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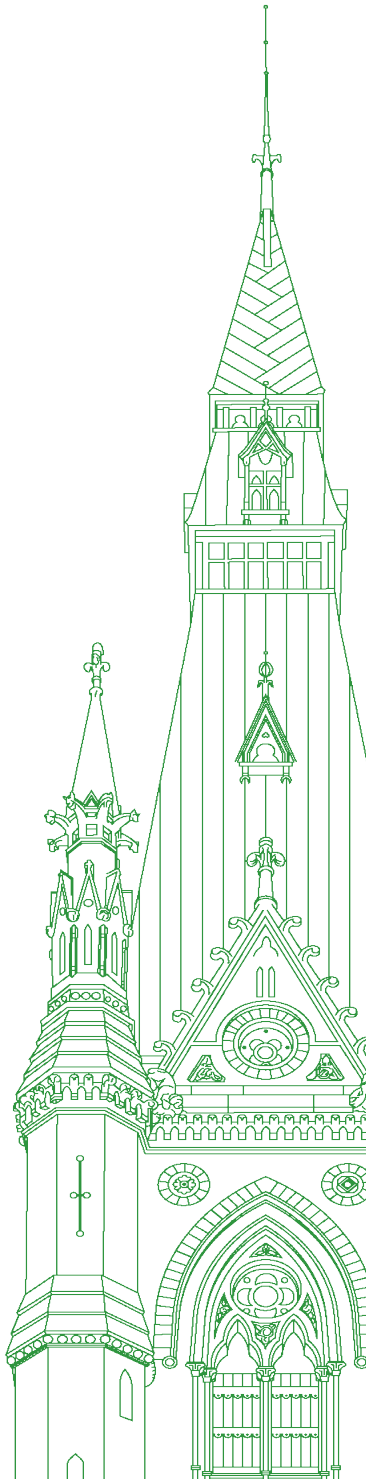

Chair: Ms. Valerie Bradford

Standing Committee on Science and Research

Tuesday, June 4, 2024

● (1100)

[*English*]

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

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

It's now my pleasure to welcome our witnesses to this committee. From the Inuit Circumpolar Council Canada, we have Lisa Koperqualuk, the president of that organization. From the Natural Environment Research Council's Arctic office, we have Henry Burgess, the head of that organization.

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

Ms. Koperqualuk, I invite you to make your opening statement of up to five minutes.

Ms. Lisa Koperqualuk (President, Inuit Circumpolar Council (Canada)): Thank you, Madam Chair, for this opportunity to share with you today the things that are truly important to us in terms science and research in climate change.

My name is Lisa Qiluqqi Koperqualuk. I'm the president of the Inuit Circumpolar Council Canada, which was formed, along with all of the other ICC countries, in 1977, representing over 180,000 Inuit across Chukotka, Alaska, Canada and Greenland.

Today, I'm speaking to you in the late afternoon from Bonn, Germany, where ICC is present to advocate for Inuit and the impacts that climate change has on our circumpolar homeland, Inuit Nunangat, and on our lands, ice and waters.

While a lot of our work is on the international scale, there are national implications. The consequences and impacts of climate change in the Arctic are felt in every aspect of day-to-day life and in the foundation of our culture. Arctic sea ice decline is expected to result in ice-free summers by the middle of the 21st century. Inuit have observed this and are experiencing its impacts. Increased shipping in the Arctic is changing the migration routes of marine mammals and forcing Inuit to also travel much farther to find our healthy country food.

Permafrost temperatures have increased to record levels in the past 30 years. As it thaws and degrades, the buildings, pipelines and airstrips that are built upon it can tilt and become unstable. Up to 50% of Arctic infrastructure may be at risk of damage by 2050. This will require significant financing commitments.

Surface waves with increased intensity and frequency are projected in the Arctic Ocean and along the coast, resulting in increased rates of coastal erosion in the coming decades. Thawing permafrost and waves erode the Arctic coastline at an average of half a metre per year. In northern Alaska, the rates are 1.4 metres per year.

Here, at the international level, one of our key messages is that Inuit and all indigenous peoples around the world require equitable, sustainable and direct access to climate finance. The climate change adaptation needs are extensive across Inuit Nunangat, from emergency management to ice safety and infrastructure. We are encouraged by the indigenous climate leadership agenda within Canada, and hope to see ambitious action from beyond the current mandate.

Indigenous knowledge involves multiple methodologies, evaluation and validation processes, and ways of storing and sharing information. It offers a holistic approach that can contribute to a fair, equitable and truly just transition. Indigenous knowledge aids in identifying research needs and can inform decision-makers. While there's been progress, there's also a lot of teaching to be done on how to use and incorporate our knowledge in a way that is equitable and ethical.

The Inuvialuit Regional Corporation recently announced the creation of an Inuvialuit community research network. This is a great example of Inuit determining their research priorities in their communities. This will bring capacity and self-determination, and it needs to be the norm of community-led research by Inuit for Inuit.

This year, Makivvik released its climate change adaptation strategy. That report acknowledges the need for greater involvement of Inuit knowledge holders and youth, and the use of Inuit knowledge in climate change research. Such examples are achieved through a lot of effort and time, and people dedicated to the issue of climate change in Inuit Nunangat.

Climate change research and capacity-building are areas that must continue to grow as they experience significant demand and require specific expertise. Limited funding prevents ICC Canada from adequately fulfilling its mandate.

● (1105)

Proper financial and human resources would then allow ICC Canada to support Inuit in achieving self-determination at the international level, where decisions around climate action are made and those decisions are far removed from the Arctic.

Through equal partnership with Inuit and our knowledge and experience, we have an important role—

The Chair: Thank you, Mrs. Koperqualuk.

Ms. Lisa Koperqualuk: —to play in understanding change in the Arctic and what it means to Inuit, Canada and the globe.

The Chair: Thank you. That's all the time we have. Thank you very much.

Ms. Lisa Koperqualuk: That was my conclusion. Thank you.

The Chair: Now we will turn to Mr. Burgess for five minutes.

Mr. Henry Burgess (Head, Natural Environment Research Council Arctic Office): Thank you, Madam Chair.

Good morning, *bonjour*. Thank you very much for the opportunity to give evidence to your inquiry today. It's a great pleasure to share this opportunity with the chair of ICC Canada, Lisa Koperqualuk.

My name is Henry Burgess, and I am the head of the Natural Environment Research Council Arctic Office, which is hosted by the British Antarctic Survey in Cambridge in the United Kingdom. I've been in this role since 2016, and prior to that I was the deputy head of the Polar Regions Department in the Foreign, Commonwealth and Development Office. For the period 2022-26, I'm also the president of the International Arctic Science Committee, an independent, non-governmental organization that has existed since 1990 with 24 member states, the role of which is to encourage and facilitate international co-operation across all forms of Arctic science.

Our role in the U.K.'s Arctic Office is to support Arctic researchers based in the United Kingdom, to provide advice to policy-makers and decision-makers, to represent the U.K. in a range of international science discussions and fora, to support the delivery of the U.K.'s physical presence in the Arctic through our research station in Svalbard, Norway, and to create new international research programs.

Canada has been a major focus of our approach over the last six years. We have made a significant commitment and investment in developing a new international program and implementing Canadian, U.K. and Inuit priorities. The Canada-Inuit Nunangat-United Kingdom Arctic Research Program 2021-25, known as CINUK, is an $18 million-plus program to address key themes connected to climate-driven changes to terrestrial, coastal and near-shore marine environments across Inuit Nunangat as well as the impacts on Inuit community health and well-being. Full details of the program are available at the website, cinuk.org.

The CINUK programme represents the United Kingdom Research and Innovation's largest current single strategic investment in Arctic research. It is delivered and funded in partnership with Polar Knowledge Canada, the National Research Council, Fonds de recherche du Québec, Parks Canada and in fully equitable partnership with Inuit Tapiriit Kanatami. The program is delivering 13 projects involving more than 150 program participants and over 60 research, community and other organizations.

Themes include human health, animal health and country food, beaver range expansion, food security, glaciers and ecosystem health, shipping trends and risks, plastics and health, search and rescue, coastal erosion, integrated renewable energy, safe sea ice travel and much more. Combining environmental themes with social, economic and technological themes is central to the program.

Equitable and empowering partnerships between Inuit researchers and community members and those in Canada and the United Kingdom in governance, core design and assessment, project delivery, publication and data ownership are central to this program. Every step of the development of the program has been done in partnership with Inuit Tapiriit Kanatami and with the aim of meeting the expectations of the national Inuit strategy on research. Every project has had Inuit involvement in the planning and delivery from the very start.

The development of the program, which included the signing of a groundbreaking memorandum of understanding between all the partners in 2021, has involved a major commitment by U.K. Research and Innovation. It has stretched, in many good ways, our existing ways of working. I'm extremely grateful to all our Canadian and Inuit partners for their patience, support and partnership in taking forward this new way of working.

Whilst the CINUK programme represents only part of the U.K.'s Arctic science and research connection with Canada, the innovative and stretching nature of the program represents an important development, with implications for wider international partnerships. As we think about the next phases of research connection with Canada and other international partnerships and about the international polar year coming up in 2032-33 as a whole, we are committed to ensuring that we spread the learning from this approach.

I look forward to assisting the committee in any way I can.

Thank you.

● (1110)

The Chair: Thank you so much, Mr. Burgess.

I'd like to point this out to the committee that we were not able to get the headset to our third witness in time for today. We sent it over three weeks ago. It's probably going to arrive tomorrow. We're hoping to re-book Mr. Andrew Arreak from SmartICE at another time.

That concludes the opening statements.

Because we're in a hybrid format, I would like to remind those participating virtually to please wait until I recognize you by name before speaking. Those by video conference can click on the microphone icon to activate your mic. Please mute yourself if you're not speaking. For interpretation, those of you on Zoom have the choice, at the bottom of your screen of the floor, English or French. Those in the room can use the earpiece and select the desired channels. Please raise your hand if you wish to speak. Members on Zoom can use the "raise hand" function. The clerk and I will manage the speaking order as best we can, and we appreciate your understanding. I remind you that all comments should be addressed through the chair.

Now we will open the floor for questions. Please be sure to indicate to whom your questions are directed.

We'll kick it off with MP Tochor for six minutes.

Mr. Corey Tochor (Saskatoon—University, CPC): Thank you, Madam Chair.

Thank you, witnesses. I have some questions for you that we'll get to shortly.

I have a question for our chair, though.

On February 27, 2024, we had Mona Nemer, the Liberal chief science adviser for Canada, before this committee. We asked her a couple of questions that she promised to answer. However, it is now June 4 and we still have not received any answers despite repeated reminders. These were simple questions: What is your budget? What are you doing? Yet, months later, we've heard nothing.

Madam Chair, what are you doing to hopefully resolve this for all committee members?

The Chair: I will suspend for a moment while I converse with the clerk.

The clerk has reached out three times, most recently on May 27. The response was that they're working on it and will get us something, but they didn't give us a time.

What are the thoughts of the committee?

MP Rempel Garner.

Hon. Michelle Rempel Garner (Calgary Nose Hill, CPC): On this point, it should be concerning that we have a public servant who can't answer basic questions like what their budget is and what they are working on. If they are listening, I find those to be pretty basic questions. This shouldn't be a partisan issue. Departments like this exist at the pleasure of Parliament, not the other way around. The fact that we're not able to get this information is a borderline question of privilege, at this point, I think. We've been asked to scrutinize spending. A lot of the recommendations that could be made in some of the reports on issues that we are considering could ostensibly be affected by this lack of information. I just don't understand why this is happening.

My inclination, at this point, would be to either discuss this as a matter of privilege or use a stronger motion. I also think she might need to come back to committee to answer for why it's taking three months to produce such basic information. It's really deplorable.

Chair, we're at the point where we need to escalate this. If you're not able to get that information, I think we'll probably have to look at other options.

● (1115)

The Chair: I'll suspend for a moment.

As chair of the committee, I would be quite willing to write a letter to her saying that we have asked three times—most recently on May 27—and are looking for answers to these straightforward questions. I would give them a date. Let me see. It is June 4 now. I would say a week is more than reasonable. The original request dates back several months now.

What are your thoughts? Do we have unanimous consent for that approach?

Mr. Corey Tochor: I'd go further. I would put in a line about how she will have a week to provide these answers in writing. If not, we would have her at committee the following week.

The Chair: What are your thoughts on that?

Yes, MP Jaczek.

Hon. Helena Jaczek (Markham—Stouffville, Lib.): Could we see exactly what we were requesting originally?

Mr. Corey Tochor: It was last year's budget.

Hon. Helena Jaczek: Was there any particular detail required?

Mr. Corey Tochor: It was just requesting numbers.

Hon. Helena Jaczek: It seems puzzling.

I certainly think the letter should include a timeline. We would still have time, possibly, at that point—once we have the information—to see if it's necessary for her to return. I think the letter as you described it, Madam Chair, would be sufficient, with possibly even next Monday, June 10 as the deadline.

The Chair: I could say something like "failing which, we will ask you to reappear before committee and provide the answers in person".

Thank you.

I've restarted your time.

Mr. Corey Tochor: How much time do I have?

The Chair: I restarted it to five minutes.

Mr. Corey Tochor: Thank you.

Witnesses, thank you so much for being here and for your testimony.

I was surprised and encouraged that the Inuit Circumpolar Council started back in 1977. That's a great year. That was the year I was born. More importantly, with all those years—now 47 years—of existence studying climate change in the Arctic, I'd like to hear any concrete research or solutions that are impacting the north right now. What research have you been working on in the last 47 years that people are actually seeing the fruits of in adaptation or different strategies to actually make a difference in the north?

That's for Lisa.

Ms. Lisa Koperqualuk: I'm sorry. I was waiting to be addressed in order to speak.

The Chair: Yes, we're waiting for your answer.

Please, go ahead.

Ms. Lisa Koperqualuk: Thank you.

ICC Canada represents Inuit at the international level. The work we have participated in is very much related to international negotiations, where we bring light to the Inuit situation and warn the world about the changing Arctic over the last several decades.

Mr. Corey Tochor: I just want to clarify. There has been no conveying of meetings about solutions as of yet.

Ms. Lisa Koperqualuk: Always we meet together in conveying solutions. One of the solutions is that we must acknowledge indigenous knowledge as equal to western science. One of the issues is that when bring our knowledge—

● (1120)

Mr. Corey Tochor: We have limited time here. I just want to clarify it.

You bring together Inuit knowledge. What is the Inuit knowledge to fix climate change in the north?

Ms. Lisa Koperqualuk: The observations of Inuit on what is happening with the ice, the reduction of sea ice, is what Inuit have been observing for the last decades and have been warning the world about.

Now, we're not the ones causing climate change; that is also what we're saying. According to our knowledge and our indigenous knowledge-holders, we're not the ones causing climate change. We are asking for climate finance, for direct access to climate funding. As Inuit, we live in a developed country. As Inuit, we are not receiving any direct access to funding provided through the United Nations system, and that's part of the problem. We have limited funds and limited resources to be able to work on climate change.

Mr. Corey Tochor: The Arctic is primarily in Canada. Which countries are receiving the United Nations funding?

Ms. Lisa Koperqualuk: It's going to developing countries, the least developing countries, and these are states that are members of the United Nations Framework Convention on Climate Change.

Mr. Corey Tochor: I want to switch from the research angle just a little bit. You talked about the cultural importance of Inuit people and the different practices. One of the other witnesses talked about the economic importance of the seal hunt to Inuit people. I just want to get your take on the seal hunt, and if the federal government is doing enough to support the seal hunt for Inuit people.

Ms. Lisa Koperqualuk: I can't speak for the seal hunters, but I know there have been challenges for Inuit relying on seal hunting for their economy due to the ban on seal products. There is supposed to be a special exemption for seal products. However, the Inuit are impacted by that ban, so they require support from all states that have to do with that ban.

Mr. Corey Tochor: Thank you so much.

To our other witness, I'm limited in time. I have five seconds. Are you aware that the Natural Environment Research Council Arctic Office is working with Russia? Did you receive direction from your government to stop doing research projects with Russia and/or China?

Mr. Henry Burgess: Thank you for the question.

Yes. At the time of Russia's full-scale illegal invasion of Ukraine, there was a government-wide look at ongoing research funding with Russia. All of those areas within the Natural Environment Research Council where there was work with Russia on Arctic science has been either paused or relocated to other countries. Some work that was scheduled to happen in Russia has been moved to Greenland or elsewhere.

Mr. Corey Tochor: And China?

Mr. Henry Burgess: No. There is no such injunction with regard to China.

Mr. Corey Tochor: [*Technical difficulty—Editor*]

Mr. Henry Burgess: I'm sorry. I didn't catch what you said just now.

Mr. Corey Tochor: Are you currently working with Chinese companies or agents?

Mr. Henry Burgess: There is no restriction on work with China in that form. There will be a range of researchers across the Natural Environment Research Council and universities in the U.K. who will have connections with China. I don't know the exact details of that.

The Chair: We're over time. That can be pursued in another round.

We'll now turn to MP Longfield, who's online.

You have six minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thank you, Madam Chair.

Thank you to our witnesses for joining us in a different time zone and a different part of the world. It's good to have you both here to talk about research in the Arctic.

I want to start my questions with you, Ms. Koperqualuk, on indigenous involvement. I heard in the testimony from Mr. Burgess that indigenous involvement was separated, rightly so, from Canadian involvement. We've recently done a study in this committee on indigenous traditional knowledge.

Could you speak to how the conversation is changing? Are we getting to the place where we're needing to be in terms of involving Inuit and other indigenous peoples?

● (1125)

Ms. Lisa Koperqualuk: Thank you for this question. It's a very important one, because we've been advocating for the use of indigenous knowledge for many years and for it to be at equal par with other knowledge, and that it is not western science that validates it.

Now I am hearing of change in the players and the parties in Canada. Perhaps also because of the reconciliation process, there's more openness in working, collaborating and partnering with, on an equal basis, indigenous people in research initiatives. This is really good, because reconciliation cannot be done only by indigenous people.

We have the Qanittaq initiative, for example, between ICC Canada and Memorial University. We have a partnership on a research initiative for bringing more sustainable shipping as well as building capacity in Inuit communities and Inuit knowledge holders with their maritime expertise.

I do hear and understand that there is more openness and better collaboration starting. It's not perfect. We have to push.

Mr. Lloyd Longfield: It's a pathway, and we're hopefully on it together.

Ms. Lisa Koperqualuk: Yes. Thank you.

Mr. Lloyd Longfield: Thank you.

Mr. Burgess, there's very impressive research being done at Cambridge University in the U.K., and also your involvement with CINUK. The question of governance is one we're wrestling with in this study, to know how we can provide the proper collaborations between the parties that can be involved in solution-building in the Arctic.

Could you maybe talk about the challenges of governance, how working groups might interplay, or whether we need some new forms of governance to consider in this study that we're doing?

Mr. Henry Burgess: Yes. Thank you.

I said in my opening statement that the CINUK programme and the way we had designed it together as partners had challenged us within the U.K. That's certainly the case, because when you combine traditional western forms of knowledge with other Inuit and local and traditional forms of knowledge, those are not systems that we have a huge amount of expertise in yet. We're on a journey here, and we're just at the very start of it, particularly in the U.K.

When you come to design a program that has U.K.-based researchers, Canada-based researchers and Inuit Nunangat-based researchers, you have to find new ways of assessing the quality of the proposals that come forward. Normally within the U.K., you would do that on a peer review excellence-of-science level, and we retained that within the design of the CINUK programme, but we also had local regional committees across Inuit Nunangat looking at it from from their perspective. Did it meet their priorities? Was the partnership open and fair? Was it going to produce meaningful results for them? Was there a legacy that was going to come to their community from that work?

We took those two forms of weighting and brought those together. I think that's the kind of thing that we'll need to do more of in the future if we're going to do more of these international partnerships.

Mr. Lloyd Longfield: Terrific. Thank you.

With a minute and a half left, I will go again to Ms. Kopequaluk.

You mentioned sustainable finance. I also sit on the Standing Committee on Environment, where we are doing a study on sustainable finance right now and on the role that international capital can play in providing the resources for solutions. Could you expand a bit more on sustainable finance and how Inuit can play a role in decisions around that?

Ms. Lisa Koperqualuk: Right. I think I meant sustainable shipping.

Or, is this about the climate finance through...?

Mr. Lloyd Longfield: Climate finance, yes.

Ms. Lisa Koperqualuk: Right.

Our issue here in our advocacy at the UNFCCC process has been having indigenous peoples have access to climate financing. Now in Canada, we don't. We understand that Canada spends millions of dollars in developing countries for their climate work, so I think that's the big difference. If we had access to more climate financing, we would be able to do work on adaptation. We would be able to dedicate more time to mitigation costs.

We do get consultations, but we would build capacity in our ICC Canada office itself. I am one person who goes to these climate meetings, with an adviser, and we have youth and knowledge holders and so on, but our office has limited capacity—

● (1130)

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

Ms. Lisa Koperqualuk: Thank you.

Mr. Lloyd Longfield: Thank you very much.

The Chair: We'll now turn to MP Blanchette-Joncas for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Thank you, Madam Chair.

I thank the witnesses who are here with us today.

My first question is for Mr. Henry Burgess.

Last week, your colleague, Anne Barker, appeared before us. She is the director of the National Research Council of Canada's Arctic and northern challenge program. She said that federal government underfunding was causing problems for allocations or determining who's filling that space to fund research.

I'd like to hear your comments on that. Based on what you're seeing first-hand, what are the consequences of the federal government chronically underfunding research in the Arctic?

[*English*]

Mr. Henry Burgess: Thank you for your question.

I'm not in a position to give a view on the level of funding and the appropriateness of funding within the Canadian federal system. That's not something that I can address in those terms, but in thinking about it in a U.K. context, I would say that, of course, as researchers, as people committed to understanding climate change across the Arctic, we would all want to see as much investment as possible in that, because we realize the urgency of it, and we realize what really major gains there are to be got, nationally and internationally, from knowing more about what's happening so that we can mitigate and also adapt to it.

That's as true in the U.K. as it is elsewhere. There is, frankly, never enough funding for science, and particularly Arctic science, but I can't get into the detail of a specific amount.

I would say that the work we've done through the CINUK programme and elsewhere with the National Research Council has shown that they are incredibly positive, supportive and skilled in international work, and we really value that. The work we are doing with them is something that will bring real benefits to Canada, but Canada in terms of internationally as well, growing on knowledge of the change that's happening in the Arctic.

[*Translation*]

Mr. Maxime Blanchette-Joncas: You work with the United Kingdom. How does Canada compare with the United Kingdom in terms of its infrastructure and the number of researchers conducting scientific research in the Arctic?

[*English*]

Mr. Henry Burgess: I don't have the exact figures on hand, but I would say that there are proportionally more researchers in Canada than there are in the U.K. What's interesting is that there was a study by the University of the Arctic that was released in the summer of 2023 that looked at the ranking of countries in producing Arctic science publications. It ranked Canada third in the world when it came to the volume of Arctic science publications and put the U.K. at number six. Canada is a major player in Arctic science and, as the U.K., we're very keen and grateful for the partnership that we have with your federal research agencies and others.

[*Translation*]

Mr. Maxime Blanchette-Joncas: You said Canada is a major player in research in the Arctic. Are you saying that Canada is a world leader in northern research?

● (1135)

[*English*]

Mr. Henry Burgess: I would say that, if you are third in the world in the number of Arctic science publications, that puts you world class. Yes, I would safely say that.

[*Translation*]

Mr. Maxime Blanchette-Joncas: I'm not sure I fully understand, Mr. Burgess. I have before me the chief science advisor's report, entitled, "The Polar Continental Shelf Program and the Rapid Rise of Northern Research". This report dates back to 2023, which is not that long ago. I will read you an excerpt, quoting the chief science advisor: "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."

So, are you telling me we're not getting the truth from the chief science advisor?

[*English*]

Mr. Henry Burgess: I'm not familiar with the details of the report, but, in all of our countries, in all our international work, we strive to be as good as we possibly can be. From the quote you read out there, I got the sense that she wanted Canada to be as good as possible, rather than saying that it wasn't world class at the moment. All the connections that we've had with the partners through the CINUK programme have shown that Canada has the most supportive, patient and skilled connections. I have no doubt that, from our perspective, Canada is one of many countries that's world leading in Arctic science. This is very much an international partnership. Very few countries do this alone; it's the international partnerships that make the real difference.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Very well, Mr. Burgess. I'm just trying to understand in order to help you.

On the one hand, the chief science advisor is saying one thing. On the other hand, you, the head of the National Research Council of Canada's Arctic office, are saying another. You will therefore understand there's some confusion.

I'm trying to determine who's telling the truth. Is it the chief science advisor? Is it you? Are there other people, such as scientific experts, who support what you're saying and belie what the chief science advisor said in her last report?

[*English*]

The Chair: Be very brief

Mr. Henry Burgess: You'll have to forgive me, as I'm not an expert in the Canadian kind of science funding models and individual bodies. From my own experience, having seen Canadian researchers at international meetings, I know that in the work that happens within the International Arctic Science Committee and at events like ArcticNet and elsewhere, I see the quality and the skill of the researchers there, and I put them at a world-class level.

The Chair: Thank you, Mr. Burgess.

Now we will turn to Mr. Cannings for six minutes, please.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you.

Thank you to both witnesses for being here today. I'm going to start with Mr. Burgess.

What I want to start with is the fact that, as we know, the Arctic is being impacted by climate change much more than other parts of the world, and those changes, whether from reduction in sea ice or release of methane from melting permafrost, are causing vicious cycles that are affecting the rest of the world.

Your group has gone into this in previous research projects. I would first of all want to know if those research projects are continuing. How do you support those projects? Do you have scientists that do them themselves? Do you use funding for researchers in various countries to do them? What's your model of delivery for that research?

Mr. Henry Burgess: Thank you for your question.

I represent the Natural Environment Research Council. That's one of seven councils under the UK Research and Innovation organization. We are funding bodies, essentially. It's a mixture.

There are research centres funded by UKRI, such as the British Antarctic Survey, the National Oceanography Centre and others. We have our own researchers and a fleet of ships—blue-water and ice-capable vessels—that work in the Arctic, as well as planes and a research station. There is direct capacity there. It's a bit like the National Research Council. Also, UKRI is a funder of science with competitive grants. Some of those are at a relatively small scale for people to bid into. Others are more strategic, directed funds—a bit like the CINUK programme I was talking about.

It's a mixture of funding for universities and research centres, together with direct research that comes from UKRI employees as part of research centres.

● (1140)

Mr. Richard Cannings: Are there pots of money assigned to certain topics? I know in the past that you had Arctic research to ask questions about climate impacts both in the Arctic and beyond. Do you have those as directed funds?

Mr. Henry Burgess: Yes, some of the funds are directed.

In the past, we had the Arctic research program and the changing Arctic ocean program. Both of those were strategic investments through the Natural Environment Research Council. The money was placed on the table, the questions were set and it was then for universities and research centres to bid into that money with good ideas. There is that strategic level. There's also the day-to-day funding, if you like, where we leave it up to researchers themselves to come up with particular ideas they might have and that they think should be funded. Then there's something in the middle, which is the opportunity for researchers to group together to design individual research questions themselves. That goes out for wider opportunities and funding.

It's a mixed market, essentially.

Mr. Richard Cannings: You mentioned working with Polar Knowledge Canada and Inuit Tapiriit Kanatami. How does that work? How do you manage those very important partnerships when you're working in the Arctic?

Mr. Henry Burgess: It was decided, back in 2018 or 2019, that Canada and the Arctic were priorities for UK Research and Innovation investment. At that point, we began open and frank conversations with funding agencies in Canada to see how we could work together, essentially—how we could bring the best of UK expertise and assets together with Canadian expertise and assets, and, from that, develop the CINUK programme. It was very much as a result of frank and direct conversations with Polar, NRC, Fonds de recherche du Québec, Parks Canada and Inuit Tapiriit Kanatami. Understanding what each partner could bring to the table meant we could then bring this program as a whole together, which works equally well for all three communities.

Mr. Richard Cannings: Thank you.

How much time do I have, Chair?

The Chair: You have 56 seconds.

Mr. Richard Cannings: Okay. That's one minute, more or less.

I'm going to turn to Ms. Koperqualuk.

You mentioned the Inuvialuit Community Research Network. I wonder if you could expand on that. How does that work, and what role might the Inuit Circumpolar Council play in projects?

Ms. Lisa Koperqualuk: This network is under the Inuvialuit Regional Corporation and brand new. They'll be doing research priorities in their communities. They're already quite busy doing research on the impacts of contaminants and plastic pollution on marine mammals, so they're quite active. They're building capacity and self-determination through that community-led research on climate change.

Mr. Richard Cannings: Thank you.

I'll leave it there, Chair.

The Chair: We will now turn to our five-minute round, beginning with MP Michelle Rempel Garner.

Hon. Michelle Rempel Garner: Thank you, Chair.

We're at the point where we're trying to drive towards recommendations for a report by the committee. One thing that's been coming up in other testimony has been the need for a formal Arctic research strategy for Canada that links with both the Arctic strategy itself and any potential Arctic defence strategy that the government chooses to make stronger.

I note that the United States has a biannually updated Arctic research strategy that has clear goals and objectives for its research strategy, which also ties into a piece of legislation that the Americans have with regard to Arctic management.

To any of the witnesses, is a specific Arctic research strategy something that the committee should recommend developing to the government?

● (1145)

Ms. Lisa Koperqualuk: Sure. Definitely. I would say that an Arctic research strategy should include Inuit and Inuit knowledge.

Hon. Michelle Rempel Garner: Yes.

Ms. Lisa Koperqualuk: As I said in the presentation earlier, we have a lot of research fatigue. Researchers are coming into our communities doing scientific work and being really good western scientists and so on, but that often means that our knowledge is not included, because western science often has trumped Inuit knowledge. It must include it.

Hon. Michelle Rempel Garner: So you're recommending that the government develop a research strategy that includes Inuit indigenous knowledge as an underlying foundation, as part of that strategy.

Ms. Lisa Koperqualuk: Exactly. Yes.

Hon. Michelle Rempel Garner: Perfect.

The other thing, Laurie, if I may call you that, that I keyed in on was the fact that I think you were trying to say that Canada isn't sufficiently addressing climate change adaptation, either infrastructure or initiatives, in its own Arctic. Is that a correct summary of what you had mentioned in passing earlier?

Ms. Lisa Koperqualuk: Did you mean Lisa?

Hon. Michelle Rempel Garner: Lisa. I'm sorry. My apologies. My friend Laurie is on my mind this morning. I'm sorry about that.

Ms. Lisa Koperqualuk: Okay.

Yes, I think there are gaps. There could be more efficient communication and more efficient consultations. We can't expect Inuit, who don't have very easy access to the Internet, to be able to answer survey questions just through the Internet. The connection with communities is very important when creating those strategies. That's a gap. It's missing.

Hon. Michelle Rempel Garner: In terms of recommendations, then, as part of an Arctic research strategy that includes Inuit knowledge, one of the recommendations would be a requirement for processes to consult with Inuit community members in ways that are sensitive to the communications needs and context of the community. Would that be correct?

Ms. Lisa Koperqualuk: This is correct.

Hon. Michelle Rempel Garner: Thank you.

I noted another recommendation. There are five goals within the American research strategy. I'm not saying that we necessarily cut and paste what the Americans have outlined, but it is very goal-focused. You have talked about the need for research around climate adaptation in Canada's Arctic so that it could inform funding. Would that be correct?

Ms. Lisa Koperqualuk: That would be correct.

Hon. Michelle Rempel Garner: Great.

Are there other specific research areas or goals that you would recommend within your cultural context that an Arctic research strategy should include in Canada?

Ms. Lisa Koperqualuk: Other research areas would be inclusive of Inuit definitions of climate change and the impacts of climate change. What does adaptation mean? What are the mitigation costs? With the high cost of living in the north, any transitionary costs cannot just be done without consulting with us. It has to be a just and equitable transition.

Hon. Michelle Rempel Garner: That's a great recommendation.

As well, how could we structure our research? What should the committee be recommending on the content of a research strategy in terms of linkage with your cultural context to a northern sovereignty or a northern defence strategy? What are the research area gaps that an Arctic research plan should include in that context?

The Chair: That's over the time.

Could we get our witness to submit a written answer? Would you be able to do that, Ms. Koperqualuk?

Ms. Lisa Koperqualuk: Yes.

The Chair: That would be great. Thank you.

Ms. Lisa Koperqualuk: If the question could be be resent to me, please, I'll be happy to answer it.

Thank you.

The Chair: Okay. Thank you.

Now we will turn to MP Chen for five minutes.

● (1150)

Mr. Shaun Chen (Scarborough North, Lib.): Thank you very much.

Thank you to the witnesses joining us today.

Ms. Koperqualuk, it's my understanding that as an anthropological researcher, you have examined the impacts of globalization on traditional Inuit ways of life. How has globalization specifically affected indigenous communities and their connection to the environment?

Ms. Lisa Koperqualuk: I think it requires a book to tell that story.

Globalization is so immense. It's connected to colonization as well.

First of all, centralized communities have changed family dynamics. There were missionaries who came into our communities. Our economy has changed. It now requires money to be able to buy things. There's a difference between a southern family's income and an Arctic Inuit family's income, which is lower. We also deal with a high cost of living.

There are many impacts of many decisions, and there was autonomy lost by Inuit. Inuit men lost sled dogs. There were boarding schools and all these things.

Those are all part of globalization. Some had good impacts, but many had negative impacts as well.

Globalization brings climate change. Industrialization has brought contaminants into our communities. We have mercury in our food. Our people, pregnant people and families, need to be careful what they eat. Our healthy food has become contaminated.

There are so many other impacts. Plastic pollution is now part of those contaminants coming into our Arctic waters. Microplastics can be found in great numbers now in the Arctic Ocean.

There are many impacts from globalization.

Mr. Shaun Chen: In thinking about how to reverse these trends, the federal government could apply and promote indigenous traditional knowledge in its climate change policies and decisions. You have examined in your research the importance of Inuit cosmology, spirituality and traditional ways of life.

In what ways do you believe they can play a role in developing an effective Arctic strategy?

Ms. Lisa Koperqualuk: In our belief system, from our shamanism times, we have relations with the whole—*sila* and the exterior—that we are living in. This exterior is also when we experience it to the fullest. It brings us knowledge. It brings us wisdom. That's called *silatuniq*. It's one who has the greatest sila and the greatest outside.

That relationship we have with the environment around us is what guided us through our knowledge system in our relationships with animals and with spirits. Animals are beings that we had to rely on in order for us to live, because in the Arctic, we can only live from the animals we have relationships with. That relationship was one of respect and protection.

That link was with our story of Sedna, who was also the protector of the sea mammals, but we had to have a good relationship with Sedna and have good conduct. That good conduct is the love of our kin and the love of our environment, so it's the protection of our environment.

Human behaviour is what it comes down to. If we don't behave well, and if we don't protect and respect the animals and the environment around us, it will do the reverse to us. It's part of our belief system.

Mr. Shaun Chen: We have seen globalization generally have a negative impact on the environment. In your opinion, could that be turned around if we were to incorporate more traditional indigenous knowledge into globalization? Could it be used as a force for good for the environment?

● (1155)

The Chair: Give a very short answer, please.

Ms. Lisa Koperqualuk: Yes, it can. That's a very short answer.

Absolutely, and this is what we're talking about over here in Bonn. Indigenous peoples' knowledge systems offer this change.

The Chair: Thank you very much.

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

[*Translation*]

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

I will address Mr. Burgess once again.

On the subject of the Canada-Inuit Nunangat-United Kingdom Arctic Research Programme, commonly called CINUK, I'd like to hear what you have to say about the main priorities or gaps in research the program identified in terms of fighting climate change in the Arctic, especially regarding means of subsistence, culture and well-being of the Inuit.

[*English*]

Mr. Henry Burgess: Thank you for your question.

Yes, the reason why the CINUK programme was developed very much in partnership with Inuit Tapiriit Kanatami and local community members, northerners, Inuit and others was to make absolutely sure that the themes of the program addressed local priorities.

That's why, right from the very start, we made sure that this wasn't just environmental science, classic work on glaciers, permafrost or other things, but had a human dimension to it as well, a social science dimension to it.

It was clear from the very start that, if people wanted to put forward proposals to the program, they had to have Inuit partners right at the very start, and they had to address not just hard-science environmental questions but how that would affect the life and the future of the communities in the north.

There's a really broad range of work that's supported through the program looking at country foods and animal health, human health, housing and energy and plastics. It's a really wide range. That came about, not through direction from the program but from the people who put forward the proposals. I think that links very closely to the sustainability of life in the north.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Could you quickly explain how you establish priorities and determine what you will study in terms of research? Did communities work with you in making decisions?

[*English*]

Mr. Henry Burgess: Yes, very much so. Particularly in this CINUK programme, yes, absolutely, because we knew, having cast the net widely for ideas and having said to people that you have to have Canadian, U.K. and Inuit researchers together, that it wasn't going to be enough to just filter the quality of those through a Western science lens.

That's why we had an excellent assessment of the proposals, but we also had a local assessment for what that would mean to the communities themselves, and both of those had equal weight when we decided which ones of them were going to be funded. I think you can see, from the nature of the 13 projects, that they're not all traditional, Western, hard science projects; they are a really broad range of work.

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

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

Mr. Richard Cannings: Thank you.

I'm going to continue with Mr. Burgess to dive into some more of the details of the CINUK project. I'm looking online, as you suggested, to see some of them. I see things on community surveillance of animal health, muskox, and beavers moving north. Who knew about that? There's also a very interesting project on, basically, climate testimony from people living in the Arctic and from communities about how climate change is affecting them.

I'm just wondering if you want to maybe comment on that latter project, about how important it is to get the voice of communities on the impacts that climate change is having in the Arctic.

Mr. Henry Burgess: Yes, absolutely. There is a really broad range of projects within the CINUK programme.

We have wanted to make sure that, all the way through, we share the knowledge from the projects across the 13 projects as well. It's not just 13 individual projects that are doing their work; they're coming together at least once a year to share what they know.

That project in particular might be the CCT project: Inuit Youth, Wellness and Environmental Stewardship.

● (1200)

Mr. Richard Cannings: Yes, that's it.

Mr. Henry Burgess: Thank you.

We made sure that in our most recent annual science meeting—we held it here in Canada—there was funding provided for Inuit researchers and community members to come over from Canada, from Inuit Nunangat, to the U.K., to Cambridge here, to share their testimony. That was in really all of the 13 projects, and it was fantastic to see because we don't just want to have western science results; we want to have a combined knowledge. The whole point of the CINUK programme is to combine indigenous ways of knowing together with western science. It was really good to hear that view first-hand from the community members.

Mr. Richard Cannings: Thank you.

I'll leave it there.

The Chair: Thank you very much. That allows us catch up our time.

Thank you very much, Ms. Koperqualuk and Mr. Burgess, for your testimony. Please see the clerk with any questions. You may also submit additional information through the clerk.

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

Members attending via Zoom, please stay connected to this session.

● (1200)

_____(Pause)_____

● (1205)

The Chair: Welcome back.

I'd like to make a few comments for the benefit of our new witnesses. Please wait until I recognize you by name before speaking. Those participating by video conference, please click on the microphone icon to activate your mic, and please mute yourself when you are not speaking. With regard to interpretation for those on Zoom, you have the choice at the bottom of your screen of the floor, English or French. Those in the room can use the earpiece and select the desired channel.

It is now my pleasure to welcome, as individuals, Dr. Susan Kutz, professor and tier 1 Canada research chair in Arctic One Health, who is here by video conference; and Dr. Warwick Vincent, professor, centre for northern studies, Université Laval, who is here in the room. From the Arctic Institute of North America, we have Dr. Maribeth Murray, executive director, who is here by video conference from Cambridge Bay.

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

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

Dr. Susan Kutz (Professor and Tier I Canada Research Chair in Arctic One Health, As an Individual): Thank you very much.

I am a wildlife veterinarian and a Canadian research chair in Arctic One Health. I have spent 30 years working in northern communities to study and mitigate the impacts of climate change on wildlife health, and it's from this perspective that I'll speak to you today.

Climate change is rapidly, dramatically and irreversibly altering the physical and the biological systems in the Arctic in a myriad of ways. This is having serious downstream consequences for northern food security, cultural continuance, the economy, biosecurity and Arctic sovereignty.

Today, I wanted to share with you just one example about umingmuk, the muskox, to illustrate some of these concepts. During my research over the last 20 years, I've witnessed the largest muskox population in the world, on Banks Island, Canada, undergo a massive decline as a result of climate change driven severe weather events and emerging infectious diseases. In 2003, a rain-on-snow event led to a thick, impenetrable ice layer covering vegetation, resulting in starvation of tens of thousands of muskox and a 50% population decline. This type of severe weather event is only expected to increase in frequency under the current climate scenarios, and it poses as a major threat to caribou, muskox and all other wild life across the Arctic.

Subsequently, between 2010 and 2014, the same muskox population suffered a major disease epidemic, which resulted in an additional 60% decline. This herd essentially went from 72,000 animals down to about 10,000 today. A similar outbreak with similar consequences occurred on Victoria Island nearby, which was previously the second largest muskox population in the world. With these declines, the commercial muskox harvests and the guided sport hunting, which are important contributors to the wage economy on these islands, have ceased, and the food insecurity for these muskox-dependent communities is exacerbated.

By 2021, this emerging disease had spread all the way across the Arctic Archipelago to Ellesmere Island. Similar declines have been seen there, and today, the future of this ice age survivor on the Arctic Archipelago remains uncertain. Detecting, understanding and mitigating the impacts of such catastrophic mortality events and population declines is clearly critical for the ecosystem, for the Inuit communities and for food security.

However, wildlife disease emergence has additional implications for human health, where over 70% of zoonotic emerging infectious diseases in people are of wildlife origin. Avian influenza is just one example, and the disease muskoxen are dying from is another. For national defence, this is really important. Mass mortality events in any wildlife species should be viewed with concern from the biosecurity and biowarfare perspectives, perhaps particularly in the Arctic.

Finally, these issues are really important for Canada's livestock industry, where wildlife disease emergence may threaten our global trade status.

To address these issues, strong, inclusive and innovative research approaches are needed. There are some excellent examples in the Canadian Arctic, where indigenous communities, academia and government are working together to address wildlife health. These include the beluga monitoring program in the western Arctic, the muskox and caribou health monitoring program in the central Arctic and the Arctic Eider Society in Hudson Bay, and there are many others.

Common to these programs are a foundation of respect, a focus on local concerns, concerted efforts to elevate community voices and capacity in research, and braiding indigenous knowledge into western science. However, these programs are expensive. They're typically run on short-term funding. They can stretch the local human resource capacity, and they remain dependent on southern academics or governments. To move forward in science and research in the north, by the north, there really needs to be a significant and sustained investment not only in human resources in the north in the form of training, but also in ongoing support for northerners, not only in research, but also in everything around that: administration of grants and funding, project management and other areas. Arctic colleges and universities are critical to support these goals, but other parallel intersecting initiatives are also critical.

As for accessible research infrastructure, we do have infrastructure in the north, and it's growing. However, it tends to be centralized, and it's not particularly accessible to communities, as it sits within government institutions. Breaking down the barriers for indigenous residents to access this infrastructure is critical. Northern research is incredibly expensive, but quality and quantity time spent in the north, with northern partners, is crucial to develop equitable relationships and to understand and address northern priorities.

Innovative thinking that encompasses indigenous knowledge and ongoing investment in the development of novel technologies that can be implemented in low-resource settings are also needed. Replicating what works in the south is not always an effective strategy for the north, so we need to look to northerners for this innovative thinking.

● (1210)

Finally, Canadian values are really critical when working with northerners. Our Canadian values of working with northerners really must underlie any international collaborations. We need to teach our international partners these values and how to work with communities.

I just want to finish by highlighting to the committee—and I'm certain the committee is aware of it—the recent report by the Council of Canadian Academies on northern research and equity. I'd emphasize that this report really outlines the philosophical underpinning and the paradigm shift that's needed to truly move our research forward in a world-class, effective and ethical way.

Thank you very much.

The Chair: Thank you.

We'll now turn to Dr. Vincent for an opening statement of five minutes.

Dr. Warwick Vincent (Professor, Centre for Northern Studies (CEN), Université Laval, As an Individual): Thank you, Madam Chair, and members of the committee. Thank you for this invitation and the opportunity to appear before you.

My name is Warwick Vincent. Throughout my career, I have conducted research on environmental change in the polar regions.

I have recently retired from Université Laval in Quebec, where I held a senior Canada research chair and was a full professor in the department of biology. I continue my work as an emeritus professor and researcher at Université Laval and the Centre for Northern Studies—Centre d'études nordiques, which is the inter-university research centre in support of sustainable development in the north. I was scientific director of the Centre d'études nordiques for eight years and I am a founding member of ArcticNet, the Canadian network for northern research and for knowledge co-production with Inuit and first nations.

Over the course of my career, I have witnessed first hand the enormous impacts of climate change in the Canadian north. In consultation and partnership with federal agencies and Inuit communities, we established a small research station on Ward Hunt Island, on the northernmost coast of Canada in a region now referred to as the “last ice area”. This Canadian station is the furthest north in the world. It is 4,000 kilometres due north of us here in Ottawa and it is logistically supported each year by the vitally important federal agency, the polar continental shelf program.

During these recent decades, we have seen and reported on massive changes in this far northern region of the Canadian Arctic. These are driven by recent warming and are without precedent for thousands of years. For example, the ancient ice shelves—thick permanent ice that fringed the northern coast of Nunavut until very recently—have largely melted and collapsed into the Arctic Ocean. We now observe that many of our northern glaciers are also shrinking at accelerating rates, resulting in the further extinction of unique habitats and biodiversity.

At the same time, I have had the great honour and privilege of working with indigenous elders, communities and young people in the north and to witness their resilience to change. I have been humbled by their depth of indigenous connection to northern lands and seas, and by their deep knowledge and sense of connectedness of people, the natural world and the environment.

Other testimonies to this committee have drawn attention to how the lack of a Canadian strategy for Arctic science is holding us all back, whether that research be southern-led, indigenous-led or co-produced knowledge. I would like to add my voice to this concern.

In my professional activities over the decades, I've had the opportunity to sit on many research advisory and funding panels in Canada and abroad, including, at present, on the scientific advisory board for the Alfred-Wegener-Institut in Germany, which is the largest research institute in the world conducting Arctic climate research.

These experiences have always been very informative and enlightening. Unfortunately, they have also been reminders of how far behind we are in Canada compared with other nations that are continuing to advance their Arctic science strategies and activities. This includes countries such as China, which is newly branding itself as a near-Arctic nation, and India, which is an emerging leader in space technology and whose stated objective in India's Arctic policy is to expand satellite remote sensing of the Arctic.

Canada has a pressing need to develop a Canadian strategy for Arctic science that indicates our ambition towards international leadership in both applied and basic fundamental Arctic research and that draws upon and is strengthened by the indigenous sense and knowledge of connectivity and resilience. Such a strategy would be uniquely Canadian, identifying science objectives relevant to indigenous and other national, as well as international, priorities. It would connect our many sources of expertise, resources and infrastructure for efficient Canadian research and knowledge exchange within the broader context of circumpolar and global science.

A Canadian strategy for Arctic science would send a clear message to the rest of the world that Canada is very serious about the Arctic and it would be an inspiring message to all of us in Canada that science and research in Canada's Arctic is to the great benefit of all Canadians.

Thank you very much.

● (1215)

The Chair: Thank you very much, Dr. Vincent.

Dr. Murray, I now invite you to make an opening statement for up to five minutes.

Dr. Maribeth Murray (Executive Director, Arctic Institute of North America): Thank you very much. I'd like to thank the committee for inviting me to speak on science and research needs in Canada's Arctic and in relation to climate change in particular.

I'm the executive director of the Arctic Institute of North America, a role I've held for 10 years. The Arctic Institute was established at the first session of the 20th Parliament via Bill H., an act to incorporate the Arctic Institute of North America, which was passed by the Senate of Canada on November 1, 1945. Our institute has a long history of studying change in the north.

I'm also a full professor at the University of Calgary, with my personal research focused on climate change impacts, human and environmental history in the Arctic and ways to improve Arctic observation for societal benefit. In addition, I represent the Arctic Institute as the head of delegation to the Arctic Council, where the institute holds non-state observer status.

I'm very pleased to be speaking to you today from Cambridge Bay, Nunavut.

As we've heard from Dr. Vincent and Dr. Kutz, climate change is having a profound impact across the Arctic. Changes in phenomena such as temperature, sea ice dynamics, precipitation and others are having cascading effects through the ecosystems to people and to the wider global system. Changes to the cryosphere—snow, sea ice, river ice, lake ice, permafrost—are unprecedented and present significant challenges to adaptation and sustaining civic infrastructure and supporting people, fisheries and wildlife. For example, as the glaciers thin and retreat, regional hydrology is impacted by freshwater flow to streams, rivers and lakes potentially resulting in dramatic lowering of lake levels or drying of streams, or alternatively rapid melt of glaciers leading to flooding and landslides.

In the case of the Greenland ice sheet, during the melt season we're seeing increasingly vast quantities of fresh water discharged into the marine environment, contributing not only to sea level rise in regions far removed from Greenland, but also leading to the freshening of the North Atlantic Ocean, with not yet well understood impacts on marine productivity, the marine food web and the carbon cycle. The consequences are too many to enumerate here, but suffice to say that research infrastructure, investments and capacity can help us to ameliorate impacts in Canada and to better understand present change and the trajectory of change going forward, and most importantly, inform solutions to adaptation and mitigation.

Over the past 60 years, Canada has made significant, but sometimes sporadic, investments in Arctic research infrastructure. We have many small facilities across the north that are operated by universities, the northern colleges, northern research institutes, indigenous organizations and communities. We also have a patchwork of federal and territorial facilities. All of these facilities serve one or more functions in support of research on land and in the coastal areas, and we have research vessels that facilitate marine science and community-based research programs and monitoring activities. There are Arctic researchers, I would venture to guess, in nearly every institution of higher learning in our country and in many federal and territorial departments and indigenous organizations. There are indigenous-led programs and established indigenous strategies on research and the management of indigenous data and information. Our research relationships with northern and indigenous people, including support for self-determination research, is slowly improving, and Canada is leading the way among Arctic countries in this area.

On the surface, then, we—Canada—seem well-equipped as a nation to provide scientific leadership for the Arctic and to understand and tackle climate change and the consequences of climate change going forward, along with leading across a whole range of other forms of scientific inquiry.

Individuals and coalitions of partners can drive important initiatives like the Arctic pulse initiative, which Dr. Jackie Dawson brought to the attention of this committee earlier, and the Canadian Consortium for Arctic Data, which is an ongoing movement to build interoperability across Arctic data centres in the country. Individuals can and do build collaborations with our colleagues across sectors and cultures to improve Arctic observation, such as this understanding of muskox and population dynamics that Dr. Kutz talked about.

● (1220)

However, these individual and coalition efforts are necessary, but not sufficient for pushing research where it needs to go and for leveraging our research infrastructures to best effect. For that, Canada needs a national plan that clearly identifies our science priorities—and I would include indigenous priorities for research here, obviously. This plan also needs to have an implementation strategy so that it can be realized. It needs to be developed with all parties at the table—indigenous, academic, territorial, provincial, federal, relevant NGOs and others. Also, they need to be at the table in sufficient numbers to reflect the diversity of expertise and experience across the community of Arctic researchers.

Canada—

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

Dr. Maribeth Murray: Okay. Thank you.

The Chair: You can speak to those issues further during the questioning.

I'll now open the floor to questions.

Please be sure to indicate to whom your questions are directed.

We'll kick off our six-minute round with MP Rempel Garner.

Hon. Michelle Rempel Garner: Thank you, Chair.

I'll start with Dr. Vincent.

You mentioned that you were listening to the testimony, and you were talking about the need for a coordinated or specific Arctic research strategy. We've heard from some witnesses about what could be included in terms of goals or structures, but you also mentioned that you sat on various different advisory bodies.

Do you think that an Arctic research strategy, if that were something the committee were to recommend, should be formally embedded within the federal government's tri-council funding agencies in terms of helping to set funding priorities?

Dr. Warwick Vincent: Thank you for that question.

I think that would be very helpful, but we have to also be thinking about a distributed portfolio.

Hon. Michelle Rempel Garner: Yes.

Dr. Warwick Vincent: When it comes to the north, there has to be a clear emphasis upon adaptation strategies, on local needs and on application of indigenous knowledge to changes in the north.

At the same time, we need to encourage other scientists who have new ideas, new ways of thinking, to also take an interest in the north, to join forces with northern communities and to participate.

Hon. Michelle Rempel Garner: You're talking essentially about embedding a principle of multidisciplinarity.

Dr. Warwick Vincent: That's right—and to allow some flexibility there in terms of how those objectives are actually defined.

Hon. Michelle Rempel Garner: Understood.

With any sort of strategy, I think the strategy is on one side and the key performance indicators are on the other. In terms of what the government should be driving to in terms of outcomes with an Arctic research strategy, are there clear key performance indicators, in your experience, that should be considered therein?

Dr. Warwick Vincent: Again, I think they are distributed across the spectrum: from basic research through to applied research and indigenous knowledge application.

Of course, we would like to see the application of new knowledge to solve immediate problems in the north, but we would also like to see the development of fundamental expertise that is able to produce new solutions in the future. Today's basic research is the solution to tomorrow's problems.

● (1225)

Hon. Michelle Rempel Garner: Understood—

Dr. Warwick Vincent: There are many examples that we could talk about, whereby some of those more basic components will help indigenous communities and that ultimately require close linkages with indigenous communities.

Also, I should say that we need to be encouraging indigenous participation in that basic research, as well as the applied research.

Hon. Michelle Rempel Garner: Understood and agreed.

For all of the witnesses—Dr. Vincent, Dr. Kutz and Dr. Murray—I'm not quite sure how to frame this. We've heard from all witnesses that a common theme is the need for international collaboration on Arctic research. That has clearly been a recommendation. On the other hand, we've also heard about some of the challenges given geopolitical complexities, particularly with Russia and also with the current government of China.

How do we square that circle?

As researchers in that area, what do you think the committee should be recommending to the government in terms of developing an Arctic research strategy that also protects Canadian sovereignty in the face of open aggression from hostile nations that have an interest in the Arctic?

Dr. Warwick Vincent: I could pass that to Professor Murray.

Hon. Michelle Rempel Garner: Professor Murray, would you like to to go ahead?

Dr. Maribeth Murray: Thank you.

Well, it's a challenging question, for sure.

First, I would note that the situation with Russia is a great detriment to Arctic science in general, because we—as I'm sure this committee is well aware—have now lost access to a lot of very critical scientific information that allows us to work on improving climate models, projections and all of those things.

I think it's important for us, as a nation, to build strong partnerships on Arctic research with like-minded countries in the Arctic. I will speak a bit about why I think that's important with respect to research infrastructure.

As I mentioned in my comments, we have a lot of research infrastructure in this country, but we don't have all of it. We work in partnership with our collaborators. I'm thinking of Germany, for example, with their research vessels that Canadian scientists are able to work on. I think the problems we face on a pan-Arctic scale are too big for any one country to tackle independently, so co-operation is key to understanding the whole system and where that system might go. With the absence of Russia, and the absence of information coming out of the Russian Arctic, the only way we're going to get close to having some sort of comprehensive understanding and pan-Arctic solution that can be applied is through co-operation.

Hon. Michelle Rempel Garner: I'd like to flag this for the analysts as they draft the report.

Essentially, what you would be recommending is increased formal collaboration with like-minded allied nations on Arctic research, as well as an Arctic research strategy that highlights the need for research infrastructure in Canada's Arctic, given the geopolitical uncertainty that Russia's aggression has provided in terms of Arctic research.

Dr. Maribeth Murray: Yes.

Hon. Michelle Rempel Garner: Thank you.

The Chair: Thank you.

We will now turn to MP Jaczek for six minutes.

Hon. Helena Jaczek: Thank you, Madam Chair.

Thank you to all of the witnesses for your testimony today. Having said that, I'm getting more and more depressed from what I'm hearing. Certainly, you have outlined many of the challenges and problems.

Perhaps I will start with you, Dr. Vincent.

You talked about research priorities and also hinted at solutions. Could you give us some concrete examples of where a problem was observed, and where we now have some success in addressing that particular situation?

Dr. Warwick Vincent: Thank you very much for that question.

I think we should try to avoid depression. We should take a leaf out of the indigenous book. When you talk to northern communities, they are very positive. They explain that they have been through extraordinary changes in the last 200 years and have an incredible resilience. We can learn from them.

I think there are many examples where we have solutions. In my own centre, the Centre for Northern Studies.... You talked earlier in the proceedings with Professor Michel Allard. He started with some very basic research using medical technologies to examine soil and permafrost. It was very theoretical, working in remote areas—

● (1230)

The Chair: I'm sorry. I'm hitting pause because it looks like the bells are ringing.

Do I have the committee's consent to continue during the ringing of the bells?

Some hon. members: Yes.

The Chair: I stopped your time, so we will continue. Thank you.

Dr. Warwick Vincent: I'm very good at multi-tasking. Thank you very much.

The example I had was of my colleague Michel Allard applying CT scans to permafrost. That was very theoretical. Then, the mayor of Salluit came to him and said, “We have a terrible problem up in the north of Quebec. The land is falling apart. We have had to move 20 of our buildings. We may have to move the entire town of Salluit. Well, we can't afford to do that.” Of course, culturally, that would be a terrible thing to do. Also, it would break the Bank of Canada to move all Inuit communities.

He worked with the CT technique to examine ice within the permafrost. He worked very closely with the Inuit community to identify traditional lands that would be of cultural interest for further development. They developed a risk map for future climate change such that the community can now build for the future knowing that, in the decades ahead, they are on the most stable ground in that particular area.

Hon. Helena Jaczek: Thank you so much.

I'll turn to Dr. Kutz.

You've told us about the muskox population disappearing due to Arctic warming. What else have you come up with, other than observation, in terms of ensuring that food supply going forward? Are there solutions that you've come up with?

Dr. Susan Kutz: Thank you.

I would echo Warwick's comments about the Inuit being so very resilient and able to switch from species to species, depending on the season, etc. However, they are in a food security crisis nowadays because multiple species are declining.

Some of the ways we've been working toward solutions.... One piece is just knowledge. If people understand what to look for in animals and if the meat is safe, there will be far less wastage.

Right now, communities are hearing about mad cow disease and bird flu. This creates a lot of uncertainty about their food source and distrust in it, which can lead to them going to the grocery store instead. As we learn more about what's in the species and whether or not there is a risk for people to consume it, that can increase their confidence in country foods.

The other piece of what we're doing is very much technologically driven, and that is looking at emerging infectious diseases in the Arctic and being able to provide rapid tests, not unlike a COVID test, for food safety.

At this point in time, when people find something unusual, it's a long trip for that sample to get down to a lab in the south and for an answer to come back to that community, but if we can develop.... We have the molecular technologies to do these things. When we develop these tests, we can then provide a rapid response to people and support them in their food choices. That alone will help prevent meat wastage and unnecessary harvests, etc.

Hon. Helena Jaczek: That's quite reassuring. Thank you so much for that.

We've heard about the issue of increased shipping through the Arctic. I wonder, again, how people are researching that.

What, specifically, are the problems related to the human population within the Arctic due to the increased shipping that is occurring?

Perhaps Dr. Vincent could start.

Dr. Warwick Vincent: Actually, I've had the pleasure of working with an international lawyer on that question related to Arctic shipping in Canada. There is a long list of issues to consider.

Of course, the greatest concern is oil spills. Given the danger of uncharted territory in many parts of the Arctic.... We have very poor charts and bathymetric charts in many areas. The ice is changing very rapidly. It's a lot less predictable than it was in the past. We need to understand more about what happens if there is an oil spill. How quickly will that degrade and break down?

There's research going on, including with local Inuit communities, to try to understand response and recovery times of the ecosystem to oil spills. The results to date indicate that there will be a very persistent effect of any spill of that sort.

However, there are other questions that relate to, for example, underwater noise in shipping. The Arctic Ocean is a very quiet place because of that ice cap—

● (1235)

The Chair: That's our time. You could expand on that in a written answer, if you choose to.

Thank you very much.

We'll now turn to MP Blanchette-Joncas for six minutes.

[*Translation*]

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

I welcome the witnesses who are here with us for the second hour of our study.

My first question is for Mr. Vincent.

It’s a pleasure to welcome you here at committee. I congratulate you on your long career as a professor emeritus. You have a pretty good résumé. You are the founder of ArcticNet. You also acted as the director of the Centre for Northern Studies at Laval University for eight years. I had the opportunity and privilege to visit; it’s fascinating.

As I just said, you were one of ArcticNet’s founders. Recently, the federal government publicly confirmed approximately $32 million of funding, which it had already announced in December 2023. However, this is a decrease in funding. Yet, scientific research is a priority for the government.

My question is simple: If scientific research is a priority, why reduce funding for ArcticNet and northern research?

Dr. Warwick Vincent: Thank you very much for the question, sir.

[*English*]

I don't have the exact figures for overall funding, but I can say that funding levels are low relative to other countries. For example, in the report that Professor Kutz referred to, “Northern Research Leadership and Equity”, it's shown on page 69 that Canada's funding for Arctic research is less than 50% of that in Norway. Canada's funding for Arctic research is less than 20% of that in the United States. Only 1% of NSERC funding is given to Arctic research.

Its conclusion is that the data demonstrates that Canada is not a global leader in Arctic and northern research investment.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Mr. Vincent, I’ll come back to the government’s recent public announcement. It was quite recent, specifically on May 26.

Mr. Champagne, the Minister for Innovation, Science and Industry, said that Canada has everything to become a world leader. He said that, to this end, Canada has a ship for conducting research, the *Amundsen*. However, we know this ship is coming to the end of its useful life. Mr. Champagne also talked about the Institut nordique du Quebec established at Laval University. He said these elements could help us become a global centre for research on the Canadian north.

Based on your expertise, how does one become a global centre for research on the Canadian north while reducing research investments?

[*English*]

Dr. Warwick Vincent: I think you're correct. The minister is correct in that there are some strong elements in Canada, but we need to federate them. We need to bring them together. The *Amundsen* is a case in point. That's a beautiful ship. I just passed it in Quebec City before leaving. It's heading up to the Lincoln Sea again this year. It's in good shape but it's 45 years old. A typical lifetime for a ship is between 30 and 50 years.

The polar continental shelf program has been in a crisis situation off and on over the 30 years that I've been obtaining support, including this year. It propelled 100 of us to write to the Minister of Natural Resources in distress about the way in which our programs may be coming to a halt as a consequence of a lack of continuity of funding of that critically important agency, and yet at the same time we see other nations scaling up in a large way.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Professor Vincent, I have a very important question to ask you. I’m curious to know which language is used to conduct scientific research in the Arctic and the north.

[*English*]

Dr. Warwick Vincent: It's a very good question. It's a mixture. Typically, the exchanges with Inuit or first nations are with translators. I wish I spoke Inuktitut. In northern Quebec, in Nunavik, many of the exchanges are in French. In much of the rest of Canada, it is in English. Of course, the international literature tends to be in English. However, in communicating, when we apply for science licences in the north, we have to apply in Inuktitut and provide our reports in Inuktitut.

● (1240)

[*Translation*]

Mr. Maxime Blanchette-Joncas: I’m curious about that, because in his announcement at Laval University, Minister Champagne said the money would also lead to more research in French, which is in decline in Canada. “Research in the Arctic, in the North, will happen in French. Obviously, that’s important to me as a francophone. The decline we are seeing … is not just a Canadian issue,” he said.

Is the minister right to say that funding the ArcticNet network will promote French-language science in the Arctic and the north?

[*English*]

Dr. Warwick Vincent: I think French is a very important part of working in the north. We hear French commonly in the north when speaking to colleagues. My team is a francophone team that I take up to Ellesmere Island. We have our nine stations where the common language within the station would be French. Working with our communities, we would try to make an effort to make sure there were translators along to talk to them in the language of their choice.

[*Translation*]

Mr. Maxime Blanchette-Joncas: In the lab, things happen in French. However, in which language are scientific articles and research results published?

[*English*]

Dr. Warwick Vincent: It depends. The scientific publications at an international level are in English, but we have a responsibility as scientists to bring back that information and transmit it to our students and to communities in the language that is most appropriate. At our community science centre, for example, at Whapmagoostui-Kuujjuarapik, everything there is in French, English, Inuktitut and Cree. Respect for language is so important.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you.

Dr. Warwick Vincent: Thank you very much.

[*English*]

The Chair: Thank you.

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

Mr. Richard Cannings: Thank you to all three witnesses for being here today.

I'll start with you, Dr. Murray, to first of all thank the Arctic Institute for all your work and support you've provided scientists over the years. I used your station at Kluane probably 10 times to teach a field ecology course. I know a lot of people who've gone through that station. We've had two of them as witnesses already on this study.

I'm just wondering about that infrastructure available to researchers across the Arctic. You're in Cambridge Bay right now, where POLAR is headquartered at CHARS. How can we best coordinate the infrastructure supports for research across the Arctic? It's such a huge place.

Dr. Maribeth Murray: Yes. It is true. We do have a lot of research infrastructure. A lot of it is in dire need of refurbishment and upgrading.

I would say that we need coordination across the country. To go back to Professor Vincent's comments, if we had a national science strategy, it would allow us to think carefully and strategically about where resources need to be put with respect to different infrastructures. It would allow us also to make difficult decisions about which infrastructures might need to be retired because they're past their use-life—to the point about the *Amundsen* and the need to soon replace that vessel.

I think a national plan that actually sets out our priorities would help us to determine where money needs to go infrastructure, but there is also a need for coordination. We do have the Canadian Network of Northern Research Operators, which is still really in its infancy but can serve as an entity to bring the different research infrastructure operators together to work on some common planning so that we have common training protocols, we have the ability to move scientists from one facility to another and we have pathways for opening up those facilities to indigenous organizations and community researchers.

The short version of all of that is really that we have a mechanism for coordination. It needs some resourcing, and we need a plan with an implementation strategy for how those resources can be distributed to best support the infrastructures that already exist and the new ones we may need going forward.

● (1245)

Mr. Richard Cannings: Thank you.

Now I'm going to turn to you, Dr. Vincent, because you mentioned, as have several of our witnesses, the polar shelf. The Arctic is a big place. The logistics of getting around are critical to researchers and would break every budget in any researcher's world if they were left to their own devices.

I remember my brother phoning me in 2018 and saying, “You've got to get the polar shelf properly funded: It hasn't had an uplift of funding in 20 years.” Shortly after that, it seemed that something was done, but you say that it's in dire need of help now.

If you had one recommendation for this committee about the polar shelf, could you perhaps say what that would be? What does it need now to make sure that it's functional now and into the future?

Dr. Warwick Vincent: Thank you for that question.

I agree with everything you have said. The polar shelf program is really a linchpin for operations in the Canadian north by Canadians. It's also a front that we've put out to the rest of the world in terms of our ability to access these vast territories of Canada, and the expertise is extraordinary. My recommendation would be a commitment to continuity.

What is so difficult as a scientist is not knowing from one year to another whether, yes, you have a program—you can send your students, you can work with those Inuit partners—or not. You don't know until March or April and the season is coming up within a month or two months, and yet the expenditure is of the order of hundreds of thousands of dollars. This is, as they say, not a good way to run a railroad. We really need a more professional national focus that would be part and parcel of a national strategy.

Mr. Richard Cannings: Thank you.

How much time is left?

The Chair: You have a minute and a half.

Mr. Richard Cannings: Okay. I'll go to Dr. Kutz.

I'm really interested and curious about how climate change drives these new and emerging wildlife epidemics you mentioned. I've heard that brucellosis has been found in muskox, but I was just reading your information and see that there's a bacteria called “erysipelothrix”.

I'm just wondering how these bacteria get to these Arctic islands to then cause such havoc with wildlife populations. Maybe lemmings are carrying them. I'm just wondering about the physical nature of these epidemics: how they work and how climate change is affecting that.

Dr. Susan Kutz: Thank you for that.

That is also a whole book, but this is where a lot of the basic science is so important. Where has this come from? How has it arrived? Why is it being so devastating?

There are a number of theories. One is long-range transportation.

We have migratory waterfowl populations that are huge in the Arctic—and increasing—and that is a great avenue for globalization of pathogens, for bringing them back and forth from south to north, which also means that things that happen in the north can also be transported back. Erysipelothrix, the actual bacteria that is killing muskox, is a generalist, so it can infect everything—all species—including fish, birds and people.

That is one mechanism, and that is where we start to use the molecular methods to try to understand that better.

The other mechanism—

The Chair: Thank you. We're a bit over time, so if you want to expand on that and send a written response, that would be terrific.

We'll now start our second round with MP Lobb for five minutes.

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

I'll follow up on Mr. Canning's question to Ms. Kutz in regard to the muskox. Are the surviving or remaining muskox showing resistance to the bacteria?

Dr. Susan Kutz: Unfortunately, from what we know, we're not seeing that.

We saw major epidemics and large numbers of dead animals. We don't see as many dead animals now, but that's because there are fewer animals out there. Just last year up on Ellesmere, we continued to find more animals that had died from this.

The musk oxen have very low genetic diversity already, which means they have very low capacity to deal with new pathogens.

On the Arctic islands at this point, we don't see much more resistance developing.

Mr. Ben Lobb: Again, not to go too far on this, but is there a way, similar to what's done in areas down where I am with raccoons and rabies or other things, to drop the medication to the muskox to help them fight this bacteria, or is that too far-out thinking?

● (1250)

Dr. Susan Kutz: People ask about vaccines all the time. We have vaccines for pigs, but they need to be vaccinated every six months, so that's clearly not feasible for a wild population.

Some of the things we're thinking about have to do with their underlying resistance. Disease doesn't act alone. It depends on other stressors on the animals, so we try to reduce other stressors like disturbance and boost minerals, some of the trace elements that help them to become resistant to some of these things.

There is greater genetic diversity in the mainland musk oxen, so there may be some technologies there where we can support these other animals.

Then there are some other more advanced molecular methods that could be considered coming down the pipeline, but that would require considerable community discussions and input.

Mr. Ben Lobb: Mr. Vincent, at the beginning I was thinking that there's just this big centralized command in the Arctic, and this is where it all heads out, but, as more and more guests appear and more and more briefs are sent in, I see that there is a tremendous number of groups that are involved in research in one way or another in the Arctic.

How many are there, in your experience or knowledge? How many are operating up there?

Dr. Warwick Vincent: I don't think I have an accurate estimate of how many are operating. We know that it's in the order of 40 different research stations in the north. They vary in their level of activity, from the High Arctic Research Station, which has a very large number of scientists working out of, to very small stations such as Ward Hunt Island station. Typically that has between five and 15 people working at it over the course of a season.

It's in the order of hundreds.

Of course, in addition to the terrestrial side, there are people working on the sea through the *Amundsen*, through the *Louis St-Laurent*, and through other agencies and activities.

Mr. Ben Lobb: Out of all these organizations, my guess is that all the research, findings and data do not end up in a centralized location where it can be disseminated and used to look backwards and forwards.

Is that true, or am I wrong there?

Dr. Warwick Vincent: I think that's partially correct because it is so disparate, and it comes in from so many different sources.

ArcticNet has really tried to address that, by bringing together, in a multidisciplinary way, Inuit and first nations communities in an opportunity for the different players in the north to share their findings at the Arctic science conference that is held each year.

That is one mechanism whereby there can be some sharing. There are also mechanisms at international levels. Dr. Burgess mentioned the International Arctic Science Committee that Canada sends delegates to each year. That's a way in which there can be a sharing of ideas, but also a sharing of priorities and, right at the moment, this international community is identifying its key priorities for ongoing collaborative international research in the Arctic.

This makes it a timely opportunity to develop a national strategy that will allow us to mesh with some of those international priorities, most of which are also priorities for Canada.

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

We'll now turn to MP Diab for five minutes.

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

Let me just start off with thanking the witnesses for coming today. It's been an eye-opener listening to the witnesses we've had so far in this study of science and research in Canada's Arctic. Certainly, as a member of Parliament, I was not privy to all of that information and expertise.

Dr. Kutz, let me ask you a question and give you a bit of an opportunity with the time I have. You talked a lot about the wildlife as it affects human health and, of course, the emerging infectious diseases. Many of us don't do this for a living, nor do we study it, or whatever.

Is there anything else you want to impart to the committee today? I know you started with your opening remarks and, quite honestly, you had so much information that I felt you were trying to go through it quickly so that you could give all of it to us. Are there any nuggets you want to leave with us?

● (1255)

Dr. Susan Kutz: Wow. I suppose the value of wildlife to indigenous communities is so very high, and there are so many competing interests in the north that are or can be detrimental to wildlife, wildlife populations and that way of life.

I mentioned near the end of my comments that southern solutions aren't necessarily the right solutions and that we need to work with northerners to develop those solutions. Putting in more infrastructure, a road, can have devastating consequences for wildlife, not just in affecting their movement but also in increasing stressors and influencing their susceptibility to new diseases and other things. While it seems like a logical answer, I think any of these interventions are really important to discuss with northerners so they can understand that.

I also think that when it comes to emerging infectious diseases, the Arctic is very susceptible. We are seeing unprecedented warming rates. Lots of diseases are influenced by temperature. We've seen the range expansion of some of the parasites that are up there expanding into the high Arctic islands. We're seeing new species of animals that are bringing with them pathogens.

Therefore, those very direct effects of climate change are dramatically altering the communities. It's really quite important to understand those processes. It's changing—

Ms. Lena Metlege Diab: Thank you very much.

Ms. Murray, you talked a lot about research infrastructure coordination across the country, where resources are needed so that we can decide where best to use them. I have a question for you in this regard. Does the organization do a lot on the international level? Do you find that coordination on that level is necessary, helpful and sufficient? Can you talk a little bit about that?

Particularly in the first panel, we heard a lot from Mr. Burgess from the Natural Environment Research Council Arctic Office. Quite frankly, he called Canada “world leading” and “world class” in Arctic science. I'm just trying to understand that, coupled with some of the other testimony we've heard.

Dr. Maribeth Murray: To the first part of your question about coordination on the international level, there are a number of long-running initiatives that Canadian scientists and research infrastructure participants are members of.

One is the Interact network, which is the International Network for Terrestrial Stations. There are well over 100 stations that are part of that, including quite a few from Canada, such as the station that I'm responsible for at Kluane, and the CEN stations that Warwick mentioned.

We are part of that network, and in that context we work with our international partners to do things like develop common protocols for environmental monitoring, and share data and information across that network. Ship-based coordination is a little different. It tends to happen with the institutions that own the vessels and the scientists who have those partnerships.

We don't, as I mentioned earlier, have a strategic plan for how we want to engage. Those things have tended to happen either at the level of the individual scientists, groups or consortiums of researchers or, as Henry Burgess talked about, through one government agency to another government agency internationally. We have an ongoing program—

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

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

[*Translation*]

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

I’ll continue with Mr. Vincent.

Mr. Vincent, given your expertise, I’m sure you know that conducting research in the Arctic requires tools. Specifically, one needs a boat, because there’s water up there.

Laval University is working with the Amundsen Science organization, owned by the federal government. They both act as comanagers or coleaders in order to conduct research. According to scientists, the *Amundsen* icebreaker is coming to the end of its useful life. We are waiting for confirmation from the government as part of the National Shipbuilding Strategy, but we have no answer or very little confirmation regarding the fleet’s renewal.

I’d like to hear your opinion on the need for a boat dedicated specifically to research in the Arctic.

● (1300)

[*English*]

Dr. Warwick Vincent: I think this is absolutely critical. Canada has the longest coastline in the world, and 70% of that coastline is in the north; in fact, two-thirds of it is in Nunavut. The Inuit are intimately related to the sea. They consider themselves part of the marine ecosystem. We really need to understand that marine environment, and that marine environment is changing very rapidly. It's so critically important for indigenous communities. It is important for global circulation processes. It is important for the transfer of pollutants from one side of the world to another.

We see other nations scaling up enormously. Germany will be launching its replacement for its research icebreaker—which is actually younger than the *Amundsen*—in two years' time. China will be launching its third research icebreaker next year, and its fourth one is already under construction. North Korea has committed $200 million to a new icebreaker. We're seeing a huge ramping up. We need to be on the front line. We don't want to be just there taking information from others. We need to be on the front line obtaining that information for Canadian waters.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Indeed, we note that even non-Arctic countries, or those who do not need to conduct research in polar regions, have ships. You did in fact mention it.

I’d quickly like to hear what you have to say about the need for a national coordination strategy on northern and Arctic research.

[*English*]

Dr. Warwick Vincent: It's critical to bring together these components. Dr. Burgess referred to how we have certain elements of leadership; but they are elements, in being disconnected or components. Other witnesses have referred to some of the strengths we have in Canada, but we don't see the totality of that strength, and we don't see the totality of those resources. By bringing it together in a strategy, we show to ourselves what we have, and we also show to the rest of the world what we have.

The Chair: Now, for the final questions, we'll turn to MP Cannings for two and a half minutes, please.

Mr. Richard Cannings: Thank you.

I'm going to turn back to Dr. Murray just to bring up the subject of infrastructure of research stations. Again, you've mentioned that there are a number of research stations across the Arctic, run by quite a number of organizations, in various stages of repair and disrepair. As you say, we need a plan. We need a strategy to make sure that our Arctic research is going in the right direction and will continue into the future.

Just to put you on the spot, if you were writing that plan today and had to make a comment about what the federal government's role in research station infrastructure might be, is there a role that the government should be playing in, perhaps, building and maintaining research stations across the Arctic?

Dr. Maribeth Murray: Yes, I think there is a role for the federal government. I became responsible for the Kluane Lake Research Station 10 years ago, and at that time the funding that used to exist through the NSERC program for operation and maintenance of research infrastructures went away. Facilities that are not operated by federal, provincial or territorial organizations have a very difficult time acquiring resources to support maintenance, daily operations and upgrading of equipment. CFI is one pathway, but in the community of those of us who have these responsibilities, we have discussed the need for some kind of a national program to support the research infrastructures the network as a whole could look to in order to maintain that.

I see no other place for that other than coming from the federal government. The universities are challenged, as everybody knows, to maintain facilities that are often quite far removed. The northern organizations are also fiscally challenged. I think in the context of a national plan for research, there has to be that section that talks about roles and responsibilities and the cost benefit of supporting new and existing structures. I'm not sure if that entirely answers your question, but I don't see how it can be done without federal support and engagement.

● (1305)

The Chair: That's the end of our time.

Again, I would like to thank our witnesses, Dr. Susan Kutz, Dr. Warwick Vincent and Dr. Maribeth Murray, for their testimonies and participation in our committee study of science and research in Canada's Arctic in relation to climate change.

If you have any additional comments or things that you would like to submit to the committee, you may do so to the clerk. Check with the clerk if you have any questions.

Is it the will of the committee to adjourn the meeting?

An hon. member: Yes.

The Chair: The meeting is adjourned. Thank you very much.