INTERACT H2020
Second Annual Meeting

24-28 September 2018

Salekhard, Yamal-Nenets Autonomous District, Russia

Minutes

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Summary

INTERACT held its second annual meeting in Salekhard, Russia 24-28 September 2018. 42 participants from 17 countries representing the majority of infrastructures participating in INTERACT and all WPs but one. The aims of the meetings were to discuss further development and future plans within our current project; to assess past development; and to plan for the future beyond our current H2020 project. The nine WPs were presented and great progress had been made in all. Back to back with the annual meeting, the 4th Station Managers' Forum was held (see separate meeting minutes) and our mid-term review. An excursion to the Arctic Research Station in Labytnangi was provided by the local organisers. We thank the local organisers for providing excellent facilities, the basis for a successful annual meeting and for enabling INTERACT to meet in Russia for the first (and hopefully not last!) time.

All presentations from the annual meeting are available at https://eu-interact.org/presentations-from-interact-2nd-annual-meeting/

1. Opening of the meeting

Margareta Johansson (Lund University)

INTERACT has met in many places in Europe, and now finally the whole assembly is gathering in Arctic Russia. Many years ago Aleksandr Sokolov invited INTERACT to hold one of its meetings in Yamal, and now this could finally be realized. Tomsk State University and Yamal Nenets Autonomous District have done a tremendous job planning and organizing the meeting. The meeting consists of three different components: a General assembly, a mid-term review and the 4th Station managers' Forum. The aims of the meetings are to discuss further development and future plans within our current project; to assess past development; and to plan for the future beyond our current H2020 project.

1.1 Welcome addresses

Alexander Mazharov (Deputy Governor of the Yamal-Nenets autonomous district) and Alexey Titovsky (Director of the Department of Protected Natural Areas of the Ministry of Natural Resources of the Russian Federation)

Mr Mazharov and Mr Titovsky welcomed all participants to the Yamal-Nenets autonomous district and wished INTERACT a successful meeting and future.

1.2 BBC presentation

Sarah Titcombe (BBC) and William Lawson (BBC)

Sarah and William are working at the BBC Natural History Unit in Bristol and are now on a story finding mission for a new "Frozen Planet" television series consisting of 6 episodes to be launched in 2021. Our series will immerse the audience in the frozen quarter of our planet: from the Arctic Ocean, to the tundra, Taiga and seasonal forests, the high mountains and plateaus and the finally, the frozen continent of Antarctica.

They are looking for a new story from the frozen regions with a less well-known or a rare animal; a new or unusual story with a top species (i.e. polar bear or fox) and also spectacular views of breath-taking landscapes, large numbers of animals or places showing dramatic changes. What they are looking for is to make the audience laugh, weep or be completely captured and astounded by the untold natural world. They want to showcase behavior through the eyes of an individual character if possible. This could be a tough and arduous journey, an act of comedic stealth or the trials of raising a family.

Planet Earth II and Blue Planet II are also part of their team. These programs have reached over half a billion people. The positive impact of Blue Planet II and how addressing the impact of plastics and other marine impacts have influenced both the general viewer and legislation makers. This time there is an opportunity to address climate change and the looming challenge for wildlife and people alike living in the fastest changing part of our planet.

Now the team is reaching out to all the INTERACT stations to look for stories that show one or more of the following:

- How is climate changing in the Arctic?
- How is this change affecting local activity?
- How can both indigenous knowledge and science help understand what is happening?
- Are animals changing their behavior? Has new behavior been noticed in the last few years/decades?

These topics have already been touched on through Frozen Planet 1, but this time they want to do it with greater clarity specific to climate change.

Ideas and thoughts are welcome:

William.lawson@bbc.co.uk

Sarah.titcombe@bbc.co.uk

2. WP presentations describing progress and way forward

2.1 WP 1 - Coordination and Management

Margareta Johansson (Lund University), Luisella Bianco (CLU)

Since the last annual meeting in Svalbard, 11 new milestones have been reached (in total 25 for the first two years) and 15 deliverables have been delivered to EU (in total 22 for the first two years).

The first Periodic Report was handed in 30 May 2018, and approved in August the same year. The payment for the first periodic report has arrived to the coordinator who is currently distributing them money. In total 29 partners will receive approved costs; 9 partners will receive money up to 85%; 9 partners will not receive additional money at the moment as they have spent very little money. The payments will be finished this week or at the latest in the beginning of next week (i.e. the beginning of October).

On the 25th May 2018, the General Data Protection Regulation was implemented in the EU. This affects all handling of personal data, and it therefore also affects INTERACT. To make sure that the handling of personal data is lawful and correct, an INTERACT GDPR document has been drafted and made available at the INTERACT website: https://eu-interact.org/gdpr/

INTERACT has been presented at least 2 meetings per month, examples include: Arctic Circle Forum, Tórshavn, Faroe Islands, 8-9 May 2018, 6th Envri Week, Zandvoort, Netherlands, 17-18 May 2018, Polar 2018, Davos, Switzerland, 20 June 2018.

Two new observer stations have joined the network: Uapishka Research Station, Canada, is owned by Pessamit Innu Council and the UNESCO Biosphere Reserve of Manicouagan-Uapishka. Lammin-Suo Peatland Station, Russia, is owned by the State Hydrological Institute in St Petersburg. This

makes us now 82 stations in total. Soon another station in Canada will join INTERACT: Kangiqsualujjuaq SUKUIJARVIK Station, part of CEN.

The Daily Management Group has met twice during the last year; one online meeting and one face to face meeting. Minutes from the meetings can be found here https://eu-interact.org/daily-management-group/

The role of the International Advisory Board has been redefined. Instead of advising on the day-to-day running of the project, their expertise is used to focus on the long-term sustainability of INTERACT.

From the empty shell that was presented a year ago, our web site is now a state of the art web site. It provides an excellent overview of the stations, and all work packages have a page dedicated to them. The website provides access to all deliverables and other material that has been produced, including an extensive photo gallery. All can be found on https://eu-interact.org

Two newsletters per year are being distributed, and on the website there are at least two news items per week.

Progecta is a very helpful tool. For some on a daily basis, but it is also especially helpful during EU Reporting. When it comes to TA Applications, InterAccess is a agreat help. The online tutorials have been a great help.

INTERACT Future, we need to prepare a road map for the long-term future of INTERACT. An INTERACT Foundation will be set up, but it will take some time. There is an upcoming EU call Infraia 01-2019, where we will take the opportunity to apply for new EU money.

The announcement is as follows: *Research infrastructures for terrestrial research in the Arctic. As an international network for terrestrial research and monitoring in the Arctic, this activity should further integrate and open key research stations and large research field sites throughout the circumpolar Arctic and adjacent northern countries, to provide capacity for research, monitoring and education. The project should include work on best practises for managing stations, and (international) logistics and establish links with relevant ESFRI infrastructures.*

Finally, who to contact when:

Questions related to Progecta and EU reporting: Luisella Bianco luisella.bianco@cluweb.it

Questions related to Web, news items and communication: Katharina Beckmann katharina.beckmann@nateko.lu.se

Questions related to TA: Kirsi Latola kirsi.latola@oulu.fi and Hannele Savela hannele.savela@oulu.fi

Questions related to Deliverables, milestones and other questions: Margareta Johansson margareta.johansson@nateko.lu.se

The next annual meeting will be held in Europe in September/October 2019.

2.2 WP2 - Scientific coordination, mentoring and education

Terry Callaghan (Sheffield University)

This work package's specific aims are to coordinate the communication of the science and to foster international collaboration, and also to promote Arctic and climate change issues in school and university education and to provide appropriate resources. During the last year, mentoring and support has been provided to WP1, WP3, WP5, WP6 and WP9.

INTERACT continues to work with the award-winning UK charity Wicked Weather Watch to promote Arctic and Climate Change in education. Online educational resources are being created by University of Sheffield and Tomsk State University. The animations are based on sketches and photos and developed together with experts in each field. So far three animations have been completed: General Permafrost Dynamics; Ice Wedge Polygons; and Glacier Dynamics. Three more are in development: Hanging valley formation; Understanding past climate changes; and Land-surface feedbacks.

The resources are developed for multiple educational stages. "Wicked Climate Detectives" is for children under 11 and consists of 1-page experiments that are challenging yet easy to follow.

Educational Packages are also being produced. They will consist of a main part (an animation and/or a power point) accompanied by instructions for teachers, work sheets with tasks for students and games, quizzes, cross-words, on-line tests, short videos etc.

It is important that we all together help identifying existing online resources to avoid overlapping. We don't have to build everything from scratch. When it comes to outreach, the INTERACT Stories of Arctic Science has so far been a great success. It has reached out to politicians, schoolchildren etc. Volume II will be an interactive e-book.

Upcoming deliverables the coming year will be slightly delayed as the development of educational resources has taken slightly longer than expected.

2.3 WP3 - Station Managers Forum

Morten Rasch (University of Copenhagen), Elmer Topp Jorgensen (Aarhus University)

The overall aims of the INTERACT Station Managers' Forum are to consolidate, develop and run an expanded Station Managers' Forum (SMF) of managers of research stations throughout the circumpolar Arctic, in northern countries and adjacent alpine and forest regions for knowledge exchange; implementation of best practices of station management; development of improved services for research station users; and development of new technology and methods/procedures relevant for running research stations. The most important thing is to exchange knowledge and improve station management to provide a platform for more safe and efficient science.

The tasks in WP 3 and progress so far:

Task 3.1: Station Managers' Forum as an advanced platform (lead Morten Rasch, UCPH). So far 3 out of 6 meetings are accomplished. A new updated printed version of the Station catalogue is being produced with new features (deadline July 2019). The street view from Mapillary is also ready to be

implemented and on the INTERACT website some of the stations are linked to Mapillary with a street view of the stations surroundings and sometimes also interior. Station videos are continuously being filmed and produced. A few are already up on the website. The Research and Monitoring Report will also be updated. The INTERACT GIS Version 1 will be launched in November 2018.

Task 3.2 Creating awareness of the scene (lead Terry Callaghan, USFD). An extensive network survey has been conducted and is currently being refined. The aim is to link stations with relevant networks. A way to do this is by network presentations at SMF meetings (by networks or member stations) and also identifying network ambassadors among INTERACT stations.

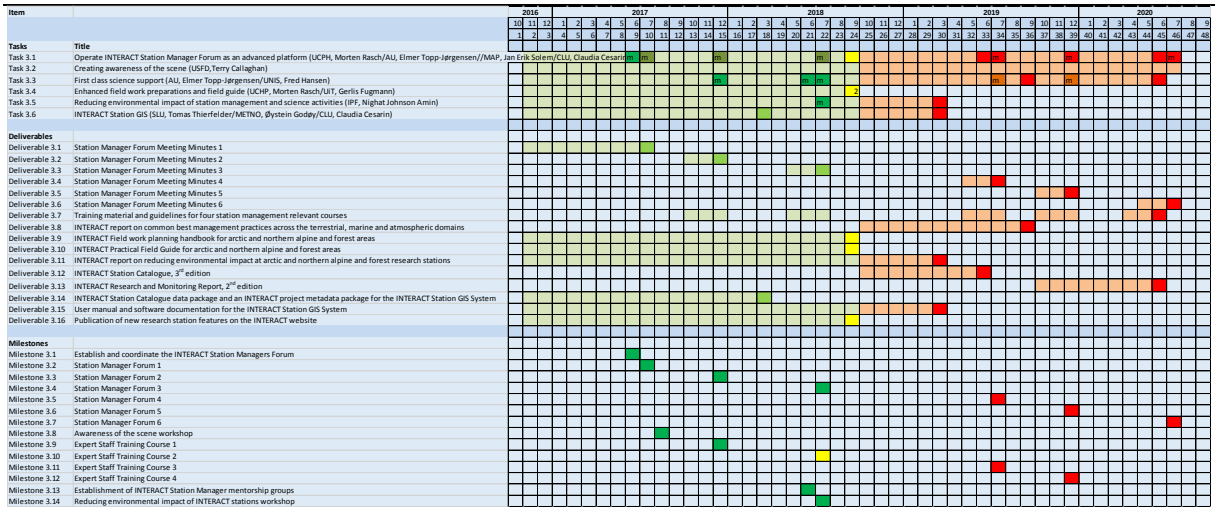
Task 3.3 First Class Science Support (lead Elmer Topp-Jørgensen, AU). Safety courses are held for station managers: One is a basic arctic fieldwork and the other a detailed course for station managers. 1 out of 3 is completed. New ways of mentoring are being developed: Network ambassadors, station manager thematic mentors, national networks and Open floor at SMF. Contacts have been established in order to sharing best practices across communities (for example aquatic and other domains). Joint workshops will be held and a best practices document will be drafted.

Task 3.4 Enhanced Field Work Preparations and Field Guide (lead Morten Rasch, UCPH). The 200 pages Fieldwork planning handbook will be ready for review and comments at the SMF IV. The Practical field guide is a shorter version that can be easily brought to the field. A template for this will also be ready for review at the SMF IV.

Task 3.5 Reducing environmental impact of station management and science activities (lead Nighat Johnson-Amin, IPF). A workshop was held at the SMF III which resulted in a report on reducing emission and examples of good practices. The Arctic stations are often old buildings, and not built from scratch, which makes the situation different from Antarctica.

Task 3.6 INTERACT station GIS (lead Tomas Thierfelder, SLU). This combines the station catalogue with the handling of access applications. The idea is for it to be a one stop shop for Science in the Arctic. Umeå University has migrated it to a Mircrosoft platform and will sustain it in the future. Version 1 will be launched in November 2018. In 2019 version 2 will be launched.

The Gantt chart below shows WP 3 status of tasks and deliverables, as can be seen the WP is currently on target.



2.4 WP4 - Data Forum

Margareta Johansson on behalf of Øystein Godøy (Norwegian Meteorological Institute)

The aim of the INTERACT Data Forum is to conform the ways of handling data. We have 82 INTERACT research stations that generate data and metadata and at the moment there are many different ways of handling this data. There are the long term monitoring, short term process studies, and external data by individual scientists/ groups. The research stations archive data and metadata (internal and external). This could be meteorological data; photos, maps, reports etc.; lists of data acquired at the stations and also information on data collection procedures (field diaries). There are many different regional and global data management frameworks

Currently, 80% of all data gathered are in general unavailable 20 years after publication. The data and/ or the people are not available anymore. The best legacy for a scientist is their data and that is why the data management is so important. What we aim to gain through the INTERACT Data Forum is interoperability between Arctic station data management and accessibility of metadata and data; increased visibility; ensured data preservation. This will comply with H2020 requirements for open data access and avoid loss of data and redundancy of activities unless specifically wanted.

Work Package 4 has four Deliverables of which two have been delivered during the first two years of the project (D4.1 Data management plan and D4.2 Report on current data flow) and two is soon to be submitted (D4.3 Field guide to data repositories and D4.4 Data policy).

Currently, ongoing work consists of the establishment of a demonstrator of the unified data portal, evaluation of the interoperability status of data centres identified so far. Tools and guidance material will be added. Data management and interoperability guidelines for field stations are drafted. The whole community needs to be engaged in order to adapt to external forcing mechanisms. Therefore, also an INTERACT data policy is drafted considering ethical principles and behavior.

Members of the Data Forum have been participating in many relevant meetings such as Polar Data Planning Summit Boulder May 2018, Polar Data Architecture Workshop Geneva November 2018. In

relation to EU-POLARNET and EU-Arctic-Cluster activities the ENVRI-FAIR is starting up, connecting infrastructures to EOSC.

2.5 WP5 - TA, VA, Giving Access to INTERACT

Kirsi Latola (University of Oulu)

Transnational Access (TA) offers free access to 43 research infrastructures and installations. 6850 person-days of TA and 970 of RA will be provided during the project period. There is a maximum of 90 person-days per user group. There is an annual call September-October with decisions taken in February-March.

A successful initiative to help promoting TA is to establish TA ambassadors. These are young researchers volunteering as ambassadors, explaining what TA is with the help of brochures and other information material. 6 volunteers started in March 2018. For previous users and new users, the TA user community meetings are a platform for the exchange of knowledge and experience. Lately there have been a lot of outreach activities on social media with the Arctic research blogs, the new INTERACT Instagram account etc. There is much more time for that now than before as InterAccess is a very useful tool for handling transnational access.

It is important for the stations to keep everything updated (how much money and how many days that are left) in the InterAccess system. This is needed in order to follow up the budget expenditure when new projects are being granted TA. Without them it's impossible to reliably estimate how many days and how much travel budget there is left for the new TA/RA projects!

Some statistics from the period Oct 2016-March 2018:

- 48 TA User Projects, 1146 days of access
- 110 TA Users from 17 countries
- 36% females, 64% males
- 48% early career scientists (undergraduate, post-graduate, post-doc)
- 51.8% experienced researcher
- 40% were new users to the infrastructures
- 6% were projects where majority of users were not working in an EU or associated country

And details can be found in the tables below.

TA / RA Call	Applications	Eligible applications	Applied stations	Days Applied	Projects Granted	Days Granted	Success rate (%)
1st TA/RA Call	108	104	34	4251	58	1689	56
2nd TA/RA Call	81	81	38	3367	47	1464	58
1st RA Call	3	3	10	55	1	30	33
2nd RA Call	6	6	12	197	2	20	33
3rd TA/RA Call	Ongoing –Deadline on 12th October						
TOTAL	194	190	40	7870	108	3203	57
Offered in GA			43	7820		7820	

TA / RA Call	Projects	Stations	Days	ODC (T&S, EUR)	Status
1st TA/RA Call	58 (2 RA)	32	1689	417 550	*Reported (PR1)*
2nd TA/RA Call	47 (3 RA, 4 mix)	36	1464	296 711	*Reporting (PR2)*
1st RA Call	1	6	30	3 600	*Reported (PR2)*
2nd TA/RA Call	2	4	20	3400	*Accepted (PR2)*
TOTAL	**108**	**40**	**3203**	**721 261**	
Offered in GA	**-**	***43***	***7820***	***1 566 936***	

Altogether, 110 researchers with 3200 of person-days (41%) and 721 000 EUR ODC (46%) has been granted/used on the consortium level > two calls left to be granted, in Aug-Oct 2018 (for 2019) and in Aug-Oct 2019 (for 2020)

Important dates and actions for TA/RA decisions in 2019

- 12th October 2018: Call deadline > applications to evaluation by 19th October
- 30th October 2018: Station managers to enter used days and paid travel reimbursements from 2018 to INTERACCESS
- 30th November 2018: TA Board evaluation deadline
- 12th - 14th December 2018: TA Board meeting
- 31st January 2019: Station Manager decision deadline
- 15th February 2019: TA/RA decisions announced to the applicants

2.6 WP6 - Rapid response to environmental emergency alerts

Alexandra Bernardová/Marie Šabacká (University of South Bohemia in Ceske Budejovice)

The main objectives of this work package are to identify and document potential risks to the Arctic environment and beyond. The idea is to establish a one-stop-shop in the Arctic to alert research station staff in the case of an environmental emergency. Protocols need to be provided for sampling,

sample transport and data transmission. In order to test this, a trial run has been set up. Cooperation needs to be established with relevant organisations and initiatives.

A survey was conducted to identify the most important risks in the Arctic. WP6 is very grateful to all who participated. These were identified as being the most significant risks:

- Environmental contaminants
- Diseases
- Non-native species
- Extreme events
- Hazards

A trial run was made in August 2018 to test the system. The selected risk was "The prevalence of selected tick and mosquitos-borne diseases in the Arctic" and in order to determine this, research stations were asked to collect samples of mosquitoes, ticks and animal droppings. What came out of this was that it was too late in the season for this kind of sampling and it also turned out that it was very complicated to collect samples and even worse to send samples across borders due to complicated regulations.

Ideal would be a system that is easy to access, for example a platform on the INTERACT website called "Report an event" with link and lists and also links to trial runs. In the discussion that followed the presentation, the Agreement on scientific cooperation was mentioned. Denmark is looking at it right now. All countries have ratified, but it is still complicated. For example, intellectual property and DNA is protected (which is very good for specific reasons), but it also complicates things a lot. A suggestion to put a white paper together was made. This could be used to lobby to politicians against difficult and complicated regulations.

2.7 WP 7 - Improving and harmonizing biodiversity monitoring

Kári Fannar Lárusson (CAFF), Hrönn Guðmundsdóttir (RIF Field station)

CAFF operates on the boundary between science and policy and works to transform and communicate findings from its monitoring and assessment activities into a form that can impact and inform policy and decision making in the Arctic. CAFF's circumpolar biodiversity monitoring programme (CBMP) started as a response to the Arctic Council's recommendations on biodiversity and ecosystem monitoring stated in Arctic Climate Impact Assessment (ACIA, 2005). Now this also functions as a tool for CAFF to implement the Arctic Biodiversity Assessment Action plan.

Work Package 7's overall goal is to test the CBMP Freshwater and Terrestrial monitoring plans at INTERACT stations. This will be done at three different site; Rif Field Station in Iceland, Zackenberg Station in northeast Greenland, and at the CHARS in Cambridge Bay, Canada.

WP7 has so far held two workshops one in Iceland and one in Denmark. Reports from the workshops are available here: https://eu-interact.org/tracking-biodiversity/. At the workshops the existing biotic and abiotic monitoring has been identified at the three stations, draft monitoring plans have

been presented, compared and reviewed, different tasks has been assigned to different team members and a time line has been agreed.

Rif Field Station Ecosystem Monitoring Freshwater and Terrestrial Monitoring Plan has also been developed and is also available on the same web site. The RFS monitoring plan provides aims and objectives of ecosystem monitoring at RFS, it outlines environmental characteristics of the area. The monitoring plan also provides an overview of existing monitoring and research. This is a living document which will be revised during the project period.

Currently, the WP is developing a data management plan in collaboration with the lead of WP4 (the Data Forum) which will soon be submitted. The data management plan is intended to ensure that data is preserved, discoverable, accessible and ethically managed.

2.8 WP8 - Developing technology for drones for scaling up from research stations

Tomas Gustafsson/Eskil Bendz (ÅF)

Work Package 8 ends in September 2018. The aim has been to find new applications through collaboration between arctic researchers and the drone technology industry, and also to increase the knowledge on drone technology and the legislation connected to the use of drones.

New opportunities for the use of drones have been identified: Snow, water and other sampling; photogrammetry; measuring of snow depths; pick up and deliveries; and search and rescue. Two Master Theses' projects have been conducted in WP8. One project was regarding snow change tracking aid with a drone. This was thought as a support to researchers who study mass balance of Storglaciären in Tarfala. Usually this is made by trekking by foot, reading the snow level on ablation stakes. There are 75 stakes on Storglaciären. The objective was to develop a drone based snow change tracking aid focusing on estimating the heights of ablation stakes. A prototype was developed and tests showed that the concept is able to estimate stake heights with the same accuracy as is done manually in the field (10 cm).

The other master thesis project worked on the development of an automatic water sampler for drones. This is traditionally done manually by trekking, bringing boats sometimes long distances etc. A couple of field test prototypes for water sampling were developed and the conclusion was that it is definitely possible to use drones for water sampling.

All deliverables have been submitted and approved for WP8. Deliverable 8.1 reported from the drone workshop held back to back with the first annual INTERACT meeting on Svalbard. Deliverable 8.2 was a report on drone legislation in the different countries where INTERACT is represented. Deliverable 8.3 presented the requirement specifications for drones in arctic environments, including drone types, drone projects and sensor technology. This is an extensive reading for beginners and advanced users about drone technology, accessories, sensor technology and applications for drones and sensors. Deliverable 8.4 is a report on recommendations for new sensor development. Deliverable 8.5 presents guidelines for drone usage in arctic environment. Deliverable 8.6 is a report from the TA Drone Workshop, a webinar with 50 participants from 11 countries held in January 2018 together with Work Package 5. In addition to the formal deliverables, the Drones pocket guide which was developed for the workshop in Svalbard has been updated.

Other projects of relevance for Arctic Research using drones are presented below. ÅF has together with the Swedish National Agency for Higher Vocational Education and Lund University developed a commercial drone operator programme which is one of the first in Europe. It is a one year education for 35 students. The students will have a work placement and this could be at INTERACT research stations. This is a unique opportunity for the research stations to take advantage of the knowledge of one of these students. Periods relevant for work placement are 22 April – 31 May 2019 and 1 Aug-15 Sept 2019.

Another project in the pipeline is Drone guided search technology to support alpine avalanche rescue. The objective is to decrease lead time and help the person to survive through user friendly and time-critical assistance with a specific drone and specific user interface. There will be a public demonstration May 2019. The project is financed by the Swedish funding agency Vinnova. Another project funded by Vinnova is Snow4all. The objective is to develop a snow-forecasting tool with the combined indigenous knowledge and drone technology.

During 2019 there will also be focus on navigational issues in the Arctic. There are an abnormal number of crashing drones in the Arctic region, which is why it is important to find a way to develop more reliable and robust navigation.

2.9 WP9 - Adapting to environmental change

Anders Oskal (International Reindeer Centre)

Environmental change occurs in a very fast rate in the Arctic – how can societies handle rapid and profound change? A society's vulnerability can be described according to the following equation:

Vulnerability = impacts-adaptive capacity

It is very important to combine traditional science with indigenous and local peoples' knowledge. Scientific expeditions to Yamal and White Island in 1928-29 included indigenous knowledge for the first time in the Arctic. This helped preserve reindeer herding traditions.

The overall aim of this work package is to develop a deeper mutual understanding of how to work together to build integrated local observation systems. One hands-on task is to produce an inspirational guide book for research station managers and local communities based on case studies in Greenland, Finland and Russia.

Achievements within the project have so far included meetings with different partners; collection of best practice guidelines on ethics; an academic seminar; and a world reindeer herder's congress. A new article by WP 9: *Snow cover and the loss of traditional indigenous knowledge* was just published in Nature Climate Change (Eira et al., 2018. Snow cover and the loss of traditional indigenous knowledge. *Nature Climate Change*).

Next steps for this WP are to arrange a youth and science session during the Arctic Biodiversity Congress and the Arctic Environmental Ministers Meeting in Rovaniemi in October 2018, and also to arrange a side event during the 2nd Arctic Science Ministerial Meeting in Berlin in October 2018. A case study gathering will be held in January 2019, in Norway.

3. Mid-term review

3.1 INTERACT in progress

Margareta Johansson (Lund University), Terry Callaghan (Sheffield University)

In a nutshell – INTERACT is about infrastructure, it is not a research project. INTERACT is a network of 82 research stations with more than 5000 scientists visiting every year conducting excellent science. INTERACT is financed for 4 years through the EU Horizon 2020 project. There are 47 partners from all Arctic countries and the total budget is 10 million €. INTERACT activities include networking; outreach and education; transnational access; joint research activities; and coordination.

The work packages in INTERACT are:

- WP 1 - Coordination and Management
- WP2 - Scientific coordination, mentoring and education
- WP3 - Station Managers Forum
- WP4 - Data Forum
- WP5 - TA, VA, Giving Access to INTERACT
- WP6 - Rapid response to environmental emergency alerts
- WP 7 - Improving and harmonizing biodiversity monitoring
- WP8 - Developing technology for drones for scaling up from research stations
- WP9 - Adapting to environmental change

3.2 Mid-term review presentations by WPs

All WPs presented the aim of the work package, partners involved in the WP, achievements so far, added value and deviations (if any). The presentations are found on INTERACTs web site: https://eu-interact.org/presentations-from-interact-mid-term-review/

3.3 Midterm review concluding remarks - Legacy: Integration, impact, added value, future

Margareta Johansson (Lund University), Terry Callaghan (Sheffield University)

INTERACT contributes to lifelong science support for school kids, through university students to researchers to politicians etc. INTERACT also integrates with international consortia and networks, such as the EU Arctic Cluster, Business, the education system, Arctic Council Working Groups and permanent participants and 172 networks. One of INTERACTs Legacy are the impacts on science through the mass training of potential future scientists, on society by increasing awareness of global change issues and on political establishments through reaching out and advising governments.

During the first 18 months, the added value highlights have contributed to INTERACT Legacy through:

- Business opportunities from drone work package
- Education - master students and new courses
- Interactive science stories book
- Research hut in Greenland
- An unfunded joint research activities
- SECNET workshops
- Input from the permanent participants to the Arctic Council
- Czech Academy of Sciences support analyses of disease vectors
- Aligning data management efforts with developments within the EU Arctic Cluster

INTERACT seeks to continue to provide opportunities for Early Career Scientists in the future. INTERACT will seek opportunities for funding within the upcoming Horizon2020 Infrastructure call but is also making progress on establishing a non-profit organisation to secure long term sustainability.

3.4 Midterm review immediate feedback

Elena Nikitina – EU External Reviewer

Elena's first impression was that INTERACT is a fascinating project. Most of the objectives of INTERACT are met and correspond with the DOA. Significant progress has been made and it has been shown during the last two days. The results, the list of deliverables and the impacts are quite impressive. Elena was especially impressed with the result of the project's outreach and education. In addition, she was also impressed with the industry work package and the involvement of Indigenous Peoples' knowledge. INTERACT provides important information for future generations and is using thoughtful design of outreach to ensure that information gets across. An example of the design is the INTERACT Card Game that Elena enjoyed playing and which is user friendly to people who are not involved in these matters.

One of Elena's concerns deals with small deviations and delays in deliverables and milestones. She concluded that this is not just formality but the work packages in the project are linked to each other and hence a delay in one WP can affect another. Is there any risk for the whole project with these delays and how does the project management tool work? Please pay more attention to this in the future.

> *Respond to comment from INTERACT. There have been some minor delays in some deliverables and milestones but they are all justified and have resulted in added value and better end products. It has not affected the other WPs and has not endangered the whole project. We have taken action and added alerts in Progecta to ensure fewer delays in the remaining part of the project.*

Elena suggested that the links between the different WPs should be more visible, especially between the Data Forum (WP 4) and the Station Managers Forum (WP3) and the Joint Research Activities.

Respond to comment from INTERACT. It was unfortunate that the leader of WP4 Øystein Godøy could not participate in this meeting as he planned to do as the idea was to discuss the linkages between the different WPs during this meeting. For the future, the coordinator will pay more attention to this and also facilitate these links through initiating e.g. online meetings between relevant WPs.

Elena thought that INTERACT covered the external linkages and outreach profoundly, they were diversified and multiple. One suggestion might be to think a little bit more about the Arctic Council Scientific Agreement and try to reinforce the links to them.

Respond to comment from INTERACT. INTERACT suggested to maybe write a white paper about our experience on pan-arctic collaboration.

A list of scientific publication that is arising from INTERACT (mainly from TA projects) are note visible on our web site, Elena suggested to put it on a more visible place on the website. Promote more. Articles, events and conferences we are taking part in.

Respond to comment from INTERACT. INTERACT assures that such a list will be made more available on our web site.

Elena concluded that INTERACT's list of possible risks and mitigating actions. Has not been updated during the first 18 months, have we identified any other risks and what do we do to avoid them? An example that has surfaced during these meeting days is from WP6 – the problems of getting samples for the rapid response WP across borders.

Respond to comment from INTERACT. We have not thought about it but will look into it during the coming years to update if needed.

Elena asked what are the major bottlenecks of the implementation of the project during these first 18 months? If you are aware of your problems it is easier to solve them.

Respond to comment from INTERACT. During INTERACT I we had a problem with pan-arctic funding, but thanks to EU's new regulation during INTERACT II we can now provide pan-arctic transnational access which is excellent and needed to solve Arctic issues. Another bottle neck is actually that the possibilities for INTERACT are enormous. There are new possibilities that pop up all the time, a bottle neck is that we are too few people (even though we are a huge network) to seize all opportunities. We have established a network of INTERACT Ambassadors to try to seize as many opportunities as possible.

Elena concluded that in our presentation on Monday, we presented the payment plan from the first periodic report. In this plan we presented three different groups, one group that has spent all of their budget and hence will receive 85% of the total budget, one that has spent according to the plan who will receive money according to the guidelines from EU and one group that has spent very little money who will not receive any money as they will then most likely have to return money in the end of the project which is very difficult for some institutions (especially in Russia). Elena wonders how we deal with the 3rd group?

Respond to comment from INTERACT. For most of the partners that will not receive additional money now, there is a logical reason why they have not spent money according to the plan. E.g.

some partners have started late due to validation problem, some stations have not received any applications from TA users yet etc. To promote such stations we can target TA calls and even put in extra calls to increase their chances of receiving TA applications. We also have a TA Pool, where partners that have not used all their TA money can allocate some money to stations that have used more than they originally thought due to many visitors.

4. INTERACT Future

4.1 INTERACT Future – EU Call

Luisella Bianco (CLU), Margareta Johansson (Lund University)

There will be an upcoming call from EU "Infraia-01-2019". The call will open on 14 November 2018 and the deadline for an application is 20 March 2019. One of the topics announced in this call is: *Research infrastructures for terrestrial research in the Arctic.* With the description: *As an international network for terrestrial research and monitoring in the Arctic, this activity should further integrate and open key research stations and large research field sites throughout the circumpolar Arctic and adjacent northern countries, to provide capacity for research, monitoring and education. The project should include work on best practices for managing stations, and (international) logistics and establish links with relevant ESFRI infrastructures.*

As you can read this is a call directed to INTERACT. However please note that we will have very tough competition. This is one of 20 topics, which means that we have 19 other topics to compete with in many different areas (both geographically as well as different disciplines). We propose that INTERACT should apply to this possibility.

Margareta Johansson got the mandate to continue to be the Coordinator of INTERACT in this new application. She also got the mandate to lead the application writing together with Terry Callaghan.

4.2 INTERACT Foundation

Luisella Bianco (CLU), Margareta Johansson (Lund University)

To ensure long term sustainability we want to establish a non-profit legal entity. We have EU funding until 2020 but after that we don't know what will happen. Best case scenario, we will receive another round of funds from the EU. However, nothing is certain so we have to be prepared for the future.

A nonprofit legal entity is something that can survive. We have developed different levels of activities in the nonprofit organization depending on how much funding will be available. The core activities are:

1) Project management (admin, website, fundraising)
2) Networking (key contact, outreach)
3) SMF (1 meeting/year)

4) TA (access management)

As the world needs INTERACT, we need good fund raising so that we can achieve as many activities as possible on the list above. We agreed that we need to establish a legal entity before the end of the project. We have started working on this and a lawyer has been consulted. At this point in time we are not sure exactly what type of legal entity is best suited, but we will get back to you on this. Morten and Luisella will continue to talk to the lawyer and will keep us updated on any progress.

4.3 INTERACT Future – Brainstorming for upcoming EU call

As concluded above, the competition for the upcoming EU call will be tough and therefore we need as much input as possible at this point in time for potential topics for our application. Four groups were formed and the topics for discussion were the following:

1) Joint research activities with industrial (SME) involvement. Spin-off so that businesses can benefit from the development (for example drone package)
2) Content of the Station Managers' Forum
3) Transnational access
4) Data management (The links with EOSC should be emphasized)
5) Education
6) Proportion of funding (TA, SMF and coordination takes major part of funding)

Below are the reports from the four different groups and the outcome of general discussions afterwards.

Group Hanna Maria

- What has been done at the station and what can be done. Tracking devices for birds and other animals. This can be further developed, for example measure hormone levels over time. Used for scientists and in farming.
- Sensor equipment very expensive. Beneficial develop something less expensive.
- Decrease energy consumption
- Safety and communication equipment often does not work in the field. Something new could be developed for eco-tourism and hunters
- Possibilities for INTERACT stations becoming test groups for different technical equipment or other things (can benefit industry)
- 3D printing in remote areas. Scientists do not have to bring everything to the site, but can print things on site (environmentally friendly)
- Transportation on remote areas for people and equipment. Shipping (dry shippers) dry-ice to keep samples cool. Easier more lightweight equipment to keep samples cool. Something instead of dry ice
- Remote access: INTERACT could help making standardized protocols to make the process standardized

- Validation protocols could be looked into
- Data management: Useful to add monitoring that all stations could help participating in so that they all measure the same thing (for example temperature). Continuous measurement. Global Cryosphere Watch is developing a meta-database

Group Donie

- Joint research activity and Station managers forum
- WP on drones has been very successful but a lot more can be done. Many problems related to cold areas that haven't yet been addressed by the drone industry. We want something new, but and advanced drone package would be very useful
- Develop energy solutions for energy consumption to be put on existing station. Small micro power systems that can be added on existing station. Can help industry for small villages in arctic and other places. Micro hydro power plants. Multiple benefits
- SMF or JRA: sustainable food production for station. Here some research can be done for greenhouse. Some stations could benefit from this
- SMF – online courses. More topics other than field safety could be very useful. Registration management or energy solutions. Or working with tourism. Number of tourism is increasing in the north. How to optimize relationship with tourism industry.
- Biggest desire for SMF. Having a program to think about permits and how to manage them. Shipping samples. Where to start? Difficult for station managers and scientist. And also how to handle waste
- Videos of all stations. Yes – update everything that has been already done.
- Data management. Link that better to SMF and JRA. Not beneficial if it is just a study that sits somewhere on the website.

Group Elmer

- Develop new sensors combined with all development that already goes on
- Tracking devices
- Alternative energy solutions for off-grid stations
- Space technology (sensors and materials are often useful in Arctic environment)
- Drones. But why only drones? Submarines is also an alternative
- Machine learning. Computer looking into big data. Scientist + computer. Shipping companies could find fastest/cheapest route, or tourists could want. Data is valuable. Conclusions from the data that is already collected.
- What are our strengths and what makes us different from others? Some things can be better organized. Unusual things (new species etc. like WP6) put them together from all the stations. Offering INTERACT as platform for technology development.
- Upscaling/downscaling. Linking satellites and stations. Online data from station up to a satellite (Copernicus)
- Arctic Council Science Cooperation… Keep AMAP and CAFF close, could join forces.
- In relation to TA. Drone access. Training team of drone experts to take samples. Hardware based on some stations. Survey of which stations have drones.

- Scientific networks have protocols but gaps. Secure better geographic representation. Using the same standards.

Group Marie

- Communication in the Arctic: expensive and unreliable
- Clean energy technology. Making station less dependent on fossil fuels
- Sensor technology. Software analysis
- Open source field notebook. An assistant. Easier to share data. Coordinated monitoring. All stations have time series because they have their own value. But if we want to know the same things across the Arctic, developing PDA system (open source) on IPad. Makes it easier to collect data. Could help in standardizing between stations.
- The TA application process. The TA system requires some information. This creates metadata. Updates. First you know what is happening. Metadata knowing that the research is done. But not from the daily samples. (The INTERACT GIS will capture the metadata which will be available to the stations)
- Metadata could be immediately distributed to the cloud.
- App for people living in the Arctic. Alerting system. Take a picture of invasive species
- Linking past and future. 3D visualization models. How the station looked 100 years ago. What will it look like in the future? Immense educational value.

General Discussion

- The data in the stations is collected by the scientists and therefore not owned by the station. Most Universities require their researchers to make the data available. Within a year the data goes public. The way forward. Therefor standardized data is necessary. The data needs to be preserved for the future.
- Big data: big handwritten data, photographs. A lot of data that hasn't been analyzed yet. New technology helps us. Putting data together old (undiscovered) data (sitting in different university libraries) and new data to create interesting conclusions. Data past and present.
- Each of the networks should have their protocols.
- Robotics in general is a way forward (lawn mower making snow measurements!)
- Expensive for each station to handle all the data.
- Iridium's director could potentially help out.
- Plastics: We could play a huge role. How much plastic gets imported into the stations?
- People: The people who live in the Arctic. How do we involve the people who live here?
- How could indigenous people record environmental changes? They do take responsibility. Black carbon is measured by some stations.
- Forest fires a big problem.
- Tighter integration between the work packages. TA funded science monitoring – smf…
- Arctic Council: Telecommunications.
- Open data is basically a requirement that all data is made available.
- European open science part. And ENVRI Fair. EATR is a news infrastructure. Standardised biodiversity research data. Standardized protocol. 5-10 years. Formatted protocols. It will apply for all European researchers. INTERAXT needs to be part of this development. EATR

will be driving their part of it. We need to be part of these initiatives. A science cloud WILL be there.

5. Wrap up and ways forward

Margareta Johansson (Lund University), Terry Callaghan (Sheffield University)

We can conclude that we have had a very good start in INTERACT II. Thanks to everyone for all your hard work. Also, very many thanks to all WP leaders for the great quality of the presentations. In addition, we would like to thank our mid-term reviewer for a great review with very positive feedback and good input for areas of improvement. We look forward to see you all in a year's time with new and exciting progress. Finally, a very big thanks to the local organisers who did a fantastic job to welcome us to Russia (for the first time in INTERACT's history).

Appendix I: Programme

INTERACT H2020 Second Annual Meeting

24-28 September 2018

Agenda

The meeting will be held in the Yamal-Nenets governmental buildings in Salekhard, Russia

Sunday 23 September 2018 Arrival in Salekhard	
	Arrival in Salekhard *Check-in at Arctic Hotel*
	Lunch (individual)
18:00	Organizing Committee meeting *(Hotel Lobby)*
19:00	*Dinner (Hotel Restaurant)*

Monday24 September 2018**General Assembly** (Yamal-Nenets Government building, room 113)	
07:00 – 08:30	*Breakfast*
08:30	*Transfer to Conference venue*
09:30	Opening of the meeting *Margareta Johansson*
09:35	Welcome addresses *Deputy Governor of the Yamal-Nenets autonomous distcrict Alexander Mazharov* *Director of the Department of Protected Natural Areas of the Ministry of Natural Resources of the Russian Federation Alexey Titovsky*

09:50	Introduction to the meeting *Margareta Johansson*
09:55	*Round table introduction*
10:05	*Short break*
	WP presentations describing progress and way forward
10:10	WP 1 - Coordination and Management *Margareta Johansson, Luisella Bianco*
10:30	*Coffee break + Meeting with mass media*
11:00	WP2 - Scientific coordination, mentoring and education *Terry Callaghan*
11:20	WP3 - Station Managers Forum *Morten Rasch/Elmer Topp Jorgensen*
11:40	WP4 - Data Forum *Øystein Godøy*
12:10	WP5 - TA, VA, Giving Access to INTERACT *Kirsi Latola*
12:40	WP6 - Rapid response to environmental emergency alerts *Alexandra Bernardova/Marie Sabacka*
13:00	*Lunch at the Café in the Yamal-Nenets Governmental Building*
14:00	WP 7 - Improving and harmonizing biodiversity monitoring *Kári Fannar Larusson*
14:30	WP8 - Developing technology for drones for scaling up from research stations *Tomas Gustafsson/Eskil Bendz*
15:00	WP9 - Adapting to environmental change *Anders Oskal*
15:30	*Summary of the day*
16:00	*Coffee break*

18:00	*"Late" Icebreaker*
19:00	*Dinner at the Hotel restaurant*

Tuesday 25 September 2018 **Mid-term review**
(Yamal-Nenets Government building, room 332)

07:00 – 08:30	*Breakfast*
08:30	*Transfer to Conference venue*
	Mid-term Review
09:00	INTERACT in progress *Margareta Johansson, Terry Callaghan*
	WP presentations describing progress and highlights
09:10	WP 1 - Coordination and Management *Margareta Johansson, Luisella Bianco*
09:25	WP2 - Scientific coordination, mentoring and education *Terry Callaghan*
09:40	WP3 - Station Managers Forum *Morten Rasch/Elmer Topp Jorgensen*
09:55	WP4 - Data Forum *Øystein Godøy*
10:10	WP5 - TA, VA, Giving Access to INTERACT *Kirsi Latola*
10:30	*Coffee Break*
11:00	WP6 - Rapid response to environmental emergency alerts *Alexandra Bernardova*
11:15	WP 7 - Improving and harmonizing biodiversity monitoring *Kári Fannar Larusson*
11:30	WP8 - Developing technology for drones for scaling up from research stations *Tomas Gustafsson*

11:45	WP9 - Adapting to environmental change *Anders Oskal*
12:00	Midterm review immediate feedback
13:00	*Lunch*
14:00	Midterm review immediate feedback (continued)
15:00-16:30	*Drone demonstration and coffee break*
18:00	*Transfer to the open air ethnographic complex Gornoknyazevsk*
19:00	*Dinner with national cuisine /rituals*

Wednesday 26 September - **General Assembly**

(Yamal-Nenets Government building, room 332)/ Excursion

07:00 – 08:30	*Breakfast*
08:30	*Transfer to Conference venue*
09:00	INTERACT Future Upcoming call from EU "Infraia-01-2019" INTERACT Foundation *Margareta Johansson / Luisella Bianco/Morten Rasch/Terry Callaghan*
10:30	*Coffee break*
11:00	INTERACT Future (continued)
12:30	Wrap up and ways forward *Margareta Johansson / Terry Callaghan*
13:00	*Lunch*
14:00	*Excursion to The Arctic Research Station (former Labytnangi Field Station) (across the river Ob)*
19:00	*Conference Dinner*

Thursday 27 September 2018 **Station Managers' Forum**
(Yamal-Nenets Government building, room 332)

07:00 – 08:30	*Breakfast*
08:30	*Transfer to Conference venue*
09:00	Welcome and introduction *Morten Rasch/Elmer Topp-Jørgensen*
09:15	Task 3.2 - Awareness of the scene: Identification of network representatives within INTERACT *Terry V. Callaghan*
09:30	Network presentations (by station managers already belonging to networks)
09:40	Network presentations (by station managers already belonging to networks)
09:50	Network presentations (by station managers already belonging to networks)
10:00	Breather presentation – The Arctic Research Station (formerly Labytnangi Station)
10:30	*Coffee break*
11:00	Task 3.5 – 0-emission: Draft report for discussion and input from station managers to idea catalogue (examples of emission reduction initiatives) *Gigi Nighat Johnson-Amin*
12:00	Task 3.3 - First Class Science Support: Station Manager Course II *Ann Christin Auestad*
13:00	*Lunch*
14:00	Task 3.3 - First Class Science Support: Station Manager Course II (continued) *Ann Christin Auestad*
15:00	Task 3.6 - INTERACT GIS: INTERACT GIS status and use for INTERACT Station Catalogue 2019 *Elmer Topp-Jørgensen, on behalf of Tomas Thierfelder*

16:00	*Coffee break*
16:30	Task 3.6 - INTERACT GIS: INTERACT GIS status and use for INTERACT Station Catalogue 2019 (continued) *Elmer Topp-Jørgensen, on behalf of Tomas Thierfelder*
17:30	*Excursion to the Shemanovsky Museum & Exhibition Center (the world-famous baby mammoth Luba)*
19:00	*Dinner*

Friday 28 September 2018 Station Managers' Forum

(Yamal-Nenets Government building, room 332, 113)

07:00 – 08:30	*Breakfast*
08:30	*Transfer to Conference venue*
09:00	Task 3.4 - Fieldwork planning handbook and practical field guide: Feedback on draft report *Fiona Tummon*
10:30	*Coffee*
11:00	*Open Floor*
11:30	*End of meeting*
15:30	*Transfer to the airport / Departure to Moscow*

Appendix II: List of participants

INTERACT H2020 2nd Annual Meeting

Participant List

Surname	Name	Partner	Institution
Barnard	Christine	29-CEN	CEN - Centre d'études nordiques (ULaval)
Beckmann	Katharina	01 –LU	Lund University
Bendz	Eskil	40-AF	ÅF Digital Solutions AB
Bernardova	Alexandra	11-USB	University of South Bohemia in Ceske Budejovice
Bianco	Luisella	06-CLU	CLU SRL
Bret-Harte	Syndonia	32-UAF	University of Alaska Fairbanks
Callaghan	Terry	02-USFD	University of Sheffield
Chalov	Sergey	22-MSU	M.V.Lomonosov State University
D'Acqui	Luigi Paolo	31-CNR	Consiglio Nazionale delle Ricerche - Istituto per lo Studio degli Ecosistemi ISE
Dick	Jan	09-UKRI	Centre for Ecology and Hydrology
Guðmundsdóttir	Hrönn G.	28-RFS	Rif Field Station
Gíslason	Ó. Sindri	33-SSLC	Southwest Iceland Nature Research Centre
Gustafsson	Tomas	40-AF	ÅF Digital Solutions AB
Johansson	Anna-Maria	N/A	EC, DG RTD
Johansson	Margareta	01-LU	Lund University
Johnson-Amin	Nighat	44-IPF	International Polar Foundation
Jokinen	Mikko	20-LUKE	Natural Resource Institute Finland LUKE
Kehl	Alexander	25-LFU	Faculty of Geo- and Atmospheric Sciences, University of Innsbruck
Kirpotin	Sergey	TSU	Tomsk State University
Kristjansdottir	Hanna Maria	33-SSLC	Sudurnes Science and Learning Center
Lapshina	Elena	26-YSU	Yugra State University

Surname	Name	Partner	Institution
Lárusson	Kári Fannar	35-CAFF	CAFF
Latola	Kirsi	04-OULU	Thule Institute University of Oulu
Lawson	William	N/A	BBC
Leppänen	Leena	34-FMI	Finnish Meteorological Institute
Mathiesen	Svein	47-ICR	The International Centre for Reindeer Husbandry
Mortensen	Lis	27- JF	Faroe Islands Nature Investigation
Nikitina	Elena	N/A	Primakov National research institute for world economy and international relations
Oskal	Anders	47-ICR	International Centre for Reindeer Husbandry
Óskarsson	Hlynur	42-AUI	Agricultural University of Iceland
Rączkowska	Zofia	30-IGSO-PAS	Institut of Geography and Spatial Organisation PAS, Department of Geoenvironmental Research
Raundrup	Katrine	16-GINR	Greenland Institute of Natural Resources
Sabacka	Marie	11-USB	University of South Bohemia in Ceske Budejovice
Shaduyko	Olga	10-TSU	Tomsk State University
Sielski	Wlodek	17-IFS-PAS	Institute of Geophysics, Polish Academy of Sciences
Skov	Henrik	05-AU	Aarhus University - Depart of Environmental Science
Sokolov	Aleksandr	N/A	Arctic Research Station of Institute of Plant and Animal Ecology Ural Branch Russian Academy of Sciences
Sokolova	Natalia	N/A	Arctic Research Station of Institute of Plant and Animal Ecology of Ural Branch Russian Academy of Sciences
Titcombe	Sarah	N/A	BBC
Topp-Jørgensen	Elmer	05-AU	Aarhus University
Tummon	Fiona	36-UiT	APECS - University of Tromsoe
Zarov	Evgeny	26-YSU	Yugra State Univeristy