



Progress since last meeting

www.eu-interact.org



Morten Rasch¹, Elmer Topp-Jørgensen², Marie Frost Arndal²

¹University of Copenhagen, Denmark, ²Aarhus University, Denmark

INTERACT III, Station Manager Forum 6,
Toolik Field Station, Alaska, 12-13 September 2023



Progress, Deliverables and Milestones

WP2 Station Managers' forum tasks

Task 2.0 Operate the Station Managers' Forum

Task 2.1 The unpredictable Arctic

Task 2.2 Transport and communication

Task 2.3 Making station data and publications widely available

Task 2.4 Station outreach: Educating local communities and decision makers

Task 2.5 Cleaner Arctic

Task 2.6 The Arctic Resort



Progress, Deliverables and Milestones

Deliverables

D2.1 INTERACT GIS with new features (Month 22)

D2.2 Updated digital Station Catalogue integrated in INTERACT GIS (Month 28)

D2.3 Web-editions of updated 'Best Practices of Station Management' (Month 35)

D2.4 Web-editions of updated 'INTERACT Fieldwork Planning Handbook' (Month 48)

D2.5 Updated 'INTERACT Minimum Monitoring Programme' (Month 48)

D2.6 Guide on research permit systems for all arctic countries on INTERACT website (Month 14)

D2.7 Pocket guide on how to reduce CO2 emissions in Arctic science (Month 26)

D2.8 Pocket guide on metadata standards for scientific networks (Month 29)

D2.9 Repository with selected data from INTERACT stations integrated in INTERACT GIS (Month 44)

D2.10 Checklist for environmentally friendly stations (Month 36)

D2.11 Pocket guide on how to reduce plastic consumption and pollution (Month 40)

D2.12 Pocket guide on how to handle effects of tourism at research stations (Month 30)

D2.13 Pocket guide for tourist



Progress, Deliverables and Milestones

Milestones

M2.1-5 SMF Meeting

M2.6-9 Seminars on themes chosen by station managers

M2.10 Technical staff workshop

M2.11 Workshop on best practices with participation of other communities

M2.12 Extreme event monitoring field test implemented at minimum four stations

M2.13 Rapid biodiversity change monitoring field test implemented at minimum four stations

M2.14 Session at SMF on communication and positioning systems

M2.15-16 Seminars on state-of-the-art methods/technologies for environmental monitoring

M2.17 Selection of photos from different stations provided to WP6

M2.18 Courses on community based monitoring of local relevance

M2.19-20 'Open House' thematic days at minimum ten research stations

M2.21 Course for station managers on improvement of communication to decision makers



Station Manager Forum Coordinating Activities (Task 2.0)

- Bring together station managers
- Ensure progression of tasks
- Liaise with other WPs
- Representing INTERACT/SMF at international meetings/workshops/conferences
- Cooperation with other infrastructure networks and organisations
- Operate INTERACT GIS
- E-book versions of INTERACT Handbooks
- Circulate 360 cameras



Achievements since last SMF meeting (Task 2.0)

- International collaboration

The Future of Research Infrastructure in the Arctic

October 27, 2022 - 9am-7pm
 Location: SQUARE Brussels Convention Centre
 Program: Talks and Panel Discussion
 Register at: <https://bit.ly/3NWFvG>

During this one-day event, experts from science, policymaking, industry, and infrastructure organizations will come together to discuss key topics related to research infrastructure in the Arctic.

Organized by:

EUROPEAN POLAR BOARD

Synthesis Report on the Environmental Impacts of Research and Logistics in the Polar Regions
 by the Environmental Impacts Action Group of the European Polar Board

www.europeanpolarboard.org

RoPON Registry of Polar Observing Networks

Home About Contacts POAawg ARCTIC PORTAL, GP

Systems and related organizations that coordinate or track observing activities & infrastructure in the polar regions.

▲ Work in progress. The RoPON initiative is under development. The information and data are incomplete and their verification is ongoing. The project database and its presentation tools are being implemented and functionality may break without notice. For further information, visit the [About](#) section.

ARCTIC SCIENCE SUMMIT WEEK
 21 - 29 March 2024
 Edinburgh, Scotland, UK #ASSW2024 IASC

Physical and virtual access to arctic terrestrial observing platforms and their data for the global science community

Elmer Topp-Jørgensen¹; Hannele Savels²
¹Aarhus University / INTERACT; ²Thule Institute

Abstract:
 Arctic surface temperatures are increasing 3-4 times faster than the rest of the Globe and changes affect regional and global climate systems with potential significant implications for the societies. Understanding cause and effect of Arctic climate change is therefore of interest to the wider world. Knowledge about accessible research platforms and how to access these are therefore

INTERACT Transnational, Remote and Virtual Access: The past, the present and the future

20 February 2023 | 14:00 - 15:30 (GMT+1)
 Open Session - HYBRID

Room: Hörsaal 31

Session Conveners: Hannele Savels (INTERACT / University of Oulu, Finland)

Carbon footprint and Environmental Impact Reduction Workshop

20 February 2023 | 16:00 - 18:00 (GMT+1)
 Open Session - HYBRID

Room: Hörsaal 31

Session Conveners: Svenja Holste (Bielefeld University, Germany)

ARCTIC CIRCLE

11:20 - 12:15 | ALIGNING ARCTIC RESEARCH PRIORITIES, INFRASTRUCTURES AND ACCESS IN SUPPORT OF ICARP IV
 Organized by: European Polar Board; INTERACT - The International Network for Research and Monitoring in the Arctic

Planned October 2023

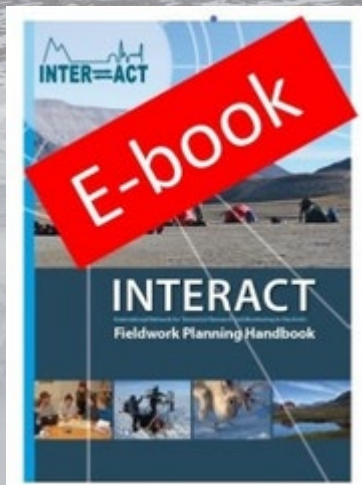
- Jennifer M. Mullen, National Science Foundation, USA;
- Opening Workshop on Arctic Research Operators
- Gerlis Fugmann, Executive Director, Arctic Science Committee (IASC), Iceland;
- Infrastructure
- Elmer Topp-Jørgensen, Special Consultant, INTERACT Network and the INTERACT GIS and Access
- Miguel Ojeda, Logistics Manager, Marine Technology Unit, Cultural Resources Division, Spanish National Research Council (CSIC); European Polar Board and the PolarDex Infrastructure Catalogue



eRImote
 Expert group on remote training of infrastructure staff and users

Achievements since last SMF meeting (Task 2.0 and 2.5)

- Books



Checklist for environmentally friendly stations
- To be incorporated into a book for public use
Text in review
Impact of Research Stations



Achievements since last SMF meeting (Task 2.0)

- Minimum Monitoring System

Brief communication in Nature Climate Change (2nd review)

Towards an increasingly biased view on Arctic change?

manuscripttracking system nature climate change

tracking system home submission guidelines reviewer instructions help logout journal home

Detailed Status Information

Manuscript #	NCLIM-23061130A
Current Revision #	1
Other Version	NCLIM-23061130
Submission Date	31st August 23
Current Stage	Editor Decision Started
Title	Towards an increasingly biased view on Arctic change?
Manuscript Type	Brief Communication
Corresponding Author	Dr Efrén López-Blanco (elb@bios.au.dk) (Aarhus University)
Contributing Authors	Mr Elmer Topp-Jørgensen, Professor Torben Henriksen, Dr Marie F. Amdal, Dr Niels Schmidt, Professor Niels Schmidt
Authorship	Yes
Abstract	The Russian invasion of Ukraine is likely to bias our view on Arctic change. Here, we benchmark the accuracy of the largest high-latitude network of research stations against the Russian stations included. Excluding Russian stations, the accuracy of the network is significantly lower, and biases are in some cases of the order of magnitude. This highlights the need for increased transparency and shifts caused by climate change by the end of the century.
Subject Terms	Environmental sciences/Climate sciences/Climate change Environmental sciences/Biogeochemistry Environmental sciences/Environmental sciences/Climate-change ecology Environmental sciences/Climate-change ecology Societal sciences/Societal sciences/Scientific community
Show Author Information	Follow Reviewers to see Author information.
Research Square and Research Square for	I understand that my manuscript and associated personal data will be shared with Research Square for the delivery of the author dashboard.
In Review	No, my co-authors and I would not like to benefit from <i>In Review</i>
Competing interests policy	There is NO Competing Interest.
Applicable Funding Source	No Applicable Funding
Previous Interactions	None of the above
Research Data Deposition	No

Stage	Start Date	End Date	Approximate Duration
Editor Decision Started	4th September 23		
Manuscript under consideration	1st September 23		

More on day 2 of SMF



Achievements since last SMF meeting (Task 2.4)

- Open Station Event materials

Climate Change theme

INTERACT brings together managers of more than 90 research stations to discuss how research stations can be developed and improved. The network offered to the scientific community.

International Network for Terrestrial Research and Monitoring in the Arctic

INTERACT stations worldwide to improve understanding of arctic climate and ecosystems.

Developed jointly to be used by international scientific networks and organisations to assess climate and ecosystem changes on a large scale. Data is also used to make snow reports and issue advisories for decision-makers locally, nationally and globally.

Climate Change

Global temperatures are rising increasing 1.1°C since 1900. Global temperatures in 2020-2021 are the warmest on record.

The Arctic is warming 3-4 times faster than the rest of the globe.

Three IPCC Climate Change scenarios predict a reduction of global, arctic and alpine ice extent.

Predicted temperature increase Year: 2000-2100

Scenario	2020-2021	2030-2039	2040-2049	2050-2059	2060-2069	2070-2079	2080-2089	2090-2099
W1 - Business as usual	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W2 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W3 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W4 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W5 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W6 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W7 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W8 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W9 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C
W10 - Fossil-fueled development	1.1°C	1.8°C	2.6°C	3.4°C	4.2°C	5.0°C	5.8°C	6.6°C

Summer sea ice extent is returning to 1980s levels.

Impacts Climate Change

It is getting warmer and the Arctic is warming 3-4 times faster than the rest of the globe.

Climate Change is also having impacts on the environment and human health.

Extreme events are becoming more frequent.

Permafrost thaw is causing ground subsidence and infrastructure damage.

Glacial melt is contributing to sea level rise.

Rock slides and landslides are becoming more frequent.

Permafrost thaw is causing ground subsidence and infrastructure damage.

Slideshow

INTERACT Open Station Event

Happening at research stations all over the Arctic

What can you do? theme

Greenhouse gas emissions

Greenhouse gas emissions are the main driver of climate change.

What is the problem?

Greenhouse gas concentrations

Increasing temperatures and global challenges

What can you do?

You can help minimize Climate Change by:

- Using energy wisely
- Reducing energy consumption
- Using public transport
- Using energy-efficient light bulbs
- Using energy-efficient appliances
- Using energy-efficient windows
- Using energy-efficient doors
- Using energy-efficient roofs
- Using energy-efficient floors
- Using energy-efficient walls
- Using energy-efficient ceilings
- Using energy-efficient floors
- Using energy-efficient walls
- Using energy-efficient ceilings

Invasive species

What is the problem?

Invasive species are species that are not native to an area and cause harm to the environment.

How do they get here?

What can you do?

You can help by:

- Not introducing invasive species
- Not releasing invasive species
- Not buying invasive species
- Not selling invasive species
- Not trading invasive species
- Not transporting invasive species
- Not storing invasive species
- Not using invasive species
- Not disposing of invasive species
- Not dumping invasive species
- Not discarding invasive species
- Not donating invasive species
- Not giving away invasive species
- Not lending invasive species
- Not borrowing invasive species
- Not using invasive species
- Not disposing of invasive species
- Not dumping invasive species
- Not discarding invasive species
- Not donating invasive species
- Not giving away invasive species
- Not lending invasive species
- Not borrowing invasive species

Plastic pollution

What is the problem?

Plastic pollution is a major environmental problem.

What can you do?

You can help by:

- Reducing plastic use
- Reusing plastic
- Recycling plastic
- Not littering plastic
- Not dumping plastic
- Not burning plastic
- Not throwing plastic away
- Not leaving plastic around
- Not using plastic
- Not disposing of plastic
- Not dumping plastic
- Not discarding plastic
- Not donating plastic
- Not giving away plastic
- Not lending plastic
- Not borrowing plastic

Roll-ups

Kevo Research Station

Creating a circumpolar platform

Kevo Research Station is a circumpolar platform for research and monitoring in the Arctic.

INTERACT logo and social media icons.

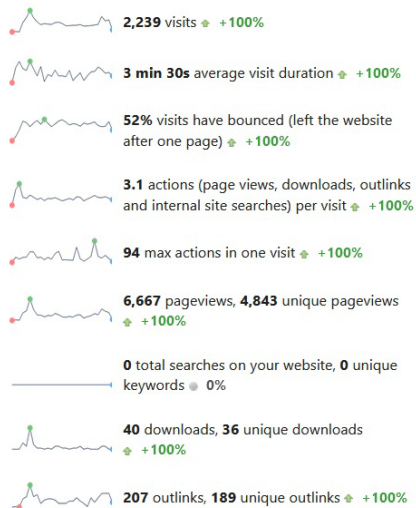
More later today



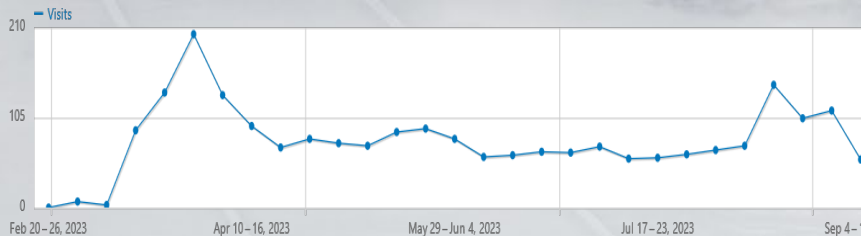
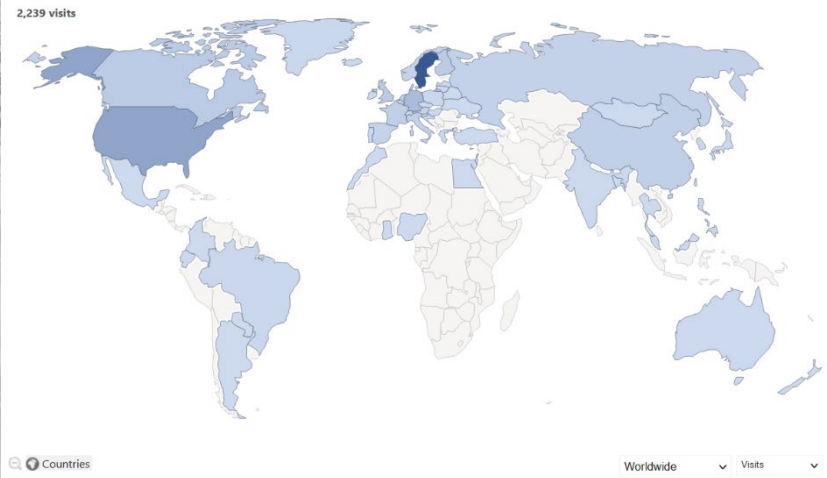
Achievements since last SMF meeting (Task 2.0)

- INTERACT GIS developments

Visits Overview



Visitor Map



Achievements since last SMF meeting

- INTERACT GIS developments

Downscaled monthly temperature and precipitation data retrieved from all stations from 1950 until today.

Will be presented on station pages

Shown as WMO Climate Normals (1961-1990 and 1991-2020) and individual years after 2020.

Can be added annually by SMF staff. Opportunity for stations to upload own measurement data if so desired.



INTERACT GIS
 Station Address and Real estate
 Station Research Application About

ZACKENBERG RESEARCH STATION
 3

ADDRESS STATION MANAGER CONTACT STATION
zackenbergs@geo.aau.dk

STATION FEATURES
 Opening year: 1967
 Status: Open

SPECIFICATION
 LOCATION
 CLIMATIC

FACILITIES
 HOUSING AND ACCOMMODATION
 LOGISTICS

SCIENCE
 SCIENTIFIC NETWORKS
 PROJECTS
 ACCESS PROGRAMS

STATION NAME AND OWNER
 Zackenberg Research Station is owned by the Government of Greenland. Aarhus University (Denmark) is responsible for running the station.

LOCATION
 Zackenberg Research Station is located in Young Sund - Young Sund cove in Northeast Greenland. The station is situated in the southern part of the National Park of North and East Greenland. The largest national park in the world (approximately 1 million km²). The nearest settlement is the military outpost Godthaab (a former research facility) 25 km southeast of the station. The nearest town is Ilulissat, 450 km south of the station.

BIODIVERSITY AND NATURAL ENVIRONMENT
 Zackenberg Research Station is situated in the high Arctic in an area with continuous permafrost. The study area comprises the drainage basin of the river Zackendalgrøften, with a total size of c. 500 km². A great variety of tundra, the ponds, low heaths, tall herb tundra and grasslands occur within the catchment area. (Sediment, benthic, Arctic fox, and Arctic hare are among the common mammals in the area, while polar bear and Arctic wolf are occasional visitors).

HISTORY AND FACILITIES
 In 1947, a research post was established in Northeast Greenland, which became a UNESCO Mon and Biosphere Reserve in 1977. In 1967, the first expedition under the research programme Zackenberg Ecological Research Operations was made to Zackenberg. In 1968, a temporary field station was established, and in 1987 Zackenberg Research Station was officially opened. Each year, the station is manned from 1 May to 31 October, in the remaining part of the year, the station is only in use for research. The station has 25 beds, two laboratories, a workshop, a mess with table and kitchen-based equipment, fuel and mail service. An accommodation and laboratory facility is located near the military support tenting. The facility accommodates 10 scientists.

GENERAL RESEARCH AND CAREERS
 Zackenberg Research Station provides facilities for specific but comprehensive research projects and for an extensive long-term research monitoring programme, called Zackenberg Basic. Zackenberg Basic consists of five sub-programmes: Chronology (monitoring the climate), Climatology (monitoring the carbon balance of the ecosystem, water feedback to climate change, and physical landscape processes), Biodiversity (monitoring the living network), Microclimate (monitoring physical and biological processes in the near-surface environment) and Geobotany (monitoring the rock balance of local glaciers). At the station, there are approximately 25 ongoing projects per year, of which about two third focus on Climate Change related. Results from the research and monitoring at Zackenberg are reported in the ZEDO Annual Report published by Aarhus University. PDF versions of the annual reports are available at www.zackenberg.dk. The database of the Zackenberg Basic monitoring is available for direct access through the internet at data.zackenberg.dk. The homepage also holds the manuals for the different monitoring sub-programmes. All data from Zackenberg Basic are provided free-of-charge to any scientist interested in making use of the data for scientific purposes. Existing databases also include a bibliography of publications arising from research at the station since it opened in 1968, with a GIS of the study area with access through the internet.

STATION MONITORING

HUMAN DIMENSION
 The nearest town is Ilulissat, 450 km to the south. The population in Ilulissat is approximately 420 people. Zackenberg Research Station cooperates with other field stations in Greenland (Arctic Station, Sermitss Station and Greenland Institute of Natural Resources), and two Greenlandic research institutes (Polaris and Proqrammi) are located in the south of Zackenberg.

ACCESS
 Transport is and from Zackenberg Research Station is handled by the Zackenberg Secretariat at Aarhus University as a package solution from any airport served by Greenland. Flights are based on a combination of commercial flights to Aasiaat or Isortoq and chartered flights from Aasiaat to Zackenberg. It is necessary to book an application to the Zackenberg Secretariat prior to the visit of the station. The application will be reviewed by a scientific committee and afterwards the secretariat will take care of all practicalities in relation to logistics.

AVERAGE TEMPERATURE (°C)

AVERAGE PRECIPITATION (CM)

Member of:
 INTERACT

Achievements since last SMF meeting

- INTERACT GIS developments

Insert link to direct scientist to your own application system

or

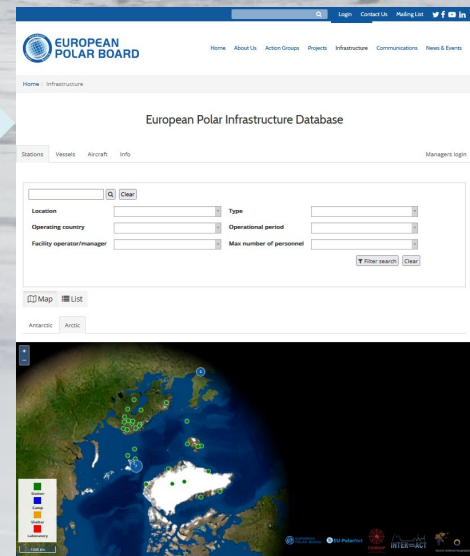
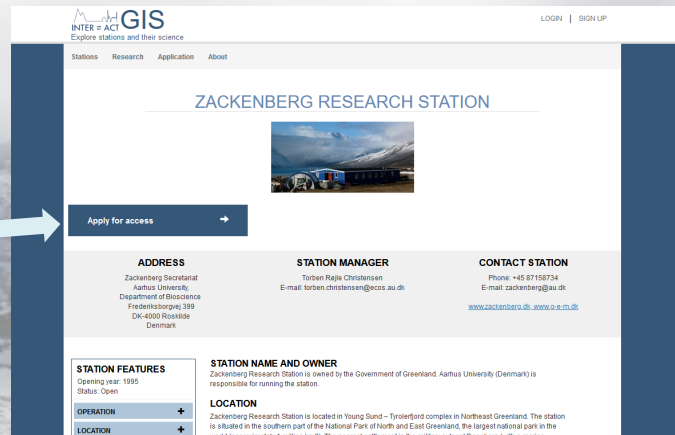
Register for using the INTERACT GIS application module

API allowing others to harvest our data

Russian stations on pause

User statistics

Added new stations
Mongolia, Spain, Finland, Canada, Faroe Islands

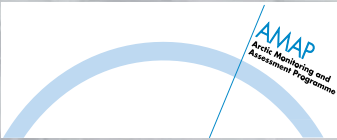


Achievements since last SMF meeting (Task 2.1 and 2.5)

- Arctic Council WGs



CAFF/CBMP Extreme events and rapid biodiversity change monitoring test implementation

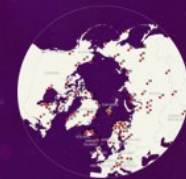


AMAP Plastic test implementation

More later today



Coffee break



SMF 6

12-13 Sept 2023

Toolik, Alaska

10:30-12:00	Open floor
12:00-12:15	The unpredictable Arctic
12:15-12:25	Making station data and publications widely available
12:25-12:30	Station outreach
12:30-13:30	Lunch break



Let's INTERACT

www.eu-interact.org



INTERACT III, Station Manager Forum 6,
Toolik Field Station, Alaska, 12-13 October 2023

