

# REXSAC

## ARCTIC RESOURCES & COMMUNITIES



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### ANNUAL REPORT 2016

REXSAC  
Resource Extraction and Sustainable Arctic Communities  
A NordForsk Centre of Excellence

## 1. Introduction

REXSAC is focusing on the integrative study of extractive resource industries in the Arctic as cultural, social, economic, and ecological phenomena – from analysis of why resource extraction commences, to what consequences it has for communities in the Arctic and beyond, and what opportunities exist for transitioning toward post-extractive futures.

Our *mission* is to study extractive industries in the Arctic in an integrative, comparative and interdisciplinary manner, bringing together insights and tools from across geographic and disciplinary boundaries to develop new tools and support best practices and processes. Our *vision* is to build a world-leading centre for interdisciplinary research and training that identifies pathways to sustainable futures for Arctic communities.

### 1.1 Original aims

Our aims are the following:

- Findings will be part of an ongoing process of building toward best practices and processes in the relationship between resource extraction and Arctic communities rather than singular achievements.
- Print, web and non-written deliverables: Ten Research Tasks (RTs) are expected to produce at least one larger academic product (book, special issue) and several peer reviewed journal articles/book chapters.
- All in all REXSAC is expected to produce at least ten academic volumes, ten dissertations, some fifty articles/chapters including several cornerstone/review papers, twenty policy briefs, and several reports with more elaborated policy recommendations.
- REXSAC will contribute lectures, talks, seminars, media appearances and other forms of non-written research communication that are vital in keeping with the centres mission of political and social relevance.
- REXSAC will in the course of the five years produce one common book on ‘Arctic Transitions’.

Enduring, systemic impacts: REXSAC will produce new tools for dealing with key challenges of resource extraction.

- REXSAC will pursue community participation in environmental and social monitoring.
- REXSAC will seek deeper integration of different knowledge traditions, like natural/social science/local, and fostering ways of co-producing knowledge will be a significant achievement.
- REXSAC will offer a PhD training with systemic innovation as a development project in its own right and train in total ca ten PhD students toward their degrees.

## 1.2 Design and methods

REXSAC is a multi-nodal, multiple methods and multiple research designs Nordforsk Center of Excellence which seeks to bring transformative understanding through innovative combinations of different kinds of knowledge and scholarly and lay approaches.

- Core REXSAC issues cannot be dealt with by any single discipline, and every research task has been structured to include transdisciplinary or interdisciplinary collaboration in addition to developing existing approaches.
- REXSAC's research will be framed around four underlying objectives – to be *integrative, co-productive, community based, and transformative*.
- These principles will guide the application and development of more established methodologies and data collection tools including climate and weather monitoring, water monitoring, GPS tracking systems, industrial archaeology, cultural heritage studies, many strands of history, cultural and social anthropology, land and urban planning, political science, and security studies.
- A particular feature is the integration of Arctic issues with other global issues.

## 1.3. Practical changes to original plan

No major changes have occurred in relation to the original proposal and plan. A few things to note though: on the organizational level REXSAC has had an additional partner included as one RT leader took up a position at Luleå Technological University, which therefore was added as a partner. Similarly in Denmark, one REXSAC researcher secured a position at the University of Aalborg and for this reason – as well as the Arctic research environment there – REXSAC added Aalborg University to the consortium. The total number of contracted partners is therefore fifteen, including the host organization. Also, some individual researchers mentioned in the proposal have not been active in REXSAC during the start-up phase. These changes will not affect the overall design and workings of REXSAC.

## 2. Personnel of the Centre

\* = PhD student funded by NordForsk

<b>Research team 1 – KTH (Div of History of Science, Technology and Environment)</b>
Team leader: Sverker Sörlin
Dag Avango
Peder Roberts
Eric Paglia
Per Högselius
Göran Cars
Camilla Winqvist (PhD student)*
Jean Sebastien Boutet (PhD student)*
Corinna Röver (PhD student)
<b>Research team 2 – Stockholm University (Dept of Physical Geography &amp; Dept of Political Science)</b>
Team leader – Gunhild Rosqvist
Rebecca Lawrence
Ulf Mörkenstam
Jerker Jarsjö
Arvid Bring
Carl Österlin (PhD student)
Josefin Thorslund (PhD student)
Sandra Fischer (PhD student)*
Anna Maria Fjellström (PhD student)*
<b>Research team 3 – (Stockholm Environment Institute)</b>
Team leader – Annika Nilsson
Rasmus Kløcker Larsen
Ylva Rylander
<b>Research team 4 – Sila: Arctic Centre at the National Museum of Denmark</b>
Team leader – Bjarne Grønnow

Jens Fog Jensen
<b>Research team 5 – University of Oulu (Dept of Cultural Anthropology)</b>
Team leader - Hannu I. Heikkinen
Jarkko Saarinen
Esa Ruuskanen
Élise Lépy
Vesa-Pekka Herva
Ritva Kylli
Sami Lakomäki
Jasmiini Pylkkänen (PhD student)*
Teresa Komu (PhD student)
Alix Varnajot (PhD student)
<b>Research team 6 – University of Copenhagen (Department of Cross-Cultural and Regional Studies)</b>
Team leader – Kirsten Thisted
Frank Sejersen
Anne Mette Jørgensen
<b>Research team 7 - University of Oslo (Department of Social Anthropology)</b>
Team leader - Marianne Elisabeth Lien
Gro B. Ween
Thomas Hylland Eriksen
Britt Kramvig
Wenzel Geissler
<b>Research team 8 – (Greenland Institute of Natural Resources)</b>
Team leader – Mark Nuttall
Lene Kielsen Holm
<b>Research team 9 - Stefansson Arctic Institute</b>

Team leader – Joan Nymand Larsen
Jon Haukur Ingimundarson
<b>Research team 10 – SLU, Dept of Wildlife (Fish &amp; Environmental Studies)</b>
Team leader – Göran Ericsson
Navinder Singh
Christian Foringer (PhD student)*
<b>Research team 11 – Dalarna University (Tourism Studies Department, School of Technology and Business Studies)</b>
Team leader – Albina Pashkevich
Susanna Heldt-Cassel
<b>Research team 12 – Norwegian Institute for Cultural Heritage (NIKU)</b>
Team leader – Anne Cathrine Flyen
<b>Research team 13 – Memorial University of New Foundland (Dept of History &amp; Dept of Human geography)</b>
Team leader – Arn Keeling
John Sandlos
<b>Research team 14 – Luleå Technological University</b>
Team leader – Dolly Jørgensen
<b>Research team 15 – Aalborg University (CIRCLA - Centre for Innovation and Research in Culture and Living in the Arctic)</b>
Team leader – Lill Raastad Bjørst

### 3. Detailed research progress in 2016

In general, research in REXSAC has developed according to plan. Year 2016 was planned as a start-up year with the main focus of organizing collaboration within Research Tasks (RTs) and with little or no planned new fieldwork and with a main ambition being to recruit and hire PhD students and organize PhD training including new PhD courses. The overall Research Plan said that: “September 2016: all PhD students appointed, all research tasks

commenced. Meeting to plan new research funding applications. September 2017: all PhD students to have started common course work, all research tasks to have completed at least one deliverable. Second meeting to plan new research funding applications.” In reality, given the three month delay of the start of the Nordforsk Arctic CoEs (1 April rather than 1 January), the PhD students were hired at the end of 2016, with starting dates ranging from November 2016 to March 2017 (with one exceptional PhD student starting salaried work only 1 June 2017). All students had started common course work by March 2017.



REXSAC PhD students presenting their theses projects in Copenhagen, March 2017. Photo: Dag Avango.

Several RTs have been able to connect well to already ongoing work and have hence started to produce deliverables already during 2016 (see list of publications and other output). For example, RT2 has conducted comprehensive fieldwork. RT4 has conducted archival work in Greenland and Canada. RT8 has presented work in the Museum of Cultural History in Oslo. Researchers in RT7 from KTH and Dalarna University have also conducted fieldwork and pursued research in Greenland, Norrbotten (Sweden), and Svalbard. From the same RT, NIKU has conducted fieldwork at Svalbard, Gruve 6, in September 2016. A popular publication and a scientific article are under production. Researchers at The Memorial University of Newfoundland in RT 7 continued ongoing fieldwork and knowledge mobilization activities related to the material legacies of contamination at Giant Mine in Canada (not directly funded by REXSAC). The same team also joined a new Canadian research network examining post-mining environmental remediation, which will contribute to the outcomes for RT6 on re-wilding. Researchers in RT1 has conducted fieldwork in Nanortalik, South Greenland, and is in the process of planning a series of focus group interviews with young people to take place in Greenland, Iceland, and Norway on topics of sustainability indicators and scenario building. RT 8 has explored and begun research around a planned quartz quarry in Austertana, Norway, and several publications are under way. Together with researchers in RT 4, 5 and 7, RT 8 has also planned a workshop in Oslo in autumn 2018 entitled Uchronotopia, with the aim of publishing a special issue.

In addition, a series of research presentations were made during an upstart and planning conference in Stockholm in June which also included a public seminar. At the first REXSAC

research conference in Copenhagen in March 2017 there were papers/presentations by all six PhD students and some 15 REXSAC researchers all reflecting ongoing research or work in advanced stages of preparation that had taken place in 2016.

Telling from the papers presented, there is no doubt that the research ideas and the ambitions of the researchers are on a high level. This gives cause for optimism. Some caution is warranted though, due to the fact that internal REXSAC funding for the operational research and fieldwork is quite limited, beyond that of the PhD students that are well funded by the CoE. Existing funding from other resources will take several RTs forward, and some new funding has successfully been secured in some. But bottlenecks may occur in some RTs and there may over time be varying opportunities to realize ideas across the CoE as a whole which will be a challenge to both RT leaders and to the CoE co-directors and the Executive Committee. This is one of the key challenges for REXSAC.

#### **4. Nordic added value**

The project brings added value to the Nordic countries in three main ways – 1) scientifically, 2) for the consortium, and 3) for stakeholders.

REXSAC specifically addresses what is arguably the most important question facing communities and polities across the Nordic Arctic today, given the dominance of mining in discussions concerning the future of regions across northern Scandinavia, Finland, Svalbard, and Greenland. We offered that REXSAC could link centres of expertise and education across Norden and beyond and promise to deliver and build research based knowledge over the long term. We expected Nordic added value in the following areas:

1. Stronger research environments.
2. A new pan-Nordic model for PhD training.
3. Enhanced transfer of practices. This impact is related to community-based knowledge production across the Nordic Arctic.
4. Improved legislative and administrative capacity across the Nordic countries.
5. Community capacity building.

It goes without saying that influence and impact on points 4 and 5 can only be indirect.

Added value for science and for the consortium: During 2016 we have initiated work that promises to deliver Nordic added value in particular in areas 1, 2, 3 and to some extent 5. The work in combining the existing strengths of REXSAC institutions (e.g. industrial heritage studies at KTH, cultural history at Copenhagen University, hydrology at Stockholm University, ethnography at the University of Oslo, reindeer herding anthropology at Oulo, and more) has begun in the forging of collaborative workshops and conferences to take place in 2017 (the first pan-REXSAC conference in Copenhagen in March, and the Uchronotopia workshop in Oslo in November), in the planning and writing of research proposals (several written during 2016 and several also funded), and the initial work of the RTs that in and of themselves are examples of Nordic collaborations. The pan-Nordic model for PhD training was developed in an initial phase through the collaborative hiring of REXSAC's six PhD students to four universities and adding several more PhD students funded through other sources.



Added value for stakeholders: The transfer of practices was worked upon, especially through work in the Kiruna-Tarfala area in Sweden (Sami villages in the Kiruna region). The “empowering” of local communities has become manifest through public appearances and media coverage of Sami participants. This has contributed to community capacity building. Scenario planning workshops have been tried out and will be exercised on a full scale in a workshop in September 2017. As a direct outcome of the above mentioned field work at Svalbard, researchers in REXSAC are contributing with a publication for the department for environment of the Governor of Svalbard (Sysselmannen).

## **5. How the centre has facilitated and developed cooperation with non-Nordic research groups within Arctic research**

Already the REXSAC original consortium had non-Nordic participation. The proposal also stressed the importance of globalizing the Arctic, and de-exceptionalizing it by putting it into the context of more general concerns of extractive industries and mining, and also more generally. We share an ambition to produce knowledge that is useful for the Arctic and its residents while at the same time being generic and relevant elsewhere, in contrast to some of the traditional knowledge production about the Arctic. This work is ongoing and influences REXSAC at large, it also affects our publication patterns, i.e. we intend not to publish in Arctic journals and book series only and we have indeed already started a wider spread of results (see the publication report below).

That said it is important to also report that we have been strengthening our Arctic mining and resources research networks considerably by setting up collaborations with two Canada-based major research programs. The first is ReSDA (Resources and Sustainable Development in the Arctic), a network of organizations dealing with similar issues as REXSAC, involving a broad range of participants from academia, communities, NGO’s and companies, led by Prof. Chris Southcott, Lakehead University, Thunder Bay, Ontario. REXSAC took part (Dag Avango) in the sixth annual workshop of ReSDA in Ottawa in early November 2016 and received Chris Southcott for conversations in Stockholm on 8 December. A ReSDA activity of particular interest for REXSAC is The Toxic Legacies Project, based at REXSAC partner Memorial University of Newfoundland. ReSDA has reorganized for a new possible seven year period with a proposal to continue their activities 2019-2025 in a network called Social Innovation for Sustainability in Arctic Resource Development (SISARD) with three main themes: 1) *Managing Impacts on Northern Communities*, 2) *Food security, Subsistence Activities, and Culture*, 3) *Building capacity and diversifying the economy*, signaling transitions to post-extractive futures much along the lines we follow in REXSAC.

A second network of which REXSAC has become a formal member is: MinErAL (Knowledge Network on Mining Encounters and Indigenous Sustainable Livelihoods: Cross-Perspectives from the Circumpolar North and Melanesia/Australia), led by Prof. Thierry Rodon from Université Laval, Quebec City. Rodon took part for several days in the REXSAC conference in Copenhagen in March 2017. MinERAL has partners in Canada, France (New Caledonia), Sweden, Norway, Denmark, Australia.

Another international extractive industries network with which we have engaged is “Mining in the European Arctic”, coordinated by Aileen Espiritu, Barents Institute at Kirkenes, University of Tromsø. Their research interests clearly overlaps with REXSAC’s, both in terms

of research themes and sites (Kiruna, Kirkenes). Espiritu visited REXSAC in Stockholm in November 2016. This network is based in Norway but has broad non-Nordic participation.

We have also engaged with the network Arctic-FROST (Arctic FRontiers Of SusTainability: Resources, Societies, Environments and Development in the Changing North), led by Prof. Andrey Petrov, University of Northern Iowa, and members from across a range of countries outside Norden. Joan Nymand-Larsen and Annika Nilsson in REXSAC took part of an Arctic-FROST workshop in Vienna in September 2016. REXSAC will also be collaborating with the Arctic Youth and Sustainable Futures project led by Joan Nymand Larsen (core funding from NCM). In addition, Joan Nymand Larsen is a partner in the international NSF funded project entitled Arctic Sustainability – A synthesis of Knowledge (ASUS), which is led by Dr. Andrey Petrov. Together with Prof Lee Huskey she is writing a chapter on Sustainable Economies in the Arctic.

Non-Nordic participation has also been secured in the hiring of PhD students, of whom the SLU student comes from a university in Austria, one of the additional (albeit it not REXSAC funded) Oulo students is from France, and one of the KTH students is from Labrador, Canada. In addition, just at the beginning of 2017 a PhD student from Russia arrived for a one year visit at KTH to work on Soviet/Russian coal mining in Svalbard as part of the REXSAC network.

## **6. Cross disciplinary, gender perspectives, open science and user contribution to the research**

In this section we discuss cross-disciplinary aspects of the work undertaken, gender perspectives in the research, contribution to open science, and finally the contribution of users of research results (industry, policymakers, local communities, etc.) to the Centre in 2016.

All research in REXSAC happens in a cross-disciplinary context and in a disciplinary context. Both are embraced and their relationships vary from scholar to scholar, from RT to RT and among scholars and RTs also with time. There may be periods when REXSAC researchers have particularly strong reasons to collaborate across disciplines, and others when the best solution to the research at hand is to work individually and within a disciplinary tradition. We have organized REXSAC for a very large and optimal presence of interdisciplinarity, not least in the PhD training, but we do not intend to police research practice. The main interest is to make sure that good work is carried out and to support and stimulate.

The CoE at large has a good gender balance and the cohort of PhD students as well. Several of the research tasks address gender issues, for example the role of women in transition post-mining and 'affective' economies.

REXSAC will provide well organized and annotated meta- and raw/observational data building on the efforts made during the Fourth IPY, covering both natural and social sciences. Such data will be formatted to ease submission to databases following provided protocols. We will present our project and results of analysis through different open access platforms, such as the Arctic portal, which is a comprehensive gateway to Arctic information and data (<http://www.arcticportal.org/science>), the Swedish SITES station network (<http://www.nordgis.org/sites/home/index.php>), the Bolin Centre Database

(<http://bolin.su.se/data/tarfala/>), International Network for Terrestrial Research and Monitoring in the Arctic (<http://www.eu-interact.org/>), and others. We will publish scientific results in peer-reviewed Open Access journals promoting cross-disciplinary studies and popular science papers in international, national, regional and local publication channels, and in books with recognized international and peer reviewed academic publishers, and popular books with national publishing houses in the spirit of also reaching out to larger audiences. During 2016, with research in a build-up phase, few results have reached publication phase and data management of ongoing work has followed established procedures which means that some of the databases mentioned above have been used, but also others.

Given the considerable disciplinary and geographical diversity of REXSAC (and the the other Nordforsk Arctic CoEs) and the very different kinds of data there are still unresolved questions as to the optimal way of securing open science and data management in an efficient way while at the same time achieve coherence and overview of REXSAC data. Issues related to open science have been actively discussed in REXSAC in relation to a grant proposal (to Nordforsk) in October 2016 (not accepted) and in a broader discussion across all four Nordforsk Arctic CoEs on data storage and management. As more data are collected this discussion will continue during 2017.

Contributions of users and local communities during 2016 have occurred in several RTs. The largest of these, RT2, have had active participation of the Sami community in the Kiruna region and of reindeer herders in Finland. RTs 1 and 5 have collaborated with regional authorities at Greenland while RT 7 has collaborated with authorities at Svalbard.

## **7. Timetable for upcoming impact products, including possible risks and challenges**

So far REXSAC has worked hard to follow the plans, and the difficulties we have encountered have not been beyond the ordinary. We do see challenges in the complexity of data management and we expect these to be a central part of our work during 2017 and 2018. However, we have not undertaken any significant changes to our plan and nor do we anticipate such changes in the near future.

In the contracting process several of the ambitions in the proposal were detailed and entered into the working documents. The Progress plan, Annex 3 of the contract, details how program wide workshops/conferences are held once per year, typically in March. Coordination Board meetings are also held in March as part of the workshops and also in the fall, typically in September and typically in relation to PhD training activities and/or field work. Deliverables are expected to be produced more or less according to the plan presented in the proposal. A more detailed presentation of deliverables was made in the Publication plan, Annex 4 to the contract.

Risks: We deem that the biggest risk has to do with availability of research funding. If external funding in addition to the core Nordforsk grant doesn't come through the CoE will be affected from 2018 onwards especially when existing research funds start to cease in certain partners/research groups. Another risk is if research staff for various reasons cannot

fulfil their commitments, which in turn is often related to funding. This is particularly true for institute partners with little time flexibility compared to university faculty members.

## **8. The governance of REXSAC**

The overarching decision making and the planning and coordination of the NCoE REXSAC is carried out in a consortium wide Coordination Board. It has one representative from each consortium member/partner and it is chaired by the Program Director. This community typically overlaps with that of RT leaders and to the extent it does not, RT leaders are also included in the Coordination Board (as described in the main contract). Each member institution names its representative. The Board has an overseeing responsibility and serves as a forum for reviewing progress in relation to the NCoE goals and research and communication plans and advises the Director and Co-director on more significant adjustments as needs appear. The Coordination Board meets in annual Centre wide meetings and in the context of regular scientific activities, minimum twice per year, with a possibility of additional shorter web meetings. Meetings during 2016 are described further down. The day by day activities of REXSAC, such as the PhD student school, the planning of upcoming meetings and financial issues, are dealt with by a smaller executive committee which meets at least once a month.

## **9. Highlights of the research**

The research has started within several of the 10 research tasks in REXSAC. Below are some examples. Within RT 1 researchers have published an article on defining sustainable development, reviewing sustainability research in the Arctic (Petrov, A. N. et al, see publication list below). Within RT9, based on earlier work in other projects, including the Arctic Council assessment Adaptation Actions for a Changing Arctic, a chapter on scenarios from the Barents region is now in press: Nilsson, A.E. Carlsen, H. Bay-Larsen, I, et al. Future narratives. In: AMAP, 2017. Adaptation Actions for a Changing Arctic - Perspectives from the Barents Area. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway.



REXSAC researchers conducting field work at Sveagruvan, Svalbard, in September 2016 as part of the research in RT7. Photo: Dag Avango, 2016.

Within RT7, Dag Avango, Peder Roberts, Eric Paglia, Albina Pashkevich and Anne-Catherine Flyen carried out field research on de-industrialization and re-purposing of mining sites at Svalbard in September 2016. Dag Avango carried out field work for the same RT in Norrbotten in June 2016, in the Kiruna and Gällivare municipalities. The field work consisted of making interviews with various stakeholders as well as mapping and documentation of abandoned and active mining sites.

Researchers in RT1 worked on a project named Arctic Youth and sustainable futures: Three sets of focus group interviews with Arctic youth on sustainability indicators were scheduled: Bodö, Norway, May31-June 1; Nuuk, Greenland, May 19; Akureyri, Husavik and Reykjavik, Iceland, during the month of May and again in the fall. An international workshop was held in Roskilde, Denmark, in November 2016 where procedures and content for the youth and sustainable futures study were discussed; a terms of reference for engaging youth in the focus group work has been developed. Socio-economic development and global change in Nanortalik, South Greenland: A series of interviews were made locals in the town of Nanortalik on the topic of global change impacts, and prospects for economic development and community viability including the potential impact of mining in the region outside of Nanortalik, including uranium mining.

#### Key findings:

- Key findings from research tasks 1 and 9 show that rather than viewing sustainable development as an end result of activities, it is more useful to view sustainability as a process, where processes for sustainability are based on co-production of knowledge and creating space for social learning.

- Scenario exercises from the Barents region show that global resource markets is a source of major uncertainty when local and regional actors list the future changes that might influence this region economically, environmentally and socially within the perspective of one to two generations. This mirrors an economic structure where extractive industries play a major role for local economies and demography.
- Findings so far from RT7 show that practices for dealing with mining legacies in post-extraction communities differ substantially across the Nordic Arctic. In some contexts (e.g. Svalbard) most actors view the material remains of mining as a valuable resource for tourism and local identity, while in other contexts the remains of past extraction is seen as an unwanted legacy that ought to be washed away from narratives of both the past and visions of the future. Ongoing research on extractive industries in the Canadian North demonstrates how historical conflicts over mining development can influence contemporary responses to large-scale projects. The material legacies of closed and abandoned mining sites in Canada include toxic contaminants which pose major remediation challenges. Remediation planning struggles to meaningfully incorporate community and Indigenous values and knowledge.



Prof. Ninis Rosqvist, Stockholm University / REXSAC, measuring the height of Kebnekaise, the highest peak in Sweden located in Norrbotten/ Sápmi. Photo: Dag Avango, 2016.

We are confident interesting findings will come forward from REXSAC. Our reasons for this confidence are mainly two. The first is the track record of the research team. REXSAC consists of a large number of scholars who have consistently provided a high level of

research quality and output. If they could only stay in REXSAC and devote a reasonable amount of their time and energy, catalysed towards REXSAC goals and collaborations, this speaks highly in favor of good results. The critical factor will be funding and the ability of leadership in EXcom and RTs to energize and stimulate work and priorities and to keep ambitions bold and high.

The second reason for confidence is the Copenhagen workshop presentations in March 2017. As described above, they already seemed promising. They demonstrated ongoing and mature planned research which makes interesting future findings seem likely.

## **10. Researcher mobility**

The PhD students within REXSAC are trained in the methods and theories of their respective disciplines at their home universities. However, a major objective of REXSAC is also to train the PhD students in multidisciplinary. We work to achieve that in three main ways: 1) through the content of our PhD courses, 2) by providing the PhD students with three advisors of which one must be located at a partner university and 3) through rotation of PhD students. During this rotation, each PhD student will spend time at a second institution within REXSAC during their studies. In this way they will become involved with at least two research environments and two disciplines/scientific traditions. According to our plan, PhD student rotation will commence in 2018. In preparation for this, we had a first meeting with the PhD students about rotation during the coordination board meeting and PhD school in Copenhagen in March 2017, encouraging them to consider how to make use of this opportunity in the best way. At the same meeting, researcher mobility within REXSAC was discussed and plans for period visits were made for 2018 for researchers within the CoE.

See also table 2.

## **11. Researcher training and education**

A core activity within REXSAC is our PhD training program. The funding from NordForsk, together with co-funding from the universities within REXSAC where the PhD students are based, covers six PhD students. Two of those are placed at the Division of History of Science, Technology and Environment at KTH, one at the Dept of Physical Geography at Stockholm University (SU), one at the Dept of Political Science (SU), one at the Dept of Wildlife, Fish and Environmental Studies at SLU and two at the Dept of Cultural Anthropology at the University of Oulu, all in all two in science departments, four in social science/humanities departments. The University of Oulu has associated two more PhD students to REXSAC, making the total number of PhD students in the program 8 at the time of writing this report. From KTH there is also an additional PhD student attending courses and at Stockholm University an additional two, making a total REXSAC PhD community of 11 students. REXSAC started the recruitment process for PhD students in 2016 and finalized it in December.



Field base education in “Environment and society in a changing Arctic” at the Storglaciären, Tarfala, Sweden in 2016 – one of the courses in which REXSAC PhD students can participate. Photo: Dag Avango.

The REXSAC PhD students will participate in a PhD training program consisting of four mandatory courses and five optional. The mandatory courses are the following: 1) Interdisciplinary introduction to Arctic studies, 2) Methods and ethics: Working with stakeholders in a context of change, 3) Mining, communities, and sustainable development and 4) Global comparisons and post-extractive futures: Natural resources, climate and communities in change.

REXSAC organized the first course – Interdisciplinary introduction to Arctic studies – March 14-21, in connection with the coordination board meeting in Copenhagen March 13-15, 2017. As the title suggests, it was an introduction to the broad range of disciplines and fields of research within REXSAC, multidisciplinary across and between the humanities, social sciences and natural sciences. The course also introduced ways of integrating these disciplines in research concerning sustainability in the Arctic. The learning goals of the course were to provide students with basic knowledge about A) the Arctic region in terms of its natural environments, communities, cultures, economies, institutions, and its history, B) social science research on the Arctic, with a focus on the fields of economy and international relations. C) Arctic research in the natural sciences, with a focus on climate change and environment and D) research on the Arctic within the humanities, with a focus on history (multiple strands), representations and heritage.

In terms of literature and learning activities the course focused on the fields of research within REXSAC and we picked the teachers accordingly with Ass. Prof. Kirsten Thisted focusing on literary science, cultural studies, representations, heritage, qualitative methods; Dr. Joan Nymand Larsen teaching economics, institutions, indicators, quantitative methods; Prof. Ninis Rosqvist dealing with natural science, impacts of climate change; and finally Sverker Sörlin teaching history, humanities, institutions, and social science in Arctic research in general. In addition to those teachers, several scholars within the REXSAC center of excellence contributed with lectures.



The learning activities in the course included lectures, seminars, individual reading of course literature and other text materials and written assignments. The course was open also for students in the PhD programs of the REXSAC partners as well as other interested PhD students. The students will also write an essay based on the readings and lectures.

We will provide a full report on the course, including course description, program and syllabus, in the 2017 annual report.

See also table 3.

## 12. Output and dissemination:

The emphasis of the output and dissemination work within REXSAC in 2016 has been placed on making the project known among relevant audiences. Specific activities include:

- A press release in English and Swedish in January 2016.
- Developing a graphic profile and dedicated website ([www.rexsac.org](http://www.rexsac.org)), including short descriptions of research activities and researchers, relevant publications, and a few blogs and news items.

In terms of publications we refer to the publication plan in the REXSAC contract (Annex 4 of the contract), in which we did not promise to produce any publications in 2016; that is publications that are solely an outcome of NordForsk funding in 2016. Nevertheless, researchers at the partner institutions in REXSAC have produced a number of publications that are of relevance for REXSAC, speaking to the research problems we work on. For this reason we have listed such publications below in order to point out the value of bringing together scholars with related research interests and expertise into our centre. Some examples of publications in the first weeks and months of 2017 are also included to signal outcomes that are the result of work in 2016.

### 12.1. Peer reviewed scientific publications (\*Open access)

L. Robin D. **Avango**, L. Keogh, N. Möllers, and H. Trischler, "Displaying the Anthropocene in and beyond the museums," in *Curating the future : museums, communities and climate change*, Jennifer Newell, Libby Robin, Kirsten Wehner Ed., Milton Park, Abingdon, Oxon ; New York, NY : Routledge, 2017, pp. 252-266.

**Avango**, Dag and P. **Roberts**, "Heritage, Conservation, and the Geopolitics of Svalbard: Writing the History of Arctic Environments," in *Arctic Environmental Modernities: From the age of polar exploration to the era of the anthropocene*, Lill-Ann Körber, Scott MacKenzie, Anna Westerståhl Stenport Ed., Cham : Palgrave Macmillan, 2017, pp. 125-143.

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**Ruuskanen**, Esa and Kari Väyrynen, "Ympäristöhistorian historiankäsityksestä", in Kari Väyrynen ja Jarmo Pulkkinen (eds.), *Historian teoria: Lingvistikisestä käännteestä mahdolliseen historiaan* (Tampere, Vastapaino 2016), 332-365

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*Anthropocene*, Lill-Ann Körber, Scott MacKenzie & Anna Westerståhl Stenport, eds. (London: Palgrave Macmillan, 2017), pp. 263-285.

Wormbs, N., Döscher, R., **Nilsson**, A. E., **Sörlin**, S., (2017). "Bellwether, Exceptionalism, and Other Tropes: Political Coproduction of Arctic Climate Modeling", in: *Cultures of Prediction: Epistemic and Cultural Shifts in Computer-based Atmospheric and Climate Science*, eds. Matthias Heymann, Gabriele Gramelsberger & Martin Mahony (New York: Routledge, 2017), pp. 133-155.

## 12.2. Non peer reviewed publications

\***Avango**, Dag, and Peder Roberts. "Resource Extraction and Sustainable Arctic Communities." *TICCIH Bulletin* 71, no. 1 (2016): 12.\*

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**Sandlos**, J., and **Keeling**, A. "Pollution, Local Activism, and the Politics of Development in the Canadian North," *RCC Perspectives* 2016/4, pp. 25-32

\*Vanhanen, K., Partanen, M., **Komu**, T., **Sarkki**, S., **Heikkinen, H.I.** (2016) Muuttuva pohjoinen ja ympäristöhallinnan haasteet: kutsuvierastyöpajan yhteenvetoraportti. - Ei sarjaa/No series. Oulu. [http://www oulu.fi/kulttuuri antropologia/node/33159\\*](http://www oulu.fi/kulttuuri antropologia/node/33159)

## 12.3. Invited conference presentations

**Avango**, Dag "Resource Extraction and Sustainable Arctic Communities", paper presented at the annual conference of *Resources and Sustainable Development in the Arctic* (ReSDA), Ottawa, Canada, October 27-28.

**Heikkinen** Hannu I. *Resource Extraction and Sustainable Arctic Communities* ARKTIKO Annual Seminar 10 – 11 May 2016. Academy of Finland. Helsinki.

**Nilsson** A,E. Mining in the Arctic in the Context of Global Change. Presentation at *Best Practices for Mining and Sustainable Development in the Arctic* Luleå, Sweden, October 13-14, 2016

**Nilsson**, A.E. Can mining in the Arctic contribute to sustainable development? A multidimensional framework for assessing impacts of extractive industries. Invited presentation. Arctic-Frost Annual Network Meeting: Arctic Sustainability in the Global Context: What Can Arctic Sustainability Research Learn from or Teach the Rest of the World? Vienna, Austria, 9-12 September, 2016.

Sverker **Sörlin**, *Resource Extraction and Sustainable Arctic Communities (REXSAC)*. Presentation at the session "Meeting Tomorrow's Societal Challenges: Cross-border Cooperation in Arctic Research", organized by NordForsk at the European Science Open Forum (ESOF), Manchester, 25 July 2016.

## 12.4 Other conference presentations

**Avango**, Dag “Small countries and European resource colonialism” (together with Per Högselius and David Nilsson), paper presented at the workshop *Technology, natural resources and crises in the past and present of Europe and beyond*, Higher School of Economics (HSE) at St Petersburg, Russia, October 21-22.

**Avango**, Dag “Sustainable Communities and the Legacies of Mining in the Nordic Arctic” (together with Peder Roberts), paper presented at the conference *Entitle: undisciplined environments*, Stockholm March 20-24, 2016.

**Keeling**, A. “New Histories of Extraction,” co-organizer and panellist, American Society for Environmental History, Seattle, WA, April 2016

**Larsen**, Joan Nymand. “Arctic Economies and Sustainabilities”. Presentation at international conference WRSA – Western Regional Science Association. Santa Fe, New Mexico. February 15-18, 2017.

**Larsen**, Joan Nymand. “Arctic Youth and Sustainable Futures”. Presentation in an international workshop held in Roskilde, Denmark, Oct 28-29, 2016. Presenter and Organizer: Joan Nymand Larsen

**Larsen**, Joan Nymand. “A Preliminary Framework for Analysing Arctic Sustainable Economies in a Global Context”. Presentation at ArcticFrost (Arctic Frontiers of Sustainability: Resources, Societies, Environments and Development in the Changing North) conference. Vienna, Austria, September 9-12, 2016. Invited.

**Larsen**, Joan Nymand. “Natural Resources, Climate Change, and Human Societies: Changing directions in a new Arctic”. Presentation at Circumpolar Agricultural Conference on “Role of Agriculture in the Circumpolar Bioeconomy”. Reykjavik, Iceland. October 6-8, 2016. Invited Keynote.

**Larsen**, Joan Nymand. “A preliminary framework for analysing indicators, stressors, risks, and resilient futures: the case of the coastal town of Nanortalik, South Greenland”. Presented at Arctic Coasts workshop, on board the Russian icebreaker “Lenin”, Murmansk, Russia. June 22-25, 2016. Murmansk, Icebreaker Lenin, Russia. Invited.

**Larsen**, Joan Nymand. “Climate Change Impacts and Adaptation. Polar Regions and Iceland”. Presented at Meteorological Institute, Iceland. June 4, 2016. Invited.

**Larsen**, Joan Nymand. „Human development trends in the Arctic. How can we achieve innovation, growth and economic development in the Arctic?“ Presented at the international conference – Arctic Circle, in session 1: An Innovative Arctic? „Nordic Nexus – Nordic connections and solutions for a developing Arctic“, October 16, 2015. Reykjavik, Iceland. Author and presenter: Joan Nymand Larsen. Invited.

**Larsen**, Joan Nymand. „Resource Stewards and Users in the New Arctic“. Presented at international conference on Arctic Marine Resource Governance, in Session 1: Global management and institutions for arctic marine resources (theme 1), October 14-16, 2015. Reykjavik, Iceland. Author and presenter: Joan Nymand Larsen. Invited

**Lien**, Marianne. “Interruptions. Broken, resistant and constitutive relations around Gjemsh, Finnmark (a story of a planned quartz quarry expansion). Invited paper presented at the

REDO conference 'Environmental change and ritualised relationships with the other-than human world'. Berkeley, 21<sup>st</sup>-22<sup>nd</sup> October 2016.

**Roberts**, Peder. 'Science and Contrasting Visions of Prosperity in Northern Canada and Greenland, 1945-1980,' workshop 'Cold Science: Arctic Science in North America during the Cold War', Peterborough (ON), April 2016.

**Roberts**, Peder 'Mining, Modernization, and Memory in Greenland', seminar on mining heritage at the Falun World Heritage Site, April 2016.

**Roberts**, Peder 'National Parks as (Geo)Political Instruments on Svalbard', American Society for Environmental History annual meeting, Seattle, March 2016.

**Rosqvist**, G. Multiple pressures on reindeer husbandry in Arctic Sweden. Presentation at The Association of American Geographers Annual Meeting in San Francisco, March 2016.

**Thisted**, Kirsten, REXSAC - Resource Extraction and Sustainable Arctic Communities, presented at UCPH Arctic Symposium on November 24th, 2016 (poster and oral).

## 12.5 Web dissemination

Information about REXSAC activities are mainly reported via the dedicated website [www.rexsac.org](http://www.rexsac.org).

Basic information about the project is also available via SEI, SU and KTH websites, as well as websites of other partners:

<https://www.sei-international.org/projects?prid=2210>

<http://www.su.se/english/about/news-and-events/press/press-releases/new-nordic-centre-of-excellence-focusing-on-arctic-mining-communities-1.266488>

<https://www.kth.se/en/abe/inst/philhist/historia/forskning/rexsac-resource-extraction-and-sustainable-arctic-communities-1.683448>

<http://www.svs.is/en/projects/rexsac>

[http://vbn.aau.dk/en/projects/resources-extractive-industries-and-sustainable-arctic-communities-rexsac\(fcb1de47-a614-4382-8b1f-8fab83b7a139\).html](http://vbn.aau.dk/en/projects/resources-extractive-industries-and-sustainable-arctic-communities-rexsac(fcb1de47-a614-4382-8b1f-8fab83b7a139).html)

REXSAC is present on:

Facebook: <https://www.facebook.com/REXSACARCTIC/>

Twitter: <https://twitter.com/rexsacarctic>

## 12.6. Conferences arranged

Arctic Futures – Past and Present. 1 June 2016. A seminar in the series Thinking Ahead organized by SEI and KTH. The seminar included a REXSAC launch presentation by Sverker Sörlin and Gunhild Rosqvist, as well as presentations by REXSAC researchers Dag Avango, Peder Roberts, Annika E Nilsson, and Rasmus Kløcker Larsen.

REXSAC Program-wide meeting Copenhagen March 2017 hosted by University of Copenhagen: Read more here:

<https://www.rexsac.org/news-events/rexsac-coordination-board-meeting-copenhagen-march-2017/>

<https://www.rexsac.org/blog/reflections-dimensions-tensions/>

## 12.7. Media

”Tar knekken på myten om Arktis”, interview on Arctic Domus project at the Center for Advanced Study, Oslo, *Apollon* 2016:2, pp. 54-57.

Renarna drabbar redan av förändrat klimat Dagens Nyheter 27 December 2016. Interview with Gunhild Rosqvist: <http://www.dn.se/nyheter/sverige/renarna-drabbas-redan-av-forandrat-klimat/>

Klimathot skapar oväntad allians i lappländska vildmarken. EXTRAKT 10 June 2016. Interview with Gunhild Rosqvist <http://www.extrakt.se/klimatforskning/klimathot-skapar-ovantad-allians-i-lapplandska-vildmarken/>

Vattnet en central fråga för gruvnäringen i framtiden. Swedish radio P4 Norrbotten. 14 October 2016. Interview with Annika E Nilsson: <http://sverigesradio.se/sida/artikel.aspx?programid=98&artikel=6540787>

## 12.8. Other outreach

”Hur svårt kan det vara? Om klimatkunskap och kloka beslut”. Participation in discussions at Almedalen political week June 2016 (Gunhild Rosqvist, Sverker Sörlin, Niila Inga). Reported by Stockholm University: <http://www.su.se/om-oss/evenemang/almedalsveckan/ska-forskare-bli-politiker-och-lobbyister-1.289953>

## 13. Meetings and networking

Over the first year of activities in REXSAC we have, in accordance with our plan, conducted two major meetings – in Stockholm and in Copenhagen – with a third one in the making. The Stockholm event was the first coordination board meeting of REXSAC and took place June 1 – 2 in 2016. Invited to the meeting were the leaders of the 10 research tasks within REXSAC, some of its key researchers and the leaders of the partner universities and research institutes in the centre (in most cases overlapping). The objective of the meeting was to launch REXSAC, to build a community and to establish a common understanding of the purpose, scope and operational mechanisms of REXSAC among all its constituent parts. The launch event begun June 1 with a symposium taking place at Stockholm Environment Institute (SEI), entitled Arctic Futures – Past and Present, which included a presentation of REXSAC as well as some its research tasks. The rest of the workshop consisted of internal sessions of the NCoE, in which we presented and discussed plans for the research to be conducted within the 10 research tasks. On the second day we planned for future collaboration between the research tasks and teams, as well as funding applications, PhD student training and discussed a draft version of the NCoE contract.



**Albina Pashkevich, Dalarna University, presenting research on Arctic tourism at the REXSAC meeting in Copenhagen, march 2017. Photo: Dag Avango**

The second meeting took place in Copenhagen March 13-15. This was the first (out of three) program wide meetings within REXSAC, involving all active researchers and PhD students within the centre. In addition to these more than 50 participants in REXSAC, the meeting was also attended by representatives of other research networks working on related issues concerning extractive industries in the Arctic – “Mining Encounters and Indigenous Sustainable Livelihoods” (MinErAL), the Arctic Centre at Umeå University (ARCUM) and Resources and Sustainable Development in the Arctic (ReSDA). The objectives of the meeting were to A) present and discuss ongoing research within the research tasks and research teams and B) to conduct a coordination board meeting for planning upcoming activities of the centre in 2017 and beyond. The

presentations of ongoing work were made in seven plenary sessions. The first session, “Research centers and networks”, was devoted to the networks and on how we can cooperate in the future. The following sessions were devoted to ongoing research within REXSAC on the themes “Indicators and assessment: Defining sustainable development”, “Multiple pressures on Arctic environments and societies”, “Mining companies and indigenous communities”, “Mining legacies in post mining futures: recoding natural resources for future livelihoods”, “Contested pasts and futures: extractive industries in Greenland”. In a final session the REXSAC PhD students presented their dissertation projects. All sessions contained generous space for discussions.

The coordination board meeting took decisions on upcoming activities such as PhD courses and PhD rotation, communication and outreach, as well as upcoming coordination board meetings. The next meeting will take place at the REXSAC partner Stefansson Arctic Institute in Akureyri, Iceland, from September 25-27 in 2017. The meeting will be followed by the next REXSAC PhD student course, “Methods and ethics: working with stakeholders in a context of change”.

In addition to the above mentioned meetings, researchers in REXSAC have participated in several meetings intended to build cooperation with other networks working on issues related to REXSAC. October 27-28 Dag Avango presented REXSAC at the annual conference of the Canadian research network Resources and Sustainable Development in the Arctic (ReSDA) in Ottawa, Canada, connecting both with ReSDA and with the network “Mining Encounters and Indigenous Sustainable Livelihoods” (MinErAL). REXSAC has also been presented at key events such as ESOF in July 2016 and Arctic-Frost in Vienna in September 2016. The project was also presented at a workshop on “Best Practices for Mining and Sustainable Development in the Arctic” at LTU in Luleå, Sweden, October 13-14, 2016.

See also Table 5.



## 14. Infrastructure and data policy

REXSAC produces new data during field-campaigns using different measurement, sampling, documentation and interview techniques. Data is gathered in GPS-units, total stations, laser scanners and digital cameras (handheld and drones), as well as dictaphones and/or in smart-phones or tablet based apps. Site specific data consist of field-notes, drawings, films, photographs and GIS data. REXSAC scientists and scholars also gather data from archives – excerpts as well as copies and digital photos of documents. During the project REXSAC scientists and students will share this data via a link from the REXSAC web page to the online file storage service “box“. Data also consists of recorded and transcribed interviews. Access to this data will be handled in strict accordance with established ethical standards.

The wide scope of REXSAC research data will be made available in the form of metadata via the REXSAC webpage. However, after having published our research results, we will also make the observational, raw and analyzed data available through the REXSAC webpage. Our plan is to make it downloadable from a GIS platform, built by our partner network Resource and Sustainable Development in the Arctic (ReSDA)(1) – the ReSDA atlas. Currently this GIS platform provide open access data and publications as well as general information on mining sites and mining communities in the Canadian Arctic. By contributing data from the case study areas of REXSAC in the Nordic countries, we can contribute to developing this atlas into a circum-arctic resource. We aim to publish our data with a Creative Commons Attribution license, which enables the re-use and new use of the materials that the research findings were based on.

### *Use and need of infrastructure*

REXSAC scientists will use data provided by Tarfala Research Station and the Swedish Infrastructure for Ecosystem Science (SITES)(2) which are available via the Bolin Center database, Stockholm University (3). We also use data from GPS tracking of reindeers provided by the Sámi communities and stored in the WRAM data base (4).

The Swedish National Data Infrastructure for Climate and Earth System Research (S-NICE) will, if funded by the Swedish Research Council, provide a national infrastructure for the integration and accessibility of data for the climate-related research conducted within REXSAC. REXSAC scientists will benefit from the transnational access program in the EU infrastructure program International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT)(5).

Links:

- (1) <http://yukonresearch.yukoncollege.yk.ca/resda/projects/resda-atlas/>
- (2) <http://www.fieldsites.se/en-GB>
- (3) <http://bolin.su.se/data/tarfala>
- (4) <https://www.slu.se/en/Collaborative-Centres-and-Projects/wireless-remote-animal-monitoring-wram/>
- (5) <http://www.eu-interact.org/>

## 15. Progress and contributions towards programme aims

REXSAC has worked towards the programme aims in several ways. Below we discuss them one by one:

**A) To strengthen the Nordic region's position within educational research in Europe and beyond:** This point has been addressed above under Nordic added value. It is too early to make any more comprehensive assessment of how a CoE nine months down the road can affect the position of the Nordic region's position within "educational research in Europe".

**B) To contribute to a knowledge-based policy for the educational sector in the Nordic countries by analyzing issues of substantial importance and relevance to both the sector itself, policy makers and researchers:** On this point as well we take a humble approach. With all due respect we don't identify REXSAC so much an effort that is set up to contribute to a knowledge-based policy for the educational sector in the Nordic countries and we have not been able to address this very demanding issue enough during the first nine months of our activities to have anything more substantial to contribute at this point – apart from the more general reflection that our PhD training has the ambition to be an innovative contribution for thematic interdisciplinary doctoral education, and we will return to progress on that score.

**C) To disseminate the results to a wide array of stakeholders in the Nordic region and internationally:** Dissemination of results has been outlined in a dissemination/communication plan in the proposal and in the Publication plan, Annex 4 to the contract. The Output and dissemination from REXSAC during 2016 presented above demonstrates that dissemination has been way above target in quantitative terms. We note with satisfaction that we have during 2016 also been able to have some of our scholars/scientists appear in media and local communities which is an important part of our ambitions.

## 16. Impact strategies and plans

The overarching goal of the REXSAC communication and engagement plan is to support full inclusion of sustainable development objectives in decisions about resource exploitation in the Arctic at the local, national and circumpolar levels. Given that we see sustainability as a process the focus of the communication and engagement strategy is to develop innovative approaches for engagement with a range of relevant actors. Examples include the further development of scenario methods as a way of visioning alternative futures and their various consequences and to link such engagement methods with research task that focus on specific aspects, such as environmental impacts or the role emotions. We already engaged with communities that are affected by extractive industries (e.g. RT2) and have during 2016 started to identify relevant national and international contacts for engagement with policy actors and industry. Especially relevant in this context are on-going discussions about workshop collaboration with the Arctic Council project Arctic EiA.

In addition to these tangible developments, indications of future plans include an application for research funding for mapping knowledge of mining impacts with an innovative approach that combines systematic literature review with collaborative methods to gather insights

from indigenous knowledge holders and practitioners. Such a project would create a strong platform for dissemination and impacts of insights from the REXSAC project overall.

## 17. Potential media stories

Already, we have media attention about the collaboration between natural science and local Sami (Dagens Nyheter 28 December 2016: <http://mobil.dn.se/arkiv/nyheter/renarna-drabbas-redan-av-forandrat-klimat/>) This collaboration is likely to be relevant for media also in the coming years. Another potential story is related to uranium mining on Greenland and the link between extractive industries and emotions and political visions about the future. In general, media stories are likely to be where REXSAC researchers contribute to important societal discussions rather than about the research projects and their results.

## 18. Supplementary funding

### 18.1. Granted funding

#### University of Oulu

- Primary Industries and Transformational Change (PITCH). Grete Hovelsrud (lead). Funding agency: Norwegian Research Council, Klimaforsk. Duration: 2014-2018. Funding for WP5: some 90 000€.
- Understanding the Cultural Impacts and Issues of Lapland Mining: A Long-Term Perspective on Sustainable Mining Policies in the North. Vesa-Pekka Herva (lead). Funding agency: Academy of Finland, Arctic programme. Duration: 2014-2018. Funding: 628000 €.
- Valuing peatlands: changing land use practices, knowledge transfer and institutionalized notions regarding bogs, fens and mires in Finland and Sweden, circa 1700-2000. Esa Ruuskanen (lead). Funding agency: the Academy of Finland. Duration: 2014-2018. Funding: 465000 €.

#### KTH-Royal Institute of Technology

- Mining heritage as a resource for sustainable communities. Dag Avango (lead), Peder Roberts, Ninis Rosqvist and Camilla Winqvist. Funding agency: Vetenskapsrådet / Swedish Research Council. Duration: 2017-2020. Funding: 4.9 MSEK.
- Mining heritage as a resource for sustainable communities: lessons for Sweden from the Arctic. Dag Avango (lead), Albina Pashkevich, Peder Roberts. Funding agency: Formas. Duration: 2017-2019. Funding: 2.9 MSEK.
- Sustainable communities and the legacies of mining in the Nordic Arctic. Dag Avango (lead), Albina Pashkevich, Peder Roberts and others. Funding agency: Nordregio. Duration: 2016-2017. Funding: 300 000 DKK. Field work funding.

- Greening the poles: science, the environment, and the creation of the modern Arctic and Antarctic. Peder Roberts (lead). Funding agency: European Research Council. Duration: 2017-2022. Funding: 1.5M Euro. + KTH co-funding for Arctic Environmental History research.

### **Memorial University of Newfoundland (RT13)**

- Towards Environmentally Responsible Resource Extraction Network (NSERC-TERRE-NET). A. Keeling, co-investigator (lead: David Blowes, University of Waterloo). Funding agency: Natural Sciences and Engineering Research Council (NSERC) Strategic Partnership Grant for Networks. Duration: 2016-2021. Value: \$6 million CAD.

## **18.2. Funding applied for**

### **Stockholm Environment Institute, Stefansson Arctic Institute and Greenland Institute of Natural Resources**

- REXSAC researchers Annika Nilsson, Mark Nuttall, and Joan Nymand-Larsen are part of an application to the Nordic Council of ministers for funding of a workshop in Ilulissat, where scenario methods will be used. Project title: Sustainable Adaptation to Climate Change and Globalization in Disko Bugt, West Greenland – Identifying Opportunities and Threats. Main applicant Morten Rasch.

### **University of Oulu (2016-17)**

- Ruuskanen, Esa (PI), Environmental history of European Arctic and sub-arctic peatlands: from conquest and colonisation to the increasingly complex perspectives of the recent past and present (EH-PEAT), Academy of Finland (September 28, 2016).
- Heikkinen Hannu I (PI) How to Glocalize Sustainable Growth? Social Innovations Functioning as Adaptations in Arctic Extractive Industries and Tourism Development (GLOWFACE). Academy of Finland 3M€ (STN call, not successful).
- Heikkinen Hannu I (PI) TRANSFORMATION, SOCIAL INNOVATION AND SUSTAINABLE ARCTIC COMMUNITIES (TRANSARCT), University of Oulu, Strategy funding. Applied for post doc and two PhD students (Not decided).

## **19. Programme evaluation**

REXSAC has experienced overall good, strong support from Nordforsk in the initial stages. We note good support in contracting and budgeting issues and the patience has been appreciated when things took more time than anticipated. It is not easy to get big research conglomerates off the ground. We may note some lack of realism when it comes to possibilities of assembling people, which we interpret as derived from a very high level of ambition.

The extra funding for special missions are appreciated but we also note that topics and themes for these were not open to consultation but parachuted down to the CoEs. The calls had short deadlines, especially the one on open data. We did sense some lack of transparency in this process. One could also question whether open calls are the adequate method to distribute funding among such a small group of possible applicants. Had enough thought gone into the process issues? Any call is after all an effort that takes time and energy from something else.

A more general reflection that has grown during the first year as we have recruited PhD students and started developing their program is that there might be a certain tension between what may be called generic and Arctic specific components of the training. This may be especially true for social sciences and humanities where Arctic careers are not as obvious as for some of the science fields. To provide Arctic relevance that is tangible and hands on for communities and businesses requires finesse if you should at the same time be responsible in relation to the long term career opportunities of students who will ultimately seek careers anywhere. We think this is a stimulating challenge to consider.

## **20. Requests for Programme support**

At the end of the day, the most significant issue in a vast CoE with little funding for senior research time will ultimately be the level of available research capacity, in practice: funding. That is also what we have identified as the main risk for the CoE. Over a five to six year period one could perhaps identify special areas of interest where it might be possible to seek common action within the family of Nordforsk Arctic CoEs to return to the funders across Nordic countries and propose funding initiatives in targeted areas. This would supplement the distributed funding attempts that otherwise tend to occur in the smallest parts of the research organization, the individual scholars or small groups.

Something similar could be said for outreach and dissemination, over the long term it requires resources to be carried out with vigor.

## 21. Tables

**Table 1: Personnel of the Centre**

Here are listed the names of the research team leaders involved in the NCoE. We have attempted to follow the instructions, i. e.: given the number of other researchers and students who have worked within the project; indicated the number of persons in each category as listed (number of, number of person years in total and the number of person years paid by the NCoE).

<b>Name of the research team leader</b>	<b>Host Institution</b>
Sverker Sörlin	KTH-Royal Institute of Technology
Gunhild Rosqvist	Stockholm University
Annika Nilsson	Stockholm Environment Institute
Bjarne Grønnow	National Museum of Denmark
Hannu Heikkinen	University of Oulu
Kirsten Thisted	University of Copenhagen
Marianne Lien	University of Oslo
Mark Nuttall	Greenland Institute of Natural Resources
Joan Nymand Larsen	Stefansson Arctic Institute
Göran Ericsson	Swedish University of Agricultural Sciences
Albina Pashkevich	Dalarna University
Anne Catherine Flyen	Norwegian Institute of Cultural Heritage
Arn Keeling	Memorial University of New Foundland
Lill Raastad Bjørst	Aalborg University
Dolly Jørgensen	Luleå Technological University

<b>Category</b>	<b>Number of Persons</b>	<b>Person years in Total</b>	<b>Person years paid by the NCoE</b>
<b>Professors and associate professors</b>	27	1,01 (12,5 months)	0,6 (7,2 months)
<b>Senior researchers (other than above)</b>	13	0,6 (7 months)	0,6 (7,2 months)
<b>Postdoctoral researchers</b>	4	0,16 (2 months)	
<b>Postgraduate students</b>	1 (+4)	3,6 (37 months)	0,16 (2 months)
<b>Other academic personnel</b>	?		
<b>Auxiliary personnel (office, technical, other personnel)</b>	2	0,16 (2 months)	

**Table 2: Researcher mobility**

Research stays abroad and visits by foreign researchers (mobility defined as a stay abroad of at least 2 weeks duration).

No researcher mobility has occurred in 2016.

### Table 3: Researcher training and education

Courses organized, number of students participating (own students and other students), number of ECTS points gained in the courses, number of PhD and Post Docs, both national and international:

Course (name of course, institution, person responsible)	Own Students	Other students	Number of ECTS points
Interdisciplinary introduction to Arctic Studies	8	4	7,5

Number of PhD students and Post Docs recruited in the Nordic countries (specified by country) and number of PhD students recruited internationally:

<b>Number of PhD students recruited in Nordic countries (specify the country)</b>	3 Sweden (2 start 2017) 1 Finland (start 2017)
<b>Number of PhD students recruited outside Nordic countries</b>	1 Canada (start 2017) 1 Austria (start 2017)
<b>Number of Post Docs recruited in Nordic countries (specify the country)</b>	1 Denmark (start 2017)
<b>Number of Post Docs recruited outside Nordic countries</b>	

Number of PhD degrees achieved at the Centre in reporting period.

<b>Number of PhD degree achieved</b>	0
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## Table 4: Output and dissemination

NOTE: The publications are listed under section 12, below are only the numbers.

The first table is for publications, reports and outreach activities with the main activities/collaboration funded by the NCoE. The second table is for publications, reports and outreach activities where the NCoE research has contributed. Also, report the number of Open Access publications.

### Outreach and Dissemination main activities/collaboration funded by the NCoE

Peer reviewed scientific publications / of which Open Access	0
Non peer-reviewed publications / of which Open Access	1
Reports	0
Publications for the public	0
Invited conference presentations	3
Conference presentations, oral / poster	7
Number of appearances in media	4
Outreach and dissemination to the public	1
Web disseminations	4
Conferences arranged	2
Summer courses	1

### Outreach and Dissemination where the NCoE has contributed

Peer reviewed Publications / of which Open Access	27
Non peer-reviewed Publications / of which Open Access	3
Reports	0
Publications for the public	0
Invited conference presentations	1
Conference presentations, oral / poster	10
Number of appearances in media	0
Outreach and dissemination to the public	0
Web disseminations	0
Conferences arranged	0
Summer courses	0

### Table 5: Meetings and networking

Number of workshops with invited speakers, conferences and other academic events organised by the NCoE:

Workshops	2
Conferences	0
Other academic events	1
Total	3



**SEI** STOCKHOLM ENVIRONMENT INSTITUTE



**UiO** : University of Oslo



**Greenland Institute of Natural Resources**  
*Pinnngortitaleriffik · Grønlands Naturinstitut*



**AALBORG UNIVERSITY**  
DENMARK



UNIVERSITY OF COPENHAGEN



**Nationalmuseet**  
National Museum of Denmark

