind, solar, as well as some retrofits—for hunting and what that could look like.

Similarly, we have projects looking at search and rescue. As climate change decreases sea ice conditions, we may see more search and rescue requirements. That is partnering the Canadian military and the Coast Guard with regional search and rescue auxiliary members and Rangers. They are coming together for stronger collaboration and coordination in the event that there are more search and rescue considerations.

We have other projects looking at the decreasing air quality, whether that's from wildfires, and what that does on a very engineering scale to your ventilation and your indoor air quality in homes, and what that looks like.

We're also working with the hamlet of Tuktoyaktuk in looking at planning. As we all know, that community is very much struggling with the effects of climate change. What do we do from a planning perspective for housing infrastructure?

These are the types of projects we have under way at the moment. We're looking forward to doing more starting in the coming years.

• (1155)

Hon. Helena Jaczek: Thank you.

As you said, you're in year three of a seven-year granting process.

Will you be evaluating the results in some way? In other words, will you be creating some sort of feedback loop to know, for example, that you're seeing progress on something, but you need to do something else in addition? Is that part of your mandate?

Ms. Anne Barker: Yes, it is, very much.

In addition to our internal processes within NRC, we have a mid-program review to see how things are moving along.

We're also doing a bit of a pilot project right now with Inuit Tapiriit Kanatami. For that CINUK program I mentioned, those projects will be coming to an end.

We also want to do an evaluation by the people that this research is supposed to be developed with and carried out with. What do they think of it? How did we do? Where can we improve?

We also have a program advisory committee made up of northern representation, including territorial science advisers and northern industry, to help us on our way. We meet twice a year with them to help correct our course and look at how things worked or did not work. All of that will be part of the process for the program.

Hon. Helena Jaczek: Do I have some time left, Madam Chair?

The Chair: Yes. You have a minute and six seconds.

Hon. Helena Jaczek: Dr. Hewitt, I'll follow up on where I think Mr. Lobb was going.

You're a member of the tri-council. What mechanisms are there to ensure that there isn't duplication between the various granting agencies for research, in this case in the north?

Ms. Barker talked a little bit about collaboration, networking and so on. Is there any sort of formal way of ensuring that there isn't duplication?

Mr. Ted Hewitt: I think that in the preparation of grants—and this is primarily where applications come from—individuals who are working in the north or with northerners develop proposals. They're doing some of that work from the start. If you're preparing a proper proposal, you're verifying, first off, that there aren't other people doing that. That's part of the peer review process that's undertaken after that.

When the applications come to the granting councils, the peer review committee, representatives from different disciplines and people who work in the north or have knowledge of that would certainly be assessing to see, right off, whether or not projects are duplicating earlier work. If they're not, that would certainly almost always indicate that a project was less worthy of funding than another, for not having caught that.

I think that's part of the key process that we all engage in.

• (1200)

The Chair: That's our time.

Thank you so much.

Now we will turn to MP Blanchette-Joncas for six minutes, please.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I welcome the witnesses who are here today.

My first questions are for Ms. Barker.

Ms. Barker, during your opening remarks, you stated that the National Research Council of Canada is the biggest research network in the country. Of course, it's a federal government organization.

I'd like you to tell me about government investments, more specifically about the \$22 million investment over seven years. Do you think this investment is enough, compared to investments received by countries located closer to the Arctic Circle?

[English]

Ms. Anne Barker: That's a good question.

However, we are performing research in a very particular area, which is applied science and technology and engineering. This is not the scope of all the research that is happening globally.

Of course, there are many different disciplines that need to come together for that research. I'm sure, as you've heard before, more funding would be wonderful. However, we can still be impactful with what we have.

[Translation]

Mr. Maxime Blanchette-Joncas: You're saying that federal government funding is insufficient for research in the Arctic, specifically.

What are the immediate and tangible consequences of underfunding northern research?

[English]

Ms. Anne Barker: In terms of underfunding of Arctic research, I suppose, in my opinion, there can be challenges in terms of who's filling that space to fund research. However, there are also opportunities, as I mentioned, such as the Canada–Inuit Nunangat–United Kingdom research program. By doing that collaboration, we tripled the amount of investment that we put in, because the United Kingdom was very interested in supporting climate change research.

There are also opportunities for partnerships, for bringing countries with similar priorities together.

[Translation]

Mr. Maxime Blanchette-Joncas: Have members of your organization already communicated with the department or members of the government to try and convince them to invest more into northern research?

[English]

Dr. Shannon Quinn: As a departmental corporation, we do benefit from significant appropriations. The National Research Council receives approximately \$1.5 billion in annual appropriations. This funds a vast array of scientific activities. To give you a flavour, we have 24 installations in 10 provinces, and we also support small and medium-sized enterprises so that we can also see innovation coming out of our small businesses across the country.

[Translation]

Mr. Maxime Blanchette-Joncas: Ms. Quinn, I think you misunderstood my question. My question was not in fact about determining the number of facilities or the amount of funding you received.

I will ask it again. Did members of your organization speak with members of the government to tell them the lack of money meant that Canada was unable to conduct research near the Arctic Circle?

In the eyes of our scientific colleagues from other countries, we look like we're uninterested because it's not a government priority.

Canada is unable to be as present as other countries located closer to the Arctic Circle in terms of scientific research activities and research intensity.

[English]

Dr. Shannon Quinn: In my own words, I would say that the activities that we're doing in the north are very significant, very impactful. Dr. Barker has already told us about a number of projects that are making a real contribution to the north. I think we have taken many opportunities to disseminate to all Canadians aspects of the research that we're doing in the north. However, more broadly, the research that we undertake in climate change in our labs across the country also has very significant implications in terms of what is offered to the north in technologies.

[Translation]

Mr. Maxime Blanchette-Joncas: Very well.

I will come back to the main point of my questions, which is funding. I don't doubt the effectiveness or the importance of the research you do. When we talk about countries located around the Arctic Circle such as Finland, Sweden, Denmark, Iceland and Norway, we are not talking through our hats. These countries invested more into research than Canada.

I want to understand why the federal government's biggest research network is underfunded. Do your scientific counterparts from countries located near the Arctic Circle talk to you about the fact that federal state funding is insufficient?

• (1205)

[English]

Ms. Anne Barker: I think we do talk about it.

There was a recognition in the 2018 ministerial mandate to create a research program on the north to take these funds to create this research. It should also be noted that the NRC does do a lot of Arctic research outside of our programs as well. We work very collaboratively with the military and the Coast Guard.

There is other funding happening. I suppose there's nothing to stop us from being one of many asking for additional funds. However, right now we feel quite fortunate with the funding that we've received to have a very dedicated, long-term funding program, which is also critical. Something that we don't often see outside Canada is that recognition of the time required for these research programs.

[Translation]

Mr. Maxime Blanchette-Joncas: Okay. I understand.

I'm also trying to understand the connection between your research and what the Chief Science Advisor wrote in the report entitled, "The Polar Continental Shelf Program and the Rapid Rise of Northern Research". It reads as follows: "Canada has one of the largest territorial claims in the Arctic. It should aspire to be a leader among circumpolar nations in terms of northern research ..."

What can you tell us on the matter?

Ms. Anne Barker: Could you repeat the question? Are you talking about the Arctic Council?

Mr. Maxime Blanchette-Joncas: Yes, that's it. What is the nature of your collaboration with the organization, specifically regards to the program?

[English]

Ms. Anne Barker: We do a lot of collaboration internally with federal government departments, academic organizations, Arctic and northern peoples and municipalities.

At an international level, we do coordinate in particular and by choice with the United Kingdom. In terms of the other polar nations, most of that is through networks, research dissemination and having conversations about how we can learn best practices from each other, because technologies and tools that may have been developed, as you mentioned, in Norway, Sweden and Finland may not work in the Canadian Arctic. They have access by rail to their northernmost regions. That's not going to be a factor for our regions, so we need to coordinate with them, understand how we can learn from each other and look at opportunities like CINUK to enable that international collaboration.

The Chair: Thank you.

We will now turn to Mr. Cannings for six minutes.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you all for being here today.

I'm going to turn to Dr. Hewitt.

SSHRC is one of the funding agencies, and you touched on the coordination aspect of that. It's not really an inherent thing; it happens organically through your funding processes.

You also mentioned a couple of other agencies or groups that may provide more of that coordination. I'm just wondering what part you play in them. One is ArcticNet, which, from what I understand, is a big network of people working in centres of excellence across the country and coordinating around the world.

What kind of role does SSHRC play in ArcticNet? Perhaps you could comment on ArcticNet and its role in coordinating Arctic research specifically about climate change, which is what we're talking about here today.

Mr. Ted Hewitt: The most important thing to remember is that we are funders of research that is developed almost exclusively by the individuals who are doing the research.

Big projects like that are themselves well coordinated. They've been put together, in some cases, over years. They've applied for funding either from us at SSHRC or through tri-agency mechanisms like the Canada first research excellence fund, and then they're adjudicated again by peer review. This is a way we help ensure there isn't overlap and that projects are undertaking the research they're intended to do.

We've also started to work more internationally on projects that will meet or speak to international priorities, which is the case with the competition I mentioned earlier. It's being organized by NordForsk, which is the representative body of the research funding

councils of the Nordic countries. Canada will be joining that, as we were invited to do. There will be specific questions and objectives, as I recall, from the NordForsk initiative that countries will be looking to put forward. We can provide you with some more information on that.

Our role is primarily as a funder of projects developed by the researchers themselves and, more and more, by researchers in northern communities, which is our objective overall. That's how we work as a funder.

• (1210)

Mr. Richard Cannings: Are there models or buckets of funding set aside for collaborative projects?

I used to be involved with projects that had researchers from a number of universities working together on a project that was funded by NSERC or whatever, all of them focusing on the same big question but coming at it from different angles. Does SSHRC have models for that kind of funding? Does that happen in the Arctic?

Mr. Ted Hewitt: We do indeed, and projects have been funded in the Arctic. I'm going to pass the mic to my colleague Sylvie Lamoureux, who can talk a bit about our partnership program and how that works.

Ms. Sylvie Lamoureux (Vice-President, Research, Social Sciences and Humanities Research Council): Thank you very much.

There are the SSHRC-specific programs and also the programs through the TIPS, the tri-agency institutional programs. Some of these are quite large.

As an example, in 2022 the Canada first research excellence fund awarded the Qanittaq clean Arctic shipping initiative over \$91 million. It is a partnership between Memorial University of Newfoundland and the University of Ottawa, but there's a host of other partners, so it's a very large, unique partnership. The Inuit Circumpolar Council was part of the co-development of that. That's, I think, a shift that we've seen in the past 10 or 15 years, with co-development of applications, co-construction of knowledge and co-publication. All of that is happening much closer together. That's one example.

In ArcticNet, we have nine SSHRC-funded Canada research chairs whose work is on the north. There are three NSERC-funded CERCs—Canada excellence research chairs—and Canada 150 research chairs. In the partnership in insight grants, we have some projects in French, which are on intercultural mediation and ontological conflicts in justice in Nunavik. There's also a scoping and “storying” project on food governance in Inuit Nunangat. There's a whole range of topics.

If you'd like, we can send you more information on these particular projects, on which ones are partnerships and the types of partners that are there.

I would just like to add with regard to NordForsk that when it seemed that we would be invited to join—because we had to be invited to join—the first thing the team did was reach out to ITK. This project is being led by a foreign organization, but we really want to work within our zone of control, to make sure to bring in ITK as quickly as possible and to see how we could influence the call that was eventually launched for this funding opportunity but, really, to work closely together. That's very important as well, because the relationship with indigenous partners is not necessarily the same when we work with some of our international partners, so I think it's an important role that the—

The Chair: That's our time. Thank you so much.

We now turn to MP Tochor for five minutes with our second round.

Mr. Corey Tochor (Saskatoon—University, CPC): Thank you very much.

Thank you to our witnesses for being here today.

Ms. Barker, you were talking about the different costs associated with research in the north, and we understand how cold it is in the north and the costs associated with keeping everyone safe and warm. You were cut off a bit when you were talking about those costs. Can you expand on those, the challenges of doing research in the north?

Ms. Anne Barker: Certainly.

For the research that the National Research Council has carried out in the north, we need to be mindful of the costs associated with doing things in the right way with our indigenous and northern partners. That could be costs to ensure that corporations, for example, have adequate data storage for large amounts of data that may be collected through fieldwork or observation studies.

Mr. Corey Tochor: Wouldn't that be the same in the south? What are the associated different costs in the north? We should be, as we know, consulting on all developments anywhere in Canada, so that's not the difference in the north. What are some of the other costs, though, that drive up the research?

• (1215)

Ms. Anne Barker: Some of those costs could be, for example, in community consultations. Those could include honoraria for working with elders in communities and bringing communities together to help decide on research priorities and how to advance those. Even just intercity or inter-hamlet travel costs themselves are phenomenally more than for the same type of research in the south.

Mr. Corey Tochor: For people in the north, what's life like right now with the cost of living?

Ms. Anne Barker: Pardon me?

Mr. Corey Tochor: What's the cost of living in the north right now? Is it up, flattened out...?

Ms. Anne Barker: I can't answer that question. I'm sorry.

Mr. Corey Tochor: That's why I think we need to do more research in the north, to understand what's going on. For how many years has the NRC been trying to find solutions for climate change, or for how many decades has NRC been working on climate change?

Dr. Shannon Quinn: I can't give you an exact number, but it is decades and decades. Of course, there are many aspects to this, and we look at very applied—

Mr. Corey Tochor: I'm going to run out of time shortly.

You've been working for decades and decades on climate change. What are some of the solutions? What are the top two solutions that this research has come up with to mitigate or stop climate change?

Ms. Anne Barker: There are a variety of things we've been looking at, including climate-resilient infrastructure and making sure that engineers and designers have the right data to have a better design life for buildings across Canada, not just in the north.

Again, we've been looking at tools and technologies to support northern communities so that they have better homes, and homes that are better able to withstand changing climatic conditions.

Mr. Corey Tochor: Roughly, how many of these new homes that the NRC has researched or put dollars into to find better designs have been built?

Ms. Anne Barker: You'd need to talk to all the housing corporations across the north, because they are responsible at a territorial level or an Inuit regional level for those constructions.

Mr. Corey Tochor: Is there also a housing crisis in the north right now?

Ms. Anne Barker: My understanding is yes.

Mr. Corey Tochor: It's terrible across Canada.

Earlier on, Ms. Quinn, you commented on all the impactful contributions this research has had in the north. Can you give us the top two research things that have changed people's lives in the north because of the funding through the NRC?

Dr. Shannon Quinn: I'm going to turn to Dr. Barker.

Ms. Anne Barker: Some of the more impactful research has been looking at things like heat recovery ventilators in homes, recognizing that in a southern landscape, these systems are certified, for example, to perform for so many days at -5°C. That's inadequate for the north, so we've been working very closely with manufacturers to install heat recovery ventilators in a northern context that will perform under the conditions that can be expected in that climate.

Mr. Corey Tochor: Have any actual solutions been brought to the market? Perhaps some of the things you recommended or discovered in the research have impacted lives.

Ms. Anne Barker: Yes. We're working right now with.... For all of our projects, we partner our industrial research assistance program individuals with these projects to look at tools and technologies that may come out of the research and could be moved over and brought to market.

Mr. Corey Tochor: They might come out, but what about existing solutions? We have decades and decades of research. What are some solutions that you've...?

These are all things that might be products in the future. How has some of the money spent on this research over decades contributed to change the lives of people in the north?

Ms. Anne Barker: This program has only been in place for three years, so I can speak about it. Right now, we're seeing off-the-shelf technologies that can be modified to perform in the conditions—

The Chair: We're out of time. Would you like to send a written submission to complete that answer?

Would you like that, Mr. Tochor? That's a yes.

Thank you. You can submit it in writing.

We're now going to turn to MP Diab for five minutes.

Ms. Lena Metlege Diab (Halifax West, Lib.): Thank you, Madam Chair.

Let me start by thanking our witnesses for being here today.

It's an interesting study. As members of Parliament, some of us, like me, have not been privy to a lot of experience in the Arctic. It's fascinating to hear what you're saying.

Dr. Barker, rather than have you send something in writing, I will let you continue what you were saying. You spoke about the pressing issues affecting northerners and the research program in the north with technology, innovation and research partnerships.

The question you were trying to answer was what research and technologies would be most beneficial to improve the lives of those living in Canada's Arctic. I'm going to let you continue. You didn't have a chance to finish this. Rather than have you send it in a brief, we can actually hear it here today.

• (1220)

Ms. Anne Barker: Another example would be looking at waste water treatment technologies. As many people know, water and waste water are critical across the north and in many regions in Canada.

In the past, NRC has worked to patent technology that could be used for waste water treatment technologies. We partnered with engineering firms to bring those to the north, still in a research context.

Right now, we have a project just getting under way in Yukon, looking at pipe systems and how we can ensure that our infrastructure, buried or otherwise, is robust and will be able to withstand the

impacts of climate change, and that it will have a good design life going forward.

Ms. Lena Metlege Diab: Thank you for that.

You talked earlier about heat recovery ventilators, and now the waste water treatment technology. I find it fascinating, specifically when you talk about waste water. I know that Halifax, in my home province of Nova Scotia, years ago had that issue in waste water and had done a lot of studies to clean up our harbour and so on. Obviously, a lot of that knowledge transforms to other parts. With the research that's happening there, I suppose a lot of it could be used in other parts, not just in Canada but everywhere else.

Can you speak a little bit about the knowledge and the research and the innovation? I know that it's only year three of seven, but how can we benefit the Arctic and perhaps other parts of the country as well?

Ms. Anne Barker: Certainly a lot of tools and technologies, if they're going to be applicable and useful in the Arctic for a very rural location, if you want to put it like that, will be beneficial elsewhere in our very large country, which has a lot of rural locations and environments.

In addition, we have found in the past that working with some industries, they are very interested in partnering with northern corporations or northern communities to test their products in that environment. If something is going to perform at, for example, minus 40 for five days in a row in the north, then it will probably work in Montreal. There are these types of opportunities.

Not every company or industry is interested in that, but there are many. There are many opportunities like that to see how the research we're doing in partnership with northern organizations can be brought to perhaps a larger market.

Ms. Lena Metlege Diab: Thank you for that.

Dr. Hewitt, with regard to NSERC as the funder, what have you been seeing in the last few years in terms of the research that is coming across your desks or through your offices? Is it increasing, is it decreasing or is it stable? I'd just like to know for our study here.

Mr. Ted Hewitt: I would have to answer anecdotally, but I've been around for a while.

This is for SSHRC, by the way, not for NSERC. I'll let Dr. Adem answer for NSERC.

I would say that it has increased steadily, in part because of our own policies, which have encouraged greater participation of indigenous communities and northern communities in research projects that are submitted to us. The range is just phenomenal—everything from legal and jurisdictional issues to language retention to community development.

There's a wonderful project we funded in Labrador, of \$2.5 million, looking at the impact of the forced migration of thousands of residents of that area, I believe starting in the 1930s and 1940s, who were absolutely spread to the wind throughout Labrador. The project was designed to help reconnect families that had been broken and to work toward restoring livelihoods, cultural products and goods, education and so forth. It's very well documented, and I'd love to share that.

Ms. Lena Metlege Diab: Thank you very much.

The Chair: That's wonderful. Thank you.

Now we will turn to MP Blanchette-Joncas for two and a half minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

Ms. Barker, I have a simple question for you: Based on your expertise, is Canada a world leader in northern research?

• (1225)

[*English*]

Ms. Anne Barker: Are we a leader in northern research? Certainly we have been. I think our experts, and again I'll come at it from an engineering and applied science context, have been sought after for many types of research projects. Our past expertise in oil and gas offshore research is now translating to offshore renewables, for example. We have the greatest experts in the world on sea ice and ice mechanics.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Canada is therefore no longer a world leader in northern research.

What do we need to do to re-establish ourselves as a world leader in northern research?

[*English*]

Ms. Anne Barker: We need people. We need people doing that research. We need to enable our northerners to also be recognized as experts in their knowledge systems as well as a more kind of typical western science. We need to share the word about what we do. A lot of that is communication and global scientific diplomacy, and getting word out about the great research we are doing here.

[*Translation*]

Mr. Maxime Blanchette-Joncas: I was sure you were going to tell me that money was needed. I'll say it for you.

Is there a national coordination strategy for northern research in Canada?

[*English*]

Ms. Anne Barker: At the moment, we do have DM and ADM working-level committees around the Arctic broadly. As I think I mentioned earlier, we have coordination around the various funding sources around Arctic and northern research, and we have a lot of coordination with our northern and indigenous partners, so it's coming together, but it is scattered.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Barker, what are the repercussions of not having a national coordination strategy for northern research?

[*English*]

Ms. Anne Barker: I think we do have coordination. We have an Arctic and northern policy framework. It is not a strategy; however, it does outline our goals and objectives as a nation for Arctic and northern endeavours. There is a science goal within there.

To my mind, we do have a rough plan. We need to expand on it. My understanding right now is that we're working on the implementation plan with our northern partners. I think that's the most important part: It's to have these conversations get to a point where we can have that strategy and implement it.

[*Translation*]

Mr. Maxime Blanchette-Joncas: How are scientists doing research in the north currently working together to share their research?

[*English*]

Ms. Anne Barker: I think there's quite strong collaboration across the north, and we see that also at a regional level.

For example, we have a project where the Nunatsiavut Government has asked researchers to come together at one time for on-the-land sharing of the science that is happening. I think there is quite a lot of collaboration and coordination at that level.

The Chair: Thank you. That's your time, unfortunately.

For the last round, we have MP Cannings for two and a half minutes.

Mr. Richard Cannings: Thank you.

I'm going to continue with Ms. Lamoureux.

I'll allow you to perhaps elaborate on where we were when you were talking about NordForsk and what that collaboration might look like. We talked about some of the big collaborative projects.

What will becoming a member of NordForsk do to how SSHRC operates, or what benefits will that bring to our research here in Canada?

Ms. Sylvie Lamoureux: By participating in NordForsk, SSHRC is contributing money for Canadian researchers, but it's tying us into a larger picture. By participating, we're also having an impact, influencing to make sure that indigenous voices and indigenous realities are considered as part of this. I think we're taking some of the good ways that we work with our indigenous partners and are showing these as a way to move forward. It's a way to coordinate on a specific call and have those opportunities come forth.

What is a little bit harder is something that our colleagues were alluding to, which is that we need time to create the relationships. I think those who already have existing relationships—through the different Canada research chairs and the existing funding opportunities like ArcticNet and different things that have come in the past—have a leg up on those who may be just starting relationships. The time frames might be too short.

However, I think it allows us to look together at a clear problematic situation that was chosen by NordForsk. I think it's a way to encircle that, and we're going to contribute as much as we're going to get out of this, but we'll be further than we are.

• (1230)

Mr. Richard Cannings: Thank you.

You mentioned involving ITK, Inuit Tapiriit Kanatami. How do they fit into the whole organizational structure of what you're doing in general, but in NordForsk in particular?

Mr. Ted Hewitt: If I can answer that, we've been working with them for many, many years. What it ensures is that communities are going to be directly involved in the development and shaping of that research and then—in response to other questions we heard earlier—in the kinds of solutions that this research will bring to those communities. This is increasingly the model that we're using in terms of funding: working with partners so that they benefit directly from the research that's done, regardless of where it's done.

One of the things I would add is that the fact of being asked by NordForsk to participate in this consortium indicates that we do have a presence, that we do have a lot to bring to research in the north. It was for that reason that we were invited to participate. I think that our researchers will benefit tremendously—and this is across all disciplines, by the way.

The Chair: Thank you. We've gone over our time, Dr. Hewitt, but that's a wonderful place to wrap up this panel.

Thank you so much to the witnesses—Ms. Anne Barker, Dr. Shannon Quinn, Dr. Ted Hewitt, and Dr. Sylvie Lamoureux—for their testimonies. We really appreciate that.

You may submit additional information through the clerk, and please see the clerk for any questions.

We'll suspend briefly now to allow our witnesses to leave, and then we'll resume with our second panel of witnesses.

• (1230)

_____ (Pause) _____

• (1235)

The Chair: Thank you very much. Welcome back.

It's now my pleasure to welcome our second panel of witnesses.

From Polar Environment Atmospheric Research Laboratory, we have Dr. Kimberly Strong, professor of physics at the University of Toronto.

From Polar Knowledge Canada, we have Andrew Applejohn, executive director, programs, and Dr. David Hik, chief scientist.

We give you up to five minutes for opening remarks, after which we'll proceed with rounds of questions.

Dr. Strong, I invite you to make an opening statement of up to five minutes.

Dr. Kimberly Strong (Professor of Physics, University of Toronto, Polar Environment Atmospheric Research Laboratory): Thank you.

I thank the committee for undertaking this study and for inviting me to speak to you about science and research needs in Canada's Arctic.

My name is Kimberly Strong. I'm a professor and the chair of the department of physics at the University of Toronto. I'm also an atmospheric scientist and the principal investigator of PEARL, the Polar Environment Atmospheric Research Laboratory. My group has been doing research at this location for 25 years.

I'm speaking on behalf of the PEARL science team, which includes colleagues from nine universities. We also have many partners across Canada and internationally, and we work closely with Environment and Climate Change Canada and the Canadian Space Agency. Work at PEARL is conducted under a scientific research licence from the Nunavut Research Institute.

The Arctic remains one of the earth's least understood environments, and yet it is a bellwether for climate change, a receptor for global pollution and a driver for the global climate system. Northern ecosystems, including ice, snow and permafrost; wildlife and vegetation; and marine systems are all linked together by our atmosphere. It contains the air we breathe and the protective ozone layer, it stores greenhouse gases, it's where weather happens, and it transports air pollution and wildfire smoke into the Arctic.

PEARL is a flagship observatory established in 2005 for tracking changes happening in the Arctic atmosphere and for determining the causes and global impacts. PEARL is located at 80° north on Ellesmere Island near the Environment and Climate Change Canada weather station at Eureka, Nunavut. For nearly 20 years, PEARL measurements have provided insight into an array of scientific policy and societal issues that are relevant to Arctic communities, Canada and the world.

PEARL's focus on long-term atmospheric measurements in the very High Arctic differentiates it from the research activities of the Canadian High Arctic Research Station at Cambridge Bay, from ArcticNet, from the Centre for Northern Studies, and the *Amundsen* icebreaker. We're all complementary in what we do.

PEARL is an important Canadian station in five international observing networks. As the most northerly permanent station for most of these networks and one of only a few in the Arctic, PEARL measurements fill a very large gap in their geographical coverage. PEARL is also a key site for verifying the data from satellite missions, including the upcoming high-altitude aerosols, water vapour and clouds mission, which will be Canada's contribution to NASA's multi-decadal atmosphere observing system.

PEARL offers exceptional educational opportunities and has trained more than 100 students, postdoctoral fellows and technical staff, most of whom are now working in government, academia and industry. Our outreach program has been active in six northern Nunavut communities through school visits, student researcher collaborations, and workshops for teachers.

PEARL is remote and isolated, accessible only by charter aircraft and the annual summer ship visit. The nearest community, Grise Fiord, is more than 400 kilometres to the south by air. PEARL is very different from a normal campus-based lab or facility located in a community.

The December 2023 report of the expert panel on the future of Arctic northern research in Canada highlighted PEARL as a unique and internationally important research facility. The report stated that “even where infrastructure is remote and where there are no nearby communities with which to partner, facilities such as [PEARL] represent critical elements of an effective research system and cannot go overlooked.”

Over the last 18 years, Canada has invested in PEARL infrastructure, operations, science and training. However, this investment is now at risk. PEARL needs stable funding that's attuned to being a unique facility in a unique location. Unfortunately, PEARL does not fit easily into any of Canada's major recurring funding programs. Many of the programs that previously supported PEARL no longer exist, and PEARL's last major grant ended in 2021. PEARL is currently running at a minimal level and will close this year if new funding is not secured soon.

Let me summarize my remarks with reference to the three points being assessed by the committee's study.

Number one, to understand the consequences and impacts of environmental change, we need to track changes over time. We need a long-term strategy for supporting Arctic research in Canada—a strategy that's inclusive of different approaches, including both indigenous and western science; a strategy that encompasses the many different components of the Arctic ecosystem, including the atmosphere, which sometimes gets left out; and a strategy that engages and reflects the needs of local, regional, territorial, national and international partners.

Number two, to fully participate in research, Arctic and northern populations need access to infrastructure, tools and funds. This is true of Arctic research in Canada generally. PEARL is just one example of a facility that's under pressure due to the lack of continuity and sustained operational funding. Establishing research capacity is a huge effort with long lead times. Losing that capacity can happen all too easily. We need sustained funding programs that recognize that research in the Arctic is challenging and expensive, and

it should not have a one-size-fits-all model. It should be recognized that not all Arctic research is conducted in communities.

Finally, number three, collaboration with local and indigenous communities is vitally important. However, factors like distance, travel costs and the effort involved in establishing and then sustaining those partnerships present barriers to meaningful collaboration.

This is even more difficult for facilities like PEARL, which don't have the advantage of being located near a community. We need mechanisms to bring together researchers and community members to build co-operative partnerships for long-term and sustainable Arctic research.

Thank you, again, for this opportunity to address the committee.

• (1240)

The Chair: Thank you. That was bang on the time. You crammed a lot of useful information into your five minutes. We appreciate it.

We're going to turn to Dr. Hik for five minutes.

Mr. David Hik (Chief Scientist, Polar Knowledge Canada): Hello. I'd like to thank the committee for holding this important hearing.

[*Translation*]

I'm pleased to be here today to provide comments on behalf of Polar Knowledge Canada.

[*English*]

My name is David Hik. I have served as the chief scientist at Polar Knowledge Canada for the past two and a half years. I am based in Cambridge Bay, or Ikaluktutiak, in Nunavut, at our headquarters in the Canadian High Arctic Research Station. I'm joined today by Andrew Applejohn, who is the executive director of programs.

The questions the committee is addressing in this study are both timely and important. The impacts of climate change in the Arctic are already evident and will have an impact on the rest of the country and the entire world. While the impacts of climate change are drastically affecting Arctic people, wildlife, infrastructure and the environment, the consequences of these changes are reverberating throughout the global climate system, influencing extreme weather, wildfires, the sea level and increases in temperatures, with impacts on communities across Canada. The importance of Arctic research at this time cannot be overstated.

Ensuring that northern and indigenous rights holders, organizations, communities and partners are directly involved in leading science and research relevant to the Arctic is essential for identifying solutions to address the many challenges facing this region.

In October 2007, the Speech from the Throne acknowledged the need to give greater attention to the Arctic by committing to the development of an integrated northern strategy. Included in this approach was the intention to build a world-class research facility in the Arctic to work on the cutting edge of Arctic issues, including climate change, environmental science, food security and resource development.

In 2019, 12 years later, the community of Cambridge Bay and the representatives of Canada and Nunavut marked the official opening of the Canadian High Arctic Research Station, or CHARS. While the primary focus of the CHARS facility is civilian, its infrastructure and strategic Arctic location can also support, when needed, emergency response or security efforts in the region. In fact, the Canadian High Arctic Research Station will be providing operational support for the Canadian Armed Forces' Operation Nanook again this summer.

POLAR's mandate, as established under the Canadian High Arctic Research Station Act, is to undertake and support locally relevant and globally significant knowledge creation. As an organization headquartered in the Canadian north, POLAR is fully engaged with northern communities, governments and organizations to ensure that the work it undertakes respects local priorities and returns meaningful benefits to the north.

POLAR conducts and supports research focused on climate change adaptation, mitigation and innovation by bringing together diverse groups of experts and, importantly, our northern partners. Three focus areas guide our work.

The first objective is ecosystem science, improving our knowledge of dynamic northern terrestrial, freshwater and marine ecosystems within the context of rapid change. Over the past decade, we've obtained detailed baseline information about these ecosystems, including rapidly changing abiotic elements such as permafrost, snow and sea ice.

Our second objective is to increase the understanding of the connections between northern community wellness and environmental health, including aspects of food security, sovereignty and safety. This "one health" approach recognizes that northerners will benefit from a better understanding of how changes in the environment affect the abundance and diversity of country foods, the impact of environmental contaminants, like mercury and microplastics, and the impact of diseases on northern wildlife. This is consistently a top priority for northerners.

Our third objective is to advance clean energy and cold climate infrastructure solutions for the unique conditions in the Arctic. For example, northerners have a great interest in cost-effective options for waste and water management, alternative and renewable energy solutions and building technologies designed for northern conditions. CHARS supports the testing of clean energy solutions, including energy storage, biofuels and advanced renewable energy

technologies by industry, government and academia prior to technology deployment in remote communities.

Polar Knowledge Canada is implementing programs and activities that support our science and technology goals and contribute to building capacity across northern Canada in several different ways. POLAR staff and operating funds are used to conduct research at CHARS in collaboration with researchers from other government departments, academia, communities and other countries. POLAR also provides grants and contributions aligned with our objectives to qualified recipients through open, competitive funding programs. In recent years, these calls have been co-developed with indigenous and northern partners to ensure that their priorities are being addressed.

High-quality Arctic research requires high-quality research infrastructure. POLAR is committed to supporting the development of Canadian research infrastructure that is essential to conduct Arctic research and international collaboration, and is committed as well to advancing respectful engagement with Arctic indigenous peoples.

• (1245)

Why does this matter? Research is critically important to understand the drivers, the societal and environmental responses, and the possible pathways to adapt to these changes.

The Chair: Thank you, Dr. Hik. That's your time. You can cover some of the rest of that in your testimony.

Thank you both for your opening statements.

We'll now open the floor for questions. Be sure to indicate to whom your questions are directed.

We'll start with MP Tochor for six minutes.

Mr. Corey Tochor: Thank you so much.

Thank you to our witnesses.

This is to the good folks at POLAR.

Climate adaptation versus mitigation is a growing issue, even in the Arctic and northern policy framework the government released. It noted that many stakeholders want the government to focus more on adaptation as opposed to mitigation. However, in the framework, the importance of adaptation does not really make its way in to any of its goals.

Would you support a recommendation for the government to place greater emphasis on concrete Arctic adaptation strategies in its official Arctic and northern policy?

• (1250)

Mr. David Hik: Well, both are important. The root causes of many of the environmental changes that are taking place are greenhouse gas emissions as a result of current energy consumption. Some of the impacts that influence people, infrastructure, economies and northern futures will require adaptation. That's certainly recognized in the north. Adaptation is a key part of how people live every day, since we recognize that those changes are already upon us in the north.

Mr. Corey Tochor: What are some historic Inuit adaptations using traditional knowledge to deal with the climate in the north?

Mr. David Hik: There is not only climate change but also variability from year to year in seasonality. That influences where people go to harvest, what time of year they go fishing or hunting for caribou in different places, and their understanding of the different landscapes or migratory pathways of species affected by the seasons or the conditions of sea ice.

People adapt to the local conditions. It's just that the reference point for what the future is going to look like looks very different from the past, and it's changing very quickly.

Mr. Corey Tochor: Tell us a bit about living in the north: the local economy—in terms of your mandate to advance knowledge of the Canadian Arctic to improve economic opportunities—environmental stewardship and the quality of life of residents and all other Canadians.

How much of your focus is on improving economic opportunities versus the other priorities?

Mr. David Hik: Some of those things go hand in hand.

There's a significant and growing mining industry in Nunavut. Some large companies have active mines or mines that are currently being developed. Those provide all sorts of opportunities for employment in northern communities.

Just on that—

Mr. Corey Tochor: I'm sorry. We're going to run out of time.

You were saying that mining activities are significant, but we've also heard that there are no new mines coming on. Is that accurate?

Mr. David Hik: I think there's a long lead time for exploration. There's certainly a potential for new mines to be developed.

What I was going to say is that in terms of our research, the significance of understanding what's happening to wildlife can influence the type of food sharing and harvesting opportunities for local economic development through cut-and-wrap facilities in the Kitikmeot region, where we are. That would add potential for local economic development associated with the harvesting of country foods.

Mr. Corey Tochor: I'll go back to some of the economic development going on in the north and things you may or may not have been aware of. It sounded in our earlier testimony that there has been some Russian activity in the north.

Are you aware of any prospecting currently going on in the north by Russia, by chance?

Mr. David Hik: I'm not aware of any Russian activity in the Canadian Arctic.

Mr. Corey Tochor: Have you been following the developments in the British Arctic territory and Russia's involvement at the other end of the globe?

Mr. David Hik: Do you mean in the Antarctic?

Mr. Corey Tochor: Yes.

Mr. David Hik: Yes. Currently, the Antarctic Treaty consultative meetings are taking place in India. Canada is currently applying for consultative party status in the Antarctic Treaty, so we're following developments closely. There have certainly been Russian interests in the Antarctic over a long period of time as a party to that treaty. I think that has implications not just for the United Kingdom but also for other consultative parties to the treaty.

Mr. Corey Tochor: Thank you so much for your testimony here today.

The Chair: Thank you.

We'll now turn to MP Longfield for six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Chair. Thank you to our witnesses.

I want to start with Dr. Strong.

I was able to get up to PEARL in 2019. I saw the research going on there and the number of universities that are involved, the University of Toronto being the lead of nine, as I think you mentioned.

It seems like PEARL has gone from NSERC grant to NSERC grant. It is doing longitudinal studies that are giving us changes over time in the atmosphere, now picking up on forest fire implications, looking at droughts and floods and atmospheric conditions that are changing in terms of moisture in the atmosphere. It is really important work that seems to be reliant on short-term funding, and now you're in a precarious situation.

What's your current ask to try to keep the doors open?

• (1255)

Dr. Kimberly Strong: Thank you, Mr. Longfield.

Our current ask right now, our submission to the pre-budget consultations, was \$15 million over six years. That's about \$2.5 million a year to do the science and also to give us the funding to be able to resume the program that we had with some Nunavut communities. Funding of \$1.5 million per year would kind of keep us going at a baseline level, but \$2.5 million is really what we had some years ago, and that's really what we would like to have to enable us to do all the science, plus more than science with northern communities.

Mr. Lloyd Longfield: In terms of the science research, there are new funds now going into other parts of the Arctic .

Dr. Hik, in terms of your organization's involvement with an organization like PEARL, is there a communication path there, or is there opportunity there? I'm not asking you to approve funding at the table, but that doesn't seem like a lot of funding to do some very important research in Canada.

Mr. David Hik: I've worked with Dr. Strong for many years, and so we have good lines of communication. We're certainly aware of the valuable work that's been conducted at PEARL over the last couple of decades. The Arctic's a big place, so we're working together to expand some of the observational capabilities that exist at PEARL and at CHARS, the Canadian High Arctic Research Station. It will give us a better understanding of the dynamics of the whole Arctic system.

In that context, we're supporting the research work, but the work at PEARL itself, as Dr. Strong indicated, given how remote it is, has additional requirements that are over and above how remote we feel in Cambridge Bay. It's just that much further into the Canadian High Arctic to maintain those operations.

Mr. Lloyd Longfield: You've highlighted one of the challenges that PEARL is quite far north of any population base. The Inuit don't go that far north. There are certainly not a lot of voters in that part of the territory.

Dr. Strong, in terms of governance for PEARL, the University of Toronto has taken the lead and really kept the organization going over the last year, when there's been a funding gap, but the University of Toronto doesn't qualify to support all of the universities up there in terms of governance.

Could you maybe talk about Arctic research having to be a collaboration of governance? How can we look to our study to support the collaborations that are required to do effective research?

Dr. Kimberly Strong: With PEARL, we really got started back in 2003, 2004 and 2005, when we got funding from the Canada Foundation for Innovation. That allowed us to install the equipment at existing Environment and Climate Change Canada buildings and then bring up some containers and set up two other facilities. We have three facilities at Eureka. It was the CFI that really enabled that at the beginning.

We then got six years of funding from the Canadian Foundation for Climate and Atmospheric Sciences, which no longer exists. That gave us stable funding for six years and enabled us to keep operations going and do the science.

There was a gap for about a year or so, and then we were very fortunate to get funding under the NSERC climate change and atmosphere research program, or CCAR, which was a one-off. There

were seven lucky winners, and we got funding from that, which we were able to stretch out to 2021, when, because of the COVID pandemic, our expenses went down and we weren't able to travel up so far.

We also got funding from the International Polar Year in 2007 and 2008, and some funding from the Arctic research infrastructure fund.

Those were five of the big funding programs, several of which don't exist any more: CFCAS, CCAR and IPY don't exist any more.

We've also received funding—regular funding—from the Canadian Space Agency, because we do validation of satellite data. They've been a very valuable funding partner. Also, Environment and Climate Change Canada, because we're working at their facility, helps with some of the power costs, which is not an eligible expense under NSERC and other programs.

Over the last 20 years, we've written many proposals. They have not all been successful, but enough have been. The challenge is that every funding program has its own requirements, and for those that require you to have community engagement, it's very hard to do that where we are.

Our expenses are high. We try to piggyback on Environment and Climate Change Canada's monthly produce charters that bring food up to the station, but if we were to charter our own flights a couple of times a year, they're more than \$50,000 a pop. Then, to have someone on site, staying at the station, which is the only place—there's no community there; it's just the weather station—costs over \$450 a day for food and accommodation. When you send up half a dozen students for a few weeks, the costs add up.

Having programs that recognize the costs of being in such a remote location is really quite critical.

● (1300)

The Chair: Thank you so much.

Go ahead, MP Blanchette-Joncas, for six minutes, please.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I welcome the witnesses and thank them for being with us for this second hour of study.

Mr. Hik, the organization you represent plays a very important role. According to the organization's website, "Polar Knowledge Canada is responsible for ... strengthening Canadian leadership in polar science and technology, and promoting the development and distribution of knowledge of other circumpolar regions, including Antarctica".

Your colleague Anne Barker, from the National Research Council of Canada, who is also director of the Arctic and northern challenge program, said that Canada had previously been a world leader in northern research, but that it was no longer. I'd like to know why you think that is.

[English]

Dr. Kimberly Strong: My translation is not working.

Could someone have a quick look at this? I just want to make sure I understand properly.

The Chair: We're going to pause because of a translation issue.

Dr. Kimberly Strong: Maybe you could repeat that. I'm sorry.

[Translation]

Mr. Maxime Blanchette-Joncas: The question was for Mr. Hik.

[English]

Dr. Kimberly Strong: No, it's not working. Maybe I'll try plugging it over here.

The Chair: I'll stop your time while we sort out this translation issue.

[Translation]

Mr. Maxime Blanchette-Joncas: Madam Chair, I think I'll start again.

[English]

The Chair: Yes. Start your question again.

[Translation]

Mr. Maxime Blanchette-Joncas: Thank you very much.

Mr. Hik, your colleague Anne Barker, director of the Arctic and northern challenge program at the National Research Council of Canada, talked about the fact that Canada had previously been a world leader in northern research, but that it no longer was.

From your perspective, as chief scientist of Polar Knowledge Canada, which is responsible for strengthening Canadian leadership in polar science and technology, what's the reason for that?

[English]

Mr. David Hik: Thank you for the question, Madam Chair.

I might not entirely agree with my colleague Anne. We work together on a number of programs. I think it's important to recognize that we can't be leaders in absolutely everything, and there are many countries that have expertise that's very complementary and overlaps with Canadian expertise. It's a relatively small science community in the Arctic, and we all work closely together.

Investments in the last 20 years through ArcticNet, through the International Polar Year—the last International Polar Year—and through a number of other programs have really built a capacity for

the next generation of Arctic science in Canada. I think what's important to realize is that sometimes it's not so much what we do but how we go about doing it, and it's the way we're working with putting the priority on ensuring that indigenous and northern Canadians, who should be leading that work, are involved. That has taken a little time.

When I meet with international colleagues, I think that in many respects they look at Canada with a bit of envy that we've managed to advance on certain issues. On technical issues, there are other countries that sometimes have perhaps more expertise or capabilities than we have, but I think we are world leaders in many ways.

• (1305)

[Translation]

Mr. Maxime Blanchette-Joncas: Mr. Hik, I want to make sure I understand what you're saying.

Dr. Mona Nemer, Canada's chief science advisor, noted in her most recent report, "The Polar Continental Shelf Program and the Rapid Rise of Northern Research":

Canada has one of the largest territorial claims in the Arctic. It should aspire to be a leader among circumpolar nations in terms of northern research, in much the same way it strives to be a global leader in other disciplines.

Do you agree with that?

[English]

Mr. David Hik: I would agree. Canada needs to be a leader in polar science and Arctic science across all of our north, not just in one area.

[Translation]

Mr. Maxime Blanchette-Joncas: In your opinion, what would it take for Canada to become a world leader again? Why is Canada no longer a leader?

[English]

Mr. David Hik: As I said, I think that in some areas we are still very much world leaders. Our expertise and our scientists are sought after as partners on international collaborative programs with other countries, and certainly within our own country there are many areas in which we are leaders.

However, in a rapidly changing environment, there are unknowns. Those are the things that we need to be aware of and continue to invest in. Funding is one part of it, but there's also making sure that we create the forum to understand what the priorities are and who can bring expertise into those programs. That's an important part of the work that Polar Knowledge Canada is doing.

[Translation]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Hik.

Should Canada have a national strategy to better coordinate northern science?

[English]

Mr. David Hik: Many departments and agencies are involved in supporting different aspects of Canada's Arctic science activities. Many of those organizations, like Polar Knowledge Canada, have frameworks or strategies that are focused on particular topics.

What I think you're asking is whether there should be a national Arctic strategy.

Within the Arctic and northern framework policy framework, there are a number of goals and sub-goals that specifically address research requirements. I think what's important, and what we've learned over the last years, is that those need to be co-developed with northerners, with the territorial governments, with indigenous organizations, with communities and with the various bodies of the land claims and rights holders agreements.

I don't think it's as easy as it sounds to just say that we're going to create a national policy, because there are regional and local nuances as well.

The Chair: Thank you. That's our time.

The final member for this first round is MP Cannings for six minutes.

Mr. Richard Cannings: Thank you.

Thank you all for being here today.

I'm going to start with Dr. Hik, if only because we go way back to the research that Dr. Hik started on the tundra ecosystems in the southwestern Yukon. He has continued that line until his very new job in the last couple of years.

This study is about research in the Arctic, especially with regard to climate change. The urgency there is because climate change is impacting the Arctic at a much greater speed than it is us in temperate or tropical latitudes.

You mentioned things like ice extent and permafrost. Some of the most important research—and it may not be the sexiest—include those long-term monitoring datasets that tackle those questions. How can we fix something that we don't know about?

I'll ask Dr. Strong about this as well, but can you talk about the importance of long-term data sets of 10, 20, 30 or more years and how priceless they are when it comes to understanding our world? I'm wondering if you could comment on that.

• (1310)

Mr. David Hik: That's a very important question, because at the heart of being able to develop adaptation and mitigation responses is knowing what's changing and how quickly it is changing. Is it a cycle, or is it just a perturbation? Is it really a long-term directional change?

For that, we need longer-term records. We have many of those records in Canada. Maintaining them in the long term is a challenge. Many people are committed to maintaining those records, but we're realizing that historically we have observations in certain places that may not be where the largest changes are taking place or where the impacts of current changes are being observed. Those places are in remote places like PEARL or the Northwest Passage,

where accessing and maintaining marine buoy observations can be done only during a very short window during the open water season.

We're realizing all of these things are complemented by the local and community and indigenous knowledge that lets us extend our understanding of changes much further back in time. Our scientific observations span perhaps only 20 years, but once we start understanding how people who lived in those places observed that environment over generations, it puts things into a better context for us and allows us to better forecast what might happen in the near future.

Mr. Richard Cannings: Dr. Strong, at PEARL you have a 20-year dataset. It breaks my heart to hear that PEARL is facing closure. I just think about another long-term dataset under fire.

Could you comment on the importance of this kind of work?

Dr. Kimberly Strong: I certainly agree with what David said. Long-term measurements are the lifeblood of understanding what's happening in the Arctic. We've recorded some long-term datasets. I started doing measurements in the spring of 1999. This is the 25th anniversary of measurements of ozone and some gases and of ozone depletion. As a result of those records, we were able to see from year to year a lot of variability in the stratospheric ozone, which protects us from harmful UV. The years when we had very low ozone levels, in 2011 and 2020, were really there and visible in the record, because we had the long-term baseline.

Similarly, we're also measuring wildfire smoke. We see plumes coming up over Eureka. The fires in the Pacific northwest and B.C. in August 2017 injected record amounts of a number of different pollutants into the atmosphere. They came right over PEARL, and we had these big spikes. Again, they were very obvious compared to the baseline we'd collected over the years.

It's the same thing with aerosols, clouds and other things we're measuring. Because of COVID, which limited our access to PEARL, and funding problems, we now have gaps in some of our data records. Some of the instruments need maintenance, but we no longer have an operator on site year-round. You can't go back, right? We're never going to go back and get the measurements that we didn't get after March 2020 with some of our instruments.

We have some instruments that are still running. Some are automated, and for some we have remote control. We have some campaigns to go up and do things. We used to have an on-site operator year-round who would deal with minor issues, but right now we're not able to do that. We sadly have gaps, and we'd like to ramp back up to where we were.

Mr. Richard Cannings: How much time do I have?

The Chair: You have 44 seconds.

Mr. Richard Cannings: I'll go back to Dr. Hik.

Could you spend a little bit of time on the connections between community wellness and environmental wellness in the Arctic?

Mr. David Hik: I'm going to pass it to Andrew to talk about a caribou project that I think is relevant to that.

Mr. Andrew Applejohn (Executive Director, Programs, Polar Knowledge Canada): There's a close connection between how people live, particularly in smaller and more isolated northern communities, and environmental health. POLAR made a strategic investment with the Government of the Northwest Territories, starting about two years ago. It came into effect this year. They began to look at a variety of perspectives on what's driving the extreme variability in Barren-ground caribou populations. Those programs, funded through that collaboration, were done in a way that really provided communities with the opportunity to play a leadership role.

I believe seven programs were funded. The majority of those programs focused on community perspectives on what was changing on the landscape and what was changing with animal behaviour. They looked at some of the influences potentially driving the health of some herds versus other herds. It was a program that was conceived in response to pressure coming from communities that were asking questions about what was happening and what was driving changes in the caribou population.

• (1315)

The Chair: Thank you. That's the time.

We'll now go to our second round. We will start with MP Soroka for five minutes.

Mr. Gerald Soroka (Yellowhead, CPC): Thank you, Madam Chair.

Thank you to the witnesses.

I want to start off with the fact that our chief science adviser, Dr. Mona Nemer, after three months still hasn't responded to our questions. Can we get the clerk to once again reach out to her?

Dr. Hik, you mentioned food. With the emphasis on food and energy security in your recent initiatives, what innovative approaches are being explored to ensure sustainable solutions for Arctic communities? How can federal policies better support these efforts?

Mr. David Hik: Thank you. I'll provide perhaps two answers.

One, there's an important need to be able to share food in communities. When hunters, harvesters and fishers are out, they bring food back not just for themselves but also for elders and for the community. Traditionally, being able to have community freezers as a focal point for food sharing and food storage over seasons has been relatively easy. With warming, we've needed to look at innovative options and new solutions. We're working very closely with hunter and trapper organizations, wildlife management boards and communities to look at how community freezers could be adapted to warming conditions, with everything from sea cans that are powered by clean energy to ways of preserving or packing and sharing things more efficiently.

Second, we're also working on greenhouse technologies. There's a very high cost and challenge in transporting fresh produce in the north. In the Kitikmeot region alone, three separate greenhouse projects over the last few years are looking at different ways that community-supported growing of foods of interest could be commercially viable in those communities.

Those are both very close to being adapted or adopted by different communities to serve their needs, recognizing that different communities might have different requirements.

Mr. Gerald Soroka: Okay.

How effective has the collaboration between scientists and policy-makers been in addressing Arctic challenges? What improvements do you suggest to ensure that scientific research more directly informs policy decisions?

Mr. David Hik: That's an important question for all of us to think about. How do we ensure that the science policy nexus is something that is readily apparent on what those knowledge mobilization and knowledge-sharing pathways are to make sure that information is shared in a timely way, and also to make sure it's appropriate? There are a number of forums for doing that.

One way we do that is to meet once or twice a year with the hamlets, hunter and trapper organizations, wildlife management boards, Inuit development corporations or organizations in Nunavut and with the other equivalent indigenous organizations in Northwest Territories and Nunavut so that we can share information that we're learning, or that others in the research community are learning, with community members. I think it's important that this be normalized and done on a regular basis. We're invited to those meetings. We make sure we always have someone attending. That provides a mechanism for feedback.

Does that get up to the federal level? We need to find other mechanisms for that, but we need to be able to share things locally, regionally, at the territorial level, at the provincial level in some cases, and also with federal colleagues and with policy-makers.

• (1320)

Mr. Gerald Soroka: Then there's still lots of work to be done.

Dr. Strong, what technological advancements have been most impactful in your atmospheric research, particularly in remote sensing techniques? Are there emerging technologies that you believe will significantly enhance our ability to monitor and understand the Arctic atmosphere?

Dr. Kimberly Strong: That's a good question. PEARL is quite useful as a site for testing instruments, particularly under fairly harsh conditions. For example, we have been testing solar panels for a Canadian solar panel company. They're very interested in seeing how well they perform, and will then perhaps deploy them elsewhere in northern Canada.

One thing we helped do was evaluate the performance of an infrared instrument that will be deployed on Canada's HAWC mission, which I mentioned earlier. This is Canada's contribution to the atmosphere observing system that NASA will be launching later this decade. LR Tech and ABB developed this technology. We had it at Eureka. We had it side by side with an instrument that's been there for a longer term. We did side-by-side measurements to evaluate the performance of that instrument and prove that it would be able to do the kind of cloud measurements that we want to do from space. That's been very useful. That instrument is now being actively developed for deployment on a satellite later this decade.

The Chair: Thank you, Dr. Strong. That is a bit over our time.

Now we'll go to MP Chen for five minutes.

Mr. Shaun Chen (Scarborough North, Lib.): Thank you, Madam Chair.

Thank you to the witnesses.

My question is for Dr. Strong.

You mentioned today in your testimony that PEARL is running out of money. It's a bit heartbreaking to hear, because PEARL plays such an important role in bringing researchers together in an important facility that is widely regarded as important and crucial to producing knowledge around climate change, the atmosphere, pollutants and how they interact with the environment.

In terms of funding, I know you've had moments in the past and in your history, since being formed in 2005, when you have been financially challenged.

My question for you is twofold. Can you shed some light in terms of helping us understand how you have been funded? Second, what does sustainable long-term funding look like?

Dr. Kimberly Strong: It comes back to my earlier answer.

The initial equipment was bought with CFI funding. Then we had the six-year project grant from the Canada Foundation for Climate and Atmospheric Sciences, which is an organization that no longer exists. Then we had a six-year grant from the climate change and atmospheric research program at NSERC, which was kind of a follow-on from CFCAS, and that program no longer exists. Those were our two primary science funding programs.

Then, as I mentioned, we had some funding from International Polar Year and from the Arctic research infrastructure fund. We've had regular small amounts of money from the Canadian Space Agency that have helped, and some support from Environment and Climate Change Canada.

We've also had funding from NSERC. An NSERC CREATE training program in Arctic atmospheric science funded us for six years, from 2010 to 2016, and that really funded students. We ran six Arctic summer schools as a part of that. That wasn't supporting the lab per se, but it was supporting the students who were doing some of the research at the lab. At the summer schools, we brought in Inuit and other northern representatives to come and talk to the students, and that was very enlightening for them.

Looking forward, we need programs that will cover the operational expenses of working in the Arctic, which is different from

working at a university lab down south; that recognize the costs of transport, travel and on-site accommodations; and that can fund the staff that we need. It's that kind of operational funding.

We don't.... We are always looking for programs to apply to, but many of them have different requirements, and it can be hard to meet the criteria. None of them are quite like the CFCAS and the CCAR funding that we had in the past.

Mr. Shaun Chen: Looking into the future, if there was a way that government could help support your work in a more stable way, how do you envision that to flow through?

Dr. Kimberly Strong: It's funding for research facilities. I know there's work going on in the government right now to look at major research facilities, very large ones like TRIUMF, SNOLAB and Ocean Networks Canada. I just finished a five-year term on the SNOLAB board a few weeks ago, so I'm well aware of how that works.

It's also to be able to fund smaller research facilities. I mean, PEARL is just one facility. It's a fairly large one compared to some others. There's an organization called the Canadian Network of Northern Research Operators, which includes several dozen stations across the north, and it's really been struggling over the years. They did try to get some funding some years ago, but because it's a disparate group and not all under one university, it's kind of hard to fund that broadly.

It's some kind of funding that maybe isn't major but is medium-sized—even for some smaller research stations, too—to provide that continuity so that you can get staff, build up the expertise and keep things going. That's what we're looking for. It's not just PEARL; there are other stations as well that are struggling.

● (1325)

Mr. Shaun Chen: Are there any examples that you can give from other countries that are involved in research in the Arctic? Are there any examples of how other nations support research labs such as yours or other activities related to better understanding the climate in the north?

Dr. Kimberly Strong: Right. I mean....

The Chair: Give a short answer, please. We're down to 10 seconds.

Dr. Kimberly Strong: I can't comment on details of how they're funded, but I certainly know that we partner with labs at Ny-Ålesund in Norway and Sodankylä in Finland. They have funding through Europe-wide and national programs that they can tap into. Obviously, we don't have access to those.

That's the short answer.

The Chair: Thank you very much.

We will now turn to MP Blanchette-Joncas for two and a half minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

Mr. Hik, Canada signed the Agreement on Enhancing International Arctic Scientific Cooperation on May 11, 2017. One of the objectives was to attract world-class researchers to do research in the north.

Do you feel that Canada has been able to attract talent since then?

[*English*]

Mr. David Hik: Even before that Arctic Council agreement, Canada was very attractive for international collaboration and partnership. The intent was to improve the mobility of researchers, infrastructures, samples and data. That agreement was enabled through three Arctic science ministerial meetings up until the last one in 2020. There's a pause right now.

That's been important. Canada is a very attractive place for international researchers. That agreement helped a little bit, but there were already lots of mechanisms in place.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Mr. Hik, I'm a little confused. Richard Boudreault, the first president of Polar Knowledge Canada, appeared before the committee last Tuesday. He told us that there is a shortage of researchers in Canada to do northern research. According to him, Iceland had 13 times as many researchers per square metre as Canada, and there was a shortfall of about \$500 million for northern research right now.

I don't know if the fact that you're in your current position prevents you from telling us the truth, if you lack information or if Mr. Boudreault lied to us. I would like you to enlighten us on this.

[*English*]

Mr. David Hik: I'm not sure how his calculations were made. I was in Iceland yesterday morning, and it's a much smaller country, so maybe the density per square metre of scientists is higher.

Quite honestly, I think we have a wonderful community of researchers across Canada in the academic community, in government and, increasingly, in the north.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Mr. Hik, Mr. Boudreault told us that Canada would need three or four times as many researchers to reach the average number of researchers in other Arctic Circle countries.

You just told me that, since 2017, you have managed to attract talent from outside the country. There's a bit of a disconnect between the two narratives. I remind you that Mr. Boudreault was the first president of Polar Knowledge Canada. Either you don't have a clear picture of the data or what you're saying doesn't match the current overall reality.

[*English*]

Mr. David Hik: I think there are two things. There are the Canadian researchers, researchers who are trained and working in Canada, and there are researchers from other countries who are collaborators in conducting research in Canada. In my experience, there's been growth in both of those communities. There have been Canadian researchers, and there's more and more interest from international researchers.

• (1330)

The Chair: Thank you.

We'll now have our final questioner today, MP Cannings, for two and a half minutes.

Mr. Richard Cannings: I will continue with Dr. Hik.

Polar Knowledge Canada is based in Cambridge Bay, where CHARS is. How do you coordinate things across the Arctic from Herschel Island or Kluane to Pond Inlet to Nunavik when you're in a remote area yourself?

The Arctic, as you said, is a very big place. How do you manage to develop your mandate over that huge area?

Mr. David Hik: There are challenges having a federal agency headquartered in Cambridge Bay on an Arctic island, and there are lots of challenges that go along with operating there.

We have staff in Yukon, Whitehorse, Yellowknife, Rankin Inlet and Iqaluit in the north. We also have staff across Canada, working not just in the national capital region but in other locations as well, often co-located with other federal departments. We have staff in the Department of Fisheries and Oceans, in universities and in wildlife health laboratories, and we're able to leverage those relationships.

We also have an ear on the ground, if you will, with organizations and with people in other communities very directly by having staff who are not just concentrated in Cambridge Bay in the north but located in other communities. That's at the research scientist level, at the staff level and at the executive level as well.

The Chair: You have 45 seconds.

Mr. Richard Cannings: That's okay. I'll leave it there.

The Chair: Thank you very much to our witnesses—Dr. Kimberly Strong, Andrew Applejohn and Dr. David Hik—for your testimony and participation in relation to our study of science and research in Canada's Arctic in relation to climate change. You may submit additional information through the clerk. Please see the clerk for any questions.

Again, we thank you. It was fascinating testimony today.

Before we adjourn, I want to give a brief reminder to members that at Thursday's meeting we will continue our study on science and research in Canada's Arctic in relation to climate change for one hour. Then we will resume consideration of the draft report for the study of the integration of indigenous traditional knowledge and science in government policy development.

We will also consider the travel budget proposal that was shared with members yesterday. It came out to your P9s, I believe, around

5:00 p.m. It's very detailed. I would congratulate the clerk, the support staff and our analysts for coming up with a very comprehensive proposal, which hopefully you will have a chance to look at so that we can consider it fully on Thursday. We will need to make a decision on it so we can submit it by the deadline on Friday.

Thank you very much.

The meeting is adjourned.

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