

Theme 4: Strengthen

07 April 2021

Transcription

Start Time: 13:00 UTC

1. Housekeeping Remarks, Lindsay Arthur: Thank you all for joining. We're just waiting for the meeting to fill up as we've just opened it up so we still have people entering. And we'll get started shortly. OK, as people keep coming in, we'll just get started with some housekeeping notes. So we'd like to begin: first of all, thank you for joining this webinar and we're beginning with an Arctic lands acknowledgement which is adapted from the IASC state of the Arctic report for use in our webinar today.

The circumpolar Arctic is the contemporary home to many different indigenous peoples. Wherever you may be participating in this webinar, we honor and recognize the place based knowledge of Arctic Indigenous Peoples and their ancestral and contemporary stewardship of their homelands, and we welcome you to do the same.

So thank you all for joining us. This webinar is being recorded and will be posted to the European Polar Board YouTube page and share it on the ASM3 website. The microphones and cameras of the audience are automatically off if you're having any trouble technically, you can use the chat box and ask for assistance, or you can see the zoom website support pages and a link for that will be posted in the chat. The full program is also available on the ASM3 website and a link that will also be posted in the chat. So any questions that you have that come up especially for our speakers, we ask that you type those directly into the Q&A box. That's easiest for all of the speakers to see it and respond, and we will have a short Q&A at the end where all questions will be addressed. So again, use that Q&A box, not just the regular chat box for any questions you have.

Just to sort of give an overview before we start: this ASM3 science process is really what resulted partly in this webinar series. We've solicited updates on Arctic Science and research from many different channels, countries, indigenous peoples, organizations, an international organizations, including the working groups of the Arctic Council and have submitted project updates, new projects, and a survey on international cooperation through the ASM3 Science process. So Additionally, we have solicited feedback through online surveys and through research, community workshops. Then our Science Advisory Board has reviewed all of this science submitted through this process, and that's really what we're trying to share through this webinar series in a free, open and public platform for everyone. We are getting very close to the actual ministerial of the Arctic Science Ministerial. It's to be held in May in Tokyo, and as it draws closer, we are now starting to wrap up all of the final product of the ASM3 which is a result of the science process. So we are finalizing the collaboration of all the countries on the joint statement administrators which also included input from the indigenous peoples organizations engaged in the ASM3 process and the final report is being developed which we're planning to share more online resources and recordings from the webinar series and research page on international research opportunities and the Arctic Research overview submitted by the participants as well as a new idea which is sharing a project based database on the science admitted through this process. So that's all that's happening right now, and we're getting close to the end, but we have a few more webinars left in this series. So today we're looking at Theme 4. Strengthen and to get really into the theme, I'd like to introduce our moderator for today, which is Andrey Petrov. Andrey is the president of the International Arctic Social Sciences Association, better known as IASSA and serves as a member of our ASM3 Science Advisory Board. So Andrey is going to provide an overview of theme four before giving the floor to our speakers. With that Andrey, please take it away.

2. Moderator, Andrey Petrov (Science Advisory Board, IASSA): Alright, thank you, Lindsey. Thank you very much. It's exciting being part of this webinar and share some of the work that the Science Advisory Board was doing and also we have a few exciting projects to report. My task here first is to introduce a little bit this area and share what the Science Advisory Board has been up to and our kind of main thoughts and conclusions.

So strengthening the Arctic research enterprise and strengthening our relationship with communities in the Arctic and outside the Arctic is, of course is a key component of anything that we do. In this region. The Arctic scientific community recognizes that there is an urgent need to invest in capacity building, whether it's a local capacity building in the communities or capacity building in science itself and education, in networking, and being connected to Arctic communities, but also ensuring our connection to the global community so that issues in the Arctic and research in the Arctic is a part of a global knowledge domain. And in that context, it was important for us and the Science Advisory Board, but also in general or the Arctic Science Ministerial team to emphasize that as one of the four sort of main pillars that we had discussed as a part of the ministerial. That's was sort of the basis for looking into that. They call as you know, been made to variety of jurisdiction to send their projects to share their research achievements over the last several years. 20% of all submissions from more than 20 countries contained elements that would go to the strengthening local capacity, strengthening science capacity in developing the Arctic Science enterprise in a way that advances its future. As you could see here at the bottom there are some word clouds that pertain to what we received from various countries, focused on a variety of locations in the Arctic and various countries, but also having global linkages. And variety of subjects. Variety of disciplines, interdisciplinary areas as well as activities such as education and training and things like that. There is really a variety of things that we received and reviewed in order to understand how the Arctic science is investing in strengthening itself and communities its work.

While the understanding that strengthening is an important element, comes from the notion of capacity building - this is a key ingredient of success and Arctic research. What are the main sort of areas where we find that this is happening? First of all, it's the encouragement and support knowledge holders and early career scientists that work in the Arctic and that will constitute the future of Arctic science in the decades to come. It's promoting the image of the Arctic as linked to people's lives not only in the Arctic itself, but also around the world and not as a distant or irrelevant place. And here, of course, our engagement of and variety of countries which are, for example, Arctic Council observers, is important to make sure that we are really relating to the global issues, the global challenges, but also remain relevant globally with what we do. Building educational capacity and for Arctic residents, including Indigenous peoples, so that we invest in educational programs and processes that actually are inclusive of variety of knowledge systems and that allow us to advance knowledge in various ways in those communities, but also make sure that educational systems are up to date and provide results that elevate all kinds of knowledges that exist in the Arctic. In this case, of course, adapting research and education to include indigenous and local knowledge is a key element of strengthening our work in the Arctic, and I think that a lot of projects are contributing to it substantially, so that is very good. Another element is that we of course can't just talk about it without really thinking what happens to Arctic science in the post COVID-19 world and how it will change and how we build resilient science enterprises that would exist in different and difficult circumstances during and post COVID-19 apart potential other pandemics? Which of course also needs to be reflected in our capacity building.

What to do? This project that we emphasize first is on strengthening and capacity itself as a part of research project is important but also important as a standalone goal. So some projects really incorporated those elements into their research goals. And other just will stand alone that focus specifically on addressing strengthening of the educational in various other capacities. For early career scholars and students it's very important that we invest in those groups that really would drive science in the future. Emphasis on strengthening indigenous and local communities also was a separate focal area that we find in a lot of projects. And preserve on Indigenous knowledge system as a part of science and community capacity building. As we see about 27% of submitted projects incorporated some forms of indigenous knowledge engagement, so that's that was good. But

I think it probably needs further improvement. And only 14% or community driven. So that's maybe something that we need to work further. But again, the progress is there and the process is happening, making those projects more inclusive of indigenous knowledge and community inputs. Emphasis on state rights, knowledge holders and public engagement. Again, about 44% of all projects we received from various countries included outreach as part of their activities, which is very important of course, and various kinds of outreach to any of the groups that are listed. And of course emphasis on education, but nonetheless education was not as prevalent as at least I would have hoped. Only 5% explicitly include educational components. That is, of course, something again that we, you know, commend those who did, but maybe further improvement is needed and further expansion of that would be important to secure that our scientific enterprises societally relevant.

We did develop a number of key thematic areas in which strengthening has been and shared with us, part of those submissions. I also tried to flag them with different colors, green and yellow. Green is where we have a good progress, but we need to capitalize further on success, and the yellow where we have some progress, but more efforts may be needed. Of course, elements contribute to strengthening science in the Arctic and in respect to building capacities, education, and connectivity. I'll go quickly between those different topics.

Networking collaboration coordination has been done. There's some very well known projects, INTERACT III, EU-PolarNet2, that provide those connectivities and coordination that are really needed for successful science operations in the Arctic. Other things like FARO, U.S. Fulbright Arctic Initiative and Arctic-FROST are networks that connect people across the Arctic with a variety of subject areas that allow us to maintain those activities that of course especially key and covid times and will be in post covid times. How do we keep that? And how do we ensure that we capitalize on those networking, collaboration, and coordination opportunities? I think it's something for us to consider as we move along at the ministerial and pass ministerial without research plans.

Part of this is conferences and meetings and we are all facing your reality and that nonetheless our Arctic science community has been successful in holding a variety of events including an Arctic Science Summit Week was just a few weeks ago, just very recently, and then Arctic Observing Summit was held last year, and the International Congress of Arctic Social Science will be held in a few months by IASSA. So we really are in a mode of continuing that, but we really need to reflect on how those new modalities for conference and meetings are commensurable with strengthening our capacities locally and with, of course, investment in our students and early career researchers. It's really still, I think, the jury is out on how we handle that. But the good news is those activities are continuing and engage a lot of scientists and a lot of community members as well.

Education and training, of course, a key component of strengthening and we have a growing recognition that education needs to be an integral part of science projects. Although I just set a few minutes ago that it's not as prevalent as we would like to - at least I would like to - we do also have excellent entities in the Arctic that focused on education such as University of the Arctic or APECS or Polar Educators International, which we will hear from a little bit in a few minutes. So we found that there a variety of modalities in education is completed, which it would be short courses and field schools and workshops. We have a number of educational programs that span across nations that bilateral, multilateral educational programs. And of course, a lot of countries invest in national higher education by developing innovative graduate and undergraduate degree programmes including encounters that are not Arctic countries that are Arctic Council observers, for example, that actually have been heavily invested in that capacity. I think that's important.

The outreach component is also quite well represented. Again, there are variety of projects that have been successful in reaching out to a variety of communities with stakeholders, rightsholders knowledge holders or general public or policymakers as well and such as rapid response assessment for coastal offshore, permafrost, or climate issues concerning report by AMAP that addresses recent development. On climate indicators, there are things like Arctic Festival for example that makes a connection between artists and scientists in the Arctic in the

Czech Republic and kind of brings the relevance of the Arctic work into Central Europe, which is of course very, very interesting. As I said, a lot of jurisdictions outside of the Arctic eight countries also hold various events, so Singapore and Japan, for example, hold regular events that inform engage members of the public and students and academics with Arctic research and so that is of course also important to make sure that we are relevant around the world.

Science capacity and resources in the last few years, we have a variety of new or updated products that have been published or emerging, including the Polar resource book that we'll hear about in a few minutes, but also state of Arctic Science 2020 and 2021 is being finished as we speak that IASC is putting out to inform us an various accomplishments of Arctic scientific enterprise. Edu-Arctic is another capacity and resource that we hear from in a few minutes. UArctic is developing one stop shop for our tech knowledge that will bring together various types of information and knowledge and single infrastructure. So there's important processes that go here in shoring up and consolidating resources and developing synergies to support science capacity.

There are still areas to improve and funding is one of them, I think. We do have national programs that are working to strengthen capacity and, where possible, facilitate exchange co-funding and collaboration. But still there is some mileage to be crossed right to improve international coordination in that area and better connect, research funding and local capacity. And so two things: one we need to develop way more strength and the ways in which we coordinate funding across jurisdictions. But on the other hand, how do we make sure that this funding is actually invested in and supports local capacity building? We've had success in last few years there multilateral and bilateral coordination between funding agencies and Europe and other jurisdictions. We have very strong national programs that invest in Arctic science simply navigating the Arctic in the United States. Of course, Horizon2020 has been going on for awhile. There's a programs in Dutch program for polar Tourism. In Japan, we have J-ARC Net and PROPOLAR in Portugal. But again, I think it's excellent that those jurisdictions invest heavily in Arctic science or increasing their investment. Across the board and multi national coordination would be of course even more important in the coming years and that we hope they will be strengthened further.

Indigenous local capacity building. Again, there is a growing recognition and growing number of projects that focus on building capacity in the Arctic both as a region and the whole and specifically and indigenous communities. This said, we do need to emphasize this further and to make sure that this becomes part of most projects and all projects that work on indigenous homelands. I think that's really important, that we advance that progress that we achieved. Yes, we did have, you know, a very important process completed. UArctic and IASC, for example, are working and uniting their activities. IASC, the Arctic indigenous and Engagement Action Group and had recommendations done, for example. We have various networks that are emerging, because of COVID-19 like AIVAN that connects various jurisdictions. The artist, Indigenous artists and crafters, jurisdictions in Canada - we will hear in a few minutes, have major development both on the side to the government and science enterprise, but also of course from the Inuit community that will develop the national new strategy and research will here in a second about. But again, there's a lot of progress here, but we need to advance further.

Infrastructure and data. More research infrastructure is created. However, we need to further investment to ensure that this infrastructure is local, embedded, resilient and actually developed science operations that are resilient to various changes that are also investing in local capacities itself. Basically what we see is that we have centers and hubs that are emerging in the last few years. New field stations and ice breakers and data infrastructure. Three major elements. Again, we have advancement in all of them, but again some of this has to be rethought. Probably in the coming years in respect to COVID-19 and other changes.

I tried to share with you some of the thoughts of the strengthening submissions that we received. I think it's important that we continue to invest in that area. But now we have a unique opportunity to hear from specific

projects that we reviewed and that represent some of the components of that strengthening that we just discussed. The first presenter is Agata Gozdzik (I hope I pronounced it right). She will talk about Edu-Arctic, an innovative education program attracting young people, natural science and [...]. She's from Poland and represents the Polish Academy of Sciences.

3. Speakers:

Agata Gozdzik (Edu-Arctic): Good afternoon, yes. My name is Agata Gozdzik, and my institute was honored to coordinate Edu-Arctic project. The project was financed by the European Commission via the Horizon 2020 program and it started in 2016 and officially ended in 2019. However, we have managed to successfully provide some follow up for network and community which we developed during the project.

I will explain a little bit about the project and the ideas and objectives. The idea was to present the Arctic region and support science as a vehicle to inspire interest in STEM science, technology, engineering, and mathematics in secondary schools. We were collaborating with teachers and students aged 13 plus and so we were offering a complex program of online lessons and other activities using the Arctic research as inspiration. We also wanted to establish links between research and education and we wanted to bring the Arctic closer to societies living outside the Arctic. The idea was to raise awareness about the region also about the challenges it faces in terms of climate change and other challenges that we are facing now.

We were collaborating in six partner organizations. We were coordinating the whole consortium, but we had to partners from Iceland, Faroe Islands, Norway, Poland and France and we were offering also online lessons directly from Arctic research stations for state stations that are mentioned here, we're providing information and materials, educational materials for schools.

Our program had five components. The most popular, the most important one was online lessons, and these were virtual lessons by experts often directly from the stations. As we started in 2016, this distance education was not popular at that time, so it was something extra for schools at the moment of coffee time. It's a new reality. The online lessons were dedicated to STEM topics, but also to some social sciences. It was not only science classes - we also developed Polarpedia. This is an online encyclopedia dedicated to polar issues. At the moment we have more than 600 terms. Many of them were translated to 17 languages. So not only the languages of the consortium, but also additional languages. Thanks to the help of teachers who wanted to volunteer and develop this tool further. We also had a monitoring system dedicated to environmental observations, mainly focused on metrological measurements, but also some observations in the vicinity of schools. Arctic competitions were chance for students and teachers to win a trip to the to the Arctic to some of our stations working in the project and we have some training for teachers who were involved in the project.

We were very happy to see how many teachers registered for the program, so we had at the end of the project some more than 1200 teachers. However, as we succeeded with developing it further, the network of the Community of Edu-Arctic teachers is still growing and at the moment we have almost 2000 teachers and educators, from more than 60 countries.

This is a great community that is still developing, and as I mentioned, we have this opportunity to follow up with the project. And thanks to EEA grant that we received together with Norwegian partners we are developing Edu-Arctic 2, so the program that offers online lessons but also some educational packages that are freely available online and we are still getting new teachers interested and involved in the product. Thank you very much.

Andrey Petrov: Thank you very much, Agata.

Lindsay Arthur: Next up we have David Arthurs, who's going to be discussing the polar Thematic Exploitation Platform.

David Arthurs (Polar Thematic Exploitation Platform): Great, thank you, Lindsay. I'm here to talk about data infrastructure is one of the topics Andrey mentioned.

We're all fortunate to be in an environment with unprecedented amounts of data about the Arctic, and the question arises, what do we do with all this data? How do we handle it? The traditional model of downloading data is basically going to break the Internet. The quantities are so great and a number of organizations have tried to figure out what to do about this. ESA's response are what they call their thematic exploitation platforms. There are seven of these. And one of them is focused on polar data. That's the one that I'm responsible for, so a thematic exploitation platform is a virtual research platform that brings together the data, but also computing power storage and analysis tools that are appropriate for a certain thematic area. These capabilities, in addition to the problem of downloading large amounts of data, these capabilities are of a certain degree of power that users might not otherwise have access to.

So our thematic exploitation platform is called Polar TEP. It provides polar relevant data tools and processing in the cloud. It allows users to bring their algorithms to the data or to use algorithms that we provide for them on the platform. We see ourselves as a central hub in the polar data ecosystem. We're not doing everything, we collaborate closely with other data portals, developers of data, processing chains, etc. And we provide access to very large amounts of data currently where we're looking at over 15 petabytes of Earth Observation and other types of polar data.

We're here to help the polar community. We help them in addition to providing software and hardware, we provide data management services and advice. We help foster international collaboration. And we're very much focused on topics such as safety of life, supporting northern communities, and of course helping support environmental understanding and protection. And particularly to do with climate change. We divide our user communities nominally into three areas. The operational community, probably the best example of this are the national ice services and use of sea ice information and marine transportation. The science community, which covers a very wide range of topics and an important part of that is training the next generation of researchers. And of course, Northern residents who live and work in the Arctic, we help them adapt to climate change and pursue traditional ways of life.

Just three quick use cases to give you a sense of what people do with our platform. This use case is the international ice patrol who provide iceberg information in the North Atlantic. This example is where they used our platform to help U.S. Coast Guard Cutter transit the Northwest Passage.

An example from the science community: The Geological Survey of Denmark and Greenland has been using the polar TEP site to process very large amounts of optical earth observation data to develop a albedo products principally in Greenland, but also in some of the other Arctic islands.

Finally, an example from Northern communities. We for a long time we've been providing fast ice information to Arctic hunters, and increasingly we're looking to automate that process, and so we're doing some pretty sophisticated analysis of synthetic aperture radar data to develop the flow edgeline.

In conclusion, we work collaboratively with a large number of organizations. Here's some examples we'd be happy to hear from you and talk about how we can work together, or how we can help to meet your needs. Thank you.

Andrey Petrov: Thank you, thank you very much, David. I actually don't see any screen, but I could continue based on my notes here. So our next speaker is Lyubov A. Zarubina from the Northern Arctic Federal University. She will tell us about the excellent project, the Arctic Food and Innovation Cluster.

Lyubov A. Zarubina (Arctic Foods Innovation Cluster): Thank you very much. It's my great pleasure to welcome you all from the Russian Arctic. The city of a [...] can present you briefly Arctic Foods innovation cluster projects, its goal and its ongoing activities.

AFIC is a jointly appreciated initiative of Canada, University of Saskatchewan, and the project leader Professor David [...] of Russia, Finland, Iceland, Norway, and the Arctic indigenous organizations. So the project is built upon previous activities and its second stage up to 2023 has been endorsed by their Arctic Council Sustainable Development Working Group is a very demanded action in addressing the issues of achieving food sustainable systems in the Arctic. Despite the that Arctic today is recognized as a side of great economic potential for local, small, and remote communities, food systems development is really challenged by a number of factors including environmental, logistics, economic, social, educational etc. So achieving sustainability and investing into innovative food production requires capacity building, collaborative actions, and food policy formulation grounded on interdisciplinary research so the epic project is mission to contribute to achieving this tasks with its main aim to respond to complex challenges by joining together Arctic local food producers with governments, indigenous communities, academia, business, and the young researchers for finding solutions for developing novel food products and regional economic development based on the cluster approach. A number of countries are engaged in different parallel and integrated projects within key activities as creating value chains supporting indigenous food intrapreneurship, creating new products and development, developing management strategies to increase the resilience of local food systems.

Since capacity building is really critical in fostering food transformation and food innovations, Arctic food Policy Research and Action Network is designed in the project as a tool to support knowledge transfer for local capacity building and enabled policy formulation based on quality research. So this network serving as a kind of think tank, it seeks to mobilize knowledge and expertise. Including the knowledge of our local and indigenous communities and provide multidisciplinary research to support policy decisions. Also, it's very important to meet the requirements of each local community and that is why analyzing food policies on all the levels is very important to make them tailor made to specific needs of the Arctic residents and to make the results available for the project, beneficiaries and stakeholders. So we are launching for the next two years a series of webinars with very interesting and variable topics, including food, culture, food identity, marketing, branding, storage, mobile food, laboratories, food policy and etc.

Each country is focusing on this topic - as for the Russian part of the project that we are launched in 2019, this is mostly focused on the key four areas including agroforestry development, by a technology used for making novel products are supporting local entrepreneurship, and solving food security issues. For example, in cooperation with our Finish partners and supported by the [...]. We are introducing best agroforestry practices combining agricultural and forest management technologies and identifying scenarios for multi use of non-wood products, such as berries, herbs, mushrooms, plants, etc. So our researchers are engaged in mapping the yields of wild plants and are planning berry plantations in the local communities, to increase the local markets. Another subproject, for example, is aimed at improving their technology of extraction and processing of their wide SLG and planning artificial cultivations of seaweed and creation of new Pharmaceuticals.

Securing Arctic food systems for the benefit for the benefit of the locals. It's really an ambitious goal which demands multifaceted solutions center diverse network of partners. So this year the Center of Excellence called the Russian Arctic has been established at our University within the Russian governmental Arctic program, and it is intended to facilitate innovative and technological development of the Russian Arctic. In its prioritized fields,

listed in cooperation with our national and international partners. So we see this center of excellence is an efficient platform for capacity building and networking within the Arctic project and within the tasks to be sold under the Russian chairmanship program in the Arctic Council and we invite our partners to join the efforts and to strengthen them and to increase the resilience of the food systems for the Arctic residents. Thank you very much.

Andrey Petrov: Thank you very much. It was very, very interesting. So our next speaker is Tim Argetsinger from ITK, which is a national organization of Inuit in Canada and will share with us the information about national unity strategy on research that has been developed recently.

Tim Argetsinger (National Inuit Strategy on Research): Thanks Andrey. My name is Tim Argetsinger and today I'm going to be sharing about the national news strategy on research. ITK is the National Union Representative Organization in Canada. This is just a map of Inuit Nunangat. This is the Inuit Homeland in Canada. You can see the four regions starting from the Inuvialuit Nunangat on the left, Nunavut, Nunavik, and Nunatsiavut. It's approximately 1/3 of Canada's land mass and more than half of its coastline. In fact, almost all of Canada's coastline is located within Inuit Nunangat. There're 51 communities, one of three indigenous peoples recognized in Canada's Constitution along with them 80 and First Nations. And importantly, you know our rights holders in the area of research and in Canada we are not stakeholders. Inuit also to live in Northern Alaska and Greenland.

This is just a slide of ITK governance structure, so the four regions that I just talked about, each of those four regions has Inuit have settled in Inuit Land claim agreement with the federal government and those agreements are what determine the rights that have been affirmed and the obligations that different levels of government have within each region. To summarize concisely, ITK is overseen and directed by the four Inuit laying claims organizations that you see to the bottom of the screen, and representatives from each of those regions form the national Inuit Committee on Research, which is the committee that advised the development of this strategy.

What the national Inuit strategy on research does is reflected in three of these bullet points was released in 2018, along with a corresponding implementation plan, outlines a number of objectives and actions that are intended to improve the way Inuit research is governed, resourced, conducted and shared. It defines expectations for all research in the regions and communities should take place. Identifies areas for partnership in action between you and the research community, as well as between union governments. It's trying to solve 3 main problems. Those problems in Canada or that there are multiple federal departments that are involved in any way to Inuit research that conduct and fund research, and oftentimes those departments and that those programs and initiatives are not coordinated. It is also trying to improve the cost effectiveness of research investments in Inuit Nunangat, Inuit Community, so that actually those investments create value for Inuit, for the majority population that live in our communities. And finally there is a need for governments and research institutions and researchers to respect and support the right of Inuit to self determination in all aspects of research. What that means: Inuit self determination research is put into action, using representational organizations are engaged as partners and setting the research agenda and have equitable opportunities to access funding for any lead research and engages partners with reach researchers in the design, implementation and dissemination research.

These are the five priorities for action that are identified in the strategy. Just pause for a second so that you can absorb them.

So this infographic is taken from the strategy and it reflects where Inuit in Canada want research to go. This is reflective of a vision of Inuit Nunangat research that moves our role from the position of stakeholders to rights holders that results in equity, visibility, and control over different aspects of the conduct of research.

I want to focus on this slide. This slide reflects some of the ongoing work that is taking place to actually implement the strategy. It has been challenging to secure federal engagement and resourcing, and supporting the implementation of the strategies, objectives, and actions. There are 19 objectives and 27 actions. There have been some really positive developments that have taken place in the last few years. The regions that oversee ITK have used the strategy to advocate and leverage for policy changes within their regions, as well as the development of their own research protocols and activities. Other positive changes include bilateral relationships that have been brokered between Inuit and different federal departments, including through work plans that have resulted in funding capacity building for Inuit, as well as partnerships between federal departments and Inuit, as well as potentially with other countries on the development of international research programs, as well as domestic research programs.

In conclusion, looks like you have a conclusion. Innovative planning an active and dynamic role in the conduct of research in Canada and having an active interest in all aspects of research, I think there's a been a tendency in the last couple of decades to pigeon hole Inuit and other indigenous peoples into certain segments of research, including the area of indigenous knowledge. This strategy really is trying to change that, and it has resulted in some concrete, positive measures that really are causing I think federal departments and agencies as well as universities and researchers to catch up to where some other jurisdictions are headed when it comes to respecting and supporting the rights that Indigenous peoples have been conducting research and supporting research. So with that, thank you and I appreciated the other presentation so far, thanks.

Andrey Petrov: Thank you, Jim. There's of course a very pioneering work that, in other jurisdictions should be looked very carefully, so I will ask speaker of that segment, Julia Dooley, from Polar Educators International, and she will share information about their activities.

Julia Dooley (Polar Educators International): Thank you PEI is very grateful for the opportunity to be here with you. Founded in 2012, Polar Educators International or PEI, was created by dedicated members of networks formed during the International Polar Year as a direct outcome of the Montreal Conference under the theme from Knowledge to Action.

By leading dialogue and collaboration between educators and researchers, PEI aims to highlight and share the global relevance of the polar regions.

PEI represents all who worked to inspire appreciation and build knowledge of the polar regions, their connectedness to all earth systems, and their importance to all humans across latitudes and cultures. A PEI member is anyone interested in making the poles accessible, promoting understanding and stewardship of the polar regions, and seeking to grow polar literacy. Our community of scientists, educators, graduate students, community activists, museum educators, policy researchers, digital communicators, early career scientists, artists, cruise ship, citizen science practitioners, and myself as school classroom teachers. We work together to accomplish our goals and the education of future global leaders.

The three C's of PEI's core strengths are how we connect the qualities of scientific and educational organizations defining our unique position, which allows us to provide a deeper understanding of current polar Sciences to a global audience.

We are deeply committed to PEI's echoes and wish to see it expand, reaching an important place of influence. This ambition can only be fully achieved if we have a secretariat to take care of the daily running of PEI, leaving its members the freedom to increase its influence in the polar world and the world of education in its widest sense. Whichever institution is in a position to host a PEI Secretariat will gain the experience of a large number of

educators coming from diverse backgrounds and qualifications. But with a common goal to make polar science in the polar world available, and to grow partnerships with Arctic and indigenous organizations.

PEI works with partners to support and connect people within and outside of the Arctic. As a community of practice, polar educators support and learn from one another, given the means to build capacity, we connect an essential, stable and trusted network contributing to Arctic research, providing platforms for exchange of good practice and professional development for researchers and educators.

A permanent administrative base will enable PEI to achieve another goal using its connections to keep Arctic literacy up-to-date and relevant, and to take the concept of polar engagement in education upstream in the Arctic science process. This can be accomplished by building goals into research proposals that include community members, and learning opportunities and field work, data collection, and more diverse publishing and engagement activities. PEI believes that polar educators and learners have a role to play in all of the ASM3 themes, observe, understand, respond and strengthen.

We have submitted three deliverables for the project. Andrey mentioned the first one. Thank you. We proposed to share an updated digital version of the Polar Resource Book with our partner organizations. This work is in progress or about halfway well beginnings and now reaching out and seeking new funding opportunities to start working on some of the work of the new book will provide easily accessible tools to strengthen teaching and communication of important Arctic science.

Next deliverable is Iceland 2022. It was supposed to be 2021, but of course with our current situation we have put that off a year, so we're going to have our next fifth, an international conference to help in Iceland with themes focused on polar education, relevant to knowledge for sustainable Arctic, offering a direct opportunity for 50 plus participants. In the meantime, we will host a full table of online events to build interest and excitement. Our first event will be our lesson in Icelandic, so I can learn how to pronounce this word that will be happening later this month. Our events will be running from April through mid October leading up to our in person conference. Sign up in time. Got a little something for everyone. Second event will be a virtual walk to connect the miles from our previous conference in Cambridge, UK to Iceland so we've got a little something for everyone.

Our third is a global conversation. It's going to be a network opportunity based on a concept of a World Cafe to bring conversations to the table that address identified gaps and barriers encountered in the strengthen on that list was inclusivity and upstreaming education, building resilience in the Arctic, so we'd like to invite people to be part of that table conversation so you can find more information about that on our website coming up.

Andrey Petrov: Thank you. Thank you Julia. Very much. Very interesting presentation and various activities. I just want to say for a second that there are some questions Q&A for some of the speakers. They will get a check and maybe respond, but we have very few minutes left so our next speaker is Henry Burgess who will talk about recommended actions for strengthening Arctic education and networking as a part of the Arctic Science Ministerial Science Advisory Board.

4. Closing Remarks:

Henry Burgess (Science Advisory Board, IASC): That's great, thank you very much, Andrey. Thank you and thank you to all of our speakers. So I don't want to take too long because I'm very conscious of leaving some time for Q&A, but I'm also very conscious that ASM3, strengthen is really one of the most important areas of ASM3. It's about moving from observations and understanding and how to respond to those in order to have a kind of a increasing our ability to have a stronger and longer lasting impact. And it's clear from many of the presentations that we've heard already that the core messages about education and capacity building and indigenous

engagement and empowerment are already there, loud and clear. The key is to continue to develop those ideas and combine them with practical action in full partnership and with Co production where we possibly can, and so the key to ASM3, as with ASM2 is to make sure we have actions coming out of it and that's why kind of these webinars are so important and all the collective efforts that you've made so far is so important as well.

I wanted to kind of bring out some of the areas that it looks like it's going to be part of the recommended actions, and one of those is making sure that those most affected by change, including indigenous and local communities, are able to take the lead in identifying research needs in the kind of way that Tim was talking about with the national Inuit Strategy on research, and not only are very involved in that work, but they are equal partners in delivering work. I suspect there will be a range of recommendations around understanding and recognizing the positive impact that research with education and outreach at its center plays, which recognizes different forms of knowledge and skills and which particularly supports the next generation and the impact that will have on Arctic science as a whole. I suspect there will also be recommendations around kind of expanding some of the creative and practical solutions that we've heard about in this session bringing together educators, local communities, and researchers in reaching out beyond their usual networks, and particularly including educators early in the planning for research projects. I think there will be recommendations around appreciating respecting difference about how to build influential teams and then reaching new audiences in the Arctic and beyond, and that will end up with we will have more respectful an empowering partnerships that fully include indigenous and local researchers that involve Co production as Tim was talking about that produce new knowledge and where challenge is fair and welcome because we're not. This isn't an area where we're seeking to avoid challenge. But where we want to find a kind of positive resolution to challenge and recognize that that challenge is part of the research process and will take us somewhere better and different.

This is the last slide and just wanted to check in for final things in terms of building capacity, there will be recommendations that recognize the links with physical and social infrastructure so we know that in the in northern communities these physical and social infrastructures are not there in the same way that they are in the in the global South, and so making sure we recognize that and respond to that will increase capacity and education impact in the future. Focusing on education, including education outreach, is core elements at the design stage of research programs with resource is attention and scrutiny. Creating these positive networks wherever possible encouraging and recommending funding of international opportunities and participation in major Co developed programs for early career researchers, indigenous people, and local communities, so really bringing together these big projects but with local connections. And then growing resilience, so recognizing as I said already, that working in these new ways will be challenging. Not everything will be successful. We're trying to do something different and so there will be some ways in which we need to learn and challenge ourselves. But that will mean in the end that they impacted the work, its longevity, and its wider influence will be greater. So I hope I've given you a sense of where we may see some of the recommendations that come through from the Arctic science ministerial process.

Andrey Petrov: Thank you. Thank you very much Henry. So I think I'm not sure how well we doing on time. I think we're kind of past our time.

Lindsay Arthur: Yeah, we're just at the end here, but yeah, so there are a few interesting questions I think, but I know whether we have really time to respond.

Andrey Petrov: I think there is a question for David and for Henry and myself, and maybe encourage people to respond via email or in one lively discussion talking about pedagogical components whether there is actually educational projects that are not just outreach projects or dissemination, but actually pedagogical projects, and I think that's something that is the last prevalent that that we would like to, so I guess there is David and Julia talking about other questions we could just handle through email is that Lindsey. What we would do?

Lindsay Arthur: Yeah, I think I mean most, it looks like most of the questions have been answered by the panelists in the chat except we have one that looks like Henry is answering now.

Andrey Petrov: We are out to strengthen Arctic science enterprise and that's part of the charge of ASM3 I itself to bring this strengthen to emphasize those elements. Because of course what we do in the Arctic is focused on developing capacities. Otherwise neither science enterprise nor our communities will be able to exist successfully and adopt A changing climate. Changing social and economic conditions. So I think that's why strengthening further is so important to pursue.

Lindsay Arthur: Yeah, indeed, thank you Andrey. Thank you to all of our speakers just for their wonderful presentations and to our Science Advisory Board members Andrey and Henry for giving those great kind of overviews of what we've learned and where we're going with this. And you know, with this team for this webinar, this was meant to be the last theme based webinar with that theme of strength and you could almost think about this whole series of starting with that one because of course you know that's also just the building block for everything that we're doing in Arctic research, but we actually have one more web and are left with. So we rescheduled our theme three webinars which was meant to take place in March. It's been rescheduled for April 15th and that one actually starts at 4:00 PM. UTC, so we hope to see you all there. You can register for it on the ASM3 website and the program is there as well, so that's where we're going next. And again, if you have further questions, feel free to reach out to the ASM3 organizing committee. And again, just thank you to all of our speakers and to Andrey and Henry especially for your contribution. So thanks all for participating. Thank you, thank you very much.