Third Arctic Science ministerial Webinar Series

Co-hosted by Iceland and Japan

This webinar series is a cooperation between the ASM3 Organizers in Iceland and Japan and the European Polar Board.

Third Arctic Science Ministerial Webinar Series

Theme 4: Strengthen

Capacity building; Education; Networking; Resilience - preparing future generations

7 April 2021
13: 00 - 14: 00 UTC

Program here! ▶ https://asm3.org

Update on ASM3 Process

Lindsay Arthur

ASM3 Organizing Committee

Theme 4: Strengthen

Overview of Theme 4: Strengthen – Progress since ASM2 and Upcoming Projects

- Andrey Petrov, ASM3 Science Advisory Board Member

Highlights from Theme 4: Understand

- Edu-Arctic – Innovative educational program attracting young people to natural sciences and polar research
  - Dr. Agata Godzik, Poland
- Polar Thematic Exploitation Platform
  - David Arthurs, Polar View
- Arctic Foods Innovation Cluster, AFIC
  - Lyubov A. Zarubina, AFIC Project Coordinator, Northern Arctic Federal University, Russia
- National Inuit Strategy on Research (NISR)
  - Tim Argetsinger, Inuit Tapiriit Kanatami
- Polar Educators International
  - Julia Dooley, PEI

Recommended Actions for strengthening Arctic capacity building, education and networking

- Henry Burgess, ASM3 Science Advisory Board Member

Question and Answer Session

Overview of Theme 4: Strengthen

Capacity building; Education; Networking; Resilience - preparing future generations

Andrey Petrov

ASM3 Science Advisory Board Member

Strengthen

- The research community recognizes the urgent need and existing gaps in capacity building, education and networking, both in Arctic and global communities, and provide pathways of support.
- 20% of all submissions; 20+ countries

Countries

Locations

Keywords

Strengthen: capacity building is key to Arctic research

- Encourage and support knowledge holders and early career scientists
- Promote the image of the Arctic as linked to people's lives and not as a distant and irrelevant place.
- Build capacity in education for Arctic residents, including Indigenous Peoples.
- Adapt research and education systems to include Indigenous and local knowledge.
- Rethink Arctic science in the post-COVID-19 world.

Highlights of accomplishments

- Emphasis on strengthening and capacity building as part of research projects and a standalone goal
- Emphasis on early career scholars and students
- Emphasis on strengthening Indigenous and local communities
- Emphasis on Indigenous knowledge systems as a part of science and community capacities
  - Indigenous Knowledge was an important part of a quarter of the projects submitted (27%) and 14% were considered community-driven.
- Emphasis on stake-, rights-, knowledge holder and public engagement
  - Outreach was part of almost half of all projects (44%).
- Emphasis on education – still needs to be improved
  - Only 5% included education and capacity building

3rd ARCTIC SCIENCE MINISTERIAL

European Polar Board

Science Capacity

Science and Public Resources

Indigenous and Local Capacity

Outreach

STRENGTHENING

Infrastructure and Data

Collaboration & Coordination

Funding

Networking

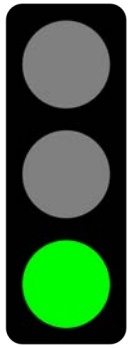
Education & Training

Conferences and Meetings

Good progress, capitalize on success

Some progress, more efforts needed

Networking, Collaboration and Coordination

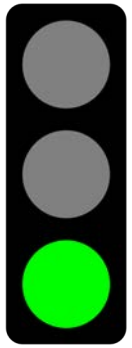


- **INTERACTIII** - International Network for Terrestrial Research and Monitoring in the Arctic
- **EU-PolarNet** is the world's largest consortium of expertise and infrastructure for polar research
- **Forum of Arctic Research Operators (FARO)** is an organization promoting dialogue on logistics and operational support for scientific research
- **U.S. Fulbright Arctic Initiative and Arctic-FROST** Research Network connect early career scholars from Arctic and non-Arctic states

3rd ARCTIC SCIENCE MINISTERIAL

European Polar Board

Conferences and Meetings – new reality



- **Arctic Science Summit Week** (ASSW) held by IASC in 1999 to provide opportunities for coordination, cooperation and collaboration.
- **Arctic Observing Summit** (AOS) is a biennial summit on design, implementation and coordination of Arctic observing systems
- **International Congress of Arctic Social Sciences** (ICASS) held by IASSA for 30 years provides an opportunity for Arctic researchers from around the world to share research results, develop collaborations and interact.

IASC Arctic Science Summit Week 2021
19-26 March | Online, Portugal

ARCTIC OBSERVING SUMMIT AOS 2020

IASSA
INTERNATIONAL ARCTIC SOCIAL SCIENCES ASSOCIATION

Education and Training

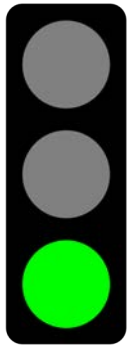
- Growing recognition that education needs to be an integral part of science projects.
- UArctic, APECS, and Polar Educators International

Short courses, field schools and workshops	International Higher Education and Early Career Opportunities	National Higher Education
• International Autumn School on Marine Biotechnology and Biochemistry • Arctic Floating University • The MOSAiC School 2019	• East Russia-Japan Expert Education Program • Future Arctic PhD program • IASC Fellowship Program	• Graduate and undergraduate degrees in Polar Sciences, Arctic Studies

Outreach

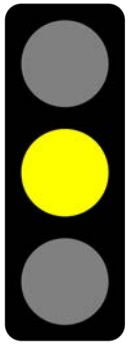
- The **Rapid Response Assessment of Coastal and Offshore Permafrost** has the goal to raise awareness about the importance of coastal permafrost environments
- AMAP **Climate Issues of Concern** Report, which will address recent developments in major climate indicators in the Arctic
- **ARCTIC FESTIVAL** is an annual event of Czech and Arctic science and culture
- Singapore and Japan hold events on the Arctic that inform and engage members of the public, students, academics, researchers, government officials and business professionals.

Science Capacity and Resources



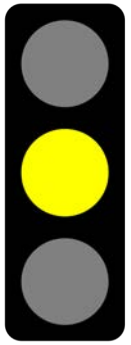
- **The Polar Resource Book** : Polar Educators International (PEI), IASC, APECS and the Scientific Committee on Antarctic Research (SCAR) are working together to update the “Polar Science and Global Climate: An International Resource for Education and Outreach - The Polar Resource Book”
- **State of Arctic Science 2020** (IASC) a synthesis of international Arctic research activities and priorities,
- **Edu-Arctic** created innovative online tools for interactive open-access available for everyone to link Arctic research and school education in Europe.
- **One Stop Shop for Arctic Knowledge** (UArctic) will further develop a stable infrastructure for access to Arctic knowledge.

Funding



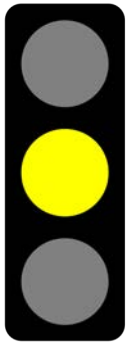
- National programs are working to strengthen capacity and where possible to facilitate exchanges, co-funding and collaboration. Still, need to <u>(a) improve international coordination and (b) better connect research funding and local capacity building.</u>
- Multilateral (The UK-Canada-Russia exchange) and bilateral (Germany-UK have Changing Arctic Ocean)
- National programs investing in Arctic science:
  - The U.S. NSF's 'Navigating the New Arctic'
  - The Dutch National Research Agenda added Polar Tourism
  - Japan's J-ARC Net
  - The Portuguese Polar Program (PROPOLAR)

Indigenous and Local Capacity Building



- There is a growing number of projects focusing on building capacity in the Arctic, both for the region as a whole and for strengthening the resources available to Indigenous communities
- UArctic and IASC are working on Indigenization of their activities
- The **Arctic Indigenous Virtual Arts Network (AIVAN)** created an informal platform that unites Indigenous artists throughout the Arctic
- Canada has established an Indigenous Community-Based Climate Monitoring. Canada's funding agencies and Polar Knowledge are working on interdisciplinary research and research training model that contributes to reconciliation.
- ITK **National Inuit Strategy on Research (NISR)**

Infrastructure and Data



- More research infrastructure is created. However, <u>further investment in locally embedded, resilient science operations is necessary.</u>

Centers and Hubs	Field stations and Icebreakers	Data infrastructure
International Arctic Hub (IAH) (Greenland) Kola Arctic Geophysical Infrastructure Network (KAGIN) NNA Community Office (USA)	• Arctic Hydrogen Energy Applications and Demonstrations (AHEAD) Station • EU Arctic Research Icebreaker Consortium (ARICE)	• Polar Thematic Exploitation Platform (PTEP) by ESA • Arctic Biodiversity Data Service (ABDS) by CAFF • OPEN POLAR (Norway) • Web-based atlas of CBM and IK (ICC)

Highlights from Theme 4: Strengthen

Moderated by Andrey Petrov, ASM3 Science Advisory Board Member

- **Edu-Arctic – Innovative educational program attracting young people to natural sciences and polar research**
  - Dr. Agata Go.dzik, Poland
- **Polar Thematic Exploitation Platform**
  - David Arthurs, Polar View
- **Arctic Foods Innovation Cluster, AFIC**
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Question and Answer Session

3rd ARCTIC SCIENCE MINISTERIAL

European Polar Board

EDU-ARCTIC

Dr. Agata Goździk

Poland

Institute of Geophysics
Polish Academy of Sciences

ENGAGING STUDENTS IN STEM EDUCATION THROUGH ARCTIC RESEARCH

EDU-ARCTIC Objectives:

- To encourage interest in science, technology, engineering and mathematics (STEM) education to secondary school students
- To provide an innovative and supportive educational program, accessible to schools, educators and students across Europe and beyond
- To establish strong links between the research and education communities by connecting schools to scientists at Arctic research stations and research institutes throughout Europe

PARTICIPATING ARCTIC RESEARCH STATIONS

Polish Polar Station in Hornsund (Spitsbergen)

Karholl research station (Iceland)

Faroe Islands Nature Investigation (Faroe Islands)

NIBIO Svanhovd (Norway)

EDU ARCTIC

Contact

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ONLINE LESSONS

POLARPEDIA

MONITORING SYSTEM

ARCTIC COMPETITIONS

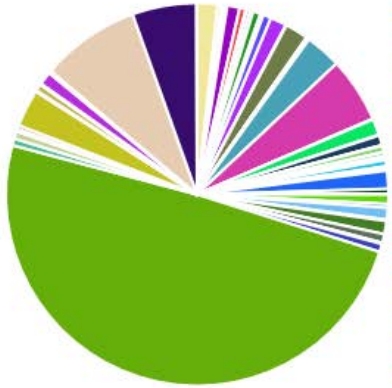
TEACHER WORKSHOPS AND TRAINING SESSIONS

EDU-ARCTIC network:

1900 teachers

from 60+ countries

Registered Teachers by Country



Spain
Switzerland
Nigeria
Bosnia and Herzegovina
Svalbard And Jan Mayen
Egypt
Antarctica
Malaysia
Israel
United Kingdom
Iceland
Ecuador
Greenland
India
Slovenia
Ukraine
Czech Republic
Turkey
Serbia
Korea, Republic of
Italy
Vietnam
Slovakia
Norway
Albania
Canada
Kazakhstan
Peru
France
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Croatia
Kenya
Ireland
Algeria
Azerbaijan
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Bulgaria
Moldova, Republic of
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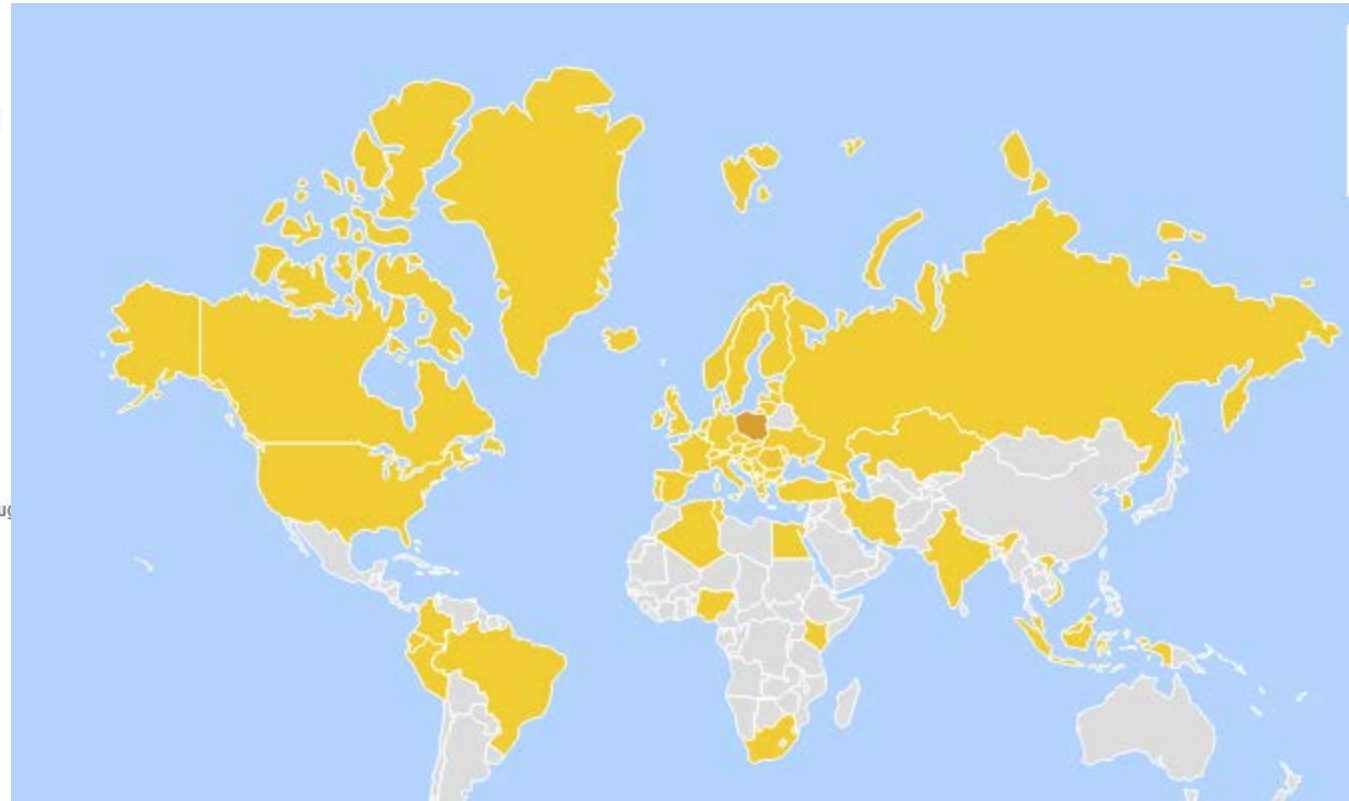
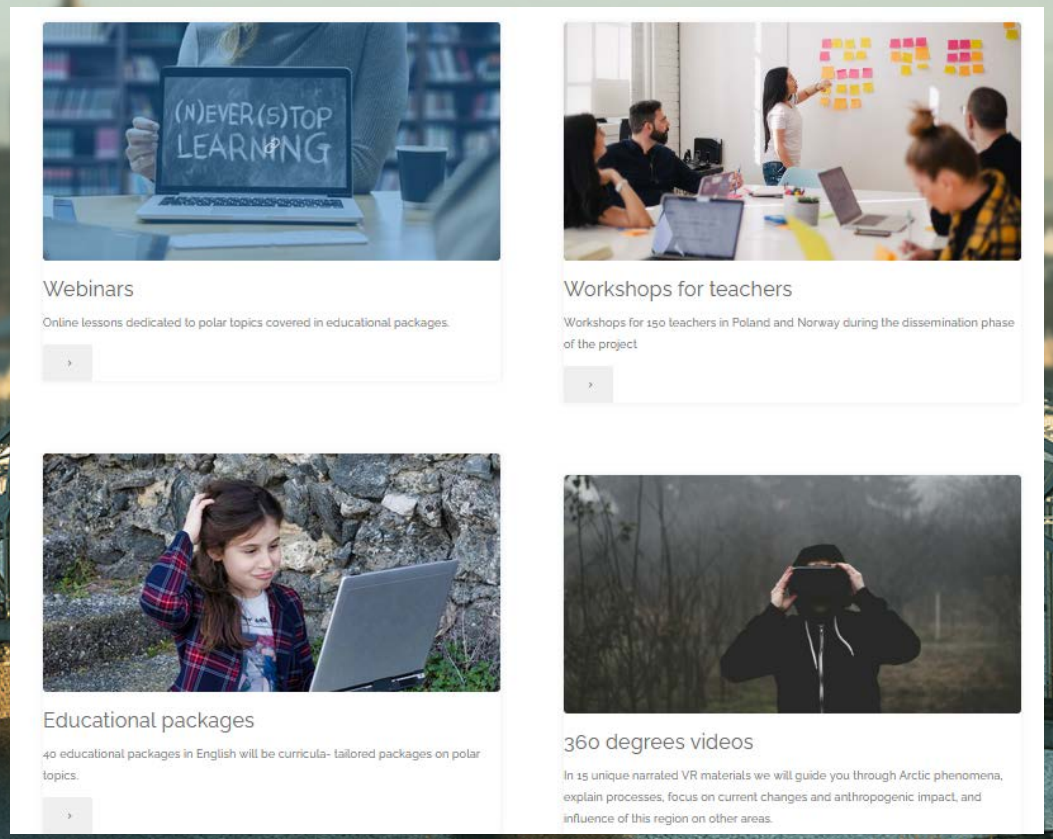


Iceland Liechtenstein Norway grants

EDU-ARCTIC 2: polar research for education – innovative programme in Poland and Norway



Polar Thematic Exploitation Platform (Polar TEP)

David Arthurs

Polar View

Virtual Research Platform Rationale

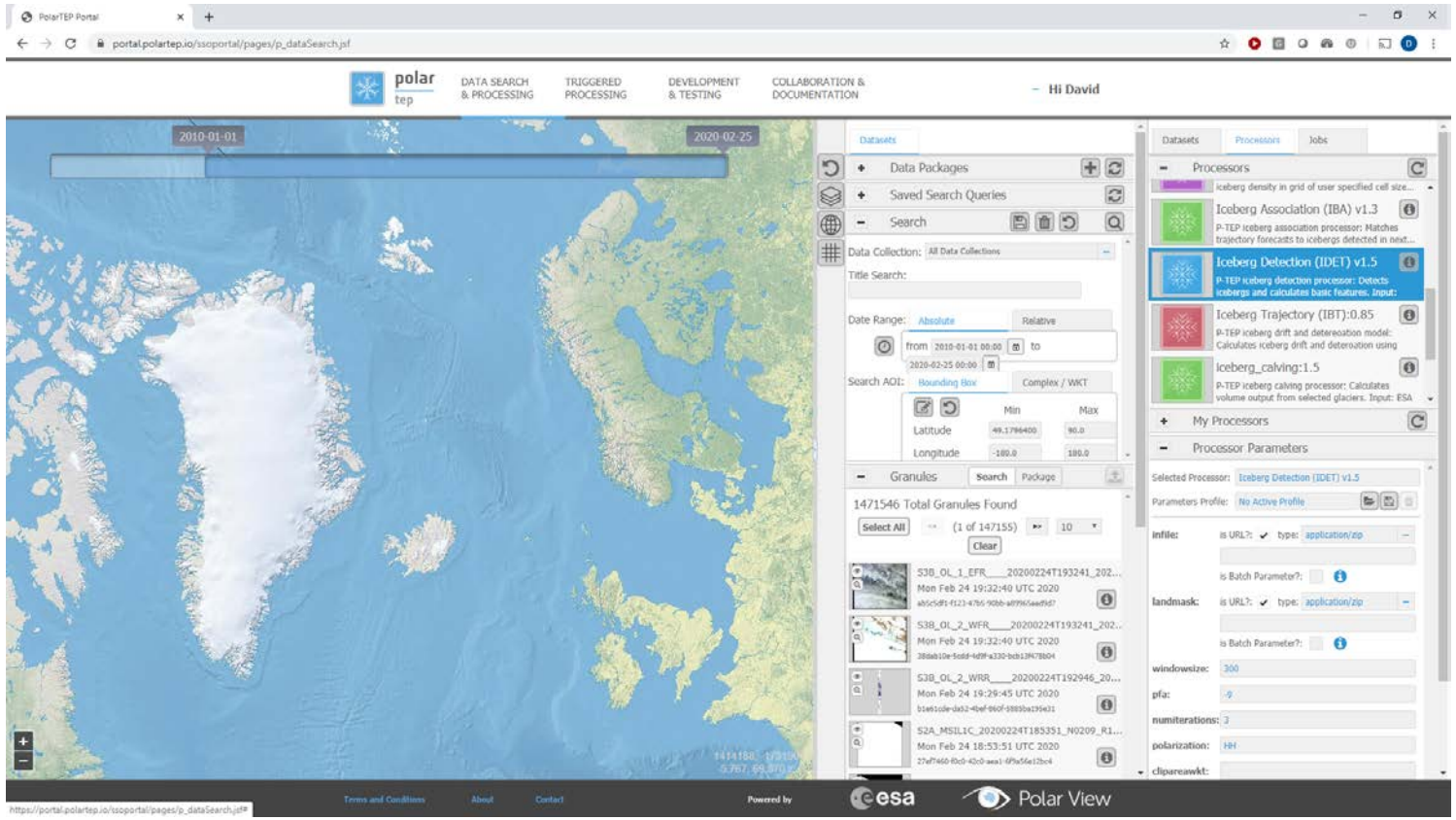
- The data available on the state of the planet is growing in **volume**, velocity, variety, precision, and value.
- ESA is coordinating the development of new concepts to meet these data challenges and opportunities. **The traditional model of bringing the data to the user is broken**.
- A virtual research platform is a collaborative environment in the cloud that brings together data, computing power, storage, and analysis tools.

tep

thematic exploitation platform

Polar TEP Overview

- A virtual research platform.
- Provides polar-relevant data, tools, and processing in the cloud.
- Brings users' algorithms to the data.
- A central hub in the polar data ecosystem.
- Access to >15 PB of EO and polar data.

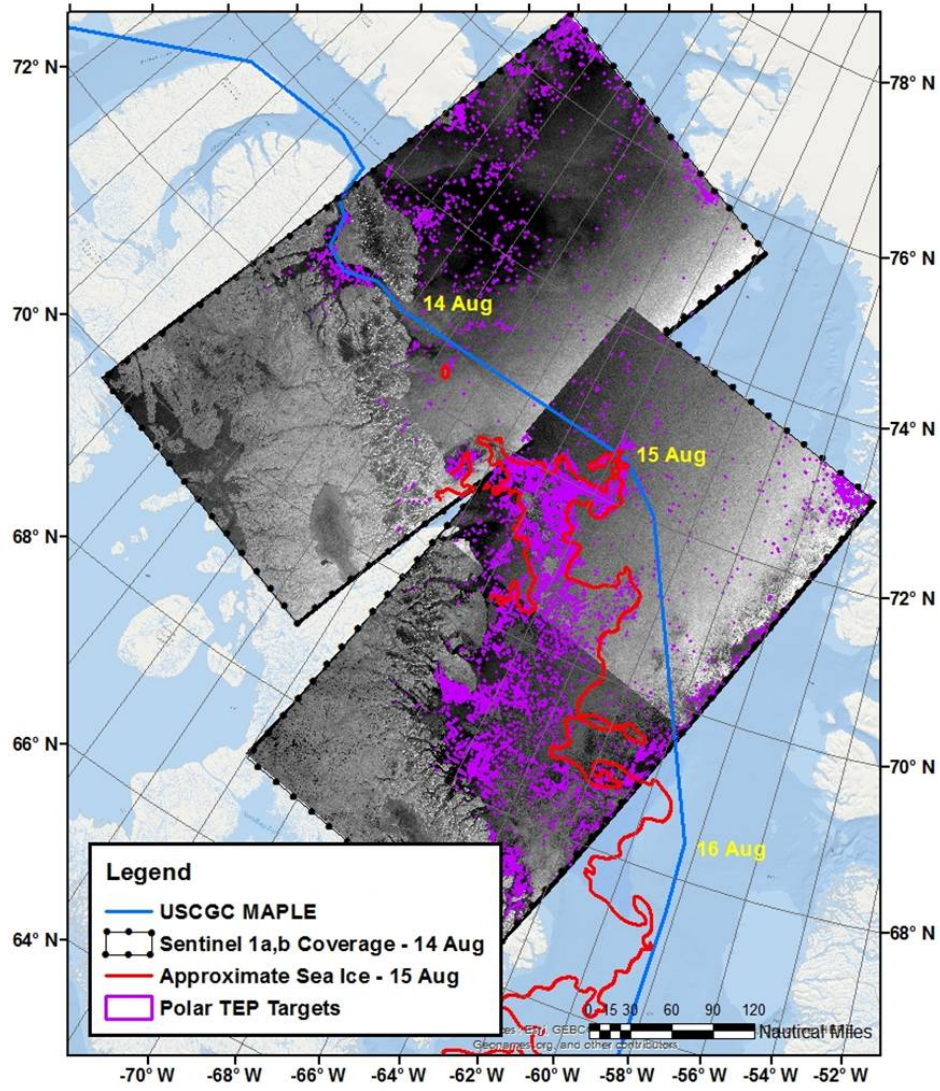


Polar TEP Purpose

- Objectives
  - Provide polar user communities with data management and processing services that meet user needs in a manner that is accessible to all.
  - Foster International Collaboration
  - Support **Safety of Life**
  - Support **Northern Communities**
  - Support **Environmental Understanding and Protection**
- Polar User Communities
  - **Operational community** – Support safe and efficient transportation, economic development, and life in the polar regions.
  - **Science community** – Work to understand the environment and climate change. Train the next generation of researchers.
  - **Northern residents** – Live and work in the Arctic. Adapt to climate change. Pursue traditional ways of life.

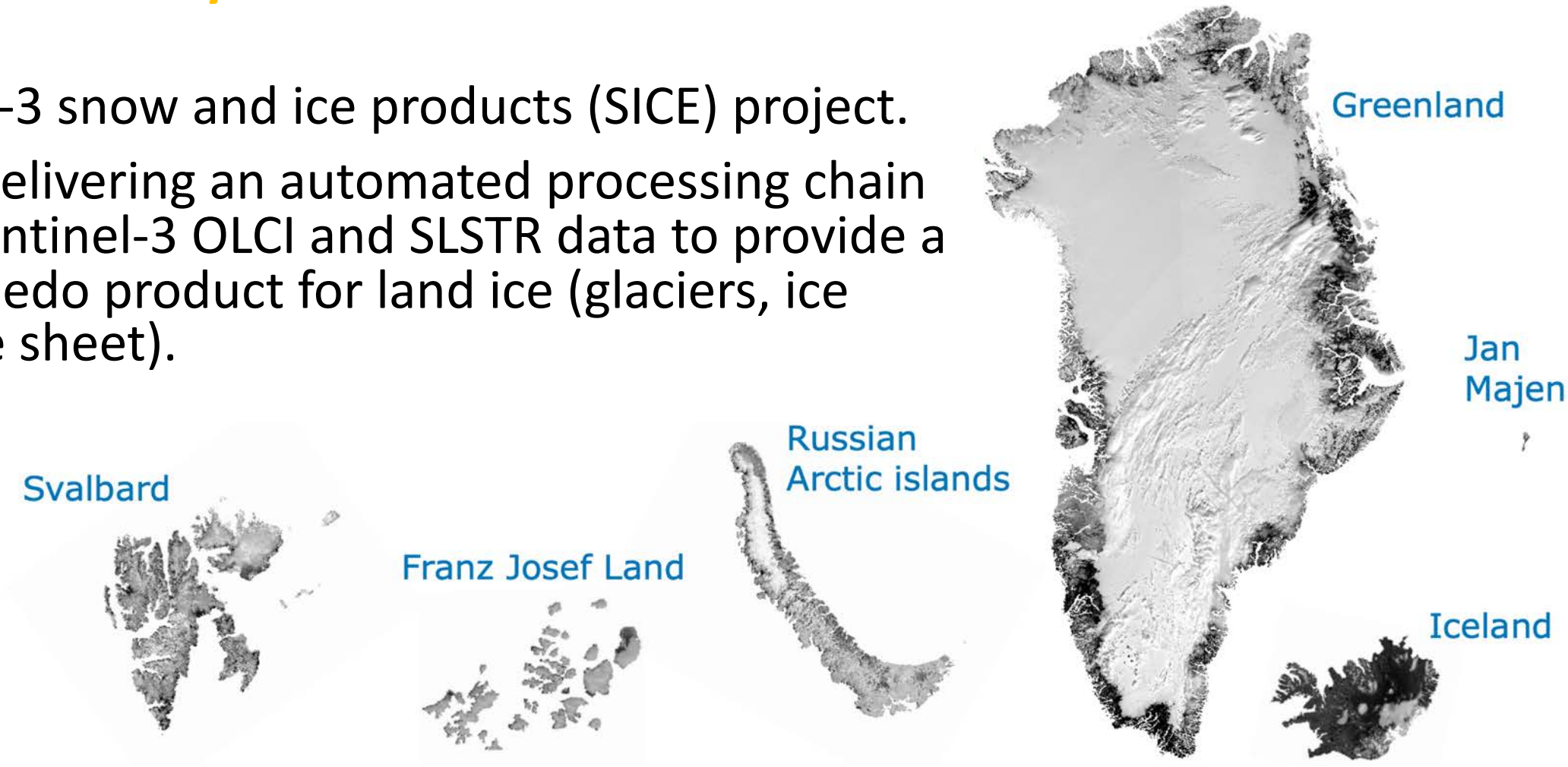
Use Case: Operational Community

- **International Ice Patrol (IIP)**
- Provision of iceberg information to ships in the North Atlantic.
- Validation of new algorithms for iceberg detection and drift modelling.



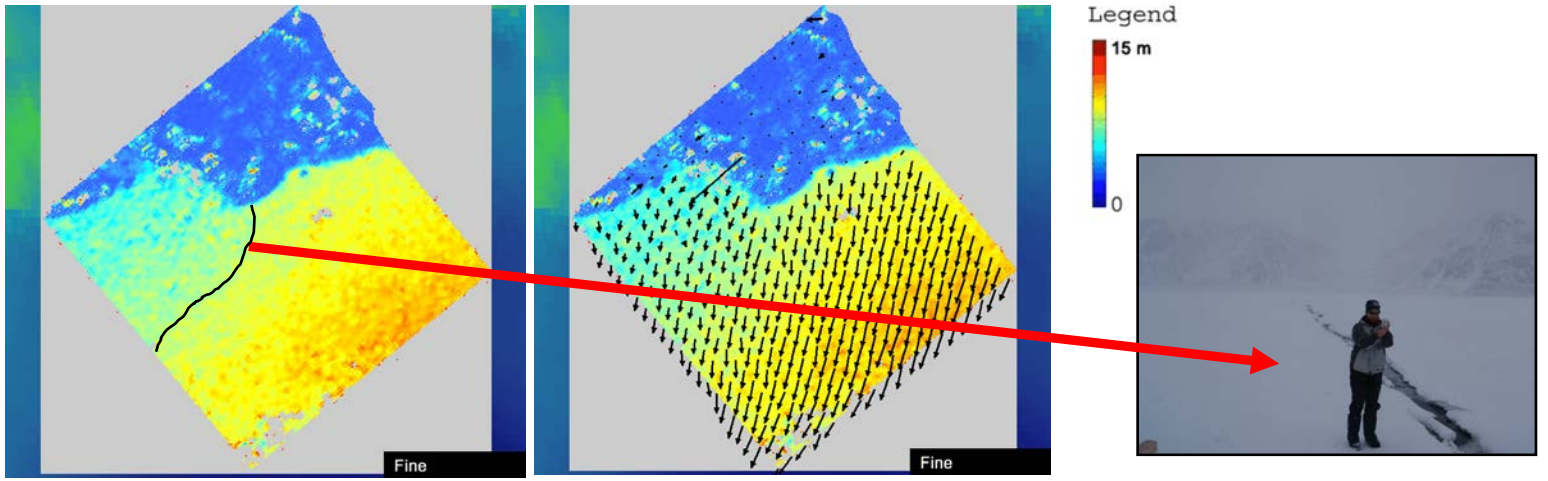
Use Case: Science Community

- **Geological Survey of Denmark and Greenland (GEUS)**
- Sentinel-3 snow and ice products (SICE) project.
- SICE is delivering an automated processing chain using Sentinel-3 OLCI and SLSTR data to provide a daily albedo product for land ice (glaciers, ice caps, ice sheet).



Use Case: Northern Residents

- **Communities across Greenland and Northern Canada.**
- For northern communities, the ability to move safely over land-fast sea ice is an essential part of their culture, community and livelihood. The challenge of travelling on sea ice is compounded by the changing climate.
- Characterization of land-fast sea ice is being automated using SAR speckle tracking and SAR derived ice motion vectors.



Polar TEP Community

Fostering International Collaboration

Supporting Safety of Life

Supporting Northern Communities

Supporting Environmental Protection

Arctic Foods Innovation Cluster, AFIC

Lyubov A. Zarubina

AFIC Project Coordinator,

Northern Arctic Federal University, Russia

ARCTIC FOODS INNOVATION CLUSTER, AFIC

International Research Collaboration for Achieving Sustainable Food Systems in the Arctic

PARTNERSHIP NETWORK: University of Saskatchewan (Canada) & NArFU (Russia) Finland, Iceland, Aleut International Association, Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Council

OBJECTIVE: the project seeks to respond to numerous complex challenges in achieving sustainable food systems in the Arctic by pulling together key stakeholders in the Arctic foods value chain for a cluster-based approach to food production and regional economic development

ARCTIC COUNCIL SDWG

https://sdwg.org/what-we-do/projects/arctic-food-innovation-cluster-afic/

ARCTIC FOOD POLICY RESEARCH & ACTION NETWORK

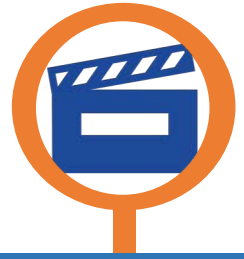
to support knowledge transfer for local capacity building and enabling policy formulation and investment in food production innovations

- ✓ To strengthen the catalytic role of high quality multi-disciplinary research on Arctic food systems: knowledge mobilization through the Knowledge Hub and Capacity Building
- ✓ To identify and analyze alternative regional, national and international policies that influence meeting food and nutrition security needs of northern communities
- ✓ To make the results of research available to all those in a position to apply them or use them

INDIGENOUS FOOD CULTURE

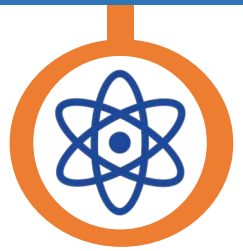
INDIGENOUS FOOD INNOVATIONS

ROUNDTABLE DISCUSSION



CAPACITY BUILDING EFFORTS: ON-LINE SEMINAR SERIES

INDIGENOUS FOOD ENTREPRENEURSHIP



INDIGENOUS FOOD POLICY

VIDEO PRODUCTION

AFIC PROJECT: RUSSIAN FOCUS

contribution to the efforts towards promoting the local foods sector in the Russian Arctic by providing innovative solutions and technologies for local foods development, entrepreneurship culture and local producers support

AGROFORESTRY

BIOTECHNOLOGY

LOCAL FOOD ENTREPRENEURSHIP

FOOD SECURITY

ARCTIC COUNCIL

SDWG

MINISTRY FOR THE DEVELOPMENT OF THE RUSSIAN FAR EAST AND ARCTIC

Kolarctic CBC
EU FINLAND NORWAY RUSSIA SWEDEN

NORTHERN (ARCTIC) FEDERAL UNIVERSITY

NArFU CENTRE OF EXCELLENCE

"RUSSIAN ARCTIC: New Materials, Technologies and Research Methods"

as AFIC platform and networking resource

KEY WORKING PRINCIPLES:

- Fundamental science and applied research
- Multidisciplinary approach
- Interregional centre (50+ partners & stakeholders)
- Global expertise exchange

MAIN WORK PACKAGES:

- **BIORESOURCES OF THE ARCTIC**
- **HUMAN IN THE ARCTIC**
- **SHIPBUILDING AND MARINE FACILITIES**
- **EXPLORATION, EXTRACTION AND PROCESSING OF MINERALS**
- **NORTHERN SEA ROUTE**

Dr. David Natcher
University of Saskatchewan
david.natcher@usask.ca

We invite others to join efforts!

Lyubov Zarubina
Northern Arctic Federal University
l.zarubina@narfu.ru

National Inuit Strategy on Research (NISR)

Inuit Tapiriit Kanatami,

Tim Argetsinger

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INUIT TAPIRIIT KANATAMI

Inuit Self-Determination in Research: The National Inuit Strategy on Research (NISR)


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Inuit Nunangat
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Inuit Tapiriit Kanatami
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Inuvialuit Nunangat
Inuvialuit Settlement Region
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C A N A D A
Ausuittuq
Grise Fiord
Qausuittuq
Resolute Bay
(Resolute)
Ikpiarjuk
Arctic Bay
Mittimatalik
Pond Inlet
Kangiqtugaapik
Clyde River
Ikaahuk
Sachs Harbour
Inuuvik
Inuvik
Tuktuuyaqtuuq
Tuktoyaktuk
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Kinngait
Cape Dorset
Salliq
Coral Harbour
Kimmirut
Qamani'tuaq
Baker Lake
Igluligaarjuk
Chesterfield Inlet
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Rankin Inlet
Kangiqsuk
Aupaluk
Akulivik
Tikirarjuaq
Whale Cove
Arviat
Puvirnituq
Tasiujaq
Kuujjuaq
Nunainguk
Nain
MaKovik
Makkovik
Apvitok
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Sanikiluaq
Kuujjuaraapik
Chisasibi
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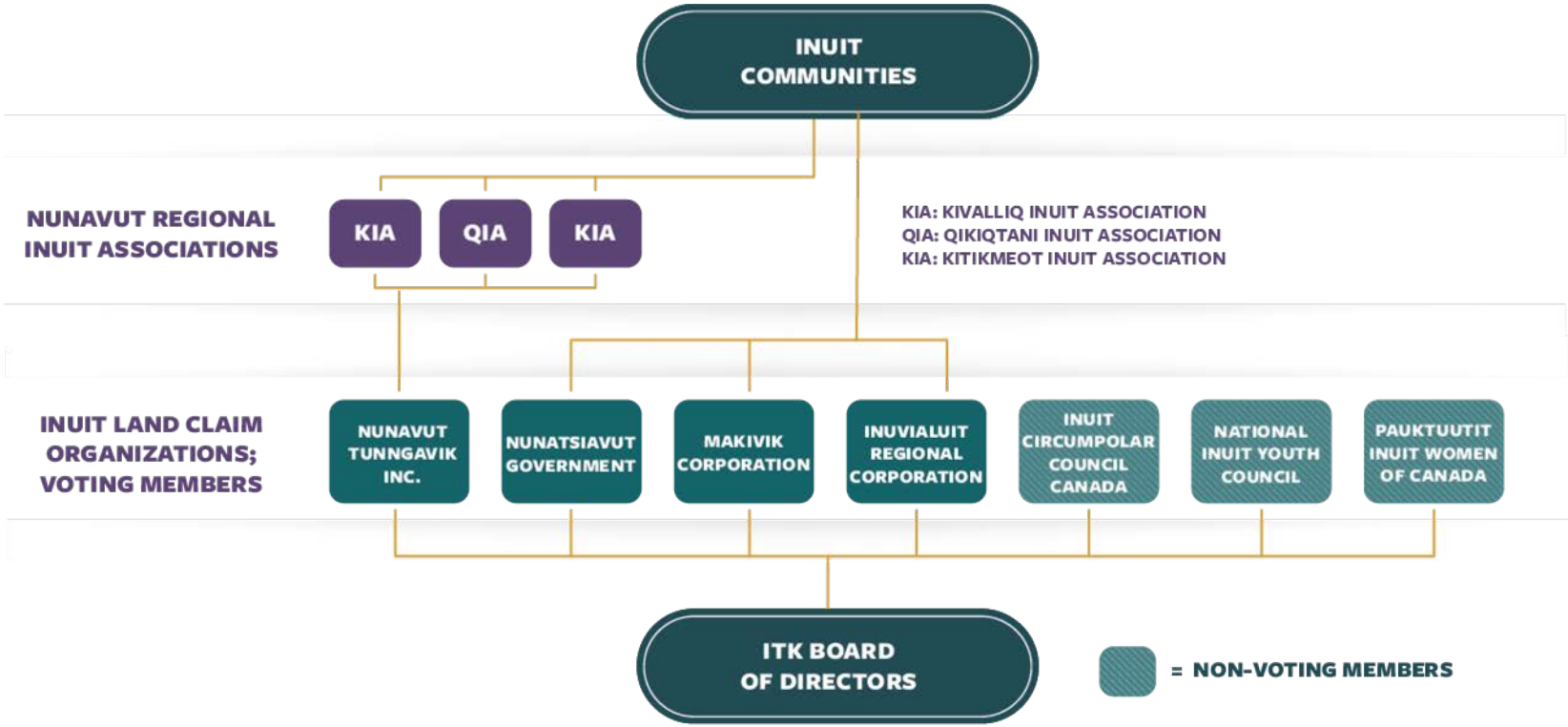
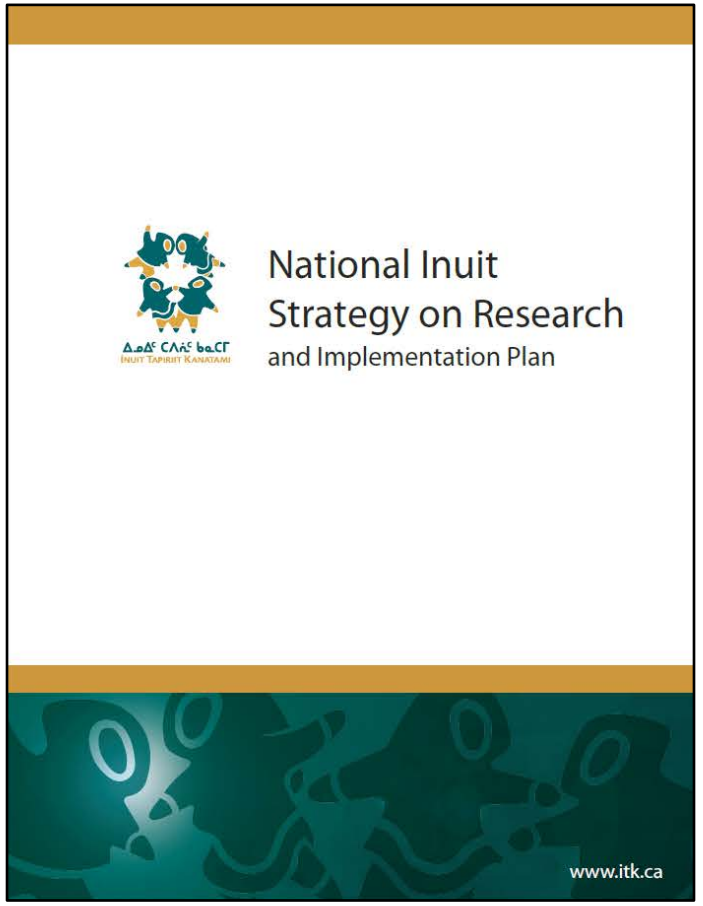
Inuit Governance Structure

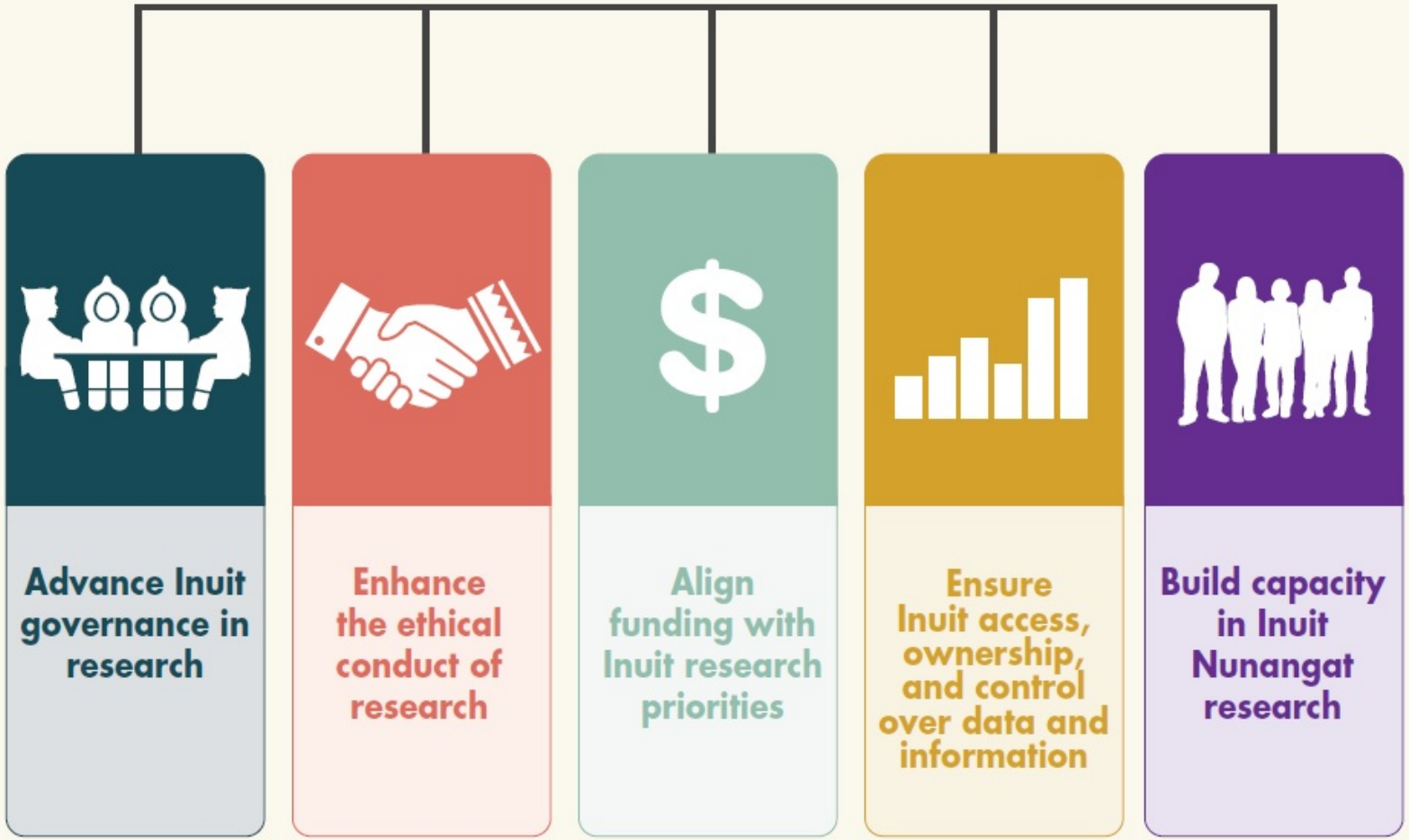


National Inuit Strategy on Research (NISR) & Implementation Plan

- Released March 2018, followed by an Implementation Plan in August 2018
- Outlines actions required to improve the way Inuit Nunangat research is governed, resourced, conducted, and shared
- Defines Inuit expectations for the role of research in the regions and communities
- Identifies areas for partnership and action between Inuit and the research community



5 Priority Areas of National Inuit Strategy on Research



WHERE WE NEED TO GO: SUPPORTING INUIT SELF-DETERMINATION IN RESEARCH

✗ Stakeholders	✓ Rights holders
✗ Inequity	✓ Equity
✗ Invisible	✓ Visible
✗ Lack of Control	✓ Control
✗ Reactive	✓ Proactive
✗ Racism	✓ Respect
✗ Paternalism	✓ Agency
✗ Extraction	✓ Investment
✗ Exclusion	✓ Inclusion
✗ Frontier	✓ Homeland
✗ Competitive	✓ Collaborative

Accomplishments and Highlights

Advocating

- For a **whole of government approach** to NISR implementation
- For a **distinctions-based** approach to research
- Inuit Qaujisarvingat National Committee (IQNC) members are **ambassadors for the NISR across Inuit Nunangat**

Advancing

- **Bi-lateral partnerships** with federal government departments and agencies through Memorandum of Understandings and work plans

Changing

- A **paradigm shift** to Inuit **self-determined** research
- **Changing practices** of how Inuit are engaged

Empowering

- The **confidence** to say "**no**"
- **Elevating the discussion** around Inuit Nunangat research

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INUIT TAPIRIIT KANATAMI

Publications

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Polar Educators International

Connecting polar education, research & the global community

Julia Dooley

President


overview

We are an international network of polar educators

- preparing next generation through learning
- capacity building by weaving networks & creating partnerships
- delivering ASM3 goals
- strengthening impact by upstreaming polar education

mission

Connecting polar education, research & the global community

We lead and support interdisciplinary and community-based dialogue to highlight and share the global relevance of the polar regions

vision

PEI is an essential network of educators & researchers aiming to provide a deeper understanding of current polar sciences to a global audience

Communicate, collaborate, create

- Develop a robust, flexible, and trusted international presence
- Grow and strengthen the PEI network and its relationships
- Provide relevant and timely opportunities for both education and scientific communities



PEI & ASM3

- There is potential for PEI to partner and expand capacity to
  - develop better technologies
  - extend partnerships with Arctic and Indigenous organizations
  - connect with a host nation or organization in support for a secretariat
  - education to support Arctic resilience and sustainability

Strengthen

How can Arctic research collaborate with polar educator networks?

Building capacity-weave networks

taking polar education upstream

Polar educators and learners have an important role to play in achieving all ASM themes - Observe, Understand, Respond & Strengthen.

Take the concept of polar engagement and education upstream in the Arctic Science Process to keep Arctic knowledge up to date and relevant.

The Polar Resource Book project

- work collaboratively to share up to date and relevant Arctic Knowledge in effective ways to a wide and diverse audience
- to take polar education and engagement with research upstream - engage at an early stage in the Arctic Science Process and Arctic initiatives

hlaðborð and PEI2022-Iceland

Educators from around the world come together for professional development & networking - by educators for educators

- new tools and tech for engaging audiences
- science and indigenous knowledge, Arctic SciArt, snap-talks, hands on activities - hlaðborð April - Nov 2021

Connecting Education, Indigenous Knowledge & Arctic research

Using its networks and partners, PEI is generating a **global conversation** researching

- the international role of polar education
- patterns and ideas in education about the Arctic
- connections to polar research, communities, the Arctic & its peoples
- evaluating Arctic polar education in the wider community

Recommended Actions

Capacity building; Education; Networking; Resilience - preparing future generations

Henry Burgess

NERC Arctic Office, UK

ASM3 Science Advisory Board Member

Theme 4: Strengthen

- Possibly the most important section of ASM3. Moving from observations & understanding and how to respond to that new knowledge, on to how to increase our ability to have a stronger and longer-lasting impact.
- Arctic & non-Arctic states, Indigenous People and local communities all have especially critical roles. Not least in setting higher benchmarks in new and better partnerships, that work for everyone.
- The core messages are already loud and clear. The opportunity is there to combine this with practical action – in full partnership and with co-production – to really make a difference in delivering change.
- Now is the time to redouble our collective efforts.

Theme 4: Strengthen

- Recognising the importance of **those most affected by change**, including Indigenous and local communities, taking the lead in identifying research needs, how to respond, and in being equal partners in delivering the work.
- Understanding the massively positive impact that **research with education and outreach at its centre**; which includes and values different forms of knowledge and skills; and which supports the next generation, will have on Arctic science as a whole.
- Finding creative and practical solutions to **bring together and support educators, local communities and researchers** in reaching out beyond their usual networks**.**
- **Appreciating and respecting difference,** building influential teams that can break down barriers and reach new audiences in the Arctic and beyond.
- **Respectful and empowering partnerships** that fully include Indigenous and local researchers, involve co-production; that produce new knowledge; where challenge is fair and welcome; and that lead to new long-term influential research partnerships.

Theme 4: Strengthen

Building capacity

- Recognising the links with physical and social infrastructure which directly support increases in the capacity for communities to engage and influence.

Focusing on education

- Including education & outreach as core elements at the design stage of research programmes, with resources, attention and scrutiny.

Creating positive networks

- Funding international opportunities and participation in major co-developed programmes for early career researchers, Indigenous People and local communities, in equal partnership with established researchers.

Growing resilience

- Recognising that working in new ways will be challenging, but will mean that the impact of the work, its longevity and wider influence, will be greater.

Questions & Answers

Third Arctic Science Ministerial Webinar Series

Theme 4: Strengthen

Capacity building; Education; Networking; Resilience - preparing future generations

Please type any questions related to the webinar series in the Q&A box.

Any remaining questions may be sent to
ml-asm3@mext.go.jp

Third Arctic Science Ministerial Webinar Series

Theme 3: Respond

Sustainable development; Evaluation of vulnerability and resilience; Application of knowledge

15 April 2021
16: 00 - 17: 00 UTC

Program here! ▶ https://asm3.org

https://asm3.org

ASM3

3rd Arctic Science Ministerial
Co-hosted by Iceland and Japan
NEW DATE: 08-09 May 2021
Tokyo, Japan

Webinar Series

This webinar series is designed to increase transparency of the Arctic Science Ministerial

Concept Note

Since the last Arctic Science Ministerial in 2018, changes in the Arctic ecosystem and the

Briefing Meetings

Briefing meetings for embassies will take place throughout the planning process for

3rd ARCTIC SCIENCE MINISTERIAL

European Polar Board

Thank You

ASM3 Email: ml-asm3@mext.go.jp

Government of Iceland
Ministry of Education, Science and Culture

MEXT MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND TECHNOLOGY-JAPAN