
Minutes

INTERACT III

Station Managers' Forum VII

6-7 November 2024

Smygehamn, Sweden



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INTERACT SMF DAY 1. 6. November

Welcome and introductions (Morten Rasch)

Morten welcomed all participants to the meeting. A short introduction round was made the previous day at the INTERACT General Assembly, hence this was skipped today.

The birth of INTERACT (Terry Callaghan)

Terry gave an introduction to how it all started, going back to the International Biological Programme with the IBP Tundra biome project. This was the first initiative to start a monitoring programme spanning across the arctic domain, trying to describe vegetation types and understand arctic plant dynamics. This cooperation led to Scantran and later to the SCANNET project – the first transnational networks of arctic research stations.

SCANNET was in the beginning a network of 9 terrestrial field bases in the North Atlantic region. The aim was to establish a network of field sites, compile and compare existing data and experiments within the network. Out of Scannet developed an idea to develop a circumarctic network of research stations - INTERACT. INTERACT was initiated with EU funding in 2011 and has since succeeded in getting funding from the EU for the network until the end of 2024. Since 2022, INTERACT has developed a non-profit association that will seek to continue the networking of research stations and improve OUR ability to Observe, Understand and respond to Arctic Change.

Developments since last meeting (Elmer Topp-Jørgensen)

i. Paper on representativeness of INTERACT stations

Link: [Towards an increasingly biased view on Arctic change | Nature Climate Change](#)

A study was published earlier this year to assess how well positioned the INTERACT network of research stations is to document and understand arctic change, and what happens if suddenly all Russian stations are removed from the analysis. Eight biotic and abiotic variables selected from 'CAMAP Arctic Climate Change Update 2021'. The analysis showed that the Russian invasion of Ukraine hampers the ability to adequately describe conditions across the Arctic, thus biasing the view on Arctic change. Excluding Russian stations lowers representativeness markedly, with some biases being of the same magnitude as the expected shifts caused by climate change by the end of the century.

ii. Plastic guidebook

The guidebook developed with input from the INTERACT station managers and was published in summer 2024. The aim of this guidebook was to raise awareness about the impacts of plastic use on climate and the natural environment. It provides practical guidelines for managing plastics at research stations, recommendations for scientists, share methods for monitoring plastic, and how to involve local communities in reducing plastic usage to help mitigate plastic pollution.

There is a working draft of the upcoming: INTERACT- Reducing the Environmental Impact of Arctic Research Stations coming out in late 2024 – see presentation later.

iii. CAFF/CBMP Biodiversity and Extreme event monitoring toolkit

The task 'unpredictable Arctic' will contribute to INTERACT's SC1 and WP4 by developing ways for research stations to help society to better cope with extreme events by developing monitoring programmes for extreme events and rapid biodiversity changes. It includes a pilot implementation of monitoring programmes on extreme events at a minimum of four INTERACT stations.

Extreme events can significantly impact ecosystems, physical landscapes and arctic societies. CAFF and INTERACT has developed a tool to inspire long-term monitoring of extreme events and their impacts on arctic ecosystems. The tool describes various extreme events, providing suggested definitions and recommend methodology for monitoring both the extreme events themselves and their potential ecosystem impacts. Guidance on monitoring extreme events is based on existing literature and expert knowledge, while ecosystem impact guidance builds on prioritized Focal Ecosystem Components (FECs) from existing CBMP monitoring plans. (See also agenda item on INTERACT/CAFF Extreme event monitoring tool).

iv. AMAP plastic monitoring – INTERACT test

In Task 2.5 'Cleaner Arctic', one of the milestones is a Plastic monitoring programme implemented at four stations. INTERACT has tested five of the 11 compartments that are recommended by AMAP on plastic monitoring:

- Beach litter
- Sediment
- Water column
- Birds
- Terrestrial soils

Results are presented later in the meeting.

v. INTERACT GIS

Activities since last meeting include drafting of a management agreement between owner, operator and user organisation (INTERACT and SITES), and the development of a new feature where temperature and precipitation data are shown graphically on station display pages. In the new feature users can select WMO Climate normals and individual years to be shown. See more below in “INTERACT GIS – recent developments”.

vi. Open station events

In Task 2.4 ‘Station outreach: Educating local communities and decision makers’, INTERACT stations will arrange ‘Open House’ thematic days for the general public. Participating stations contributed to the development of several products for the ‘Open House’ events with focus on Climate Change, invasive species and plastics. Products included Roll-ups, PowerPoint presentations and posters on above topics and about INTERACT. These outreach products are available online at the INTERACT website, some translated to for example Finnish, Danish or Greenlandic already. If any station translates products to other languages, please send to us (Marie or Elmer), so your translated version can be made available on the INTERACT website.

vii. International relations

INTERACT members are represented in the following initiatives:

- ICARP IV Research Priority team 7 – Infrastructure: Elmer Topp-Jørgensen, Morten Rasch, Marie Frost Arndal, Hannele Savela, Donie Bret-Harte (Toolik Field Station).
- EPB Action Group on Environmental Impacts: Elmer Topp-Jørgensen.
- SAON: Cornelya Klutsch (NIBIO Svanhovd).

International Workshop Sessions with INTERACT Station Managers’ Forum representation:

- ASSW 2024: INTERACT arranged a session on representativeness of the INTERACT network and effect of excluding Russian stations with presentations by AMAP and UArctic.
- European Polar Science Week 2024: session arranged jointly with AMAP. Presentation of AMAP ROADS (SIOS), INTERACT representativeness (Elmer), Extreme events (Gareth K. Phoenix), Coupling of knowledge systems (Morten) and About INPA (Caroline Coch).
- SCAR 11th Open Science Conference
 - Recorded presentation on environmental impacts (Elmer)

New publication – Reducing environmental impact of research stations (Marie Frost Arndal)

A new guidebook will be published by INTERACT SMF to give an overview of environmental impact issues relevant to research stations and with recommendations on how to minimize the environmental footprint. Research stations in remote and cold environments have a responsibility to prioritize sustainable management and develop env-friendly infrastructure. When establishing a new research station or amending existing research stations with new buildings, constructions or activities, an Environmental Impact Assessment process should be initiated to minimise the environmental impacts. This book will provide an overview of the environmental impacts associated with research station operations, covering areas like construction, transport, waste management, water use, and power supply. It includes guidelines for sustainable practices, such as renewable energy options and ethical considerations, to help mitigate these impacts and promote environmentally responsible research activities.

The publication builds on knowledge provided in INTERACT station managers and will supplement the INTERACT Reducing Environmental Impacts of Artic Science guidebook made for scientists.

Technical developments (Elmer Topp-Jørgensen)

i. Communication.

Satellite-based internet is delivered through communication satellites and has seen rapid development in recent years. Demand is increasing rapidly and the capacity of recently launched satellites from Norway is already sold out for the expected lifetime of the satellites. Below is an overview of key providers and their activities:

1. Starlink (USA). Target Customers: Businesses and private individuals. Satellite Deployment: 7,125 satellites in operation as of 2024. Plans to expand to 34,400 satellites in the coming years. 1 million subscribers in December 2022. 4 million subscribers as of September 2024.
2. OneWeb (UK). Target Customers: Telecommunication companies. Satellite Deployment: 544 satellites in operation as of January 2023. Planned expansion to 648 satellites by mid-2023. Coverage: Currently serves Alaska, Canada, Greenland, and Norway. Future expansion planned to Denmark, Finland, and Iceland.
3. Thousands Sails initiative (China). Satellite Deployment Goals: 1,296 satellites by 2027. 12,000 satellites by 2037.
4. U.S. Department of Defense (USA). Will launch 100 satellites in the coming years.

Comments:

Direct internet via mobile phone is expected in the coming years – no need for big antennas. The Starlink Direct to Cell launch campaign is underway, see their website [Starlink Business | Direct To Cell](#)

CHARS can use NASA satellites for communicating data from remote field locations (e.g. methane emissions), which are also used for ground truthing of remote sensing products.

ii. Sustainable energy solutions – experience from stations

- Greenland, Kobbefjord: Transitioned from generator to solar power and batteries in Kobbefjord. Operated almost entirely on solar power throughout the summer.
- Finland, Kilpisjärvi: Switched from oil heaters to a water/air pump system. Noted that the system is not silent.
- Canada, Kluane: Solar power implementation has reduced diesel consumption by 9,000 liters annually. Hydrogen fuel option discussed but deemed too expensive.
- UK, Scotland: Lithium batteries are being used to power instrumentation and equipment in the Cairngorms.
- Canada, Uapishka: Test sites for various energy solutions are under development. Results to be presented at the next meeting.

General Observations:

Wind turbines have limited durability at many sites, due to extreme wind and ice. Sustainable energy solutions are a topic of significant interest to many in the SMF and should remain a focus point.

International logistics cooperation (Elmer Topp-Jørgensen)

- i. **FARO:** The Forum of Arctic Research Operators ([FARO](#)) is a country-based organisation that fosters collaboration, information exchange, and logistical optimization among national operators of ships, stations, and aircraft to support Arctic scientific research. FARO is an umbrella organisation that covers all infrastructure and projects in the Arctic. A new strategy covers 2024-2028 and has many links to what we do in INTERACT, such as knowledge sharing between infrastructure operators, networking with other polar organisations and facilitating access.
- ii. **ICARP IV and IPY 2032/2033:** The ICARP IV International Steering Committee will lead seven Research Priority Teams (RPTs) from 2024 to 2025. These teams will identify knowledge gaps and research priorities for the next decade

within their topics and explore opportunities to enhance synergies among existing research plans and foster new collaborations. Preliminary findings will be presented at the ICARP IV Summit/ASSW 2025 (March 21–28, Boulder, Colorado). The final outcomes will be completed by the end of 2025 and included in the ICARP IV final report, published in 2026. Several INTERACT members are part of RPT 7, working on Technology, Infrastructure, Logistics, and Services.

International Polar Year (IPY) 2032-3033: The International Arctic Science Committee (IASC) and Scientific Committee on Antarctic Research (SCAR) have begun preparations for a 5th International Polar Year (IPY) in 2032–33, emphasizing the urgent need for coordinated global research to address critical challenges in polar and global systems, 25 years after the last IPY. We see that there could be role to play for INTERACT and its member stations, so important that we get involved now.

iii. **Observational networks:**

SAON (Sustained Arctic Observing Network). Mapping the Polar Data Ecosystem. Illustrates how data is shared and transferred among various metadata catalogues, specifically ones dealing with polar regions. System shows that INTERACT GIS is connected to EU POLARDEX (that harvest data from INTERACT-GIS). See <https://mpde.gcrc.carleton.ca/index.html>.

RoPON (Registry of Polar Observing Networks). Includes systems and related organisations that coordinate or track observing activities & infrastructure in the polar regions. See <https://polarobservingregistry.org/>

ARMAP (Arctic Research Mapping Application). A US led project where you can learn more about research projects in your region or scientific discipline of interest, explore available data or possible collaborations, plan and coordinate field logistics or use the online mapping tools to meet your own project's specific goals. See <https://armap.org/>

DEIMS (Dynamic Ecological Information Management System) is an information management system powered by eLTER. Discover long-term ecosystem research sites around the globe, along with the data gathered at those sites and the people and networks associated with them. Harvest information directly from INTERACT GIS. See <https://deims.org/>

POLARDEX Interactive polar infrastructure database developed by the European Polar Board. Harvest information directly from INTERACT GIS. See <https://deims.org/>

Comment: Arctic SDI – provides an infrastructure overview. Worth to explore whether INTERACT can and should be included in this.

iv. Logistics sharing platform

ISAAFIK - logistic platform where you can search for projects, fieldwork, infrastructure, education, and much more. Predominantly Greenlandic projects. See <https://isaaffik.org/>

INTERACT GIS – recent developments (Elmer Topp-Jørgensen)

Recent developments include climate data graphics shown on station display pages. Data is automatically harvested from Copernicus services as downscaled temperature and precipitation data from stations since 1961 and up to today. The data is automatically updated every week and do not necessitate any manual data transfer from stations. It is hoped that this can be a valuable tool for scientist seeking to learn more about relevant infrastructures for their research. It is based modeled and published data, which is described and linked to on the website.

Suggestions:

>Put INTERACT logo on graphical displays so people know where the data comes from.

>Put a statement that local data may exist – disclaimer saying that data may not be the same as the modelled data.

Response: There is a link directly to the station on the website www.interact-gis.org. The information in the system depends on what you put into INTERACT GIS – you are the manager of your site and have the responsibility of making sure that information is up to date. If you do not have an account, get in touch and we will help you set one up – it is easy.

>Can webcam images be uploaded to the GIS site?

Response: We will bring the idea forward to INPA, who will be the future operator of INTERACT GIS. Any further development work needs additional funding from now on.

>Future system management:

Costs are shared with SITES (a Swedish network of observing sites). A Management Agreement will be signed before INTERACT III ends and transfer operations to INPA. User organisations will be INTERACT Non-Profit Association and SITES (Swedish network). The system operator is Umeå University and Swedish Agricultural University is the system owner.

POLARIN will pay for the use of INTERACT GIS and plans to include Antarctic stations. This feature is still in the testing phase.

INTERACT/AMAP Test implementation of AMAP Plastic Monitoring protocols (Elmer Topp-Jørgensen+stations)

The purpose was to test implement AMAP plastic monitoring guidelines at four INTERACT stations, to assess ability of stations to implement recommended protocols. The stations were CEN station in Canada, Arctic Station in Greenland, Oulanka Research Station in Finland - and a desktop evaluation (to replace terminated Russian station). The stations tested different plastic monitoring compartments developed by AMAP, and at Oulanka, new freshwater monitoring methodology was developed as input to AMAP as there were no current methodologies for freshwater monitoring in the guidelines.

The challenges and lessons learned from the experience highlight several key points. The compartments in the study are relatively well-defined, with comprehensive descriptions of their significance and current understanding, supported by key references. The guidelines address relevant topics such as the importance of the work, methodologies, analysis, data management, quality control, and data sharing, proving particularly useful for experts in plastic monitoring. However, during the INTERACT test implementation, experts often deviated from the suggested methods, indicating the need for flexibility in protocols. Suggestions for improvement include incorporating local point source monitoring for more effective decision-making, expanding the guidelines to cover freshwater protocols, and offering more specific, simplified guidance for non-experts, reducing the reliance on for example external references.

Comments from stations:

>There have been Remote Access projects involving plastic studies in Kobbefjord (GINR) and at Kevo Research Station. CHARs has also hosted microplastic scientists, and similar studies have taken place in alpine areas. All stations emphasized the importance of having clear protocols, guidelines, and standardized methods.

INTERACT/CAFF Extreme event monitoring tool (Kari Fannar Larusson/Elmer Topp-Jørgensen/Marie Frost Arndal+stations)

The purpose of this initiative was to develop and test guidelines for integrating the monitoring of extreme events and their impacts into existing efforts at INTERACT research stations. Input has been gathered from station managers during SMF meetings, WP4, extreme event experts, and CAFF and CBMP expert groups. Test results from pilot stations have also informed the process.

Monitoring protocols were being tested at three research stations (one Russian station excluded). A CBMP biodiversity monitoring toolkit has been developed (as part of INTERACT II) and is available on the CAFF website to simplify the step-by-step implementation of CBMP monitoring plans. This toolkit now includes an extreme event element with recommendation on how to monitor extreme events and their impacts on

prioritized Focal Ecosystem Components (FECs). The extreme event monitoring focus on ecosystem components that serve as indicators of environmental change identified by CBMP expert groups.

The toolkit connects extreme events with relevant FECs, offering guidance on what to monitor, how to monitor extreme events, and how to integrate this into existing station efforts. Stations are encouraged to explore ways to monitor extreme events alongside their current monitoring activities.

The CBMP has identified Focal Ecosystem Components as key targets for monitoring due to their potential to indicate broader environmental changes. The toolkit allows users to explore specific extreme events and their impacts, offering practical advice for data collection. More information about these efforts and the FECs monitoring framework is available on the CAFF website at [CAFF](#).

Although the toolkit does not represent an internationally agreed protocol, it marks a step toward standardizing the monitoring of extreme events.

See more here: [FECs Monitoring | CAFF](#) and <https://caff.is/work/approach/extreme-events/>

Feedback is welcome—please let us know if you have any questions or comments!

Day 2, November 7

Open floor sessions

Cairngorms: The value of a long-term monitoring station as a case study for the wider scientific community (Jan Dick).

The Cairngorms site is co-located with and partly funded by several networks, such as the Environmental Change Network (ECN), where abiotic and biotic data are collected. This research site contributes data to various networks at local, national, regional, and global scales. Additionally, the site is involved in two EU-funded projects. Its impact is reflected through numerous papers, with its data serving as one of many data points in multiple studies. This is why the station is now joining INPA.

Kilpisjärvi: Building awareness through science and art and b) the art of establishing an eddy-covariance tower (Anu Ruohomäki)

An eddy covariance tower was established at the site, with QR-code signs placed for public engagement. The area is fenced to protect it from reindeer. Practical challenges include snow drift into instrumentation, manual data downloads from small SD cards in cold weather, and high methanol fuel cell consumption. The collected data will be made openly accessible.

The station recently celebrated its 60th anniversary and hosted an artist-in-residence program. At the municipality's request, a local art show was organized for schools, involving a nature photographer and three schools. The Bioart Society was also engaged, encouraging children to collect specimens, photograph them, examine them under microscopes/stereoscopes, and create collages in petri dishes. All activities were documented, and posters were made as gifts for the schools and the station. Five art pieces were created, receiving positive feedback from children, teachers, and the municipality.

Greenland Institute of Natural Resources and Zackenberg: Using station data to booster climate change awareness of the next generation – long term monitoring data applied in high school educational materials (Marie F. Arndal, Katrine Raundrup and Torben R. Christensen).

New educational materials have been developed as part of a project "Virtual Journey in the Arctic – Dive into Climate Change" funded by Novo Nordisk Foundation in Denmark. Designed for high school students in Denmark and Greenland, the materials are available in both Danish and Greenlandic. The content is based on data from the Greenland Ecosystem Monitoring (GEM) program, which has been collecting data in Greenland for over 25 years. GEM monitors nearly 400 ecosystem elements across more than 1,500 variables, including vegetation, weather, snow cover, wildlife, permafrost, oceans, lakes, glaciers, and gas flux. The project utilizes data collected from the field station in Kobbefjord, Southwest Greenland, and in Zackenberg, Northeast Greenland. The materials are particularly suited for teaching biology, geoscience, and physical geography. The package includes StoryMaps, e-book chapters, 3D virtual tour of the sites, and data and questions that allow students to engage actively with the material.

Hyytiälä: Building an Open-Access Web Application for Standardized Legacy Data (Tanja Lindholm)

Development of an open-access web application for standardized legacy forestry data at the Hyytiälä Forestry Research Station. The station spans ~40 km² of state-owned peatlands, forests, and lakes, offering a rich resource for research and education. Continuous data collection in plots from forest or peatlands – where plots were established many years ago. Data standardisation challenges associated with legacy data, includes outdated formats, lack of metadata, and data quality issues.

A two-phase web application using R Shiny is being developed to address these challenges. The first phase focuses on quality control, offering tools for data validation, summary visualization, and mapping. The second phase will enhance accessibility by adding input parameter options, visualizations, and regular data updates. The goal is to align the data with FAIR principles (Findable, Accessible, Interoperable, Reusable), improving usability and reproducibility for researchers and stakeholders.

CEN stations: Recent updates on the Qaujisarvik network (Lise Millera Ferriz and Mickael Lemay)

CEN's Qaujisarvik network of research stations provides affordable and logistically supported access to the North. Infrastructure advancements include a new station at Umiujaq focused on carbon neutrality. CEN emphasizes inclusivity, safety, and community engagement, enhancing user experiences through codes of conduct and new welcome package adapted for each station related to safety and local communities.

As a new member of the INTERACT Non-Profit Association, CEN will participate in Access, Outreach, Education, and Networking Action Groups. While currently involving the Whapmagoostui-Kuujuarapik station in the Access Program, plans are underway to include three additional stations. Collaborative efforts with Canadian partners aim to secure funding for continued participation in INPA.

[Sodankylä: Recent activities \(Leena Leppänen\)](#)

The Finnish Meteorological Institute's Arctic Space Centre in Sodankylä, Finland, is a globally unique research infrastructure supporting a wide range of studies. It features advanced ecosystem measurement systems, towers, and instrumentation, including a snow measurement field site in forests, and is also a member of the ICOS network.

Current activities include relocating equipment from a fen to a higher tower for improved performance. Testing is underway to establish communication between weather stations, and camera observation systems. Sodankylä is also a test area with a 1.7 km winter testing track for intelligent traffic systems.

[Join EUs Soil programme](#)

Presentation, questions and making connections (Cornelya Klutch, Nibio Svanhovd)

The EU Soil Mission aims to restore and enhance soil health across Europe by 2030. Key objectives include reducing desertification, conserving soil organic carbon, preventing erosion, restoring polluted soils, and increasing public awareness about soil literacy. Central to this initiative are Living Labs, real-life experimental sites fostering collaboration among scientists and local farmers -and Lighthouses, which showcase best practices.

There are opportunities for Arctic and sub-Arctic stations, such as Svanhovd, to join the Living Labs. These locations offer strengths in ecological research and community engagement. Important to incorporate social sciences and humanities to build transdisciplinary research frameworks. How to develop agriculture in the North in the best way? This could also be for a future INTERACT proposal where focus is on preparedness and food security in a future climate.

Future INPA SMF networking activities, break-groups:

A. Organisation of the INPA Station Managers' Forum

In SMF, we have experienced challenges with fully incorporating all environments that the network is covering – Alpine, Boreal and Arctic. The network has arctic embedded in its name, but the network is open to all stations in “northern” cold environments.

What can we do to have full focus on all environmental compartments and ensure that activities reflect the entire network?

- Can we organize the SMF differently to make it relevant for all?
- How can we bring knowledge into the SMF about funding opportunities that span beyond the Arctic?

B. Future SMF activities

INPA arrange General Assemblies (GA) once a year giving members a chance to meet, share knowledge and develop new ideas, projects, tools, etc. We have earlier agreed that the GAs would be a good place to meet physically, but with station fees and incoming overhead from project, it also seems that INPA may be able to expand INPA SMF related activities.

What INPA SMF activities would benefit you, as a member station, the most? What activities should we prioritise (beyond the physical meeting at the GA)?

- a) Online meetings/webinars? Topics?
- b) Products and tools?
- c) Project development?
- d) Representation of INPA SMF in International fora?
- e) Other activities?

Discussion and input from the groups

Group 1 (Tejshree, Svartberget Research Station): this group suggested:

- More frequent meetings online in the afternoon (European time) to include Alaska. Make a survey before meeting to collect recent challenges from station to come up with solutions.
- Digital catalogue – update on what is happening in INPA.
- Need for more social media outreach to make it easier to connect with each station.
- For Alpine stations – no good suggestions.

Group 2 (Donie, Toolik Field Station): It was suggested that the SMF should be inclusive, maintain focus on stations and their problems, and provide solutions. Currently, it works well for knowledge exchange. We should use INPA overhead to fund working hours for INPA staff, etc.

Meetings: Without money for travel to SMF meetings, we could use our (station's) own project funds. This may require the person to give a talk or presentation to justify the travel. The meeting format should be an in-person meeting once a year, but a hybrid option should still be possible. More online meetings need to be planned carefully. INPA should purchase equipment for hybrid meetings and ensure the technical aspects are functional.

A challenge is finding funding that can support all stations, which would be beneficial even if not all stations can participate in proposals. There should be space for time substitution, including more stations to create a gradient—moving south to north. The EU Soil programme: INPA could be involved to get funding to help keep the SMF alive.

Group 3 (Hanna-Maria, Iceland): How to make it relevant: Make sessions where stations are split into Alpine, Arctic, and Boreal sub-groups. The INPA Fundraising Group could gather input from all stations to compile a list and share information on relevant funds/calls.

Reflect on possibilities of forming a national level network with national funding for contributing to/participating in INPA. Online meetings and webinars should continue with the theme of standardized monitoring.

We should discuss our negative experiences to learn from each other.

Tools/products: Look into previous products - how have they been used before? How many are using them? This should be done before starting any new products. A new topic could be guidelines on ethics. Review current standards and consider adding new ones. Develop a strategic plan for INPA, if not already in place.

Group 4 (Jens, Finse): Alpine stations are okay with mainly Arctic-related projects. Research projects could be made cheaper and have a smaller carbon footprint by not traveling to the Arctic, which highlights the importance of alpine stations.

SMF – Products/tools: A physical book may not be so important, and there is no need for more roll-ups. The structure of SMF should be organized into more focal points based on activities. SMF could be linked to larger conferences that we are attending anyway, with a registry (inform people about who is going to specific conferences so they can meet up).

The value of visiting other research stations is important. A TA visit to a research station by station managers could be supported by funding (for personal visits). We should invite each other to our stations whenever a station manager is already traveling - reach out! North-to-North calls could allow UArctic members to apply for travel funding.

Not all station managers are scientists, and not all go to the same conferences. Not all stations have enough staff to attend all SMF meetings. We need to improve hybrid meetings and help with travel using INPA funds.

Invite non-member stations and networks to our meetings to increase awareness of the network, gain new members, and encourage new collaborations.

New project developments (Elmer Topp-Jørgensen)

i. Ongoing INPA project development - NordForsk – Sustainable development of the Arctic – Full proposal

Nordforsk proposal – OUR project, 2nd stage proposal deadline 28 November 2024

The main aim of the call is to support research collaboration among Arctic countries to promote sustainable development in the region. The call invites interdisciplinary projects of high international quality that can generate societal impact through multilateral cooperation. Projects should build on existing research infrastructure (e.g., INTERACT), engage with Indigenous and local communities, and integrate scientific data with Indigenous knowledge. The focus of this application is on addressing challenges related to food security, water security and transport safety in Arctic communities (excluding Russia), identifying specific issues through local community input, priorities from Indigenous organisations, and international goals like the UN SDGs and Arctic Council targets.

The INPA secretariat is coordinating the proposal together with also a Canadian office (CEN and Kluane Lake). The project belongs to University of Copenhagen (main applicant) and INPA support with the administrative tasks and coordination. INPA stations will receive funding to provide data and participate in meetings, and more money to those that will engage Indigenous/local communities. INPA is recognized as a research institution by NordForsk.

Local involvement is now a requirement for most funding calls, but it can be challenging at some stations due to the distance between some research stations and local communities, in some cases hundreds of kilometers apart. However, an advantage we have in INTERACT is the presence of local station managers who have established contacts with Indigenous/local communities and thus in a perfect position to bridge knowledge systems (Indigenous and local knowledge and science). The project will start by initiating the process of involving local communities, with an equity advisor evaluating the meetings and studying the process. The end goal being to develop a sustainable mechanism for integrated assessments that comes close to adhering to equity and equal engagement guidelines.

Indigenous and environmental data sovereignty will be considered as part of the informed consent procedures.

INPA project ideas – draft short descriptions of project ideas

- Presentation of project ideas from previous meeting
- Identification of project ideas to move forward (Plenum)
- Break out groups: a. Draft project idea, incl. title, aim, short description, role of stations, potential project development team members, potential funding sources (if any)

Break out groups – discussion:

Group 1 (Donie, Toolik): The group discussed creating a test bed for various technologies, such as acoustic monitoring of soils, e-DNA analysis from hair and feces, and AI for analyzing images from camera traps and drones. The goal is to leverage the diverse transects represented by INPA stations (boreal, alpine, and arctic) to address environmentally and socially relevant questions, such as invasive species, water quality, and zoonotic diseases. The gradient concept could involve all INPA stations. Food security was highlighted as a key topic, with a focus on local solutions and the pressures from agriculture in the future. Collaboration with social scientists working on this issue and building capacity at stations through local training were also discussed.

Group 2 (Rainer, Hintereisferner): Projects Discussed: Education – Children of the Arctic: Establish stations as knowledge hubs and bring students to the Arctic, connecting with UArctic to let them experience the region firsthand. Another suggestion is about sensors and logistics in the Arctic: Focus on lessons learned and the use of equipment, including building custom sensors, creating shared databases for sensors, and refurbishing/recycling existing ones. Stations can serve as knowledge hubs and test sites for new technologies. The group also discussed joining multiple stations together for collaborative activities, developing a curriculum, sharing experiences, and integrating young people through internships.

Group 3 (Mickael, CEN): Outreach and Strategy Discussion: The group emphasized that infrastructure should adapt to education needs and facilitating research based on actual research needs. The group pointed out that is important to ensure continuation of the network before moving forward with facilitating research. It may require adjustment of strategies and goals. One key idea was to get closer to the Arctic Council, potentially forming a working group based on national contributions, and exploring how to become a permanent working group under the Arctic Council.

Kari (CAFF) stressed that working groups are focused on specific topics, while INTERACT is more infrastructure-based. We should look into similar groups, such as the Arctic Spatial Data Infrastructure, which is more relevant to our work. Being associated

with the Arctic Council does not necessarily lead to funding. Instead, we should aim to attract funding agencies that are interested in supporting long-term monitoring initiatives.

We need everyone to be an ambassador for INPA, so consider if there could be a role for INPA in the applications/science proposal you are involved in! INPA can be an individual partner as a legal entity (the INTERACT non-profit association).

Open floor

Uapishka – ecotourism and science in a UNESCO biosphere region (Marianne Valcourt):

The Uapishka Station is a joint venture between the Conseil des Innus de Pessamit and the Manicouagan-Uapishka Biosphere Reserve. Uapishka is a non-profit organisation, not university-related, with a partnership based on shared goals. It is located in a biosphere reserve, which is the size of Croatia. The lodge can accommodate 30 people, and the area attracts many tourists. Ecotourism is a key focus, with recreational tourists engaging in activities like skiing and snowmobiling. The organisation receives government funding to support long-term monitoring efforts. Researchers come from both international locations and Quebec. However, there are too many scientists trying to engage with the local community, leading to researcher fatigue among the resident population.

UIC Science - Barrow Arctic Research Center, Alaska Lindsay:

Barrow is a key Arctic research hub, with nearly 100 years of collaboration between local Inupiat whalers and Arctic researchers. UIC Science's team consists of local whalers, hunters, and survival experts who integrate Indigenous Traditional Ecological Knowledge (ITEK) to support scientists with tailored logistical assistance. UIC staff, many of whom are from the community, now partner on projects and coauthor research papers. Outreach efforts include podcasts, science fairs, talks for adults, and BBQs. An app has been developed to share information about buoys, with regular feedback gathered from Indigenous partners. Internships are also offered, with projects funding local interns to work alongside scientists.

Finse, Jens haga:

It is easy to travel to Finse with a reduced CO₂ footprint, as the train station is nearby, compared to many other research stations. Still working on the lotic model on how to pass information to next generations. This summer a botany excursion for the public was organized by students, generating funding.

INTERACT SMF Legacy (Morten Rasch)

The network has grown to 95 stations over the years, facilitating science, with stations serving as knowledge hubs. Several publications have been released providing best practice guidelines for station managers and scientists alike, we have developed educational materials reaching thousands student from primary to university levels, we are cooperating with Arctic Council working groups, other infrastructure organisation and scientific networks providing guidance on standardisation of measurements, and we have developed tools for scientists to explore stations and their data and provide an overview of arctic permits systems.

Reminder: Please update the INTECAT GIS with information about your station!

What has it meant to Morten? Morten reflected on learning how to work safely in the field. The first INTERACT application was submitted in 2010—on the deadline day, Morten met with Maggan, Terry, and Luisella. The application was submitted with red track changes in the documents but succeeded!

The INTERACT Station Managers' Forum will continue in INPA and everyone is invited to contribute and help to further develop INPA as a leading infrastructure provider and assessment platform for arctic, boreal and alpine research.