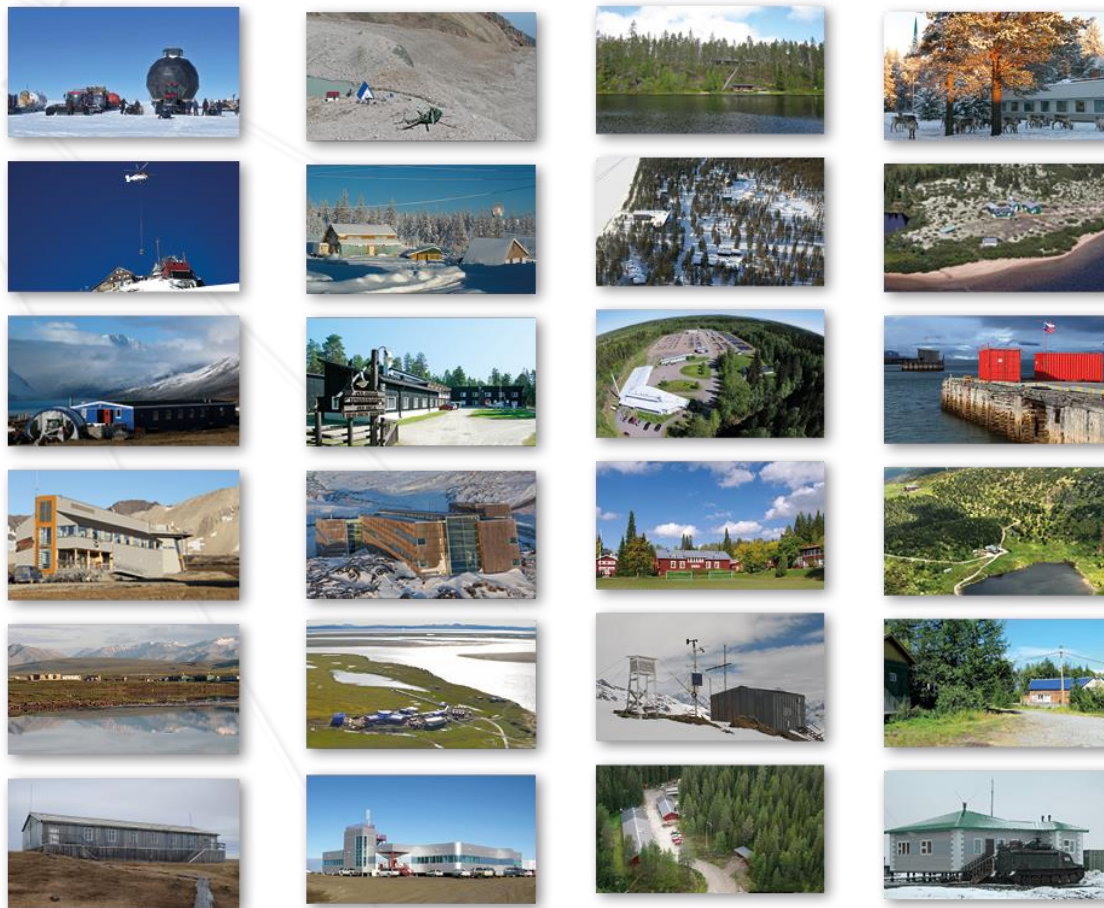


WP2 – Station Managers' Forum in INTERACT III



*INTERACT III General Assembly,
Sudurnes Science and Learning Centre,
Iceland, 29 September 2022*

Morten Rasch
Elmer Topp-Jørgensen
Marie Frost Arndal





Aims of WP2

The aim of the INTERACT's Station Manager Forum (SMF) is to foster a culture of cooperation between stations and with scientific communities, industries, local communities and infrastructures in other regions.

Specifically, the objectives are to:

- A. Innovate** station management to better support excellent research and monitoring and to collect, exchange and refine information needed for operating INTERACT stations as one advanced infrastructure.
- B. Support** excellent science and innovation addressing INTERACT's Societal Challenges (SC) by interfacing with JRA's and TA/RA/VA activities.
- C. Integrate** new partner stations, their activities and data in the existing advanced community of INTERACT stations.
- D. Promote** cooperation on infrastructure management and safety with Antarctic, alpine, atmospheric and marine communities.



Reporting of WP2

Workpackage 2 is a large workpackage:

Stations involved: 89

Partners in workpackage: 64

Tasks: 6 (16 sub-tasks)

Budget for 2020-23: c. 2 mio EURO

Deliverables: 13

Milestones: 24

We can therefore, due to time limitations, not go into details with all the work currently being done within the workpackage. In this presentation, we will focus on what we find the most important.

All achieved milestones, deliverables and publications can be found on the INETRACT website.



Tasks in WP2

Task 2.0: Operate the Station Managers' Forum (UCPH)

Task 2.1: The unpredictable Arctic – WP4 (AU)

Task 2.2: Transport and communication – WP5 (AWI)

Task 2.3: Making station data and publications widely available – WP6 (UCPH)

Task 2.4: Educating local communities and decision makers – WP7 (UCPH)

Task 2.5: Cleaner Arctic – WP8 (Lead: AU)

Task 2.6: The Arctic Resort – WP9 (Lead: UKRI)

Colour codes

Green = achieved

Blue = on target

Red = delayed

Orange = Bonus product



Task 2.0

Operate Station Managers' Forum (Lead: UCPH)

Milestones

M2.1-5 SMF meetings (Months 3, 13, 25, 37, 48)

M2.6-9 Seminars on themes chosen by station managers (months 3, 13, 25, 37)

M2.10 Technical staff workshop (Month 25)

M2.11 Workshop on best practices of research infrastructure management with participation of other communities (month 13)

Bonus products:

- Paper on workshop recommendations (barriers to arctic science)
- Policy level workshop in Brussels with EU representatives arranged jointly with FARO, ARICE and EPB

Task 2.0

Operate Station Managers' Forum (Lead: UCPH)

Bonus products

PAPER in Polar Records Ruck *et al.* 2022



<https://www.cambridge.org/core/journals/polar-record/article/international-access-to-research-infrastructure-in-the-arctic/B639D488877FDC7EDA862C451D06E5B2>

Workshop: Future of arctic research infrastructure (27/10'22)



<https://www.eventbrite.co.uk/e/the-future-of-research-infrastructure-in-the-arctic-tickets-373156560317>

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Task 2.0

Operate Station Managers' Forum (Lead: UCPH)

Deliverables

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

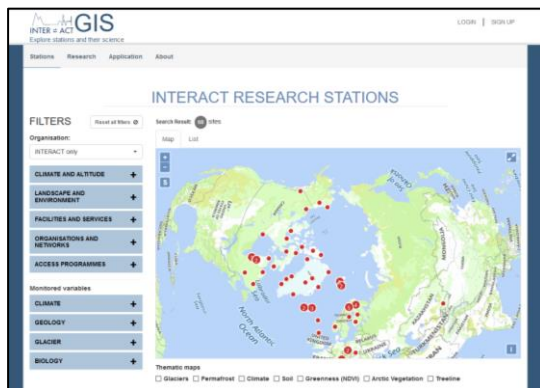
D2.2 Updated digital Station Catalogue integrated in INTERACT GIS (Month 28)

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

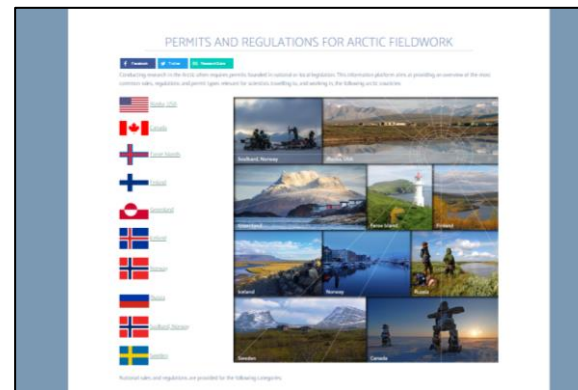
D2.4 Web-editions of updated 'INTERACT Fieldwork Planning Handbook' (Month 48)

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

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



<https://interact-gis.org/Home/Stations>



<https://eu-interact.org/accessing-the-arctic/arctic-fieldwork-permits-and-regulations/>

Task 2.1

Unpredictable Arctic (Lead: AU)

Milestones and deliverables

M2.12 Extreme event monitoring field test implemented at minimum four stations (Month 36) – Draft presented at SMF5

M2.13 Rapid biodiversity change monitoring field test implemented at minimum four stations (month 42) – Draft presented at SMF5

Milestones postponed due to pause in Arctic Council working group activities (Ukraine conflict). Expected ready for test implementation early 2023.

Bonus product: Review paper on extreme events studies in the Arctic.



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Extreme event impacts on terrestrial and freshwater biota in the arctic: A synthesis of knowledge and opportunities

297 total views

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Edited by

 Qiang Zhang
Beijing Normal University, China

Reviewed by

 Li Wen
Environment, Energy, and Science,
NSW Department of Planning, Industry
and Environment, Australia

The editor and reviewers have approved the manuscript for publication.

Download

¹ Department of Ecoscience, Aarhus University, Roskilde, Denmark
² Arctic Research Centre, Aarhus University, Aarhus, Denmark
³ Conservation of Arctic Flora and Fauna (CAFF), Secretariat, Akureyri, Iceland
⁴ Icelandic Institute of Natural History, Gaiðsbær, Iceland
⁵ Polar Knowledge Canada, Canadian High Arctic Research Station, Cambridge Bay, NU, Canada

Extreme weather events are increasing in frequency and intensity across the Arctic, one of the planet's most rapidly warming regions. Studies from southern latitudes have revealed that the ecological impacts of extreme events on living organisms can be severe and long-lasting, yet data and evidence from within the terrestrial Arctic biome appear underrepresented. By synthesizing a total of 48 research articles, published over the past 25 years, we highlight the occurrence of a wide variety of extreme events throughout the Arctic, with multiple and divergent impacts on local biota. Extreme

<https://www.frontiersin.org/articles/10.3389/fenvs.2022.983637/full>



Task 2.2

Transport and communication (Lead: AWI)

Milestones and deliverables

M2.14 Session at SMF on communication and positioning systems (month 13)

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



Revealed tonight



*INTERACT III General Assembly, WP2 – Station Managers' Forum
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Task 2.3 - Making station data and publications widely available (Lead: UCPH)

Milestones and deliverables

M2.15-16 Seminars on state-of-the-art methods/technologies for environmental monitoring (month 25, 37)

- Seminar 1: AMAP plastic monitoring

M2.17 Selection of photos from different stations provided to WP6 (month 12)

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

- Deadline postponed to align with POAwg under SAON/Arctic Council

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

- Initiated at SMF 5



Task 2.4 - Station outreach: Educating local communities and decision makers (Lead: UCPH)

Milestones

M2.18 Courses on community based monitoring of local relevance held at schools and/or high schools near four stations (month 25 – postponed due to Covid-19 – achieved month 33)

M2.19-20 ‘Open House’ thematic days on respectively invasive species and plastic at minimum ten research stations
(months 31, 40)

- Postponed due to Covid-19, material ready for first Open House already in use at some stations

M2.21 Course for station managers on improvement of communication to decision makers (month 40)

Bonus activity: Seminar on Geopolitics in the Arctic held at SMF 5

Task 2.4 - Station outreach: Educating local communities and decision makers (Lead: UCPH)

Open station event materials

INTER=ACT

www.eu-interact.org

INTERACT brings together managers of more than 85 research stations to discuss how research stations can be developed and improve the services offered to the scientific community.

INTERACT stations contribute to improved understanding of arctic climate and ecosystems.

International Network for Terrestrial Research and Monitoring in the Arctic

Data produced locally is used by international scientific networks and organisations to assess climate and ecosystem changes on a larger scale. Data is also used to make status reports and future predictions for decision makers - locally, nationally and globally.

Local scale
Landscape scale
Arctic scale
Global scale

Climate Change

Global temperatures are rising. Increasing 1.1 °C since 1900. Global temperatures in 2015-2021 are the warmest on record.

The Arctic is warming three times faster than the rest of the Globe.

Three IPCC Climate Change scenarios and their prediction of global, arctic and arctic winter temperatures ↓

Temperature change in the last 50 years

2011-2021 average vs 1950-1976 baseline

1.1 °C

Predicted temperature increase Year 2000-2100

Models show that autumn and winter temperatures will increase by 3-6 °C in the Arctic before 2050.

Scenario	Global temperature	Arctic temperature	Arctic winter temperature
RCP 8.5 'Business as usual'	+4 °C	+8 °C	+11 °C
RCP 4.5 'Current reduction commitments'	+2 °C	+4 °C	+6 °C
RCP 2.6 'Change to negative emissions'	+1 °C	+2 °C	+3 °C

Summer sea-ice extent is diminishing.

Predictions by 36 models - 'current reduction commitment'

45% Reduction in sea ice extent by 2050

65% Reduction in sea ice extent by 2100

Yellow - average of 36 models
Black - observed sea ice extent from satellite (not model)

INTER=ACT

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INTER=ACT

Impacts
Climate Change

The Arctic is warming three times faster than the rest of the Globe.

Climate Change is already today impacting arctic species, ecosystems and human livelihoods.

Arctic sea-ice change.

Prolonged ice-free periods. Potential for new shipping routes along Northwest and Northeast passage.

Reduced and shorter ice-cover and longer periods with unstable ice. Changes local transport traditions. Changing conditions for traditional and commercial use of natural resources (e.g. fishing, hunting, mineral exploitation).

Phenological changes

- Timing of events

Ecological mismatch

Changes in snow cover result in mismatch between flowering and occurrence of pollinators (insects) with implications for both plant and insect reproduction. Animals which turn white in winter like ptarmigan and mountain hare may be more vulnerable to predation.

Species composition change

Ice dependent and cold adapted species move north with changing sea ice distribution and temperature.

Arrival of southern species may out-compete original species with potential implications for the arctic food chain.

Invasive species can easier get foothold.

Permafrost thaw

The tundra produces more Greenhouse Gas from decomposition processes when the permafrost thaws leading to accelerated global warming. Previously frozen soil thaws with increasing temperatures making houses and roads collapse as soils become unstable.

Rock slides, avalanches and glaciers

Permafrost melt and more frequent freeze/thaw events are causing mountain sides to collapse and increase the risk of avalanches - potentially affecting vegetation composition and causing damage to housing/infrastructure.

Arctic and alpine glaciers are shrinking. Ice streams on Greenland Ice Cap are flowing faster and glacier outlets retreat.

Extreme events occur more frequently.

Icing events, where a layer of ice is formed on vegetation or snow, prevent caribou/reindeer from reaching food, resulting in increased mortality.

Increased lightning and wildfire in areas where they do not normally occur affect vegetation composition.

Lack of sea-ice and more storms result in increased coastal erosion.

Snow cover change.

Less snow result in less ski days.

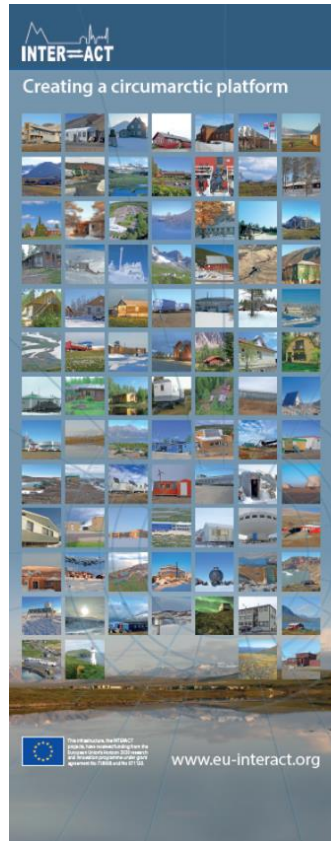
Less water accumulation in snow after hydrology.

Warmer water impact ecological processes.

www.eu-interact.org

Task 2.4 - Station outreach: Educating local communities and decision makers (Lead: UCPH)

Open station event materials



*INTERACT III General Assembly, WP2 – Station Managers' Forum
Sudurnes Science and Learning Centre, Iceland, 29 September 2022*





Task 2.5

Cleaner Arctic (Lead: AU)

Milestones and deliverables

M2.22 Survey of resource use and disposal (incl. plastic) at research stations presented at SMF (month 37)

M2.23 Plastic monitoring programme implemented at four stations (month 30 – Postponed due to Covid-19 and pause to AMAP activities)

- Implementation seminar held with AMAP experts. Development of community-based plastic monitoring and protocols for monitoring plastic in freshwater habitats.

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

- To be published soon in a new INTERACT book on reducing environmental impact of arctic research stations.

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

- Draft list of contents developed at SMF5



Task 2.6

The Arctic Resort (Lead: UKRI)

Milestones and deliverables

M2.24 Evaluation of tourism potential at INTERACT Stations (month 12)

D2.12 Pocket guide on how to handle effects of tourism at research stations and in adjacent local communities (Month 30)

- Deliverable submitted, will be turned into INTERACT publication

D2.13 Pocket guide for tourist on how to behave around research station, incl. their study areas and local communities (Month 30)

- Deliverable submitted, will be turned into INTERACT publication

Bonus Product: Scientific paper in the making

Progress - Milestones

Milestone	Milestone name	Deadline (Month)
M2.1-5	SMF Meeting	3, 13, 25, 37, 48
M2.6-9	Seminars on themes chosen by station managers	3, 13, 25, 37
M2.10	Technical staff workshop	25
M2.11	Workshop on best practices of research infrastructure management with participation of other communities	13
M2.12	Extreme event monitoring field test implemented at minimum four stations	36(?)
M2.13	Rapid biodiversity change monitoring field test implemented at minimum four stations	42
M2.14	Session at SMF on communication and positioning systems	13
M2.15-16	Seminars on state-of-the-art methods/technologies for environmental monitoring	25,37
M2.17	Selection of photos from different stations provided to WP6	12
M2.18	Courses on community based monitoring of local relevance held at schools and/or high schools near four stations	25
M2.19-20	‘Open House’ thematic days on respectively invasive species and plastic at minimum ten research stations	31(?),40 (?)
M2.21	Course for station managers on improvement of communication to decision makers	40



Progress - 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 - postponed)
- 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 and in adjacent local communities (Month 30)
- D2.13 Pocket guide for tourist on how to behave around research station, incl. their study areas and local communities (Month 30)



Ways forward

Work is in progress in accordance with the contract (and accepted delays due to Covid-19) and we are on schedule in relation to all tasks, deliverables and milestones.

We prioritize to publish our products as real books, and with the help of our cooperation partners we have been able to produce many more than we are obliged to. We hope to keep on doing that.

We have experienced delays (due to COVID-19) with Arctic Council related tasks, 'Open House arrangements at research stations' (M2.19) and 'Courses on Community Based Monitoring at schools / high schools' (M2.18). Now new deadlines have been set and we are on track to meet these.



Requirements from others

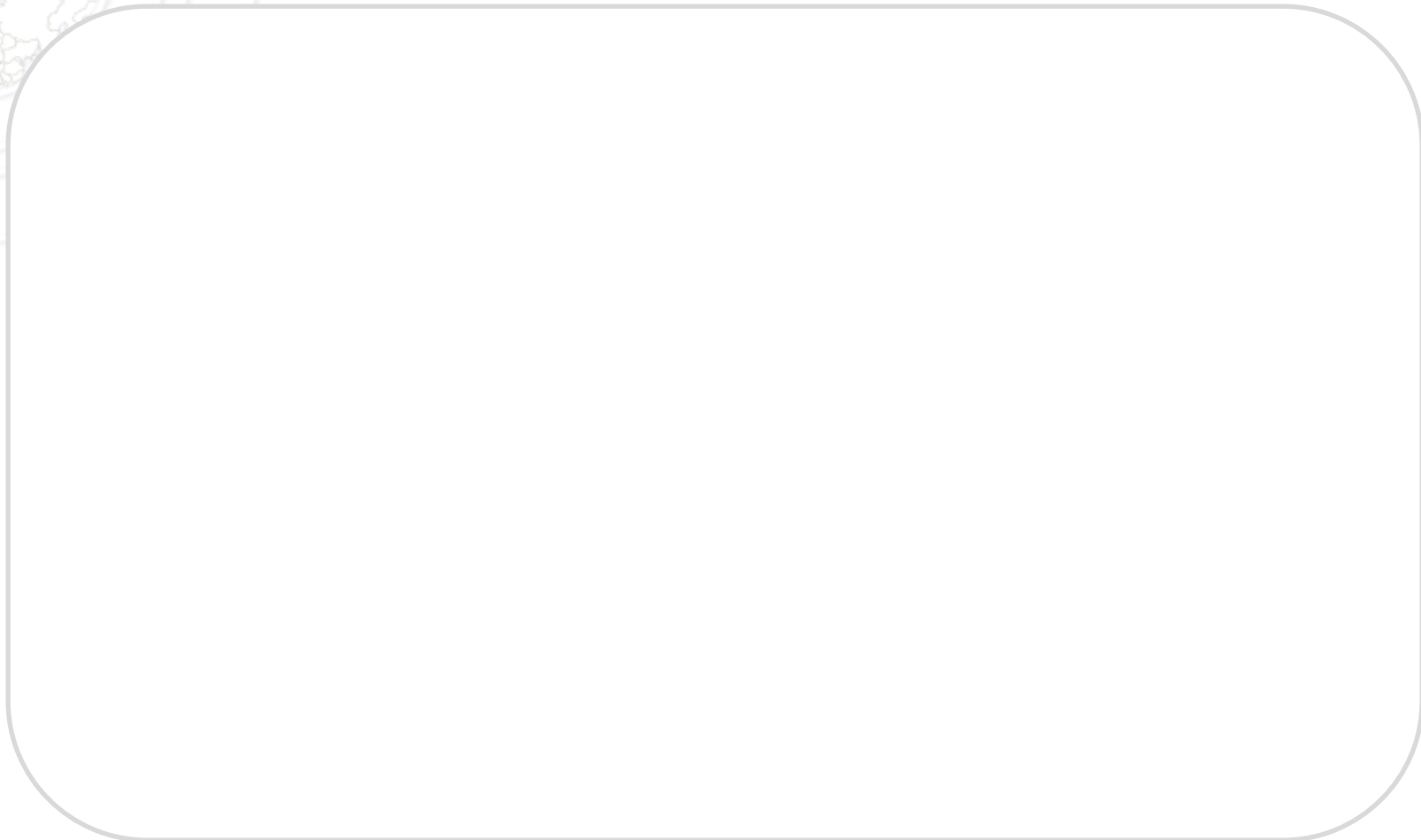
WP2 is working together with all other Workpackages, all station managers and a huge amount of external stakeholders.

We are extremely grateful for the enthusiasm put into the cooperation by everyone.

A modest wish: Please reply before deadline on e-mails from us and please help us to secure that as many research stations as possible participate in surveys, questionnaires etc. That is crucial for the quality of our work.

Thank you





*INTERACT III General Assembly, WP2 – Station Managers' Forum
Sudurnes Science and Learning Centre, Iceland, 29 September 2022*





Progress

Task 2.1 The unpredictable Arctic – WP4 (AU)

Contribute to method development, test implementation, provide observations on extreme events.

- **Identification of extreme event types to be used in test monitoring programmes submitted for publication (published 2022).**
- Development of test monitoring programmes for extreme events is in progress. AMAP's protocols ready. CAFF/CBMP recommendations drafted.
- We are considering to publish a pocket guide on how to report extreme events and a pocket guide book on how to report rapid biodiversity change as 'bonus product'.



Progress

Task 2.2 Transport and communication – WP5 (AWI)

Arctic Council science cooperation agreement, communication and positioning systems, reduction of CO₂ emissions from travel.

- **Internet platform concerning rules, regulations and permit needs (for each arctic country) of relevance to scientists planning fieldwork in arctic countries launched (D2.6).**
- A survey to identify bottlenecks for arctic cross-border science cooperation is planned for SMF IV.
- A session concerning field communication and navigation has been held at SMF II (**M2.14**).
- The '*INTERACT Communication and Navigation Guidebook*' published as a 'bonus product'.
- **APECS working group has produced the first draft of '*INTERACT Reducing the CO₂ Emission from Arctic Science*' guidebook' has been established. Review is in progress.**



Progress

Task 2.3 Making station data and publications widely available – WP6 (UCPH)

Seminars on state of the art monitoring, scientific network standards, repository for selected climate variables.

- AMAP contaminant monitoring seminar held in March 2021 (**M2.15**). One more seminar will be held early in 2023.
- **INTERACT GIS is being prepared to include a repository for selected climate variables for each INTERACT Station. Selection of parameters of relevance in process.**
- Photos for use in machine learning delivered by station managers to WP6 (**M2.17**).
- INTERACT Station Manager Forum is participating in SAON Polar Observing Assets Working Group, contributing to standard metadata for polar observing assets and data sharing (D2.8).
- Fruitful coordination across workpackages in INTERACT Data Team established by WP3 to secure harmonization of data standards across INTERACT and with international standards.



Progress

Task 2.4 Educating local communities and decision makers – WP7 (UCPH)

Courses on community based monitoring, 'Open House' days, course on how to communicate with decision makers and the use of press releases.

- Fortunately, Milestones/Deliverable are planned late in INTERACT III (Months 25, 31, 40) due to the COVID situation making courses and 'Open House' arrangements in local communities difficult.
- A course on community based monitoring of local relevance for schools and/or high schools is under preparation to be held near at least four research stations during 2022 (depending on COVID situation).
- An 'Open House' thematic day to be held on at least ten research stations is under preparation and planned to be held in during 2022 (depending on COVID situation).
- A seminar on how to communicate with decision makers and use of press releases is to be held at SMF IV (M2.21).



Progress

Task 2.5 Cleaner Arctic – WP8 (Lead: AU)

Explore ways to reduce pollution and emissions from research stations, Field test implementation of plastic monitoring programme.

- Survey on Pollution Screening Activities at INTERACT Stations has been carried through by AMAP.
- 'INTERACT Reducing the Environmental Impacts of Arctic Fieldwork' published as a 'bonus product'.
- 'INTERACT Reducing the Environmental Impact of Arctic Research Stations' almost ready for publication as a 'bonus product'.
- Guidebook with recommendation on how to reduce CO₂ emission in arctic science is in preparation (D2.7).
- Survey on energy use and sources, plastic types and usage, and waste handling at INTERACT research stations will be initiated during SMF IV (M2.22).



Progress

Task 2.6 The Arctic Resort – WP9 (Lead: UKRI)

Assess tourism potential near INTERACT stations, how to communicate with tourists, input to guidelines for tourist operators.

- **Evaluation of tourism potential at INTERACT Stations has been accomplished (M2.24).**
- **A survey among station managers concerning tourism at/near research stations has been carried through.**
- A draft 'INTERACT Station Specific Guidelines' for cruise ship operators has been produced by AECO.
- Session to get input for pocket guide on how to handle tourism at or near INTERACT stations is planned for SMF IV.



Progress - Milestones

Milestone	Milestone name	Deadline (Month)
M2.22	Survey on resource use and disposal (incl. plastic) at research stations presented at SMF	37
M2.23	Plastic monitoring programme implemented at four stations	30
M2.24	Evaluation of tourism potential at INTERACT stations	12

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Kilpisjärvi Biological Station, Finland,
23 November 2021*



Progress

Task 2.0 Operate the Station Managers' Forum (UCPH)

SMF meetings, publication updates, seminars, INETRACT GIS, etc.

- **Five SMF's** have been held (**M2.1-5**).
- **Four seminars** of relevance to station managers and a **technical staff workshop** have been held (**M2.6-10**).
- **Workshop** with participation of the marine and the atmospheric research infrastructure communities has been held (**M2.11**). Paper on workshop recommendations (barriers to arctic science) and additional workshop in Brussels with EU representatives arranged jointly with FARO, ARICE and EPB
- *INETRACT publications.*
- *INETRACT Images of Arctic Science* published (bonus product)
- *INETRACT Communication and Navigation Handbook* (**M2.14**)
- *INETRACT Reducing the Environmental Impact of Arctic Fieldwork* are published as INETRACT II product. We are planning to publish two more 'bonus products', i.e. *INETRACT Reducing the Environmental Impacts of Arctic Research Stations* and *INETRACT Arctic Fieldwork Safety Manual*.
- **INETRACT GIS** improved with new and more user friendly user interface, incl. a thematic map interface (**D2.1**).