

Arctic research in the University of Helsinki

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1. Introduction

The Arctic is a polar region located at the northernmost part of the Earth. The Arctic consists of the Arctic Ocean and parts of Alaska (United States), Canada, Finland, Greenland (Denmark), Iceland, Norway, Russia, and Sweden. Socially and politically, the Arctic region includes the northern territories of the eight Arctic states, although by natural science definitions much of this territory is considered subarctic.

Today, the Arctic region is changing dramatically. The change is related to climate change, use of natural resources and land use, having diverse social, cultural and ecological impacts. Interdisciplinary research is needed in order to understand the complexity of the Arctic change and to provide scientific basis for solutions. University of Helsinki (UH) is an important actor in the Arctic scene, according to some estimate, producing around 20% of the Finnish Arctic research.

We have limited knowledge about the Arctic research and other Arctic related activities that are conducted / carried out at the UH. This has led to lack of coordination in the field of Arctic research. In order to overcome this gap, the UH conducted the survey on Arctic research and related activities in the UH on October 2014. The results of a survey are presented in this report. Here, Arctic research means all kind of research which is conducted in Arctic context, including research in natural sciences, humanities, social sciences, etc.

The University also aims to deepen the research collaboration among other Arctic universities, particularly with the University of Hokkaido, in Japan. The Japanese minister of education is directing funding for the arctic research, and the University of Hokkaido is looking for partners for research projects on the Arctic. In addition to increasing the international research possibilities, the results of the survey will be used to develop the university's own research profile.

The survey¹ was sent to all departments of the university where all the professors –in- charge were asked to gather the information on the arctic research done in their major, or it was also possible to fill the survey individually by a single researcher. After the survey deadline, it was re-send to those faculties and departments where no responses were received. In addition, those researchers known for their arctic research were contacted individually. However, there might be researchers who have not filled the survey despite the requests, and their research is not presented here. Therefore, the report gives a general overview on the volume of the Arctic research and other activities in the University of Helsinki, but not an exact picture. For example, no responses were received from the faculties of theology, pharmacy and behavioral sciences, and we assume that there is no (major) Arctic research in these faculties.

We will first present a summary of the arctic research and activities in the faculties, and the following chapters present the details of the responses in each faculty. In the end, we draw some conclusion on the Arctic research in the UH.

¹ The survey was conducted via Helsinki university eform –service. See the survey <https://elomake.helsinki.fi/lomakkeet/53997/lomake.html>

We hope that this report also encourages researchers from the different field and faculties to learn from each other's work and creates possibilities for the interdisciplinary collaboration in the Arctic research!

Kaisa Korhonen-Kurki, Jari Niemelä, Ritva Dammert

2. Summary of the Arctic activities in the university of Helsinki

Responses were received from six faculties and one independent institute. Table 1 presents the summary of the results of the survey. Because of the variation in accuracy of the responses, particularly concerning the funding information, the overall sums by the faculties are rough estimates. The details of the arctic research in the departments and faculties are presented in the following chapters.

Table 1. Summary of Arctic research in the university of Helsinki

Faculty	Law	Arts	Science	Bio-and Environ	Agriculture / forestry	Social sciences	Aleksanteri-Institute	Faculties of Medicine and Veterinary Medicine
<i>Professors²</i>	1	4	8	9	6	2	1	
<i>University lecturers</i>	-	4	5	4	4	-	-	
<i>Other PIs</i>	1	3	10	7	4	1	-	
<i>Research groups, person years³</i>	2	~33	~66	~43	~20	~5.5	~4	
<i>Funding</i>	Academy of Finland 328 265 e	Several sources, no exact euros given ~several 100 000	several sources ~2.8 milj euros ⁴ yearly	several sources ~2.4 milj euros	Several sources, more than 1 milj euros	Nordic council 156 000 e, + side-projects	~285 710 e	
<i>National collaboration</i>	University of Lapland	Universities and museums	Universities, research stations, research institutes	Universities, research stations, research institutes	Universities and research organisations	Arctic Center, university of Lapland, and Tampere	Universities and universities of applied sciences, research institutes	Collaboration starts with various international and national partners

² In the table 1 professors, university lecturers and other PIs mean the number of personnel in that category in the faculty who are doing arctic research.

³ Person years per faculty are calculated by summing the years in the survey answers. However, it needs to be noted that they are rough estimates, because of the variation in the accuracy of the information.

⁴ Includes Kulmala's center of excellence with the estimation that 50% of the research they do is Arctic research, which might be an overestimation.

								rs for applyi ng fundin g
<i>International collaboration</i>	Several universities in Canada and Europe	Several European universities , esp. in Norway, and also Hokkaido Japan.	International observation networks, universities	Several foreign universities, in Norway, Japan, Canada etc.	Universities in Europe, China and possible in Japan	Several foreign universities and research networks	Foreign universities, including university of Hokkaido Japan	
<i>Other activities</i>	Public seminars	international movement of indigenous peoples, workshop in Lapland	Carbon tree – animation , field courses in Lapland	memberships and national representatives in international networks and in the Arctic advisory board appointed by the prime minister's office, BioArt collaboration in Kilpisjärvi station, several symposia on the Arctic	Public lectures	Public conferences, newspaper articles, collaboration with Sami indigenous people organizations		

3. Faculty of Law

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

Jarna Petman, Vice Dean of the Faculty of Law & Senior Lecturer (att. to the duties of Professor) of International Law & Deputy Director of the Erik Castrén Institute of International Law and Human Rights, Reetta Toivanen, Finnish Academy Research Fellow, Erik Castren Institute, Professor Kai Kokko, environmental law.

Number and size of research groups conducting Arctic research (in person years, past 5 years)

Toivanen: in the project one postdoc for 12 months, 2-4 PhD students with 10-40 % of work load as research assistants, and PI Reetta Toivanen (Dr. Phil.). Academy of Finland Academy Fellowship research project in legal anthropology which aim is to understand how minority rights are vernacularized in municipalities where inhabitants belong to different majority and minority populations. One of the doctoral students in International Law, Margareta Klabbers (LL.M.) uses the Arctic area as a case study on international governance (dealing with issues such as sovereign jurisdiction, environmental regimes, etc. within the Arctic). Professor Martti Koskenniemi is supervising the thesis. Kokko: Sustainable Mining, local communities and environmental regulation in Kolarctic area (SUMILCERE) (University of Lapland)

Funding (e/year, a source, name of a research project, past 5 years) of R. Toivanen

Research funding for 5 years academy researcher's salary and 328 26500 euro research funding from the academy of Finland

National research collaboration of R. Toivanen

University of Lapland, one 2-day seminar including themes relating to Saami rights.

Poga - The language survival network since 2007 (funded by Kone Foundation, HERA, NOS-HS, Volkswagen Foundation); MinorEuRus- project (funded by the Academy of Finland) since 2011 (led by J. Saarikivi, in Finno-Ugric Studies), Sanna Valkonen, University of Lapland (conducting group interviews together 2014) Janne Saarikivi, Helsinki Collegium (group interviews together 2014, joint writing processes of two books). Kokko: University of Lapland.

International research collaboration of R. Toivanen

McGill University, Canada, project on constitutionalism including native constitutionalism and native rights, funding application pending. Ronald Niezen, McGill University; exchange of information, research visits Fernand de Varennes, University of Hong Kong; exchange of information, research visit Isabelle Schulte-Teckhoff, Graduate Institute, Geneva: exchange of ideas, brainstorming for future, research visit Johanna Laakso, University of Vienna: writing together Anneli Sarhimaa, University of Mainz: writing together Sia Spiliopoulou Åkermark, Åland Peace Institute: writing together, Max Planck Institute for Social Anthropology: enhancing legal anthropological theory and methodology

Other activities (Societal Interaction related to Arctic, for example) of R. Toivanen

Research in municipalities of Porsanger (Norway), Inari, Enontekiö (Finland) and Lovozero (Russia)
Dissemination seminars, interviews, participation in local activities Seminars also at the University of Helsinki on research related topics (such as Barents Sea area identities and indigenous peoples, about Sámi matters, etc.)

4. Faculty of Arts

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

- *Finno-Ugrian and Scandinavian studies*: Ulla-Maija Forsberg, Professor of Finno-Ugric linguistics, research on Ob-Ugric languages in Siberia. There is also one Saami lecturer (PhD)
- *European Ethnology*: Hanna Snellman, Professor of European Ethnology
- *Modern languages*: Ekaterina Protassova, university lecturer Ekaterina Gruzdeva, university lecturer in general linguistics Nivkh language, Seppo Kittilä, university lecturer in general linguistics Uralic languages, Matti Miestamo, professor of general linguistics, Skolt Saami language.
- *Archaeology*: Prof. Mika Lavento, archaeology of the Neolithic and Early Metal Period, University Lecturer Antti Lahelma, Neolithic and Early Metal Period rock paintings, Docent Tuija Rankama, Pioneer settlement in northernmost Scandinavia during the Mesolithic Docent Petri Halinen, Northern Settlement in Finland, Scandinavia and some parts of the Kola Peninsula (different periods)
- *Area and cultural Studies*: Peter Stadius, Nordic Studies, Petsamo and bringing modernity to the Arctic during the First Republic of Finland. - Sub-project of ARCMOD (Arctic Modernities), project is funded by the Polar Programme (POLARPROG) of the Research Council of Norway (NFR) with a project period from 1 August 2013 until 31 July 2016. Rani-Henrik Andersson, North American Studies: indigenous first nations of Canada and Alaska. 1-3.

Number and size of research groups conducting Arctic research (in person years, past 5 years)

- *Finno-Ugrian and Scandinavian studies* : Irja Seurujärvi-Kari, PhD, lecturer of Saami language Florian Siegl, PhD, post doc researcher (2012-2015), Enets, Samoyed, Tungusic and other Paleo-Siberian languages, southern Saamic languages Lotta Jalava, MA, PhD student (2011-2014), currently finishing her PhD on evidentiality in Tundra Nenets
- *European Ethnology* : Social Sciences and Humanities Research Council of Canada, "Northern Communities in a Changing World: Towards a Better Understanding of Global Competition", directed by Ronald Harpelle, Lakehead University, Canada, 2009-2011, collaborator (Hanna Snellman responsible for applying the funding and leading the Finnish sub-project The project also included a sub-project in Uruguay directed by Diego Piniero. Hanna Snellman, Professor of European Ethnology and post docs and PhD students "Mobile borders, border mobilities: The cultural politics of everyday life in two Arctic frontier regions"
- *Modern languages* : member of two projects connected with the revitalization of the languages of the North conducted under the auspices of the Finland-Russia-Society. We try to help organizing bilingual education in those areas. Documentation project on Skolt Saami language ca.. 3 person years 2010-2014 (+1,5 htv 2015). Research on Nivkh language ca. 0.4 person years per year .
- *Archaeology* : Ca. 15 years together. One PI docent worked in the Academy of Finland together with the PhD in the project called LaPIO. To the project were connected 2-5 PhD

students and 2 MA students. The project was also an active organiser of a Scandinavian group of scholars interested in the Late Palaeontological and Early Mesolithic communication routes and communication settlement in the arctic area. In addition, one PI researcher has done his own field research in Lapland yearly.

- *Area and cultural Studies* Peter Stadius, Nordic Studies, Petsamo and bringing modernity to the Arctic during the First Republic of Finland. - Sub-project of ARCMOD (Arctic Modernities), project is funded by the Polar Programme (POLARPROG) of the Research Council of Norway (NFR) with a project period from 1 August 2013 until 31 July 2016. Rani-Henrik Andersson, North American Studies: indigenous first nations of Canada and Alaska. 1-3 person years s Marika Sandell (Phd Student)

Funding (e/year, a source, name of a research project, past 5 years)

- *Finno-Ugrian and Scandinavian studies* : University of Helsinki Langnet doctoral school (2011-2014) European Science Foundation (2009-2012) Kone foundation (Archives in Florian Siegl project) (2014-2016)
- *European Ethnology* : Currently a bending EU-funding ERA.Net RUS Plus_project "Mobile borders, border mobilities: The cultural politics of everyday life in two Arctic frontier regions" (MOBBORD for 4 years (PI Hanna Snellman); Social Sciences and Humanities Research Council of Canada, "Northern Communities in a Changing World: Towards a Better Understanding of Global Competition", 2009-2011 (Finnish PI Lead Hanna Snellman
- *Modern languages*: Finnish Cultural Foundation, n. 67 000 - / year, Kone foundation, Documentation project on Skolt Saami 2014-2015 n. 55 000 - / year, Finnish Cultural foundation Documentation project on Skolt Saami
- *Archaeology* : Most funding has been recently received from the Academy of Finland. The PhD students have been funded mostly by the money of the National research school of archaeology in Finland funded by the Academy. "Home, Hearth, and Household in the Circumpolar North", funded by European Science Foundation (ESF), see <http://www.sami.uit.no/boreas/>. Not sure about sums. "Lapland Pioneers The Early Postglacial Settlement of Northern Lapland", funded by the Academy of Finland. 100 000-/year.
- *Area and cultural Studies* PhD project funding.

National research collaboration

- *Finno-Ugrian and Scandinavian studies*: Finno-Ugrian Society Finnish National Museum
- *Modern languages*: *Institute for the Languages of Finland* 2010-. The Language Bank of Finland /FINCLARIN, archiving the material from Skolt Saami, 2014-
- *Archaeology*: National collaboration has been made together with the University of Oulu and the Arctic Museum in Rovaniemi and the Museum of SIIDA in Inari. Cooperation in Finland is natural together with many participants and local people.

International research collaboration

- *Finno-Ugrian and Scandinavian studies* : The pedagogical university of Tomsk, 2014-2016 University of Munich, 2009-2012 (EuroBABEL research project "Ob-Ugric languages", European Science Foundation) University of Wien, 2009-2012 (EuroBABEL research project "Ob-Ugric languages", European Science Foundation) University of Szeged, 2009-2012 (EuroBABEL research project "Ob-Ugric languages", European Science Foundation)
- *European Ethnology* : The bending application includes: University of Vienna Peter Schweitzer (Austria Lead PI) Jelena Tomic, Senior post-doctoral researcher Gertrude Eilmsteiner-Saxinger, Junior post-doctoral researcher N.N., pre-doctoral researcher Centre for Independent Social Research (CISR), Russia several partners
- *Modern languages*: Different Russian Universities and NGOs interested in early bilingualism. Collaboration with Hokkaido University with Nivkh language project.
- *Archaeology*: Mika Lavento together one PI has been a member of the European research project Home, House and Household which belonged to the Boreas research group, founded by the ESF. The HHH -part included Sweden, Norway, Finland and Russia. Cooperation takes place together with the archaeologists without problems in all these countries. This has happened in the University of Helsinki since the early 1990s when the first large archaeological excavations were organised in the E side of Lake Onega. University of Tromsø, Norway
- *Area and cultural Studies* ARCMOD (Arctic Modernities), project is funded by the Polar Programme (POLARPROG) of the Research Council of Norway (NFR) with a project period from 1 August 2013 until 31 July 2016.

Other activities (Societal Interaction related to Arctic, for example)

- *Finno-Ugrian and Scandinavian studies*: PhD Irja Seurujärvi-Kari, the Saami lecturer has been involved in numerous ways in the international movement of indigenous peoples, Arctic Sea region, Saami collaboration over boundaries etc
- *European Ethnology* : Collaboration in the communities within the Finnish Arctic (Salla, Kemijärvi): collaborative workshops, talks etc by Hanna Snellman
- *Modern languages* Support for revitalisation of the languages of the Skolt Saami and Nivh languages
- *Archaeology* Participation in Nordic Blade Technology Network, see <http://www.nordicbladetechnologynetwork.se/>

5. Faculty of Science

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

- *Atmospheric Science*: Professors: Markku Kulmala; Professor in Aerosol and Environmental Physics; Atmospheric aerosols and climate change in the Arctic region, Tuukka Petäjä; Professor in Experimental Atmospheric Sciences; Atmospheric new particle formation, aerosol-cloud-climate interactions and feedback mechanisms in the Arctic region, Matti Leppäranta (snow) University lecturers: 1) Mikael Ehn; Atmospheric Mass Spectrometry; Developing and deploying state-of-the-art mass spectrometric techniques for gas and aerosol phase analysis in the Arctic region 2. Antti Lauri; Aerosol Physics; Focuses on running and developing Doctoral Training around Arctic topics 3. Taina Ruuskanen; Aerosol Physics 4. Marja Bister; Dynamic Meteorology; Upper tropospheric humidity over the Arctic region 5. Jouni Räisänen; Climate change projections in the Arctic and Boreal region, Other PIs: 1.Hanna Manninen; Atmospheric Aerosols and Ions 2.Katrianne Lehtipalo; Atmospheric Aerosols and Ions 3.Mikko Sipilä; Atmospheric Mass Spectrometry 4.Nonne Prisle; Aerosol-Cloud-Climate Interactions 5.Michael Boy; Atmospheric Modeling 6.Risto Makkonen; Earth System Modelling 7.Leena Järvi; Urban Meteorology, 8. Mari Pihlatie; Soil Dynamics 10.Sigrid Dengel; Greenhouse gas exchange in the Arctic
- *Radiochemistry* professor Jukka Lehto, radiochemistry, behavior of radionuclides and foodchains in the environment in Lapland - a minor area of research, Other PIs: Dr. Susanna Salminen-Paatero
- *Geography*: Professors: Miska Luoto, physical geography Janne Soininen, spatial environmental research Petri Pellikka, geoinformatics Janne Rinne, physical geography, Heikki Seppä,

Number and size of research groups conducting Arctic research (in person years, past 5 years)

- *Atmospheric Science*: The Center of Excellence in Atmospheric Sciences led by prof. Markku Kulmala involves the departments of Physics, Forest Sciences and Chemistry at the University of Helsinki. Our main scientific objective is to quantify the feedbacks between the atmospheric processes and functioning of biosphere in changing climate. We have high standard atmospheric and environmental observation stations in the Northern parts of Finland that belongs to the Arctic region. We are approximately 100 researchers at the University of Helsinki, working in 17 sub-groups. Altogether approx. 100 person years since not all research is focused on Arctic.
- *Radiochemistry* 1-2 persons part-time
- *Geography*: Luoto group: 3 PhD students, one post doc, six master thesis students Soininen group: 1 PhD student, one post doc, two master thesis students

Funding (e/year, a source, name of a research project, past 5 years)

- *Atmospheric Science*: 786 000 euros/year; Academy of Finland; Center of Excellence 2 000 000 euros/year; University of Helsinki 100 000 euros/year; Foundations 200 000

euros/year; Tekes 100 000 euros/year; Ministry 2 000 000 euros/year; EU 50 000 euros/year; Enterprises

- *Radiochemistry*: minor as part of larger projects
- *Geography*: 80 000 – per year, Academy of Finland, "Impacts of climate change on Arctic vegetation and biodiversity" led by Luoto, post doc 2 x 30 000 – per year, Doctoral programme of geosciences, 2 PhD students 30 000 – per year, Doctoral programme of geography, PhD student 50 000 – per year, Academy of Finland, "FICCA project" led by Soininen, post doc 22 000 – per year, Nessling Foundation, PhD student

National research collaboration

- *Atmospheric Science*: The Center of Excellence (2014-2019) involves in addition to the University of Helsinki, Finnish Meteorological Institute, University of Eastern Finland and CSC It Center for Science Ltd. The collaboration between these institutes is tight. Close collaboration is also made with Finnish Forest Research Institute and Tampere University of Technology. The collaboration is in the form of several co-projects and applications. Stations for Measuring Forest Ecosystem Atmosphere Relations (SMEAR) is a network of observation stations to probe into biosphere - atmosphere interactions in the Boreal and Arctic regions. The key collaboration provides co-located comprehensive and high-quality observations with a long-term track records and vision. The SMEAR stations are operated together with FMI and UEF.
- *Radiochemistry*: Finnish Authority for Radiation and Nuclear Safety (STUK), Finnish Meteorological Institute
- *Geography* FICCA project, Academy of Finland SYKE, (Finnish Environment Institute), Global change unit, Helsinki Finnish Meteorological Institute, Helsinki University of Oulu, Department of Geography University of Oulu, Department of Biology

International research collaboration

- *Atmospheric Science*: PEEX (2012-) Pan-Eurasian Experiment, CRAICC (2011-2015) Cryosphere-atmosphere interactions in a changing Arctic climate, DEFROST (2011-2015) Impacts of a changing cryosphere, eSTICC (2014-2019) eScience Tools for Investigating Climate Change at high Northern latitudes, ICOS (2013-2031) Integrated Carbon Observation System, ACTRIS (2009-) Aerosols, Clouds, and Trace gases Research InfraStructure Network, BAEC (2014-) Biogenic Aerosols - Effects on Clouds and Climate, INTERACT (2010-2014) Intern
- *Geography* Institute of Earth Sciences, University of Lausanne, Switzerland Plant Biodiversity Lab, Jules Verne University of Picardie, France Department of Botany, University of Pretoria, South Africa Department of Biology, University of Bergen, Norway Department of Ecology, University of Aarhus, Denmark

Other activities (Societal Interaction related to Arctic, for example)

- *Atmospheric Science* Carbon Tree - a tool to learn by discovering. The core is a webpage presenting an artistic animation that visualizes the carbon uptake and release with rates

that depend on the current state of the environmental factors that are obtained by the on-line data from SMEAR II. Besides the on-line data, the web pages include interactivity: a user can change the state of the environmental factors and see the effect on the rate of carbon exchange. A transferable, interactive CarbonTree is also available in the net.

- *Radiochemistry*: Laboratory of Radiochemistry has organised several field courses in Lapland on environmental sampling

6. Faculty of Biological and Environmental Sciences

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

- *Environmental science and policy* : Atte Korhola, Professor of Environmental Change, arctic environmental change, arctic climate change , Professor Ilmo Massa, University lecturer, arctic environmental history and -policy, Tarmo Virtanen, arctic landscape dynamics. arctic ecology, geospatial analysis, Other PI:s Minna Väiliranta, arctic carbon cycling, arctic palaeoclimate, arctic peatlands Jan Weckström, arctic freshwaters, arctic environmental change Maija Heikkilä, arctic palaeo-oceanography, arctic environmental change
- *Aquatic Sciences*: Professors Samu Mäntyniemi and Sakari Kuikka, and professor, Hannu Lehtonen, fish biology, fish ecology and management university lecturer Jaanika Blomster, Other PIs: Jarno Vanhatalo Janne-Markus Rintala, Kimmo Kahilainen, fish biology, limnology
- *Environmental ecology*: Martin Romantschuk, professor, oil degradation on arctic soil, University lecturer: Juha Mikola, Plant-soil interactions and C fluxes in the Arctic, Other PIs: Aki Sinkkonen, post doctoral fellow, oil degradation on arctic soil
- *Kilpisjärvi Biological Station* Kilpisjärvi Biological Station has done arctic research and teaching officially for 50 years and unofficially for almost 70 years. The station is the only "arctic" research station in Finland. The station has a scientific leader Professor Antero Järvinen. The station is used by the Arctic researchers that are affiliated to their home departments.
- *Plant Biology* Professors: Heikki Hänninen, terrestrial plant ecology, plant ecophysiology and climate change, professor Jouko Rikkinen, plant ecology, University lecturer: Helena Åström, ecology, plant ecophysiology and climate change

Number and size of research groups conducting Arctic research (in person years, past 5 years)

- *Environmental science and policy* AK: Between 2010-2014: Leader of the ECRU; 4 PhD students, 3 post docs, 2 PIs JW: One group of 4 persons between 2010-2012 (3 years) = 12 person years MV: Between 2010-2014: 3 PhD students, (4+3+4 years), 7 MSc students
- *Aquatic Sciences*: 2-3 research groups, approximately 10 person years, 1 group, 6 persons during the last 5 years, altogether circa 11 person years
- *Environmental ecology* Terrestrial Interactions Research Group, 3-4 persons, 0.3 person years used for the Arctic research during the last three years + oil degradation on arctic soil 4 person years
- *Kilpisjärvi Biological Station* Many research groups consisting of (1) 2-10 researchers
- *Plant Biology* Plant Ecophysiology and Climate Change Group, 4-5 persons, 5 person years for Arctic research during past five years,

Funding (e/year, a source, name of a research project, past 5 years)

- *Environmental science and policy*: AK: 1) Leader of the Academy project Deposition history of black carbon in the Arctic and its contribution to climate change as detected from lake

sedimentary records. Contract 257903, Academy of Finland, 9/2012-8/2016. EUR 377 740. - Partner (leader M. Kulmala) of Science Workshop on New Approach for Earth System modelling, Finnish Cultural Fund, EUR 200.000 for 2012-2014. - Leader of the Consortium Impacts of Climate Change on Arctic Environment, Ecosystem services and Society (CLICHÉ). MV:) "Past water table fluctuations and related changes in carbon accumulation rates in mires – a quantitative multi proxy-based reconstruction from different climate regimes", Academy of Finland, 63 000 €/year, 2008-2010) "Biomarkers as potential palaeoecological tool", Academy of Finland, 59 750 €/year, 2010-2013 3) "Tracking carbon dynamic patterns and climate forcing through post-glacial mire development history by combining modern flux measurements and palaeoecological information", University of Helsinki, 40 000 €/year, 2012-2015 4) Researcher Community (RC) "Peatlanders", University of Helsinki, 7 000 €/year, 2013-2016) "High-latitude peatland and carbon dynamics". China Scholarship Council (CSC) for PhD Hui Zhang, 14 400/year, 2014-2018

- *Aquatic Sciences*: CEARTIC - Joint center of Excellence of Arctic Shipping and Operations, Lloyds Research Foundation, 100 000 -/year, Winter Ecology, Walter and Andree Nottbeck Foundation, 78 000 - Three Year grants of UH, 150 000 - Total 1.5 million euros during 2009-2014
- *Environmental ecology* : 150 000, Academy of Finland, LIMES - Limits of microbial evolution in soil
- *Plant Biology* HH: Leader of Academy project Northern plants under climatic warming modelling the ecophysiology of overwintering, 210 000 -; Finnish Cultural Foundation (Foundations Professor Pool): Overwintering of northern plants in a warming climate. 25 000 - HÅ: Leader of project Är åländska växter anpassade till milda vintrar?, 50 000 -, The Swedish Cultural Foundation in Finland

National research collaboration

- *Environmental science and policy*: Prof. Pertti Martikainen (University of Eastern Finland), Dr. Christina Biasi (University of Eastern Finland), Dr. Mika Aurela (Finnish Meteorological Institute), carbon cycling in the Arctic landscape (2013->), Prof. Heikki Seppä (University of Helsinki), palaeoclimate of the Arctic (2002->), Prof. Matti Leppäranta (University of Helsinki), lake geophysics (2008->), Dr. Antti Ojala (Geological Survey of Finland), fine-scale climate dynamics (2007->), Prof. Eeva-Stiina Tuittila (University of Eastern Finland), peatland carbon cycling (2005->), Dr. Aki Virkkula (Finnish meteorological Institute), black carbon and Arctic climate change (2012->), Prof. Lasse Holmström (Univ. of Oulu) High-altitude lake studies (2000->), : Dr. Tuomas Laurila (Meteorological Institute of Finland, Greenhouse gas group). Greenhouse gas measurements and dynamics (2009->), Dr. Tomi Luoto (Univ. of Helsinki), High-altitude lake studies (2013->), . Janne Soininen (Univ. of Helsinki) High-altitude lake studies (2009->), Petra Tallberg (Univ. of Helsinki) High-altitude lake studies (2010->) Dr. Sakari Salonen (Univ. Helsinki, Finland), post glacial vegetation and climate dynamics (2011->), Dr. Pertti Sarala (Geological Survey of Finland), interglacial-interglacial climate and vegetation dynamics (2012->), Dr. Annalea Lohila (Finnish

Meteorological Institute), high-latitude peatlands and greenhouse gas dynamics (2010->), Dr. Sari Juutinen (Univ. Helsinki), high-latitude peatland dynamics (2006->), Prof. Hanna Snellman (Univ. of Helsinki); ethnology; Prof. Veli-Pekka Tynkkynen (Univ. of Helsinki), Russian energy policy research; PhD Adjunct Professor Timo P Karjalainen (University of Oulu · Thule Institute Research Centre), interdisciplinary arctic research, PhD Lasse Heininen, University of Lapland, geopolitics and security.)

- *Aquatic Sciences* Kilpisjärvi Biological Station (prof. Antero Järvinen) - field facilities University of Jyväskylä (prof. Roger Jones) - stable isotopes University of Helsinki (prof. Juha Merilä) - genetics Aalto University, 2013-2018 Finnish Environmental Institute
- *Environmental ecology* : Mika Aurela and Tuomas Laurila, Finnish Meteorological Institute, research collaboration, last three years
- *Kilpisjärvi Biological Station* Almost all Finnish universities, and research institutes (Metla, SYKE, Metsähallitus etc.).
- *Plant Biology* Dr Sirpa Rasmus, University of Jyväskylä, snow ecology and snow physics, 2007 ->

International research collaboration

- *Environmental science and policy*: AK: 1) Prof. Darrell Kaufman (University of Arizona, USA), Arctic climate change during the Common Era (2010->) 2) Dr. Martin Tingley (Harvard University, USA), Arctic climate change during the Common Era (2012->) 3) Prof. Zicheng Yu (Lehigh University, USA), peatland carbon cycling (2008->) 4) Dr. Kaarina Weckström (GEUS, Denmark), High-altitude lake studies (2008->) 5) Dr. Emma Pearson (Univ of Newcastle UK) High-altitude lake studies (2009->) 6) Prof. Reinhard Pienitz (Laval University, Canada, PhD Ludger Müller-Wille, McGill University, cultural geography of the arctic, Professor Tony Alabaster, University of Sunderland; UK, Richard P. Tucker (University of Michigan, USA) 1) Dr. Karin Helmens (Stockholm University, Sweden), interglacial-glacial-interglacial climate and vegetation dynamics (2007->) 2) Prof. Peter Kuhry (Stockholm University, Sweden), high-latitude peatland dynamics, post-glacial vegetation and climate dynamics (2001->) 3) Dr. Erin McClymont (Durham University, UK), peat plant biomarkers methodology (2010->) 4) Prof. Hilary Birks, (Bergen University, Norway), past vegetation dynamics, plant macrofossil methodology (2001->) 5) Dr. Ülle Sillasoo (Tallinn University, Estonia), high-latitude peatland dynamics, past fire dynamics (2007->) 6) Dr. Laura Parducci (Uppsala University, Sweden), ancient DNA (2012->) 7) Prof. Dan Charman (University of Exeter, UK), high-latitude peatland dynamics, testate amoebae methodology
- *Aquatic Sciences* Memorial University, Canada (2013-2018) Norwegian University of Science and Technology Alfred Wegener Institute, Germany Universite de Liege, France Universite Libre, Bruxelles, Belgium, University of Tromsø (prof. Per-Arne Amundsen) - field data University of Tromsø (ass. prof. Kim Praebel) - genetics University of New Brunswick (Dr Brian Hayden) - stable isotopes. *Environmental ecology* : Janet Jansson, Lawrence Berkeley National Laboratory (presently: Pacific Northwest National Laboratory, Biological Sciences Division, United States) Dr Aki Sinkkonen spent four months as a LIMES employee in Professor Jansson's lab in Berkeley doing arctic microbiology research. In all the collaboration has lasted for four years. Carsten Suhr Jacobsen, GEUS - Geological

Survey of Denmark and Greenland Samples from Greenland have been analyzed as part of LIMES. Preliminary plans have been drawn up to interact with professor Masaaki Morikawa on Japan. No concrete activities as yet. Masaaki Morikawa, Division of Bioscience, Faculty of Environmental Earth Science, Hokkaido University

- *Kilpisjärvi Biological Station* Key member of the circumpolar INTERACT-network (<http://www.eu-interact.org/>). Many universities, institutes and research stations.
- *Plant Biology* Professor Elisabeth Cooper, UiT The Arctic University of Norway, Norway, snow ecology, 2006 -> Professor Olavi Junntila, UiT The Arctic University of Norway, Norway, greenhouse experiments, 2000-> Professor Karen Tanino, University of Saskatchewan, Canada, tree ecophysiology, 2010 -> ,

Other activities (Societal Interaction related to Arctic, for example)

- *Environmental science and policy*: AK: IGBP PAGES Arctic 2k network Arctic graduate school (University of Lapland) Arctic University Expert Member of the Arctic Advisory Board, appointed by the Prime Ministers Office, 2013- Member of the Expert Group of the AMAP Assessment on Climate impacts on the Arctic Cryosphere 2009-
- *Aquatic Sciences* Janne-Markus Rintala is an associate member of SCOR working group 140; Biochemical Exchange Processes at the Sea-Ice Interfaces (BEPsII), Task Group 1 working towards better practices on sea ice research Janne-Markus Rintala is also a national delegate in SCAR (Scientific Committee on Antarctic Research) Ecosystem services in terms of nature management and fisheries in subarctic Lapland
- *Kilpisjärvi Biological Station* Pioneer of collaboration between University of Helsinki and University of Hokkaido (mutual visits since 2005; individual Japanese ice researchers have worked at the station) - Pioneer of science & art collaboration via station's ArsBioarctica laboratory (Finnish Bioart Society was founded at the station in 2008) - Sami studies (indigenous people)
- *Plant Biology* The group has organized three national interdisciplinary symposia in winter studies.

7. Faculty of Agriculture and Forestry

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

- *Agricultural Economics* Professors: John Sumelius, Timo Sipiläinen, Antonis Reztis (from 13.1.2015-1.7. 2018)
- *Agricultural sciences* Name: Jukka Ahokas (retired 2014-07-31) Field of post: agricultural engineering Topic of research: energy use in field work, animal husbandry, grain drying and facility heating; use of bioenergy; animal welfare (measurement of living conditions), measuring Name: Laura Alakukku Field of post: environmental technology in agriculture Topic of research: nutrient emissions, soil structure, manure management Name: Timo Oksanen Field of post: agricultural engineering Topic of research: automation, measuring and control, robotics Name: Mikko Hautala Field of post: physics in agriculture Topic of research: measuring, physical background of agricultural phenomena Name: Matti Pastel Field of post: agricultural engineering Topic of research: measurement of animal welfare, coding Name: Hannu Mikkola Field of post: agricultural engineering Topic of research: energy use in field work, energy efficiency, energy saving. University lecturer Tomas Roslin
- *Horticulture* Timo Hytönen, molecular and translational plant biology, "Climatic adaptation of reproductive development in perennial plants"
- *Forest sciences* Professor Olli Tahvonen Forest economics, Prof. Jaana Bäck (forest ecology) University lecturer Frank Berninger, Other PIs: Dr. Jukka Pumpanen Dr. Jussi Heinonsalo Dr. Kajar Köster

Number and size of research groups conducting Arctic research (in person years, past 5 years)

- *Agricultural sciences* 2 - 10 persons depending on the project. or the past five years, the Spatial Foodweb Ecology Group has invested a total of ca 8 person-years in Arctic Research, as split among multiple researchers: <http://www.helsinki.fi/foodwebs/>
- *Horticulture* Relatively new project (funding from the Academy of Finland, 9/2014-8/2018). One half time person in 2013 (me), Currently 2 full time persons, three persons from the beginning of 2015.
- *Forest sciences* Economics of reindeer husbandry Economics of arctic uneven-aged and even-aged forestry (Tahvonen) 2 persons, Forest ecology: Size of the research group 3-5 persons.

Funding (e/year, a source, name of a research project, past 5 years)

- *Agricultural sciences* 30 k€, EU FP7, Agriculture and energy efficiency - AGREE 130 k€, Interreg 4A Programme, Energy positive farm - ENPOS 180 k€, ERDF, Energy Academy 53 k€, Vehmas, Ministry of agriculture and forestry in Finland 48 k€, SAFETOOL, Foundation of agricultural engineering research 10 k€, SUCCESS, Maj and Tor Nessling Foundation 48 k€, Poseidon, NKJ 47 k€, Predictor, EU ICT Agri 43 k€, Tool Mood, Foundation of agricultural engineering research 30 k€, TALMA, Maa- ja vesitekniikan tuki Grants to the project "A quantitative food web for the high Arctic": 2014 Ella and Georg Ehrnrooth Foundation, 60

000 – 2014 INTERACT Transnational Access programme (EU-funded) 20 000– 2013 INTERACT TA 20 000– 2012 INTERACT TA 20 000– 2011-2013 University of Helsinki, 3-yr research grant, 125 000 – 2011 INTERACT TA 21 000– 2012-2014 Kone foundation, post doc grant to Dr Helena Wirta, total ca 75 000– and more (text field exceeded)

- *Horticulture* ~140000 e/year (9/2014-8/2018), Academy of Finland, Climatic adaptation of reproductive development in the woodland strawberry
- *Agricultural Economics* No compiled Ministry of Agriculture Ministry of Foreign Affairs Some EU funded research Finnish Cultural Foundations Society of Science and Letters, Various foundations
- *Forest sciences:* ~60 000 (Tahvonen) Academy of Finland Effect of fast cycling carbon on the decomposition of old soil organic matter (FASTCARBON) 1.1.2012-31.7.2014. Funding allocated for arctic research ~30 000-50 000 eu/year in 2013-2014. Jukka Pumpanen principal investigator. Academy of Finland Recovery of soil carbon and nitrogen pools following forest fires and changes in soil carbon turnover (RECANIFIRE) 1.1.2011-31.12.2012. Budget 12000 euro for 2011 and 2000 euro for 2012. Jukka Pumpanen principal investigator.

National research collaboration

- *Agricultural Economics* MTT Economics PTT Pellervo Seura Ruralia, Lappeenranta Technical University
- *Agricultural sciences* Aalto University VTT Technical Research Centre of Finland Finnish Environment Institute MTT -Agrifood Reseach Center Seinäjoki University of Applied Sciences Dr Gergely Várkonyi, Finnish Environment Centre SYKE, collaboration on species identification and field work, 2009-2013
- *Forest Sciences* Collaboration with dr. Jouko Kumpula, RKTL Dr. Frank Berninger, University of Helsinki, joint experiment in forest fire areas at Värriö sub-arctic research station in Eastern Finland for studying the effect of forest fires on soil carbon, soil greenhouse gas emissions and soil microbiology in 2011-2014. Dr. Jussi Heinonsalo, University of Helsinki, joint experiment in forest fire areas at Värriö sub-arctic research station in Eastern Finland for studying the effect of forest fires on soil microbiology in 2013-2015.

International research collaboration

- *Agricultural Economics* Agricultural Economics has participated in the International Farm Comparison Network in order to create a better understanding of milk production world-wide showing annual economic results of dairy farms in over 30 countries. Swedish University of Agricultural Sciences, various projects 2000-2009 Other collaborators are not do not include research on Arctic Issues (but other areas and topics e.g. Africa, Bangladesh, etc.) Some EU projects
- *Agricultural sciences* Universities and research institutes in Scandinavia and in Europe. Partners vary depending on the research topic. Prof. Paul Hebert, Univeristy of Guelp, Ontario, extensive collaboration on DNA sequencing analyses, past five years Dr Niels Martin Schmidt, Aarhus University, collaboration on arctic ecology, past five years Dr Douglas Yu, Kunming Insitute of Zoology, China, extensive collaboration on DNA

- sequencing analyses, past year The Zackenberg Research Station, Greenland, field site, past five years Tens of taxonomists, globally distributed, species identification, past five years
- *Horticulture* Dr. Daniel Sargent FEM-IASMA, Italy, joint research, jointly supervised PhD student, 2014-2017 Dr. Takeshi Kurokura, Utsunomiya University, participates in the research and technology development, 2014-2018 Dr. Laura Jaakola, University of Tromsø, participates in field studies, provides plant materials, 2013-2016
 - *Forest Sciences*: Dr. Kajar Köster, Estonian University of Life Sciences, joint experiment in a boreal fire areas at Värriö sub-arctic research station in Eastern Finland for studying the recovery of soil carbon and nitrogen stocks after forest fire, and the effect of forest fires on soil greenhouse gas emissions and soil microbiology in 2011-2014. Dr. Kajar Köster, Estonian University of Life Sciences, joint project for studying the effect of reindeer grazing on soil carbon stocks and microbiology in 2013-2014 We have applied more research funding for our arctic projects on soil carbon and greenhouse gas fluxes from the Academy of Finland arctic call in 2014 and Eranet Rus Plus call in 2014. If the Academy of Finland project will be granted, we will collaborate with Prof. Akira Osawa from the Kyoto University and Dr. Yojiro Matsuura from the Forestry and Forest Products Research Institute (FFPRI).

Other activities (Societal Interaction related to Arctic, for example)

- *Agricultural Economics* Lecturers, teaching and Educational co-operation with at some polytechnics
- *Agricultural sciences* Public presentations in multiple contexts, links to (part of) our press releases and interviews compiled at <http://www.helsinki.fi/foodwebs/press.htm>; crowdsourcing of panarctic research projects described at <http://www.helsinki.fi/foodwebs/dryas/index.htm>; see also Science 1 August 2014: Vol. 345 p. 494.
- *Forest Sciences*: Our project on the effect of reindeer grazing on soil carbon stocks includes a societal aspect, because reindeer grazing is an important source of income for the reindeer owners in Lapland.

8. Faculties of Medicine and Veterinary Medicine

International and national collaboration

- A network has been established to study zoonotic infections in the Arctic region. The network includes partners from Finland, Sweden and Norway, and two non-Nordic partners from Belgium and UK. Russia and Greenland are involved through collaboration. The centre of both scientific and administrative management is University of Helsinki, Finland. The Project Leader is Professor Olli Vapalahti. The partners are: The Natural Resources Institute Finland (NRIF): professor Heikki Henttonen and Otso Huitu. The Arctic University of Norway in Tromsø (UiT): professor Rolf Ims and professor Nigel Yoccoz. The University of Uppsala (UU): professor Åke Lundkvist and professor Tomas Jaensson. The Swedish University of Agricultural Sciences, Umeå (SLU): professor Birger Hörnfeldt. The University of Oxford, and the Environmental Research Group Oxford (ERGO) and the Agriculture and Veterinary Information and Analysis (Avia-GIS): Guy Hendrickx and William Wint. The University of Oulu, Finland (Thule): professor Arja Rautio. Professor Rautio has, amongst other tasks, been the leader of the Health WP in the EU7PW-ArcRisk research project (Arctic Health Risks: Impacts on health in the Arctic and Europe owing to climate-induced changes in contaminant cycling, www.arcrisk.eu 2009-2014). The Finnish Food Safety Authority (Evira): professor Antti Oksanen.

The network is applying funding and has received 100 000 NOK in 2014 for preparing the network and a grant application to NordForsk.

9. Faculty of Social Sciences

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

- *Social Policy studies*: Janne I. Hukkinen, professor of environmental policy, arctic environmental policy
- *Development Studies* Professors: Professor Barry Gills Development Studies Arctic Governance and Sustainable Development, other PIs: (Docent) Markus Kröger Development Studies and World Politics Mining and Development in the Northern Nordic Region
- *World politics (development studies, anthropology)* Other PIs Markus Kröger, interdisciplinary social scientific research on mining, forestry and other resource-extraction changes and land-based investment project expansion in the Arctic, making comparisons to the Tropics, looking at the political dynamics, outcomes and causalities in increased resource exploitation in the region. Linking the arctic changes to global phenomena. Field research in Finnish Lapland, and on Arctic mining also in Canada, rest of Nordic countries.

Number and size of research groups conducting Arctic research (in person years, past 5 years)

- *World politics (development studies, anthropology)* Marcus Kröger 3 person years
- *Social Policy studies* Janne Hukkinen 2,5 person years

Funding (e/year, a source, name of a research project, past 5 years)

- *Social Policy studies* Total EUR 156 000 during 2 years. Nordregio/Nordic Council of Ministers. Knowledge-Based Tools for Sustainable Governance of Energy and Climate Adaptation in the Nordic Periphery.
- *World politics (development studies, anthropology)* No direct funding yet for this research; side-projects of Academy of Finland projects focusing on resource politics in Brazil and India.

National research collaboration

- *Social Policy studies* Arctic Centre, University of Lapland. Prof Paula Kankaanpää, prof Bruce Forbes. Member of the Board of Arktis national doctoral school. Informal research exchanges. 5 years.
- *Development Studies* Aleksanteri Institute, University of helsinki University of Lapland (communication with Professor Lassi Hanninen on the Global Arctic research project and Callote Academy programme)
- *World politics (development studies, anthropology)* Collaboration with researchers from Univ. Of Lapland and Tampere, and researchers at univ. Of Helsinki, co-writing papers, planning funding applications etc. Barry Gills, Lassi Heininen, Satu Ranta-Tyrkkö

International research collaboration

- *Social Policy studies* University of Santa Barbara, California, USA. Prof Oran Young. Host during sabbatical year in the US. Informal research exchanges.
- *Development Studies* Professor Gills established a network of research contacts in Arctic Research including the University of Oslo, Steffanson Institute (Iceland), the Aleksanteri Institute (University of Helsinki), University of British Columbia, Canada, University of Luxembourg (RISC : consortium for comparative research on regional integration and social cohesion) in formative stage of preparing a research proposal, and Emmanuel Brunet-Jailly, director, "Borders in Globalization" University of Victoria, Canada
- *World politics (development studies, anthropology)* Research network with Iss (the Hague), UC Berkeley, Univ. Of Greenland, UNBC (Canada)

Other activities (Societal Interaction related to Arctic, for example)

- *Social Policy studies* Hukkinen presentation title Hybrid experts as boundary workers in Arctic science and policy Arranger TENTH ANNUAL SEMINAR OF THE ARCTIC DOCTORAL PROGRAMMEARKTIS City Rovaniemi UUSI POHJOINEN JA SEN KULKUVÄYLÄT Conferences, workshops, Uusi pohjoinen vetää väkeä etelästä (Participant), Ulkopoliittikka 4/2011, 1.12.2011 Participation in interview for written media
- *Development Studies* Researchers attended the Arctic Frontiers conference in January 2014 Trömsö, Norway, and interviewed representatives of indigenous association permanent partners to Arctic Council, and various Arctic government representatives, visited Sami parliament in Inari, Finland (two trips) and interviewed representatives of Sami parliament on future of sustainable development in north Finland and indigenous peoples perspectives. There is a need for research on Arctic Governance practices as they are currently evolving in practice, including the patterns of negotiation, rule making, and representation at the Arctic Council (and amongst the Indigenous peoples secretariat) to explore best practices in regional governance (and comparisons with other regions practices) and best practices in rule making for sustainable development and resource extraction industries
- *World politics (development studies, anthropology)* Writing opinion articles in Finnish newspapers on the arctic mining and land rush, organizing seminars, giving speeches

10. Aleksanteri -Institute

Arctic researchers in the faculty (Professors, University lecturers, Other PIs)

Veli-Pekka Tynkkynen, Professor in Russian energy policy, Aleksanteri Institute,

Number and size of research groups conducting Arctic research (in person years, past 5 years)

Veli-Pekka Tynkkynen has a long-lasting research interest in Russian natural resource and energy policies and their effects on societal and regional development and environmental responsibility Daria Gritsenko (FM) 's PhD research o Governing shipping externalities.

Funding (e/year, a source, name of a research project, past 5 years)

Russia's final energy frontier – Sustainability challenges of the Russian Far North" (2014-2016: 285 710 e) . A project proposed to Finnish Academy and led by Professor Tynkkynen "Assessing Intermediary Expertise in Cross-Border Arctic Energy Development" (2015-2018). Tynkkynen is also taking part to international consortium on "The Global Arctic: between resource development and sustainability".

National research collaboration,

Finnish meteorological institute, University of Applied Science in Lapland, University of Turku Merenkulkualan koulutus- ja tutkimuskeskus (MKK)

International research collaboration

Shinichiro Tabata, (principal investigator) Professor, Slavic Research Center, Hokkaido University, Masanori Goto, Research Associate, Slavic Research Center, Hokkaido University, Masumi Motomura, Chief Researcher, Japan Oil, Gas and Metals National Corporation, Fujio Ohnishi, Assistant Professor, College of International Relations, Nihon University, Tomoko Tabata, Research Fellow, Slavic Research Center, Hokkaido University, Masahiro Tokunaga, Associate Professor, Faculty of Commerce, Kansai University

10. Conclusions

Based on the results of the survey, it can be said that there is a great variety of Arctic research in the University of Helsinki. The main volume of the arctic research is in natural sciences concerning climate change. However, there is also a great variety of research on Arctic cultures and languages in the faculty of Arts. The social science research on Arctic has been minor until recently, but growing interest towards Arctic thematic can be observed in the faculties of social sciences, arts, law and Aleksanteri institute.

Despite the Arctic research and other activities in the UH, there is no single position in the UH that a word- Arctic would be mentioned in the name of the position (cf. thematic area of Baltic Sea: professor in Baltic Sea research). The closest in this category is the university lecturer of Sami language in the faculty of Arts.

Natural science research on arctic is conducted in the faculties of science, biological and environmental sciences and agriculture and forestry. The UH has three research stations that are situated above the Arctic Circle. Kilpisjärvi Biological Station located in Enontekiö County has done arctic research and teaching officially for 50 years and unofficially for almost 70 years. Muddusjärvi Research Station, located in Inari County, has equally long history of arctic research. Third station Värriö Subarctic Research Station, located in Eastern Lapland, in the northern corner of the municipality of Salla, situates in subarctic vegetation zone. Since 2004, Värriö Subarctic Research Station has worked together with the University of Oulu's Oulanka Research Station and both of the research units now share offices in the city of Kuusamo. These three research stations have been central in maintenance and development of biological and environmental Arctic research and long-term monitoring.

The Arctic researchers in the UH collaborate extensively nationally and also internationally with other universities and research organizations. At the national scale, there are other strong Arctic research centers in Finland (e.g. Thule- Institute, University of Oulu, Arctic Center in University of Lapland) and the collaboration with them should be further emphasized.

Internationally, collaboration happens particularly with the other European universities such as those in Norway, and also with the Canadian universities. However, collaboration has been started or discussed with the University of Hokkaido in Japan within Kilpisjärvi biological station, Aleksanteri institute, research on Northern language and environmental sciences.

To conclude, University of Helsinki has potential to develop its Arctic research, particularly interdisciplinary collaboration between the faculties may create new research consortia to provide answers to the current Arctic challenges. However, at the global scale, University of Helsinki can be considered as "Arctic" but in the Finnish scale, the Northern Finnish universities have already developed a profile of being an Arctic university. Therefore it needs to be considered what is a niche and a role for the UH's arctic research nationally and in a larger context.