IASC Bulletin 2019

IASC 2019
BULLETIN

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INTERNATIONAL ARCTIC SCIENCE COMMITTEE
Borgir, Norðurslóð, 600 Akureyri, ICELAND
www.iasc.info

INTERNATIONAL ARCTIC SCIENCE COMMITTEE

[IASC] · INTERNATIONAL ARCTIC SCIENCE COMMITTEE

The International Arctic Science Committee (IASC) is a non-governmental, international scientific organization. IASC's mission is to encourage and facilitate cooperation in all aspects of Arctic research, in all countries engaged in Arctic research, and in all areas of the Arctic region. Overall, IASC promotes and supports leading-edge interdisciplinary research in order to foster a greater scientific understanding of the Arctic region and its role in the Earth system.

TO ACHIEVE THIS MISSION IASC:

- Initiates, coordinates, and promotes scientific activities at a circumarctic or international level;
- Provides mechanisms and instruments to support science development;
- Provides objective and independent scientific advice on issues of science in the Arctic and communicates scientific information to the public;
- Seeks to ensure that scientific data and information from the Arctic are safeguarded, freely exchangeable and accessible;
- Promotes international access to all geographic areas and the sharing of knowledge, logistics, and other resources;
- Provides for the freedom and ethical conduct of science;
- Promotes and involves the next generation of scientists working in the Arctic; and
- Promotes polar cooperation through interaction with relevant science organizations.

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[IASC] · STRUCTURE

Representatives of national scientific organizations from all 23 member countries form the IASC Council. The President of IASC is elected by Council, which also elects 4 Vice-Presidents to serve on the Executive Committee. Council usually meets once a year during the Arctic Science Summit Week (ASSW). The IASC Executive Committee operates as a board of directors and manages the activities of IASC between Council meetings. The Chair is the President of IASC.

The IASC Secretariat implements decisions of the Executive Committee and Council, manages IASC finances, conducts outreach activities, and maintains international communication.

IASC MEMBER COUNTRIES

Austria	Austrian Polar Research Institute (APRI)	www.polarresearch.at
Canada	Polar Knowledge Canada	https://www.canada.ca/en/polar-knowledge.html
China	Chinese Arctic and Antarctic Administration (CHINARE)	http://www.chinare.gov.cn
Czech Republic	Czech Centre for Polar Research	polar.prf.jcu.cz
Denmark/ Greenland	The Agency for Science, Technology and Innovation	www.ufm.dk
Finland	Council of Finnish Academies	www.academies.fi
France	National Center for Scientific Research (CNRS)	http://www.cnrs.fr/en
Germany	Deutsche Forschungsgemeinschaft	www.dfg.de
Iceland	RANNÍS, The Icelandic Centre for Research	www.rannis.is
India	National Centre for Antarctic and Ocean Research (NCAOR)	www.ncaor.gov.in
Italy	National Research Council of Italy (CNR)	www.cnr.it
Japan	Science Council of Japan, National Institute of Polar Research (NiPR)	www.nipr.ac.jp
The Netherlands	Netherlands Organization for Scientific Research (NWO Science)	www.nwo.nl
Norway	The Research Council of Norway	www.forskningsradet.no
Poland	Polish Academy of Sciences, Committee on Polar Research	www.polish.polar.pan.pl
Portugal	Portuguese Foundation for Science and Technology	www.fct.pt
Russia	The Russian Academy of Sciences	www.ras.ru
Republic of Korea	Korea National Committee on Polar Research	www.kopri.re.kr
Spain	Comité Polar Español	www.ciencia.gob.es
Sweden	The Swedish Research Council	www.vr.se
Switzerland	Swiss Committee on Polar and High Altitude Research	www.polar-research.ch
United Kingdom	Natural Environment Research Council (NERC)	nerc.ukri.org
USA	Polar Research Board	www.dels.nas.edu/prb

PHOTO: JEAN-CHARLES GALLET
Lunchbreak on the snow, SIOS SOS snow traverse; Dicksonfjorden, Spitsbergen, Svalbard.

IASC 2019

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INTERNATIONAL ARCTIC SCIENCE COMMITTEE

[CONTENTS]

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International Arctic Science Committee

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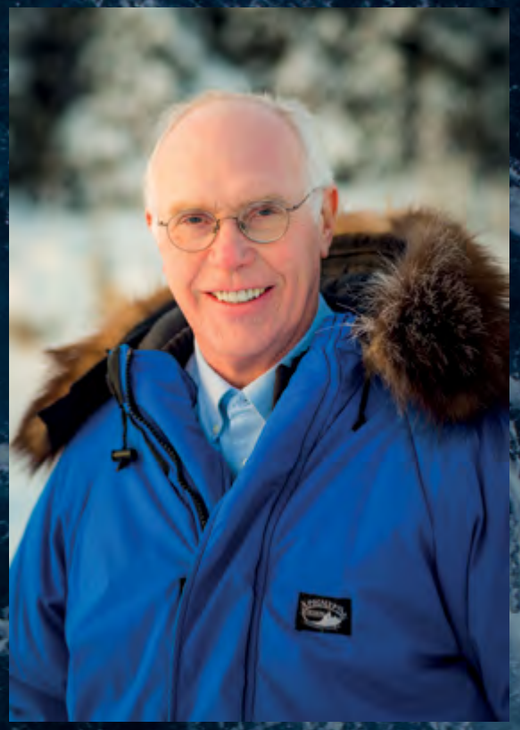
COVER PHOTO: ANNA NADOLNA
Centre for Polar Studies, University of Silesia team drilling shallow ice cores on Storbreen (Svalbard).

[PREFACE]



IASC is committed to pursuing a mission of encouraging and facilitating cooperation in all aspects of Arctic research, in all countries engaged in Arctic research, and in all areas of the Arctic region. Overall, IASC promotes and supports leading-edge interdisciplinary research in order to foster a greater scientific understanding of the Arctic region and its role in the Earth system.

As the climate continues to warm and more eyes turn to the North, the Arctic continues to rise in prominence and the need for IASC to deliver upon our mission becomes ever more urgent. While sustainable development percolates through our conversations and dwells in the background of our motivations, other driving factors compete for priority consideration. These include environmental and food security, economic opportunities for communities and industry, adventure tourism, and transpolar shipping. Underlying these social drivers is the need to improve our basic understanding of the Arctic system. Gaps in our understanding of terrestrial geophysics, marine biology, space physics, social science and the humanities, and many other disciplines limit our ability to develop innovative solutions to major challenges facing Arctic societies.

Arctic researchers around the world strive to fill these gaps in knowledge and understanding. Hearty scientists of all career stages face extreme weather, put in long working days, and push forward intellectual boundaries to gather observations, validate models, and elucidate processes. The ongoing scientific analyses being conducted every day by our esteemed colleagues provide the essential information needed by policy makers, community planners, business and industry executives, and governmental representatives to make informed decisions and to formulate the operational plans that our societies need to thrive in these challenging times.

IASC is proud to facilitate international collaborations and to advance Arctic science needed to meet our society's needs.

Dr. Larry Hinzman | IASC President

PHOTO: JULIA DAVYDOVA
The Arctic Ocean.

PHOTO: UAF PHOTO BY JR ANCHETA
Dr. Larry Hinzman, IASC President.

PHOTO: MAREK KASPRZAK
Photo taken on the Werenskiold glacier (southwestern Spitsbergen) during the implementation of the project, "Spatial and temporal controls on active layer dynamics in an Arctic mountain valley."

1. IASC Internal Development

» 1 IASC Internal Development

IASC Organization

The International Arctic Science Committee (IASC) is a non-governmental organization that encourages and facilitates cooperation in all aspects of Arctic research, in all countries engaged in Arctic research, and in all areas of the Arctic region. To fulfill its mission, IASC promotes and supports leading-edge interdisciplinary research in order to foster a greater scientific understanding of the Arctic region and its role in the Earth system. IASC was established in 1990 and began operations in 1991. It currently comprises 23 member countries. IASC member organizations are national science organizations that cover all fields of Arctic research.

COUNTRY	MEMBER ORGANIZATION	IASC COUNCIL MEMBER
Austria	Austrian Polar Research Institute (APRI)	Wolfgang Schöner
Canada	Polar Knowledge Canada	Wayne Pollard
China	Chinese Arctic and Antarctic Administration (CHINARE)	Huigen Yang, Vice-President
Czech Republic	Czech Centre for Polar Research	Josef Elster
Denmark/Greenland	The Agency for Science, Technology and Innovation	Lise Lotte Sørensen
Finland	Council of Finnish Academies	Paula Kankaanpää, Vice-President
France	National Center for Scientific Research (CNRS)	Jérôme Chappellaz
Germany	Deutsche Forschungsgemeinschaft	Günther Heinemann
Iceland	RANNÍS, The Icelandic Centre for Research	Þorsteinn Gunnarsson
India	National Centre for Antarctic and Ocean Research (NCAOR)	M. Ravichandran
Italy	National Research Council of Italy (CNR)	Carlo Barbante
Japan	Science Council of Japan, National Institute of Polar Research (NiPR)	Hiroyuki Enomoto
The Netherlands	Netherlands Organization for Scientific Research (NWO Science)	Peter Jordan
Norway	The Research Council of Norway	Christine Daae Olseng
Poland	Polish Academy of Sciences, Committee on Polar Research	Michał Łuszczuk
Portugal	Portuguese Foundation for Science and Technology	João Canario
Russia	The Russian Academy of Sciences	Vladimir Pavlenko, Vice-President
Republic of Korea	Korea National Committee on Polar Research	Yeadong Kim
Spain	Comité Polar Español	Antonio Quesada
Sweden	The Swedish Research Council	Magnus Friberg
Switzerland	Swiss Committee on Polar and High Altitude Research	Martin Schneebeli
United Kingdom	Natural Environment Research Council (NERC)	Henry Burgess, Vice-President
USA	Polar Research Board	Larry Hinzman, President

PHOTO: IRENEUSZ SOBOTA
Weather station and reindeer near Nicolaus Copernicus University Polar Station in summer, Svalbard.

TABLE: An overview of the IASC countries, organizations, and Council members. For contact information, please visit https://iasc.info/iasc/organization/council/council-members.

IASC Council

The IASC Council is comprised of representatives from national scientific organizations from all IASC member countries. The IASC Council meets once a year during Arctic Science Summit Week (ASSW). Council members provide input regarding a wide range of scientific and technical knowledge and provide access to a large number of scientists and administrators through their national committees.

The IASC Council is responsible for:

- Developing policies and guidelines for cooperative Arctic research;
- Establishing Working Groups and Action Groups that address and act on timely topics in Arctic science;
- Recommending, in cooperation with the Working Groups, implementation plans for IASC programs and activities;
- Making decisions regarding the participation of national scientific organizations from non-Arctic countries; and,
- Organizing Arctic science conferences.

IASC Executive Committee

The IASC Executive Committee operates as a board of directors and manages IASC's activities between Council meetings. The Executive Committee consists of five elected officials: the President, four Vice-Presidents, and the Executive Secretary (ex officio).

The current IASC Executive Committee members are:

Dr. Larry Hinzman, President

Mr. Henry Burgess, Vice-President

Dr. Huigen Yang, Vice President

Dr. Paula Kankaanpää, Vice-President

Dr. Vladimir Pavlenko, Vice-President

Dr. Allen Pope, IASC Executive Secretary

Secretariat

The IASC Secretariat is responsible for the daily operations of IASC including:

- Communicating with Council members;
- Communicating with other organizations including the Arctic Council and its subsidiary bodies, as well as the International Science Council (ISC);
- Providing support for the IASC Working Groups;
- Publishing the IASC Bulletin and IASC communication materials as required;
- Maintaining the IASC website, preparing the IASC newsletter, and facilitating outreach; and,
- Administering IASC finances.

The central IASC Secretariat is supplemented by the dispersed Secretariat, drawing support from institutions in a range of IASC members countries, especially addressing the support for the growing number of activities undertaken by the IASC Working Groups and early career researcher development.

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Gunnar Gunnarsson (through March 2019)
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PHOTO: SUSAN MÜHLEMEIER AND ROMANO WYSS
The IASC Council Meeting at POLAR2018 in Davos, Switzerland.

Support for the IASC Working Groups (WG) is provided by:

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Karen Cameron, Cryosphere Working Group Secretary (from ASSW2019), Aberystwyth University
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Jeanette Axelsson, Marine Working Group Secretary (through ASSW2019), Swedish Polar Research Secretariat
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Laura Ghigliotti, Marine Working Group Secretary (from ASSW2019), National Research Council of Italy
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Gunnar Gunnarsson, Social & Human Working Group Secretary, Stefansson Arctic Institute
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Rebecca Hewitt, Terrestrial Working Group Secretary (from ASSW2019), Northern Arizona University
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ISIRA

ISIRA: Moving forward within the Science Diplomacy Practice

As an Advisory Group of IASC, ISIRA is responsive to the rapid changes that the Arctic region is experiencing in its Russian sector and beyond. Over the past 1.5 years, ISIRA has been exploring its structure and roles. In November 2017, a group of more than 50 Russian and international scientists came together at the Presidium of the Russian Academy of Sciences (Moscow) to discuss the future directions of joint collaborative work and ISIRA's implementation plan to support the Arctic Council's Agreement on Enhancing Arctic Scientific Cooperation. One of the main decisions taken at that meeting was to enlarge and open ISIRA's membership to the whole Arctic scientific community within Russia and beyond. Alongside nationally-appointed representatives of IASC member countries, ISIRA includes a wide and open membership of all those scientists interested in the Russian Arctic research.

The follow-up meeting to track changes and their success was held during the POLAR2018 (Davos, Switzerland). More than 45 scientists visited the open part of the meeting while the closed part let ISIRA's members explore administrative decisions. It was discussed and decided to fulfill the request from UArctic partner for the financial contribution to support Russian young scientists to come to UArctic Congress 2018 (Oulu, Helsinki). The request was the trigger of understanding the need to officially frame some ISIRA's practices and procedures. Thus, it was collectively decided to explore Terms of References for ISIRA which will help in the future to support such activities, endorse projects and events, and create positive stimuli for changes of the group's activities.

In times of rapid and dramatic changes in the Arctic socio-ecological systems, ISIRA is ready to take actions and step forward.

Please visit ISIRA's webpage to learn more (in Russian and English): https://iasc.info/isira

Yulia Zaika, ISIRA Secretary
Contact: yzaika@inbox.ru

ИСИРА: двигаясь вперед в практике научной дипломатии

Будучи консультативной группой МАНК, ИСИРА реагирует на быстрые изменения, происходящие в арктическом регионе России и за его пределами. За последние 1,5 года группа ИСИРА изменила свою структуру и функционал, начиная со встречи в ноябре 2017 года, когда более 50 российских и международных ученых собрались вместе в стенах Президиума Российской Академии Наук (г.Москва), чтобы обсудить будущие направления совместной работы и планы группы по поддержке и исполнению Соглашения об укреплении арктического научного сотрудничества Арктического совета. Одним из основных решений той встречи стало расширение членства группы до ученых из научного сообщества России и за ее пределами. В настоящий момент, наряду с традиционными назначенными представителями стран-участниц МАНК, группа включает в себя также более широкое и открытое ассоциированное членство всех тех, кто заинтересован в исследованиях в Российской Арктике.

Последовательная встреча, которая позволила отследить изменения и их успешное исполнение, состоялась в рамках конференции POLAR2018 (Давос, Швейцария). Более 45 ученых посетили открытую часть встречи, тогда как на закрытой части члены группы ИСИРА принимали несколько важных административных решений. Было обсуждено и принято решение об удовлетворении запроса на финансовую поддержку российских молодых ученых для поездки на Конгресс Университета Арктики 2018 (Оулу, Хельсинки). Такой запрос послужил толчком для понимания необходимости официального регулирования процедур и практик работы группы. Таким образом, было принято коллективное решение о создании Положения об обязанностях группы ИСИРА, которое в будущем поможет поддерживать запросы такого рода, различные проекты и встречи, а также создаст позитивные стимулы для изменений в деятельности самой группы.

Во времена быстрых и драматических изменений арктических социально-экологических систем группа ИСИРА готова активно принимать действия и двигаться вперед.

Более подробная информация на страницах ИСИРА (на русском и английском языках): https://iasc.info/isira

Контактная информация:
Юлия Заика, секретарь ИСИРА

IASC Medal 2019

IASC Medals are awarded in recognition of exceptional and sustained contributions to the understanding of the Arctic.

This year, IASC recognizes Marika Michelle Holland's Outstanding Achievement and Scientific Leadership role in Understanding, Modeling and Predicting the Arctic Climate System, in particular Sea Ice.

Dr. Holland is currently a Senior Scientist in the Climate and Global Dynamics Division of the National Center for Atmospheric Research (NCAR) in the USA. She has in recent decades maintained an outstanding impact on international Arctic research and policy, exploring, among other topics, the coupled interactions between sea ice, atmosphere, ocean, land surface and biosphere. In addition to her excellent record of oral and written contributions, Dr. Holland has been a driver in building an integrated understanding of the Arctic, by connecting climate and Earth system modelers with experimentalists and field observers – as well as connecting the world's academic research community with the software and model development community. She has also mentored numerous students and early career scientists, many of them women, through Ph.D. committees in Australia, Canada, Sweden, and the U.S., through frequent university course lectures, and as a scientific leader at NCAR. Because of her outreach in the U.S. and internationally, her influence as a female role model in the physical sciences is tremendous. Based on her continuous and extremely productive career with a focus on the Arctic Climate System and how it is responding to climate change, IASC is honored to award Dr. Marika Michelle Holland the 2019 IASC Medal.

The Medal will be formally awarded at the next Arctic Science Summit Week, which will be held in Arkhangelsk, Russia, 22 – 30 May, 2019.

IASC would like to thank this year's Medal Committee for their service: Guðfinna Aðalgeirsdóttir (Chair), João Canário, Hiroyuki Enomoto, Manisha Ganeshan, and Heidi Kassens.

Shortlisted candidates for the 2019 IASC Medal:

Jon Ove Hagen for Outstanding Achievement in Understanding Glacier-Climate Interactions, Glacier Dynamics, Hydrology and Meteorology of Glaciers and Ice Caps in the Arctic.

Katharine Law for Outstanding Achievement in Understanding Arctic Air Pollution from Long-Range Transport and Local Sources through Numerical Modelling and International Observation Campaigns.

Sue Ellen Moore for Outstanding Achievement in Understanding Marine Mammals as Ecosystem Sentinel and how Climate Change is Influencing the Phenology of Arctic Species.

Shortlisted candidates can be nominated again in subsequent years.

PHOTO COURTESY OF DR. MARIKA MICHELLE HOLLAND
Dr. Marika Michelle Holland, 2019 IASC MEDAL.

PHOTO: MAREK KASPRZAK

Drilling for installation of thermistors for measuring coastal cliff thermal properties. Photo taken during implementation of the project, "POROCO – Mechanisms controlling the evolution and geomorphology of rock coasts in polar climates."

2. IASC Working Groups

» 2 IASC Working Groups

Encouraging and supporting international science-led programs

IASC is engaged in all fields of Arctic research. Its main scientific working bodies consist of five Working Groups (WGs): Atmosphere, Cryosphere, Marine, Social & Human, and Terrestrial. The primary function of the WGs is to encourage and support science-led international programs by offering opportunities for planning and coordination and by facilitating communication and access to facilities. Each WG is composed of up to two scientists from each IASC member country, appointed by the national adhering bodies.

All five IASC WGs are guided by scientific Work Plans which concisely articulate, with scientifically-driven high-level specifics not programmatic detail, how they will achieve IASC's vision over the next 4 years. These plans are meant to help Arctic scientists get involved in IASC activities, and it is expected that they will evolve in the coming years as the WGs continue with their work. These scientific foci are included in the WG sections which follow and the full plans are on the IASC website.

The WG members are experts in their field that have an international reputation and are from different scientific disciplines so that the full range of Arctic research is represented within the WGs. Though the WGs are somewhat disciplinary, they also address cross-cutting science questions by initiating activities that involve at least two WGs. 2017 was the last year an IASC cross-cutting funding call was held; since 2018 WGs have had their budgets expanded but are required to use 40% of their funds in collaboration with paired funds from at least one other WG. IASC hopes that this will lead to closer cooperation, coordination, and teamwork across Arctic science disciplines.

Cross-Cutting Activities

Arctic Freshwater Resources Initiative (ArcFRI)

When: 15 - 16 March 2018 | Where: Stockholm (Sweden)
Working Groups: AWG, CWG, SHWG, TWG

Highlights:

- The workshop identified a set of key indicators for impacts on Arctic freshwater resources.
- The workshop reviewed driving forces and associated freshwater system components.
- The workshop discussed how to analyze the impact of various geophysical and socio-economic scenarios on the identified indicators.

The Arctic Freshwater Resources Initiative (ArcFRI) project gathers an international and interdisciplinary consortium of senior and early-career researchers to enhance our understanding of how freshwater resources in Arctic respond to and are possibly threatened by the present rapid change in the Arctic, both climate and land-use, water-use change, while also exploring opportunities to sustain and improve water resources in the region. In the first ArcFRI workshop in Stockholm, the team continued the preparation of a perspective paper that sets out the key challenges and opportunities for freshwater resources under scenarios of changing geophysical and socio-economic conditions in the Arctic. This first workshop was the first gathering of the research team, and work focused on the structure of the review/perspective paper as well as producing the first text towards a draft manuscript. In addition to IASC, this workshop was also co-sponsored by the Bolin Centre for Climate Research at Stockholm University, which supported the workshop with premises, logistical organization and the participation of one senior researcher in a public seminar in conjunction with the workshop.

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Arvid Bring - arvid.bring@natgeo.su.se

PACES-ALPACA

When: 14 - 16 May 2018 | Where: Fairbanks (Alaska)
Working Groups: AWG, SHWG, TWG

Highlights

- Fairbanks is the most polluted city in the USA in terms of particulate matter in winter.
- The emission sources of the particulate matter and precursors thereof are not fully understood, and hence require investigation.

- The cold and dark environment in the wintertime Arctic creates very specific conditions under which atmospheric processes occur that are still largely unknown. ALPACA will tackle these knowledge gaps specifically.

The air Pollution in the Arctic: Climate, Environment and Societies (PACES) initiative has been developed as a bottom-up community action to address deficiencies in our understanding of sources, processing, and fate of Arctic air pollution. PACES WG2 focuses on interactions between Arctic air pollution and societies. Approaches to address key research questions under consideration are observational studies guided by community concerns, investigation of local air quality in Arctic communities, and feedbacks between economic development, air pollution and environmental change in the Arctic. A first city has been identified for a major international field study: Fairbanks, Alaska, USA. The IASC co-sponsored workshop brought together the scientific and local air quality communities to discuss ideas on how to investigate the air pollution problems of Fairbanks. The outcome of the workshop is to write a whitepaper on the ALaskan Pollution and Chemical Analysis (ALPACA) project. The white paper serves as a basis to acquire funding for an extensive scientific study.

Websites: https://pacesproject.org and https://alpaca.community.uaf.edu
Contact: **Julia Schmale** - julia.schmale@psi.ch

Extreme Events in the Arctic, a POLAR2018 Focus Group Discussion

When: 19 - 23 June 2018 | Where: Davos (Switzerland)
Working Groups: AWG, CWG, MWG, SHWG, TWG

Highlights

- Hosted a multi-day focus group discussion at the POLAR 2018 meeting in Davos, Switzerland on extreme events in the Arctic
- Attended by a diverse group of 15 scientists spanning various sub-disciplines of Arctic science
- A useful networking and learning opportunity for the individuals involved, with plans in place to produce a summary paper highlighting our key recommendations to the wider community

An increasingly significant and concerning issue in polar science is the rising prevalence and severity of extreme events in the Arctic. To help reconcile the gap between the needs and current efforts of the scientific community in understanding these extremes, we hosted a multi-day focus group discussion at the POLAR 2018 meeting in Davos, Switzerland. Fifteen scientists were invited to the discussion group, covering a wide range of research fields: glaciology, oceanography, atmospheric dynamics, marine biology, terrestrial/permafrost, and anthropology.

Our discussions were focused around a few key themes: the definition and characterization of extreme Arctic events; challenges of attribution and detection across various Arctic science sub-disciplines; the interconnectedness of Arctic extremes. We highlighted two different case studies of recent extreme events: (i) record high temperatures and sea ice breakup north of Greenland, and (ii) local-scale tsunamis triggered by glacial calving events with impacts on local communities. Extreme events require and indeed provide a useful framework to bring together scientists across disciplines. We hope our discussion summary and related activities will motivate further efforts to increase our understanding of extreme events in the Arctic.

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Manisha Ganeshan - manisha.ganeshan@nasa.gov

T-MOSAiC Implementation Workshop

When: 19 - 23 June 2018 | Where: Davos (Switzerland)
Working Groups: AWG, CWG, MWG, SHWG, TWG

Highlights:

- Establish the scientific connections between the MOSAiC and T-MOSAiC programs
- Science and Implementation plan discussions
- Atmosphere-Sea-Ice-Land-People interactions

The main goals of the Terrestrial Multidisciplinary distributed Observatories for the Study of Arctic Connections (T-MOSAiC) Implementation workshop were to develop the Science and Implementation plans as well as to establish the scientific connections between the MOSAiC and T-MOSAiC programs. During the science discussion aspects of the Arctic snow, permafrost, and freshwater systems were presented, and the presenters and the audience highlighted the importance of these topics to the program. In the implementation discussions, existing Arctic facilities, projects, programs, and transects were identified that could contribute to T-MOSAiC.

A key goal of the workshop was to define the scientific links between the MOSAiC and T-MOSAiC programs. The participation of the chairs of the MOSAiC program, Dr. Markus Rex and Dr. Matthew Shupe resulted in a detailed discussion about the atmosphere-sea-ice-land-people interactions and how both programs will contribute to improved knowledge of the changing Arctic. These joint discussions culminated in a conceptual diagram below that shows the complementarity and points of intersection between the two programs.

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Societal Relevance of Polar Research

When: 27 - 28 November 2018 | Where: Sopot (Poland)
Working Groups: AWG, CWG, MWG, SHWG, TWG

Highlights:

- Education and policy-making are the main dimensions of the societal relevance of Polar research.
- Effective translation of results of polar research is a key to achieve better understanding of its relevance.
- Transnational comparisons can offer better understanding how societal relevance of Polar Research could be better developed.

On November 27-28 2018, the conference and workshop Societal relevance of polar research was held in the Institute of Oceanology Polish Academy of Sciences in Sopot, Poland. The event, which aroused much interest among the participants from Czech Republic, Germany, Norway, Lithuania, Poland, Russia, the US, was organized under auspices of the IASC, IASSA, the University of Arctic and with kind financial support from the IASC Working Groups. The meeting gathered representatives of many research institutes, universities, school teachers and educators, officials from governments, environmentalists, journalists, writers, photographers and film makers. It was composed of 3 plenary panels with 15 presentations, Q&A sessions, photographic and graphic exhibitions, and a workshop. This variety of participants and forms of discussion became the source of many interesting exchanges of scientific perspectives, practical insights and personal experiences.

Website: https://www.iopan.pl/projects/Societal/index.html
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Jan Marcin Weslawski - weslaw@iopan.gda.pl

Young Permafrost Researchers Workshop, during EUCOP 2018

When: 22-24 June 2018 | Where: Chamonix (France)
Working Groups: CWG, SHWG, TWG

Highlights:

- 160 young researchers from about 20 different countries participated in this 2-day Workshop in Chamonix (France).
- 15 invited lecturers shared fundamental knowledge about permafrost, career management, "soft" skills development, and local environmental settings in the Mont Blanc massif.
- 4 plenary sessions, 6 breakout sessions and one-day local excursion

The PYRN workshop at EUCOP in Chamonix, France in June 2018 gathered 130 early career scientists from 20 different countries for 2 days of lectures, breakout sessions, and a fieldtrip to experience and learn about mountain permafrost from local experts. The workshop focused on topics of interest to early career permafrost scientists from different disciplines. Talks included fieldwork preparation and safety, working with local communities, and teaching and communicating effectively. On the second day, the workshop took advantage of the great location in Chamonix at the foot of the Mont Blanc to learn about local environmental settings (geology, glaciology and hydrology), mountain permafrost and permafrost conditions of the Mont Blanc Massif from local researchers during a field trip to the top of Le Brevent.

Website: https://pyrn.arcticportal.org/
Contacts: **Florence Magnin** - florence.magnin@geo.uio.no
Justine Ramage - justine.ramage@nordregio.org

PACES / IMPAACT Workshop

When: 28 September 2018 | Where: Takamatsu (Japan)
Working Groups: AWG, SHWG

Highlights:

- Processing during frontal export is a key driver of model uncertainty in Arctic budgets of short-lived climate pollutants.
- Wet deposition processes are likely a key driver of model aerosol differences.
- Perturbed parameter ensemble modeling is a powerful method able to identify important processes that dominate uncertainty in Arctic budgets of sulfate and black carbon aerosol. Some of these will require novel observational approaches to target.

The air Pollution in the Arctic: Climate, Environment and Societies (PACES) initiative is a bottom-up community activity aiming to address deficiencies in our understanding of sources, processing and fate of Arctic air pollution. Specifically, PACES Working Group 1 (WG1) is focused on improving predictive capability around transport of lower latitude pollution to the Arctic and its impacts on climate. Around 20 participants from Europe, North America and Asia met in Takamatsu, Japan to explore plans for new field and modeling initiatives aimed at addressing key uncertainties in these processes.

A major focus of the workshop discussion was the proposed "Investigation of Multiscale Processes Affecting Atmospheric Chemical Transport" (IMPAACT) experiment, which aims to use aircraft to track polluted air masses exported from China out over the Pacific and polewards towards the Arctic. Key uncertainties to be addressed include pollutant transformation and washout during frontal export, and chemical and physical pollutant transformation following continental export and en route to the Arctic. While funding for a central IMPAACT activity is yet to be obtained, several other international aircraft groups described plans that would align well to the IMPAACT goals. Groups from Asian countries, including Japan, expressed interest in conducting linked ship and ground-based activities. PACES WG1 modelling activities were presented, which include using novel perturbed parameter ensemble approaches

to robustly identify key processes leading to model uncertainty in Arctic pollutant burdens and distributions. Outcomes from the workshop include the establishment of a PACES WG1 steering group, aimed at coordination of separate aircraft and other field efforts to address the PACES WG1 and IMPAACT goals, as well as plans for modeling work aimed at identifying target processes and species for new aircraft measurements to be made during IMPAACT type experiments.

Website: https://pacesproject.org
Contacts: **Steve Arnold** - S.Arnold@leeds.ac.uk **Julia Schmale** - julia.schmale@psi.ch
Kathy Law - kathy.law@latmos.ipsl.fr **Jo Browse** - J.Browse@exeter.ac.uk

T-MOSAiC

When: 10 December 2018 | Where: Ottawa (Canada)
Working Groups: AWG, CWG, MWG, SHWG, TWG

Highlights:

- During the workshop, the T-MOSAiC Science Plan was presented and discussed, with special attention to data management, Indigenous priorities, remote sensing, and paleoclimate perspectives.
- The T-MOSAiC Implementation plan was discussed, particularly focusing on the creation of Action Groups.
- Early career researchers were again considered important for the program and two ECRs were selected to be on the T-MOSAiC Executive Committee.

The Terrestrial Multidisciplinary distributed Observatories for the Study of Arctic Connections (T-MOSAiC) T-MOSAiC Steering Committee met to discuss the recently published Science Plan and to discuss the Implementation Plan, the involvement of early career researchers and the importance of Indigenous participation in all phases of T-MOSAIC. At that meeting, Scott Zolkos from the University of Alberta Canada was appointed as the first early career researcher on the T-MOSAiC Executive Committee, and a second ECR position was established, to be filled via an a call open by APECS. Twenty members of the Steering Committee participated in the meeting including 7 early career researchers, some of whom received travel support from IASC through cross-cutting funds.

In the afternoon, a T-MOSAiC open workshop took place, with a series of scientific presentations and discussions about several points concerning the Implementation Plan, including the development of Action Groups.

The T-MOSAiC team is now on the road towards the 4th T-MOSAiC open workshop, to be held in Arkhangelsk, Russia, in May 2019. Participation is welcome from all IASC sectors.

Websites: https://www.t-mosaic.com/
Contact: **João Canário** - joao.canario@ist.utl.pt
Warwick F. Vincent - warwick.vincent@bio.ulaval.ca

Year of Polar Prediction (YOPP) Arctic Science Workshop

When: 14 - 16 January 2019 | Where: Helsinki (Finland)
Working Groups: AWG, CWG, MWG, SHWG, TWG

Highlights:

- More than one hundred participants discussed recent progress and ways toward improved polar prediction.
- The meeting was jointly sponsored by IASC, the YOPP International Coordination Office, and the Finish Meteorological Institute as host.
- The first day of the meeting was dedicated to keynote lectures to set the stage on current efforts to bring together observations and modelling during the Year of Polar Prediction.

One focus during the following science sessions was the analysis of additional observations that have been obtained during the first two YOPP Special Observing Periods (SOPs) in the Arctic. Extra polar observations during the SOPs captured several extreme weather events that provide useful benchmarks to assess current forecast capabilities and to understand how such events unfold.

Results presented from first data denial experiments capitalising on the SOP data indicate that the polar observing systems clearly have impacts on forecast skills not only in polar regions but also in the midlatitudes, and that in particular conventional (i.e., surface, wind profiler, and upper-air) observations are most influential during winter.

During parallel breakout sessions on predictability, processes, verification, and user engagement, the workshop participants discussed current questions and topics that are particularly relevant to help shaping the YOPP Consolidation Phase (July 2019 to 2022). During this final phase, YOPP data and research will be synthesized to ensure sustained improvements in environmental prediction capabilities for the polar regions and beyond.

Websites: https://www.polarprediction.net/
Contact: **Thomas Spengler** - thomas.spengler@uib.no

Network on Arctic Glaciology - The Importance of Arctic Glaciers for the Arctic Marine Ecosystem

When: 21-23 January 2019 | Where: Geilo (Norway)
Working Groups: CWG, MWG

Highlights

- Subglacial discharge plumes play an important role in the nutrient cycling near marine-terminating glaciers, as revealed by field-measurements and model simulations.
- Timeseries of freshwater runoff and ice fluxes are datasets frequently requested from marine ecologists. Those are now made increasingly available by glaciologists.

- Tidewater glacier response to climate/ocean warming continues to be explored.

How do glaciers effect marine primary production in the ocean? This question was raised during the break-out session of the second cross-cutting event "The importance of Arctic glaciers for the Arctic marine ecosystem" between the IASC Cryosphere and Marine Working Groups. The activity was an integral part of the Network on Arctic Glaciology annual meeting and workshop on the dynamics and mass balance of Arctic Glaciers. The workshop brought together 58 participants from 16 countries and was a good framework for the glacier and marine communities to get to know each other better and establish networks for future interdisciplinary collaboration.

The break-out session moreover offered an excellent platform to discuss a synthesis paper of the cross-cutting activity, currently being prepared by Mark Hopwood et al., addressing the following questions: Where and when does glacial freshwater promote marine primary production and where and when does it retard marine primary production? How do variations in glacial discharge timing and location affect marine organisms? How far-reaching are glacial effects of glaciers on marine biogeochemistry?

Contacts: **Thorben Dunse** - thorben.dunse@geo.uio.no
Renate Degen - renate.degen@univie.ac.at

PHOTO: ANDY ASCHWANDEN, GEOPHYSICAL INSTITUTE, UNIVERSITY OF ALASKA FAIRBANKS
Walking towards Root Glacier during the International Summer School in Glaciology, 2016.

Launching of MOSAiC, an IASC Flagship Initiative

MOSAiC - An entire year trapped in the Arctic ice

MOSAiC will be the largest Arctic expedition ever, with five icebreakers, a suite of aircraft, and 600 people operating in the central Arctic over the course of one year. The core of MOSAiC is the yearlong passive drift of RV Polarstern approximately 2500 km through the central Arctic, carrying out urgently needed observations to better understand key Arctic climate processes.

The expedition has been designed by an international consortium of leading polar research institutes, under the umbrella of the International Arctic Science Committee (IASC), led by the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), the Arctic and Antarctic Research Institute (AARI), and the University of Colorado, Cooperative Institute for Research in Environmental Science (CIRES). More than 70 institutes from 17 nations are involved in MOSAiC.

Understanding the observed rapid changes in the Arctic urgently requires observations of the underlying climate processes in the central Arctic. Key observations are needed over various spatial and temporal scales, and across all disciplines. Observations of many critical parameters were never made in the central Arctic for a full annual cycle.

PHOTO: AWI BY STEFAN HENDRICKS
Research ice breaker "Polarstern".

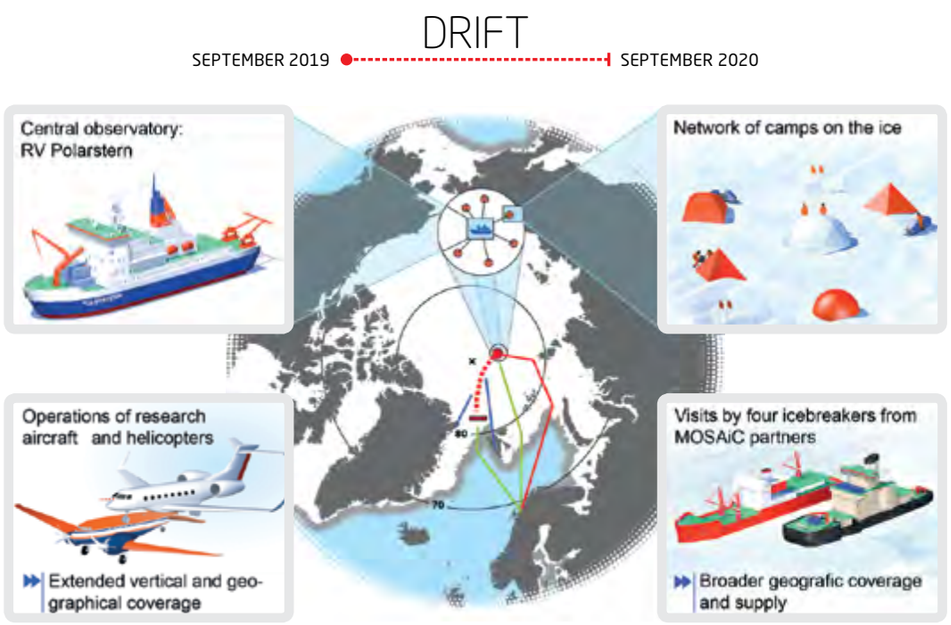
MOSAiC will be the first year-round expedition into the central Arctic exploring the coupled climate system. The backbone of MOSAiC will be the operation of RV Polarstern, drifting with the sea ice across the central Arctic during September 2019 to September 2020. MOSAiC builds on the heritage of Fridtjof Nansen's ground breaking Fram expedition during 1893-1896, which demonstrated the feasibility of letting a research vessel drift across the polar cap, driven by the natural drift of the sea ice. While Nansen has demonstrated the basic concept of such an expedition, the scientific measurements at that time were extremely limited.

During the set-up phase of MOSAiC, RV Polarstern will enter the Siberian sector of the Arctic during the thin sea ice conditions of late summer. A distributed regional network of observational sites will be set up on the sea ice in an area of up to ~50km distance from RV Polarstern, while large scale research facilities will be set up on board of RV Polarstern and on the sea ice next to it. The ship and the surrounding network will then drift with the natural ice drift across the polar cap towards the Atlantic, while the sea ice thickens during winter.

The German research aircraft Polar 5 and Polar 6 and likely further international research aircraft will be operated to complement the measurements at the central MOSAiC site, with landings and refueling on a sea ice runway that will be operated at the MOSAiC observatory. Research and supply cruises by icebreakers from MOSAiC partners will further extend the geographical coverage of the observations and will link the measurements to the larger scales of the Arctic climate system and explore global feedbacks.

The overarching scientific goal of MOSAiC is to improve our understanding of the regional and

global consequences of Arctic climate change and improve weather and climate predictions. The MOSAiC approach is highly interdisciplinary. In-situ observations of the climate processes that couple atmosphere, ocean, sea ice, biogeochemistry and ecosystem will be carried out throughout the year. These will be complemented and combined with by satellite remote sensing data and the measurements will provide urgently needed ground truth observations for improving satellite data retrievals. The results will feed into data assimilation for numerical weather prediction models and sea ice forecasts and will improve the representation of key Arctic processes in regional and global climate models, leading to more reliable climate projections for the Arctic and world-wide.



Contacts: **Markus Rex**, MOSAiC coordinator - Markus.Rex@awi.de
Anja Sommerfeld, MOSAiC manager - Anja.Sommerfeld@awi.de
Annette Rinke, MOSAiC modeling co-coordination and
Vice-Chair IASC AWG - Annette.Rinke@awi.de

GRAPHIC: AWI
Graphical representation of the set up of MOSAiC.

Atmosphere Working Group (AWG)

Scientific Foci:

- Cloud, Water Vapor, Aerosols, Fluxes
- Arctic Air Pollution
- Coupled Arctic Climate System
- Arctic Weather Extremes
- Linkages: Role of the Arctic in the Global Climate System

The scientific scope of the Atmosphere Working Group (AWG) includes research towards understanding and predicting the Arctic climate system and its change. Arctic air pollution is among the key priorities, which has influences on Arctic climate through trace gas and aerosol forcing, is harmful to Arctic communities and ecosystems, and may mediate important high latitude climate feedbacks. Other key priorities are snow, Arctic paleoclimates, and aerosol-cloud interactions in the Arctic including their controls on the aerosol population. Several of these priorities are cutting across several IASC Working Groups.

These topics have been put under the three pillars of

1) MOSAiC (Multidisciplinary drifting Observatory for the Study of Arctic Climate),
2) PACES (air Pollution in the Arctic: Climate, Environment and Societies), and
3) YOPP/PPP (Year of Polar Prediction/ Polar Prediction Project).

Two of the main pillars of the AWG, MOSAiC and PACES, are firmly rooted in the AWG and MOSAiC was in fact born out of the AWG. Over the last couple of years, the AWG has engaged with PPP's YOPP. The main role for the AWG is to support exchange among the science projects that are endorsed by YOPP. To facilitate this exchange, the AWG, together with the PPP office, successfully organized a YOPP Arctic science workshop in January 2019 in Helsinki, Finland.

Membership [1]

NAME	COUNTRY	EXPERTISE
Chair Thomas Spengler	Norway	Atmosphere dynamics; Mesoscale meteorology; Air-sea-ice interactions
Vice-Chair Annette Rinke	Germany	Arctic climate modeling; Arctic atmospheric processes; Surface-atmosphere interactions
Vice-Chair Stephen Arnold	UK	Arctic trace gases and aerosols; Atmospheric chemistry; Tropospheric ozone
Leopold Haimberger	Austria	Climate; Energy and water budgets; Surface and pper air instrumental records
Harald Rieder	Austria	Atmospheric chemistry; Chemistry-climate connections; Polar ozone
James Drummond	Canada	Remote sounding; Ozone and air quality; Climate change
G.W.K. (Kent) Moore	Canada	High-latitude air-sea-ice interactions; Polar meteorology; Paleoclimatology
Ding Minghu	China	Mass balance; Air-sea/ice interaction; Measurement technique
Kamil Laska	Czech Republic	Solar radiation modelling; Boundary layer processes; Glacier-climate interactions
Jacob Klenø Nøjgaard	Denmark	Arctic aerosol; Mass spectrometry; Source apportionment
Ole John Nielsen	Denmark	Atmospheric chemistry; Climate change; Spectroscopy
Kalevi Mursula	Finland	Space climate; Heliospheric and magnetospheric physics; Solar climate effects at high latitudes
Tiina Nygård	Finland	Atmospheric thermodynamics; Moisture/clouds; Numerical modelling
Olivier Jourdan	France	Clouds; Microphysics; Airborne measurements
Günther Heinemann	Germany	Atmospheric boundary layer; Sea ice remote sensing; Mesoscale modelling
Guðrún Nína Petersen	Iceland	Arctic weather; Extreme weather; Numerical weather prediction
Nuncio Murukesh	India	Arctic precipitation; Teleconnections; Tropical ocean atmosphere variability
S. Suresh Babu	India	Aerosol radiative forcing; Aerosol-cryosphere interaction; Aerosol-cloud interaction
Stefano Decesari	Italy	Atmospheric chemistry; Aerosol-climate interactions; Biogenic & anthropogenic organic aerosols
Hiroshi L. Tanaka	Japan	Atmospheric science, General circulation, Dynamic meteorology
Jun Inoue	Japan	Arctic climate change; Air-sea-ice interactions; Arctic weather
Seong-Joong Kim	Korea	Polar climate dynamics; Climate modelling; Climate variability
Sang-Jong Park	Korea	Polar meteorology; Atmospheric boundary layer; Surface-atmosphere interactions
Peter van Velthoven	The Netherlands	Atmosheric chemistry and transport modelling; Near term climate forcers
Maria Sand	Norway	Climate modeling; Black carbon aerosols; Aerosol-radiation interactions
Ewa Łupikasza	Poland	Climate change; Atmospheric circulation; Synoptic climatology
Andrzej Araźny	Poland	Polar climate; Bioclimatology; Biometeorology; Climate change
Daniele Bortoli	Portugal	Atmospheric physics; Active and passive remote sensing; Spectroscopy
Alexander P. Makshtas	Russia	Sea ice and permafrost - atmosphere interaction processes; Arctic climate
Boris Vladimirovich Kozelov	Russia	Geliogeophysical impact to Arctic atmosphere; Climate and micro-climate in Arctic region
Carlos Toledano	Spain	
Ana Cabriezo	Spain	
Thomas Kuhn	Sweden	In-situ measurements of Arctic clouds; Snowfall; Ice fog
Julia Schmale	Switzerland	Aerosol chemistry and microphysics; Cloud condensation nuclei; In-situ observations
Jo Browse	UK	Aerosols; Clouds; Modelling
Gijs de Boer	USA	Arctic clouds; Autonomous Observing; Aerosol-cloud interactions
Muyin Wang	USA	Arctic climate dynamics; Model-data synthesis; Sea-ice prediction

PHOTO: SUSAN MÜHLEMEIER and ROMANO WYSS
IASC AWG During POLAR2018 in Davos (Switzerland).

[1] Membership as of 29 March 2019. Please visit https://iasc.info/working-groups/atmosphere/members for updated information and contact information for each Working Group Member.

NAME	COUNTRY	EXPERTISE
FELLOWS		
Gillian Young	UK	Cloud microphysics; Mixed-phase clouds; Aerosol-cloud interactions
Sophie Haslett	Sweden	Arctic aerosols and trace gases; Mass spectrometry; Atmospheric chemistry
SECRETARY		
Rui Wang	China	(through ASSW2019), Polar Research Institute of China
Sara Morris	USA	(from ASSW2019), Cooperative Institute for Research in Environmental Sciences at NOAA

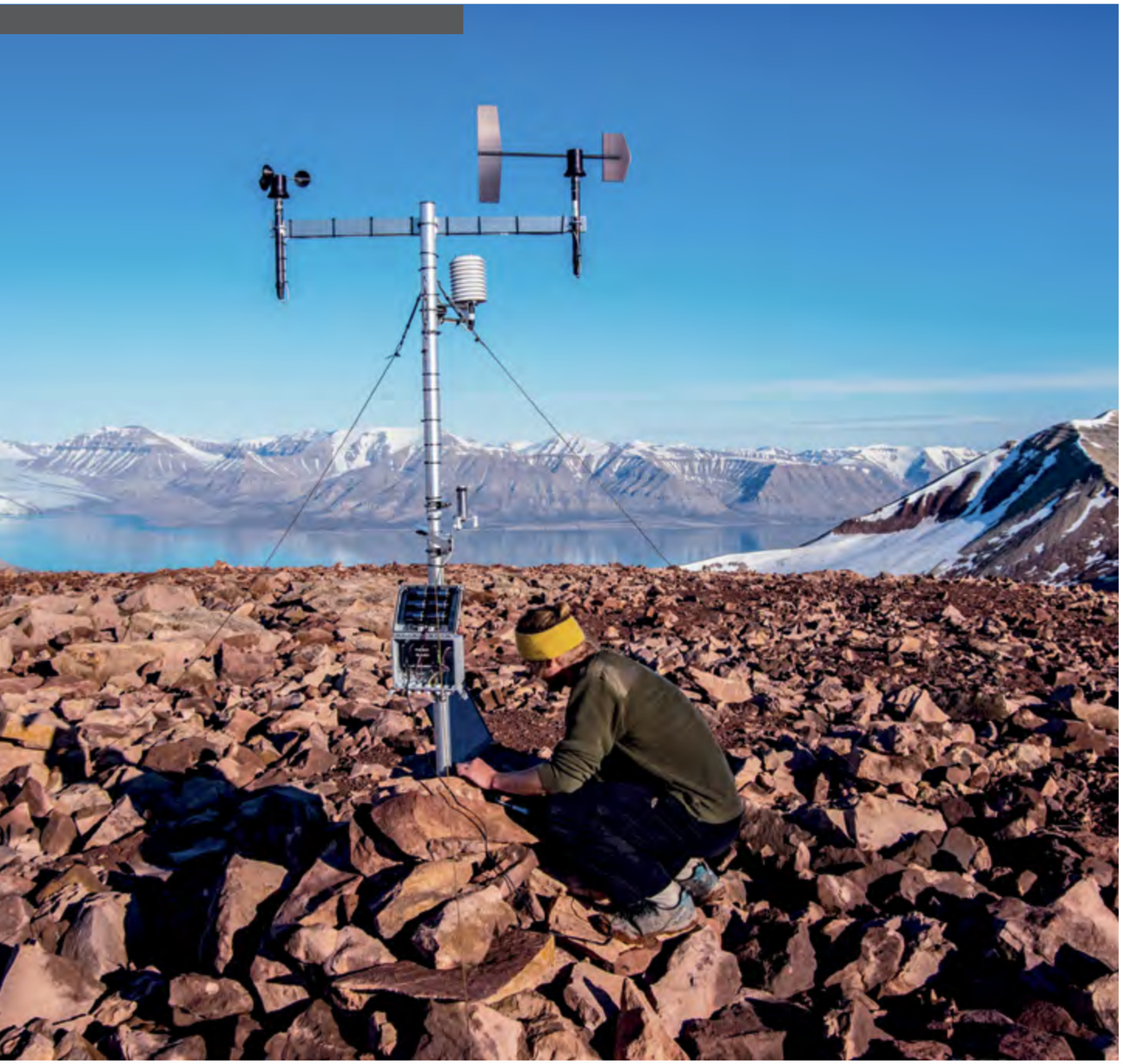


PHOTO: MARTIN LULAK
Jakub Ondruch servicing one of automatic weather stations in the vicinity of Nostoc Field Station on Mumien peak (773 m asl.) in August 2018, with Pyramiden peak and northern part of Billefjorden in the background.

Recent Activities

Polar Prediction School 2018

When: 17 - 27 April 2018 | Where: Abisko (Sweden)

Highlights

- Fascinating set of lectures and exercises developed by an expert team
- Excellent hands-on field meteorological training
- In-depth science communication program

The Polar Prediction School was held from 17-27 April 2018 at the beautiful Abisko Scientific Research Station in northern Sweden. It brought together 29 students from nine different countries and at various career stages, from early PhD students through to post-docs. The program for the school was designed to provide a comprehensive overview of the main aspects related to polar weather and climate prediction. It included theoretical lectures, practical exercises, meteorological fieldwork, and a dedicated science communication program.

Contact: **Fiona Tummon** - fiona.s.tummon@uit.no

Polar Lows and Mesoscale Weather Extremes

When: 5 - 6 April 2018 | Where: Trier (Germany)

Highlights:

- The main themes were studies using satellite data and in-situ data, climatological aspects, reanalyses and model simulations, environments for polar low genesis and operational aspects, polar mesoscale weather phenomena, and air-sea-ocean interactions.
- 30 participants presented and discussed recent research findings on polar lows and mesoscale weather extremes.
- A workshop summary was published in February 2019: Heinemann, G., Claud, C., Spengler, T., 2019: 'Polar low workshop', Bulletin of the American Meteorological Society: Vol 100

The workshop attracted 30 scientists from China, France, Germany, Japan, Norway, Russia, the UK, and the USA to present most recent findings on polar low research. The workshop summarized our present understanding of polar lows and mesocyclones as well as mesoscale weather extremes in the Arctic and Antarctic. This includes, for example, mesoscale weather phenomena such as katabatic winds, tip jets, boundary layer fronts, and cold air outbreaks in polar regions. The workshop had the following main themes: Polar low studies using satellite data and in-situ data; climatological aspects of polar lows; polar lows in reanalyses and model simulations; environments for polar low genesis and operational aspects; polar mesoscale weather phenomena and air-sea-ocean interactions. The workshop was concluded by a round table discussion resulting in recommendations for future research and actions.

Contact: **Prof. Dr. Günther Heinemann** - heinemann@uni-trier.de

Cryosphere Working Group (CWG)

Scientific Foci:

- Sea-ice boundary layer dynamics, particularly as they relate to biogeochemical exchanges and polar amplification
- Permafrost, including support of activities being undertaken by the International Permafrost Association
- This activity is intended to have a large early career scientist and training component: Tidewater glacier dynamics and response to climate change, with a focus on methods for studying these issues

The Cryosphere Working Group (CWG) is composed of 40 members from 23 countries, including three early-career IASC fellows and a Secretary. Our research interests span all elements of the cryosphere - the frozen regions of our planet - including sea ice, mountain glaciers, ice caps, icebergs, the Greenland ice sheet, snow cover, permafrost and seasonally frozen ground, and lake and river-ice. The CWG helps promote activities that enhance our understanding of these cryospheric components of the Arctic/sub-Arctic and their interaction with the Earth's climate system. While the CWG is interested in all elements of the cryosphere, our activities we have structured across three main themes:

- Atmosphere-glacier-ocean interactions: implications on the pan-Arctic glacier mass budget, which explores the link between the response of glaciers to climate change and both atmospheric changes and ocean circulation, with focus on the dynamics and mass budget of Arctic glaciers and their impact on global sea-level and regional freshwater runoff.
- Cutting barriers in snow knowledge, in which the impact of snow on glacier and ice-sheet mass balance and sea-ice variability is explored. Through this theme we seek to promote an improved common knowledge of snow-related processes by bringing together snow-interested scientists working within the various IASC working groups.
- Causes, impacts and prediction of extreme Cryospheric events, which aims to gain understanding on a wide variety of phenomena, including intense storms/cyclonic activity, severe warm periods, droughts, rapid iceberg calving events, anomalous ice-sheet surface melt, avalanches, and heavy rain-on-snow events, many of which are becoming more frequently observed in the Arctic.

PHOTO: SUSAN MÜHLEMEIER and ROMANO WYSS
IASC CWG During POLAR2018 in Davos (Switzerland).

Membership [2]

NAME	COUNTRY	EXPERTISE
Chair Gudfinna Th. Adalgeirsdottir	Iceland	Climate - glaciers/ice sheets interaction; Evolution of Icelandic glaciers and the Greenland ice sheet
Vice Chair Jari Haapala	Finland	Sea-ice physics; Numerical modeling; Climate variablity and change
Vice Chair Martin Schneebeli	Switzerland	Snow and snow tomography; Stratigraphy; Snow instruments
Annett Bartsch	Austria	Permafrost; Snow; Remote sensing
Wolfgang Schöner	Austria	Glacier mass balance; Surface energy balance; Snow climatology
Shawn Marshall	Canada	Glacier and ice sheet modelling; Cryosphere-climate processes; Glacier mass balance
Sun Bo	China	Radioglaciology; Ice sheet mass balance and sea level; Sea-ice processes and climate
Marie Sabacka	Czech Republic	Glacier ecology
René Forsberg	Denmark	Ice sheet changes from satellites; Airborne lidar; Sea-ice thickness determination
Signe Bech Andersen	Denmark	Glaciology; Greenland Ice sheet; Climate
Pentti Kujala	Finland	Modeling of Arctic shipping; Scenario based risk management of Arctic shipping and operations
Hans-Werner Jacobi	France	Snow physics and chemistry; Snow-atmosphere interactions; Climate
Hugues Lantuit	Germany	Permafrost; Geomorphology and remote sensing; Coastal science
Gunnar Spreen	Germany	Sea ice; Remote sensing; Ocean-sea ice-atmosphere interactions
Þorsteinn Þorsteinsson	Iceland	Glaciology; Ice drilling; Climate history
Parmanand Sharma	India	Glacier mass and energy balance; Surface and sub surface flow (ice flux)
Andrea Spolaor	Italy	Paleoclimate; Snow chemistry; Air-snow exchange
Hiroyuki Enomoto	Japan	Climate research; Satellite remote sensing; Sea ice, snow, ice sheet
Shin Sugiyama	Japan	Glaciers; Ice sheet; Greenland
Hyun-cheol Kim	Korea	Remote sensing; Sea ice
Jung-Ho Kang	Korea	Environmental monitoring; Glaciology; Snow and ice chemistry
Carleen Tijm-Reijmer	The Netherlands	Meteorology; Climatology; Glaciology
Elisabeth Isaksson	Norway	Glaciology; Ice cores; Snow chemistry
Thomas Vikhamar Schuler	Norway	Arctic glacier mass balance & hydrology; Subglacial processes; Modeling cryosphere: snow, glaciers and permafrost
Mariusz Grabiec	Poland	Mass balance; Geometry changes; Thickness and internal structure of Arctic glaciers
Ireneusz Sobota	Poland	Cryospheric changes; Mass balance; Snow; Permafrost
Gonçalo Vieira	Portugal	Permafrost; Remote sensing; Geomorphology
Dmitry Drozdov	Russia	Permafrost: Mapping, Thermal state, Active layer, Remote sensing; Arctic Coastal Dynamics; Arctic landscapes
Sergei Verkulich	Russia	Glaciers and permafrost; Antarctic and Arctic Quaternary sediments; Terrestrial records
Jaime Otero	Spain	
Carolina Gabarro	Spain	Remote sensing; Sea-ice extension; Sea-ice thickness
Veijo Pohjola	Sweden	Glaciology; Climatology; Natural hazards
Martin Lüthi	Switzerland	Glaciology; Ice sheet dynamics; Glacier calving
Poul Christoffersen	UK	Glacial hydrology; Ice-ocean interactions; Basal processes
Richard Essery	UK	Snow modelling; Seasonal snow cover; Snow hydrology
Cathy Wilson	USA	
Robert Hawley	USA	Glaciers, ice sheets, snow and firn; Mass balance; Remote sensing

[2] Membership as of 29 March 2019. Please visit https://iasc.info/working-groups/cryosphere/members for updated information and contact information for each Working Group Member.

NAME	COUNTRY	EXPERTISE
FELLOWS		
Alice Bradley	USA	Sea ice; Marginal ice zone and coastal processes; Environmental heat transport
Barbara Barzycka	Poland	Remote sensing; Glacier facies; Drone mapping
SECRETARY		
Pablo Sánchez Gámez	Spain	(through March 2019), Universidad Politécnica de Madrid
Karen Cameron	UK	(from ASSW2019), Aberystwyth University

Recent Activities

International Summer School in Glaciology

When: 5-15 June 2018 | Where: McCarthy (Alaska)

Highlights

- Glaciology lectures, exercises and computer projects, and an outdoor poster session where the students presented their own research
- Excursions to nearby glaciers, which provided hands-on experience of a glacial environment
- A number of evening activities including a public lecture that attracted a good number of both locals and tourists

Nearly 30 graduate students from over 25 universities and a dozen countries as far as Nepal, India, Peru and New Zealand gathered in the small Alaskan village of McCarthy to participate in UAF's fifth 11-day International Summer School in Glaciology. Steep ice-covered mountains provided the perfect setting to equip early stage PhD students with tools to address the expanding challenges in quantifying and modeling rapid changes in glaciers and ice sheets occurring in response to a warming climate, and to foster collaboration among students as well as established scientists in the field of glaciology. The eight instructors from the University of Alaska Fairbanks and three other US universities/institutions stayed for the entire period, offering plenty of opportunity for interaction between the instructors and students during and outside the formal instruction period.

Overall, the course was well received by the participants. The students left not only with a stronger background in glaciology, but also with a network of professional contacts from around the world. All course material is openly available.

Website: https://glaciers.gi.alaska.edu/courses/summerschool
Contact: **Regine Hock** - rehock@alaska.edu

SCAR/IASC/CliC Ice Sheet Mass Balance and Sea Level (ISMASS)

When: 15 June 2018 | Where: Davos (Switzerland)

Highlights

- Review recent observational estimates, and their related uncertainties, of ice sheet mass balance (including surface mass balance, basal melting and solid-ice discharge components) and their response to climate change, and to reach a consensus on the magnitude of current ice-sheet contribution to sea-level change
- Review recent improvements in ice-sheet modelling and the use of updated mass-balance observational datasets in ice-sheet models
- Disseminate this improved understanding both to other researchers and also to policymakers and the general public

Prof. Edward Hanna of the School of Geography lead-organized an international research workshop on Greenland and Antarctic Ice Sheet mass balance - links between observational data and computer model simulations. This included some of the world-leading scientists working in this area. There were two keynote talks: Prof. Tony Payne (University of Bristol) spoke on "Challenges in making useful projections of the future sea-level contributions of ice sheets," while Prof. Andy Shepherd (University of Leeds) gave a very timely rundown of "Satellite observations of ice sheet mass balance." The latter talk was based on a major new research paper on Antarctic Ice Sheet mass balance, 1992-2017, that Prof. Shepherd had lead-authored in the journal Nature the previous day. Other talks included the effects on ice sheets of limiting global warming to 1.5°C above pre-industrial levels by 2100 - an unlikely outcome but one that is highly relevant to study for an upcoming interim report of the Intergovernmental Panel on Climate Change.

Website: http://www.climate-cryosphere.org/activities/groups/ismass/meetings/1595-ismass-meeting-polar18
Contact: **Edward Hanna** - ehanna@lincoln.ac.uk

PHOTO: JULIA DAVYDOVA
Polar bears track in the Franz Josef Land archipelago.

Workshop on Knowledge Gaps of Cryospheric Extremes

When: 25-27 April 2018 | Where: Helsinki (Finland)

Highlights

- Overview on the impact of Arctic climate change on mid-latitudes weather and predictability of weather events from weekly to seasonal time scales, respectively
- New methods to detect and monitor snow and sea ice parameters from space
- Review of how the ECMWF forecasting system has been developed towards statistical calculation of probabilities of extreme events

Extreme weather events commonly encompass phenomena such as heat waves, droughts, floods and storms. In cold regions, these are augmented with snow and sea-ice related extreme events, usually triggered by anomalous atmospheric or oceanic conditions.

Although extreme events are a core climate research focus, cryospheric extremes have not received much attention yet. The overarching aim of the workshop was to review our understanding of cryospheric extreme events in the past, present and future, and to identify research needs.

The workshop was hosted by the Finnish Meteorological Institute. Around 50 participants from 11 countries attended the workshop to discuss ice and snow extremes in marine, fluvial and terrestrial settings, using meteorological, hydrological, glaciological, social, engineering and medical perspectives.

Contacts: **Jari Haapala** - jari.haapala@fmi.fi
Veijo Pohjola - Veijo.Pohjola@geo.uu.se

PHOTO: Dr. GEORGI LAUKERT, GEOMAR
Students of the POMOR master program take samples from sea ice in the East Siberian Sea during the ARCTIC 2018 expedition onboard Akademik Tryoshnikov.

Marine Working Group

Scientific Foci:

- Predicting and understanding rapid changes to the Ocean system
- Understanding biological and ecosystem processes in the Arctic and sub-Arctic seas
- Understanding sea ice structure dynamics and the Arctic system
- Understanding geochemical processes in the Arctic and sub-Arctic seas
- Climate and geological history of the Arctic basin

The IASC Marine Working Group (MWG) facilitates international coordination of research in the Arctic marine environment and supports cross-cutting objectives through face-to-face annual meetings. Frequent electronic communication is used throughout the remainder of the year, including exchange and collaboration with terrestrial, cryospheric, atmospheric and social scientists where appropriate. The MWG also seeks to encourage and facilitate two-way communication between working group members from each member state of IASC and their national science constituencies. Another important goal is to provide support for early career scientists and include their involvement in international research coordinated by IASC member countries, including expanding roles for IASC Fellows in MWG tasks.

Specific work goals that are integrated into the MWG Work Plan include project coordination and support for prominent initiatives that include: renewal of the Arctic in Rapid Transition network that has provided a mechanism for the early career science community to become engaged in international Arctic research; implementation of the Multidisciplinary drifting Observatory for the study of Arctic Climate (MOSAiC); contribution to the Workshop on Arctic Glaciology and Proglacial Marine Ecosystem; and expansion of the Distributed Biological Observatory on a pan-Arctic basis. Strengthening international cooperation with Russian scientists remains a key goal, including support for IASC's Russian Arctic (ISIRA) activities that are seeking to improve conditions for marine research within Russia's Exclusive Economic Zone. Finally, identifying new mechanisms to involve the MWG in Arctic Council observer activities and meetings are critical to connecting research with governmental affairs at the international level.

PHOTO: SUSAN MÜHLEMEIER and ROMANO WYSS
IASC MWG During POLAR2018 in Davos (Switzerland).

Membership [3]

NAME	COUNTRY	EXPERTISE
Chair Lee Cooper	USA	Marine biogeochemistry, including stable and radioactive isotopes
Vice-Chair Hajime Yamaguchi	Japan	Naval architecture and ocean engineering; Arctic sea routes; Sea ice
Vice-Chair Heidi Kassens	Germany	Marine Geology; Interdisciplinary polar research projects; Cooperation with Russia
Gerhard Herndl	Austria	Limnology; Microbial oceanography of Polar seas
Renate Degen	Austria	Marine ecology; Benthic ecosystems; Functional traits
John Fyfe	Canada	Global and regional climate variability; Role of the poles in the global system
Christine Michel	Canada	Role of sea ice in Arctic marine ecosystems; Pelagic and benthic Arctic food webs
Jinping Zhao	China	Physical oceanography; Sea-ice physics; Ice and marine optics
Oleg Ditrich	Czech Republic	Parasitology; Zoology; Polar ecology
Colin Stedmon	Denmark	Chemical oceanography; Environmental spectroscopy; Dissolved organic matter biogeochemistry
Marit-Solveig Seidenkrantz	Denmark	Climate system science; Palaeoclimate; Palaeoceanography; Palaeontology; Marine geology
Jaakko Heinonen	Finland	Arctic marine technology; Offshore structures; Offshore wind energy
Hermanni Kaartokallio	Finland	Sea ice ecology; Microbial ecology in cold marine environments
Laurent Chauvaud	France	Coastal ecology; Marine biology; Sclerochemistry
Marie-Noëlle Houssais	France	Physical oceanography; Ocean-sea ice processes; Large-scale and mesoscale ocean variability
Torsten Kanzow	Germany	Observational physical oceanography; Long-term time series observations
Anna Heiða Ólafsdóttir	Iceland	Geographical distribution, migration, life history traits, and stock assessment of small pelagic fish in the northeast Atlantic
K.P. Krishnan	India	Microbial ecology; Bacterial taxonomy; Cold adaptation
Tommaso Tesi	Italy	Paleoclimatology; Geochemistry; Oceanography
Koji Shimada	Japan	Physical oceanography; Sea-ice dynamics; Climate dynamics
Eun Jin Yang	Korea	Polar marine ecology; Microzooplankton biology
Jinyoung Jung	Korea	Chemical oceanography; Biogeochemistry
Anita Buma	The Netherlands	Marine phytoplankton; Ecophysiology; Photobiology
Arild Sundfjord	Norway	Ocean – sea ice interaction; Regional & sub-mesoscale ocean modelling; Vertical mixing
Randi Ingvaldsen	Norway	Physical/Polar oceanography; Climate variability; Climate impacts on species and ecosystem
Monika Kędra	Poland	Biological oceanography; Food webs; Carbon cycling
Waldemar Walczowski	Poland	Physical oceanography; Hydrology; Ocean and glacier interaction
Teresa Cabrita	Portugal	Marine pollution; Trace element biogeochemistry; Phytoplankton ecotoxicology
Alexander Makshtas	Russia	Air - sea-ice interaction in the Arctic; Structure of atmospheric boundary layer in the polar regions
Sergey Pisarev	Russia	Meso-scale oceanographic processes; Shot-period variations of ocean climate in the Arctic Ocean
Antionio Tova	Spain	
Manuel D'Allosto	Spain	
Pauline Snoeijs Leijonmalm	Sweden	Sea-ice ecology; Microbiology; Fish ecology; Food-web ecology
Andrew Brierley	UK	Marine ecology; Scientific echosounding; Zooplankton ecology, predator-prey interactions
Finlo Cottier	UK	Ice – Ocean processes; Coupled biological-physical interactions; Fjordic systems; Autonomous technologies
Karen Frey	USA	Land-ocean linkages; Sea ice; Biogeochemistry

[3] Membership as of 29 March 2019. Please visit https://iasc.info/working-groups/marine/members for updated information and contact information for each Working Group Member.

NAME	COUNTRY	EXPERTISE
FELLOWS		
Françoise Amélineau	France	Seabird and shorebird ecology; Spatial ecology; Microplastic pollution
Maria Paulsen	Denmark	Microbial foodwebs; Terrestrial runoff; Bacterial activity
SECRETARY		
Jeanette Axelsson	Sweden	(through ASSW2019), Swedish Polar Research Secretariat
Laura Ghigliotti	Italy	(from ASSW2019), National Research Council of Italy

Recent Activities

Polar Marine Diatom Workshop (IASC/SCAR)

When: 6-10 August 2018 | Where: Milford (Iowa, USA)

Highlights

- The Polar Marine Diatom Workshop (PMDW) provided several opportunities for taxonomic collaboration between students, individuals new to polar marine diatoms, and established experts.
- Each participant was able to take home a collection of taxonomic handouts and microscope slides based on the workshop.
- Talks and posters detailed results from recent studies and drilling expeditions and allowed the participants to network and keep up with the current state of the art.

The 6th Polar Marine Diatom Workshop, held at Lakeside Lab, was a success. A diverse group of researchers from students to full professors, representing 12 countries, spent the week engaged in microscope sessions, talks, and posters. Microscope sessions were led by experts in order to facilitate consistent species identification. Each participant took home a set of reference slides. Biostratigraphy was one of the main foci of these sessions, given the current and upcoming IODP expeditions to the Southern Ocean. Scientific talks and posters were also presented; an upcoming issue of Marine Micropaleontology will showcase that work. In addition, outreach events were held at Lakeside Lab to encourage the local community to learn more about diatom research.

Contact: **Beth Caissie** - bethc@iastate.edu

POLAR2018 Joint Meeting (IASC/SCAR)

When: 23 June 2018 | Where: Davos (Switzerland)

Highlights:

- Travel support for 10 early career scientists (ECS) to attend POLAR2018 as well as one additional ECS to attend the "MOSAiC Science Implementation Workshop"
- ECSs contributed in particular to the "Special session on "Productivity, Biodiversity & Ecosystem Shifts at Cryosphere-Ocean Boundaries", and the "Extreme Events in the Arctic", both held during POLAR 2018
- Opportunity for ECSs to present during POLAR2018 sessions, networking and building international collaborations

Encouraging early career scientist participation in IASC activities such as the annual Arctic Science Summit Week is a key priority for broadening participation in the work of IASC. One of the Marine Working Group (MWG) funding decisions made following the ASSW 2017 in Prague, Czech Republic was to commit to providing support for early career scientists to attend the POLAR2018 meeting in Davos, Switzerland in June 2018. The MWG supported in part the travel of 10 early career scientists (ECS) to attend POLAR2018 as well as one additional ECS to attend the MOSAiC Science Implementation workshop in Potsdam, Germany in May 2018. The support for ECS participation was based on a MWG initiative to develop a scientific session in Davos on the topic of "Productivity, Biodiversity & Ecosystem Shifts at Cryosphere-Ocean Boundaries," which grew out of cross-cutting discussions within the MWG. These discussions had concluded that the consequences of sea and glacial ice changes upon biological activity were key priorities for study. Identification of potential ECS to be supported was based upon contact made with ECS contributors to that session and expanded in discussions with MWG members and IASC fellows. Presentations in several POLAR2018 sessions were ultimately made, and feedback from the ECS almost universally lauded the opportunities for networking and building international collaborations, as well as the chance to present scientific findings.

Contact: **Lee Cooper** - cooper@umces.edu
Monika Kendra - kedra@iopan.gda.pl

Arctic in Rapid Transition (ART) Strategic Planning Meeting

When: 26-28 February 2018 | Where: Amsterdam (Netherlands)

Highlights

- Draft of ART Strategic Plan 2018 - 2022
- Identification of short, mid-, and long-term activities to be led by ART
- Creation of operating procedures to achieve both scientific and professional objectives

The Arctic in Rapid Transition (ART) network was created in October 2009 by early career scientists. ART is a multi-disciplinary network led by early career scientists from fields across polar and social sciences. Our aim is to synthesize existing knowledge about the Arctic, use this information to propose new initiatives, and promote the engagement of early career scientists in the development and execution of interdisciplinary polar science. ART has been endorsed by the Marine Working Group of IASC (formerly the Arctic Ocean Sciences Board) since its inception and aims to retain close connections with the IASC and the MWG and its initiatives.

Contacts: **Nathalie Morata** - nathalie.morata@gmail.com
Allison Fong - allison.fong@awi.de

Social and Human Working Group (SHWG)

Scientific Foci:

- Arctic residents and change**
- Histories, perceptions and representations of the Arctic**
- Securities, governance, and law**
- Natural resource(s)/ use/ exploitation and development: past, present, future
- Human health and well-being

Cross-Cutting Foci:

- Human health, well-being and ecosystem change
- Long-term impacts, vulnerability and resilience in Arctic social-ecological systems
- Competing forms of resource use in a changing environment
- Perception and representation of Arctic science

The scientific scope of the Social and Human Working Group (SHWG) includes all aspects of social sciences and humanities research in the Arctic, as well as their connections with other IASC Working Groups. It is important to integrate the social and human perspective into international efforts to address issues of climate and environmental change. Not only does human behavior have an enormous influence on the environment, but changing natural environments also directly and indirectly affect people. A wide range of topics is therefore of interest to the SHWG, including human health and well-being; livelihoods and land use; geopolitics and peace in the Arctic; vulnerability and resilience in changing social-ecological systems; and perspectives of gender in Indigenous communities. As demonstrated by the supported activities in 2018/19, SWHG members address these topics in all manners of ways: by going into depth on core concepts, by bringing a global perspective to the Arctic, and by working closely with local stakeholders.

In addition, the SHWG supported and participated in eight IASC cross-cutting activities, on topics as varied as air pollution, permafrost, and extreme events in the Arctic. One of these activities was led by the Polish SHWG member on societal relevance of Polar research; resulting in a conference debating and contemplating the place of polar research in the public discourse.

Photo: SUSAN MÜHLEMEIER and ROMANO WYSS
IASC SHWG During POLAR2018 in Davos (Switzerland).

**denotes a priority within the scientific foci

Membership[4]

NAME	COUNTRY	EXPERTISE
Chair Peter Sköld	Sweden	Arctic regional development; Indigenous health, cultures, identities; Research planning
Vice-Chair Gunhild Hoogensen Gjørv	Norway	Security in the Arctic; Geopolitics of the Arctic; Peace and conflict in the Arctic and globally
Vice-Chair Andrey Petrov	USA	Arctic regional/economic development; Sustainability; Urbanization
Gertrude Saxinger	Austria	Anthropology; Indigenous communities; Extractive industries; Labour mobility (FIFO); Infrastructure
Peter Schweitzer	Austria	Infrastructure studies; Anthropology of climate change; Indigenous political movements
Susan Chatwood	Canada	Health systems; Population health; Community engagement
David Natcher	Canada	Environmental livelihoods; Culture and economy; Maintenance of local food systems
Yang Lei	China	Climate Change
Xu Shijie	China	Geomagnetism; Remote Sensing
Barbora Padrtova	Czech Republic	Arctic geopolitics and security; International relations; Foreign policy
Pelle Tejsner	Denmark	Human rights; Sustainable development and climate change mitigation; Land use policy and resource extraction
Robert Chr. Thomsen	Denmark	Autonomy/self-governance movements; Greenland; Indigenous movements
Mervi Heikkinen	Finland	Women's and gender studies; Intersectionality; Ethics; Higher education
Lassi Heininen	Finland	International relations, geopolitics and security; Environmental politics; Northern Europe and Russia
Béatrice Collignon	France	Inuit geographic knowledge; Geographies of the Inuit; Inuit culture and contemporary societies
Virginie Vaté	France	Anthropology of religion; Shamanism and Christianity; Conversion; Chukotka and Alaska
Alexander Proelss	Germany	International law; International law of the Sea; International environmental law
J. Otto Habeck	Germany	Gender and social distinction; Segregation, marginality and mobility; Indigenous land use and permafrost
Níels Einarsson	Iceland	Coastal societies, climate and socioecological adaptations; Marine governance systems; Northern North Atlantic
Dhurjati Majumdar	India	Arctic sustainability
Akiho Shibata	Japan	International law; Polar law and policy
Shinichiro Tabata	Japan	Economic development and sustainability of the Russian Arctic regions
Seung Woo Han	Korea	Polar policy; Polar sociology; International law
Hyunkyo Seo	Korea	Polar policy
Peter Jordan	The Netherlands	Circumpolar Archaeology; History and Anthropology
Halvor Dannevig	Norway	Climate change adaptation; Environmental governance; Co-production of knowledge
Britt Kramvig	Norway	Indigenous peoples ontologies, politics, and art; Creativity, tourism, and innovation in Arctic and indigenous communities
Michał Łuszczuk	Poland	Interational relations; Diplomacy; Security
Agnieszka Skorupa	Poland	
Andrei Golovnev	Russia	Anthropology, ethnography and ethnohistory; Arctic nomads, migration and movement
Andrey Podoplekin	Russia	Social psychology in the Arctic; Circumpolar states; Policy of scientific researches
Elena Conde	Spain	Arctic; Law of the Sea; Legal regime of marine scientific research
Ragnhild Nilsson	Sweden	Indigenous politics; Indigenous representation and self-determination
Klaus Dodds	UK	Geopolitics; Security; Diplomacy
Lawrence Hamilton	USA	Sociology; Demography; Survey research

[4] Membership as of 29 March 2019. Please visit https://iasc.info/working-groups/social-human/members for updated information and contact information for each Working Group Member.

NAME	COUNTRY	EXPERTISE
FELLOWS		
Stanislav Ksenofontov	CH/Russia	Sustainable development; Community development; Green economy
Megan Sheremata	Canada	Sociology; Demography; Survey research
SECRETARY		
Gunnar Gunnarsson	Iceland	Stefansson Arctic Institute

Recent Activities

Gender in the Arctic

When: 6 September 2018 | Where: Helsinki (Finland)

1. Research on Indigenous queer conceptionalizations should acknowledge the conjunction of colonialism and gender and take them as points of departure to strengthen Indigenous and queer forms of social relations and fate control.
2. Beyond the focus on the difficulties and discrimination at the intersection of queer and Indigenous lifeways, research should also pay attention to notions of self-esteem, creativity and supportive forms of relatedness.
3. Strategies of participatory research can be ethically challenging in this field which still suffers from stigmatization, but it contains at the same time opportunities of expression and action for communities, groups and individuals who participate in such studies

In the Arctic, queer identities and issues are rarely discussed in public, especially in Indigenous communities. Besides the common heteronormative discrimination in society, many Indigenous queer individuals are ostracized in their communities and as the result, relocate to more urban settings. The workshop examined these experiences and practices from both an academic and activist perspective. It presented Indigenous perspectives on queerness and interrogates assumptions of Indigenous heteronormativity. The workshop consisted of three sessions: an academic panel on queer Indigenous studies, an activist panel on queer Indigenous experiences and reflections and a concluding academic-activist roundtable discussing the future prospects and challenges of queering Indigeneity and the need for queer Indigenous studies in the Arctic.

Subscribe to the mailing list if you want to list your gender-related activities and institutions on the website of the IASSA WG Gender in the Arctic. More ideas for upcoming workshops, your willingness to conceptualize/co-host a workshop as well as contributions to a broader discussion are welcome.

Website: https://gender-arctic.jimdo.com/
Contacts: **Gertrude Saxinger** - gertrude.saxinger@univie.ac.at
J. Otto Habeck - otto.habeck@uni-hamburg.de

Long-Term Perspective on Social-Ecological Change - Current and Future Change, Sustainability and Resilience in the Polar Regions

When: 19 - 23 June 2018 | Where: Davos (Switzerland)

Highlights

- Social-ecological systems approach is well positioned to improve understanding Arctic change.
- An interdisciplinary focus on a long-term dynamics is both effective for unpacking ongoing and future changes and necessary for identifying long-term resilience, adaptive capacities and sustainability in SES.
- Arctic communities are coping with rapid, formidable and often irreversible environmental and social changes that fundamentally affect human-environmental relationships and social systems.

The Polar Regions are undergoing rapid environmental, socio-cultural and economic transformation. Monitoring current change and anticipating future developments are becoming more critical than ever. This session aimed at exploring how polar communities and stakeholders deal with the combined challenges from climate change, political, economic and resource pressures, changes to the global order and new socio-cultural realities and what the future might hold for the Polar Regions. We recognize the opportunities presented by integrated interdisciplinary approaches developed within the biophysical, social, humanities and arts scholarship and invite researchers with interest in socio-ecological systems, the interaction of society and place, or in exploring the futures in a methodological or even speculative manner to contribute to this session.

Contacts: **Andrey Petrov** - andrey.petrov@uni.edu
Tatiana Vlasova - tatiana.vlsv@gmail.com

PHOTO: FLORENCIA MAZZA
Children excitedly await some outdoor fun with Geoff Caroll's sled dog team during the summer in Utqiaġvik, Alaska.

Calotte Academy 2018

When: 4 - 10 June | Where: Finland, Norway, and Russia

Highlights

- High geopolitical stability in the Arctic region relies on, and could be deepened by, functioning interplays between science and politics, between scientific knowledge and local/Indigenous knowledge, as well as between material and non-material values. It is thus important to maintain and further develop such interplays.
- Adaptation to new technologies and standards offers opportunities but also challenges the social, economic, and environmental integrity of the Arctic region. It is important for local stakeholders and communities to have the means, expertise and capacity on contributing to their development in order to benefit from and strengthen their potential advantages.

The Calotte Academy is an annual travelling symposium, international scientific forum and doctoral school in the North Calotte, the northernmost region of Europe. It is designed to promote interdisciplinary discourse as well as academic and policy-oriented dialogue between senior researchers, early career scientists and advanced graduate students and other northern stakeholders, such as policymakers, civil servants and community leaders and planners. It is a "school of dialogue" and it is participatory by nature: the principle is to share knowledge and experiences between scientists and communities.

The Academy sheds light on Arctic perceptions in the context of the regional and globalized Arctic theoretically and holistically from many angles and disciplinary approaches, from academic and policy-oriented ones – including indigeneity, development, exploration and exploitation, shipping and infrastructure, geopolitics and tourism. It discussed Arctic perceptions from the perspectives of past(s), present(s) and future(s), and from global, or international, Arctic and local contexts in the European Arctic. By bringing researchers from all around the world together with local experts and other stakeholders, the Academy's participants learned from the experience embedded in local cultures of the various stakeholders of the European Arctic.

Website: https://calotte-academy.com/
Contacts: **Gerald Zojer** - gerald.zojer@ulapland.fi
Salla Kalliojärvi - skallioj@ulapland.fi

Terrestrial Working Group (TWG)

Scientific Foci:

- Improving knowledge at multiple spatial scales of the current state of Arctic terrestrial geosystems and ecosystems
- Determining the net effect of the terrestrial and freshwater environmental and biosphere's processes that amplify or moderate climate warming
- Developing unifying concepts, fundamental theories and computer models of the interactions among species, interactions between species and their environment, and the biology of life in extreme environments
- Estimating past changes in Arctic geo- and biodiversity, measuring current change and predicting future changes
- Developing high spatial resolution models of terrestrial geosystem and ecosystem change, and other tools that can be used by Arctic stakeholders for adaptation strategies and sustainable management of natural resources and ecosystem services
- Determining the role of connectivity in the functioning of Arctic terrestrial systems, including connections within the Arctic and the global system

The Terrestrial Working Group (TWG) fosters and supports a broad spectrum of activities, reflecting the enormous geo-, bio- and social diversity associated with the Arctic terrestrial and freshwater realms. A couple of highlights for 2017 illustrate this diversity of emphasis, as well as our commitment to cross-cutting activities with other IASC WG partners. 2017 saw the launch of 'T-MOSAiC' (the Terrestrial Multidisciplinary distributed Observatories for the Study of Arctic Climate) following its inception at the TWG and CWG meetings in Prague as a circumpolar, land-based program that would operate in parallel with the IASC ocean-atmosphere program, MOSAiC; a T-MOSAiC secretariat has been established at the University of Lisbon.

With a very different emphasis, and targeting a new audience, the TWG (together with the CWG and other partners) was proud to help support the development of The Frozen-Ground Cartoon(s), an international outreach and education project led by permafrost early-career scientists. The project aims to present and promote permafrost research to the general public, specifically school children. The comic strip series was released in late 2017 (https://frozengroundcartoon.com/cartoons/) and features, among many other things, a bumpy road, reindeer herders and even a frozen turkey! Translations into other languages are underway, along with the production of augmented reality material (e.g. 3-D sketches, videos).

Membership[5]

NAME	COUNTRY	EXPERTISE
Chair Philip Wookey	UK	Biodiversity; Biogeochemistry; Carbon fluxes and cycling
Vice Chair Josef Elster	Czech Republic	Microbial ecology; Stress ecophysiology of cyanobacteria and microalgae
Vice-Chair Vladimir Romanovsky	USA	Permafrost; Geographic areas: Beringia (Alaska and NE Siberia), Norway and Svalbard
Andreas Richter	Austria	Microbial ecology; Terrestrial ecosystem ecology; Belowground plant-microbe interactions
Birgit Sattler	Austria	Microbial ecology; High altitude and polar limnology; Aerobiology
Philip Marsh	Canada	Hydrology; Snow; Permafrost; Hydrologic-Terrestrial System Interactions
Emily Jenkins	Canada	Wildlife; Parasites; Vectors
Luo Wei	China	Phytoplankton; Microbiology; Molecular ecology
Torben R. Christensen	Denmark	Biogeochemistry; Carbon cycling; Terrestrial ecosystem functioning
Otso Suominen	Finland	Animal ecology; Ecological interactions; Herbivory; Biodiversity
Miska Luoto	Finland	Data mining; Remote sensing; Biogeography
Christelle Marlin	France	
Thierry Boulinier	France	Seabird ecology; Disease ecology; Animal ecology
Nikola Koglin	Germany	Petrology; Geochemistry; Geochronology
Ulrike Herzschuh	Germany	Ecosystem change on decadal to glacial time-scales; Ancient DNA and pollen analysis
Jón S. Ólafsson	Iceland	Freshwater Ecology; Ecosystem Processes; Subarctic freshwater ecosystems
Manish Tiwari	India	Paleoclimatology; Stable isotope geochemistry; Geology
Ratan Kar	India	Geology; Palynology; Palaeoclimate
Antonello Provenzale	Italy	Geosphere-biosphere interactions; Climate change impacts; Terrestrial ecosystems
Atsuko Sugimoto	Japan	Biogeoscience; Permafrost ecosystem; Methane
Masaki Uchida	Japan	Microbial ecology; Ecosystem ecology
Ji Young Jung	Korea	Biogeochemistry; Soil carbon dynamics; Tundra ecosystems
Tae-Yoon Park	Korea	Palaeontology; Evolutionary Biology; Polar Geology
Rien Aerts	The Netherlands	Global Change effects on polar ecosystem functioning; Biodiversity; Biogeochemistry
Rolf Anker Ims	Norway	Biodiversity; Tundra ecosystems; Climate change impacts
Pernille Bronken Eidesen	Norway	Arctic botany; Phylogeography; Spatial & temporal variation of biodiversity
Piotr Owczarek	Poland	Dendrogeomorphology; Modern slope and glaciofluvial processes; Climate - landscape interaction
Zbigniew Zwoliński	Poland	Geomorphology; Geodiversity; Geoinformation
João Canário	Portugal	Biogeochemistry; Permafrost; Trace-elements
Alexander Makarov	Russia	Carbon cycle
Olga L'vovna Makarova	Russia	Tundra invertebrates; Mites; Insects; Earthworms; Taxonomy; Community structure
Benjamin Vinegla Pérez	Spain	Plant ecophysiology; Plant-soil interactions; Soil ecology

PHOTO: SUSAN MÜHLEMEIER and ROMANO WYSS
IASC TWG During POLAR2018 in Davos (Switzerland).

Membership as of 29 March 2019. Please visit https://iasc.info/working-groups/terrestrial/members for updated information and contact information for each Working Group Member.

NAME	COUNTRY	EXPERTISE
Daniel Sanchez-Mata	Spain	Bioclimatology; Biogeography; Plant sociology
Hans Linderholm	Sweden	Arctic climate change; Paleoclimate; Glacier variability
Christian Rixen	Switzerland	Arctic and alpine plant ecology; Biodiversity and ecosystem functioning
Gabriela Schaepman-Strub	Switzerland	Biodiversity; Ecosystem functioning; Energy budget; Remote sensing
Mary Edwards	UK	Vegetation ecology and palaeoecology; Quaternary biogeography; Long-term climate history
Michelle Mack	USA	Plant and ecosystem ecology; Disturbance ecology; Nitrogen cycling
FELLOWS		
Françoise Amélineau	France	Seabird and shorebird ecology; Spatial ecology; Microplastic pollution
Maria Paulsen	Denmark	Microbial foodwebs; Terrestrial runoff; Bacterial activity
SECRETARY		
Jeanette Axelsson	Sweden	(through ASSW2019), Swedish Polar Research Secretariat
Laura Ghigliotti	Italy	(from ASSW2019), National Research Council of Italy

Recent Activities

Polar Wildlife

When: 19 - 23 June 2018 | Where: Davos (Switzerland)

Highlights

- Identification of key topics of broad interest in the current context of global change, notably the importance of considering host and parasite ecology and the role of interactions with human activities
- Contributions to protocols and methodologies to address monitoring of polar wildlife health issues
- Strengthening of the relationships between the Arctic and Antarctic/sub-Antarctic wildlife disease research communities to work on polar wildlife health questions

Wildlife species are of critical ecological and socio-economic and importance in Polar Regions, yet in the current context of global change they are experiencing increasing health challenges and the persistence of many species is uncertain. A better understanding of wildlife health status, including the diversity of pathogens and ecology of infectious and non-infectious diseases (e.g., toxins, immunity, and stress), is critical in order to anticipate, manage, and mitigate wildlife health issues at the poles. This workshop aimed to identify key scientific knowledge gaps in wildlife health and disease and to foster new research initiatives and collaborations at the interface between ecology and diseases in Polar Regions.

The importance of setting up carefully designed monitoring programs and of studies focusing on wild animal systems of particular relevance in the context of global change was identified. In this context, some particularities of polar host-parasite systems were outlined, such as the relatively simple species composition of their communities, their strong spatial structure and seasonality, and the fact that they are the subject of dramatic climate change effects. Issues linked to human health and human activities at the interface with wildlife were also identified as a future priority. It was decided to pursue interactions on these topics by the future organization of a workshop in 2020 and the writing up of a synthesis paper on the topic.

Contact: **Thierry Boulinier** - Thierry.Boulinier@cefe.cnrs.fr

PHOTO: THIERRY BOULINIER CNRS/IPEV
Black-legged kittiwakes Rissa tridactyla breeding on a seacliff. A project involving French (from CNRS/IPEV, Montpellier) and Norwegian Researchers (from NINA, Tromsø) has been carried out for more than twenty years to investigate how populations of this seabird species, but also populations of its parasites (seabird ticks, Ixodes uriae), are responding to environmental change at a hierarchy of spatial and temporal scales. Local interactions but also dispersal of hosts and parasites are important to track.

NeAT – Network for Arthropods of the Tundra (1-2)

When: 9-11 October 2018 & 19 - 23 June 2018 | Where: Rovaniemi (Finland) & Davos (Switzerland)

Highlights

- New and more substantial funding secured through UArctic.
- Strengthened Antarctic and freshwater components of the NeAT network.
- Three draft field protocols for comparative research formulate.

The support from IASC has made it possible to strengthen the Network for Arthropods of the Tundra (NeAT) network through sessions at two major international conferences and a workshop. The workshop's goal was to plan the development of research protocols to stimulate further research activities of relevance to the IASC Terrestrial Working Group. The session at the POLAR2018 conference resulted in critical connections to research groups working in Antarctica and thus strengthened this element of NeAT. It also facilitated an application for funding from UArctic for further network activities within NeAT – a proposal, which was granted in fall 2018 partly due to the activities supported by IASC.

The main activity supported by IASC was the organization of a workshop during the Arctic Biodiversity Assessment Congress in Rovaniemi, Finland 8-11 October 2018. The participants of the workshop designed three protocols (related to monitoring insect herbivory, image-based monitoring of tundra arthropods, and functional traits of predatory arthropods), and these will be further developed as part of the new funding from UArctic. NeAT also managed to liaise with Arctic freshwater ecologists, to form a stronger connection to this group, which is critical since many arthropod species have aquatic larval stages. In sum, the IASC support will have positive effects on the strength and activities of NeAT in the years to come.

Website: https://tundraarthropods.wordpress.com/
Contact: **Toke Thomas Høye** - tth@bios.au.dk

Permafrost Carbon Network

When: 9 December 2018 | Where: Washington, D.C. (US)

Highlights

- Reduce uncertainty in carbon pools in permafrost and upscale carbon stocks in Arctic river deltas
- Build a decadal-scale time series of ecosystem-atmosphere arctic/boreal carbon exchange through synthesis
- Identify thaw-induced changes to the permafrost microbiome

The latest and greatest on permafrost carbon science was presented in 18 science speed-talks to an audience of 120 scientists at the 8th Annual Meeting of the Permafrost Carbon Network. Many of these brief presentations laid the foundation for nine breakouts in the afternoon during which details for data collection, spatial data representation, analysis procedures, people to involve, and timelines were discussed.

For each of the breakout topics, we will provide a summary and timeline for members of the Permafrost Carbon Network, and we will host follow-up discussions via web-communication over the course of 2019 to ensure synthesis progress. During the meeting, we also highlighted the contribution and role of the Permafrost Carbon Network to the upcoming 2019 'Arctic Futures 2050' conference that will identify needs of scientists and decision-makers and improve the dialogue between science and policy.

Contact: **Christina Schädel** - Christina.schaedel@nau.edu

PHOTO: JAKOB SIEVERS
Taking a walk across the plains outside Akureyri, Iceland.

PHOTO: SUSAN MÜHLEMEIER AND ROMANO WYSS
Congress centre Davos, Venue of POLAR2018.

3. Arctic Science Summit Week 2018

» 3 Arctic Science Summit Week 2018

POLAR2018: Where the Poles Come Together

How do you bring together more than 2500 researchers working on all three poles (north, south, and high mountain)? By inviting them to a joint conference in the highest town of the Alps!

Usually, the Arctic Science Summit Week of IASC and the Open Science Conference of SCAR, as well as their business meetings, are not at the same place, and not at the same time, as their field seasons take place at opposite ends of the year. It was therefore a unique chance that SCAR and IASC had decided in 2014 to hold a joint conference in the summer of 2018 in Davos, Switzerland.

The call for sessions was the first, very positive surprise; the scientific committee received more than 180 propositions for sessions, not only from the Antarctic and Arctic communities, but also with many topics from the "Third Pole". In close collaboration with the International Scientific Organizing Committee, the session proposers and the competent conference manager Anja Schilling Hoyle brought together 65 sessions belonging to twelve overarching themes. The committee received a surmounting 2617 abstract until the end of the abstract submission period, a number far exceeding all expectations.

The conference took place in an inspiring atmosphere, helped by pleasant mountain summer weather. The morning keynote lectures were a great success, despite the early hour. The broad session program, reaching from the humanities to economy and natural sciences, was one of the many highlights. The special session "From Entering the Field to Taking the Helm, Women's Perspectives on Polar Research" was entirely overbooked, serving as just one example to show the diversity of the conference.

The realization of this large conference by the Swiss Federal Institute for Forest, Snow and Landscape Research WSL under the patronage of the Swiss Commission for Polar and High Altitude Research was a challenge and a big success. Switzerland and the newly founded "Swiss Polar Institute" were proud to present themselves as competent partners in polar research.

Website: https://www.POLAR2018.org

Upcoming ASSWs

ASSW 2019

When: 22-30 May 2019
Where: Arkhangelsk (Russia)

ASSW 2019 will feature a science conference, ASSW business meetings, and a Business Day, as well as social and cultural events. The theme of the symposium is "Climate change and development of the Arctic population." The main IASC liaison for ASSW 2019 is IASC Council Member Vladimir Pavlenko, and IASC is also nominating other representatives to various planning committees.

The conference organizing committee will be headed by the Governor of the Arkhangelsk region, Igor Orlov. The scientific committee of the conference will be headed by Vice-President and Academician of the Russian Academy of Sciences, Valery G. Bondur. We look forward to seeing you in Arkhangelsk!

Website: https://en.assw2019.science/

ASSW 2020

When: March 27- April 2 2020
Where: Akureyri (Iceland)

The ASSW 2020 meetings will be held in Akureyri, Iceland, from March 27 to April 2. The ASSW will have four major components: an International Science Day (March 27 - joint between the Arctic Council & IASC communities), the business of ASSW members (March 28-30), the Arctic Observing Summit (March 31-April 2), and numerous side-meetings of Arctic organizations and projects. Most of the ASSW events will take place in the facilities of the University of Akureyri. Hosted by the Icelandic Centre for Research, Rannís, and the University of Akureyri, the ASSW 2020 will be an important part of the Icelandic Chairmanship in the Arctic Council.

Website: assw2020.is

ASSW 2021

When: 19-26 March, 2021
Where: Lisboa, Portugal

The ASSW 2021 will be held in Lisboa, Portugal on 19-26 March 2021. The theme of the ASSW2021 is: "The Arctic: Regional Change, Global Impacts".

PHOTO: ARVIDS SILIS

Nick Rutter (Northumbria University) makes near-infrared reflectance measurements to determine snow structure at Trail Valley Creek, Northwest Territories, in a collaboration with Environment and Climate Change Canada and Edinburgh, Sherbrooke and Wilfrid Laurier Universities.

4. Data and Observations

» 4 Data and Observations

Arctic Data Committee (ADC)

Representatives from seventeen nations assembled at the headquarters of the World Meteorological Organization to engage in discussion and collaborative workshop activities. The workshop was co-convened by the Arctic Data Committee, the Southern Ocean Observing System, and the Standing Committee on Antarctic Data Management, in part as a contribution to the Group on Earth Observation's (GEO) Cold Region Initiative.

The IASC-SAON Arctic Data Committee (ADC) was formed in late 2014. The overarching purpose of the ADC is to promote and facilitate international collaboration towards the goal of free, ethically open, sustained, and timely access to Arctic data through useful, usable, and interoperable systems. Since its formation, the ADC has convened, co-convened, or contributed to a number of activities and events including meetings and implementation workshops in partnership with many other Arctic and polar bodies (e.g., SCAR Standing Committee on Antarctic Data Management, Southern Ocean Observing System, and the GEO Cold Regions Initiative).

In late 2018 (November 28-30), more than forty experts from the polar data community participated in the Polar Data and Systems Architecture Workshop (https://arcticdc.org/meetings/conferences/polar-data-architecture-workshop) to develop organizational level strategies and high-level technical designs to enhance data sharing between and among Arctic and Antarctic data stewards and repositories. More than twenty polar data organizations worked together to build on recent working meetings, including the Polar Data Planning Summit. Work activities focused on analyzing both specific data repositories and broader international systems-level coordination and architecture design.

Moving forward, meeting participants agreed to continue working under an international, collaborative polar data community that will further develop both common data infrastructure and more domain or application-specific systems. The group recognized that ensuring continued progress will require a number of key behaviors and activities:

- Continue frequent national and international community collaboration using the established, successful model;
- Ensure that all relevant actors are included in the design and implementation process, including Indigenous Peoples and their organizations in the Arctic, the Antarctic science community, and the broader global data community;
- Establish a formal consortium organization to coordinate implementation of a focused "Polar Data Project" (i.e. raise collaboration funds, facilitate sharing of code etc.).

During 2019, the detailed results of these efforts will be used to make practical progress through, for example, initiatives like the Canadian Consortium on Arctic Data Interoperability, the NSF Arctic Data Center, and the EU-funded INTAROS project. The first priority will be working to implement federated search capabilities that connects the many polar and global data catalogues to provide "single window" data discovery. This will be done using common standards and with private sector partners such as Google. Data access and integration will be enhanced through the development of shared data services and common vocabularies.

Results will be reported at the Third Polar Data Forum being held in Helsinki in November 2019, and the Arctic Observing Summit and Arctic Science Summit Week being held in Iceland in March 2020.

Website: https://arcticdc.org/meetings/conferences/polar-data-planning-summit
Contact: **Peter Pulsifer** - Peter.Pulsifer@colorado.edu

PHOTO: MARTEN TACOMA
Group picture of the Polar Data and Systems Architecture Workshop' taken at WMO in Geneva on Friday 30 November.

Sustaining Arctic Observing Networks (SAON)

Vision, Mission, and Goals

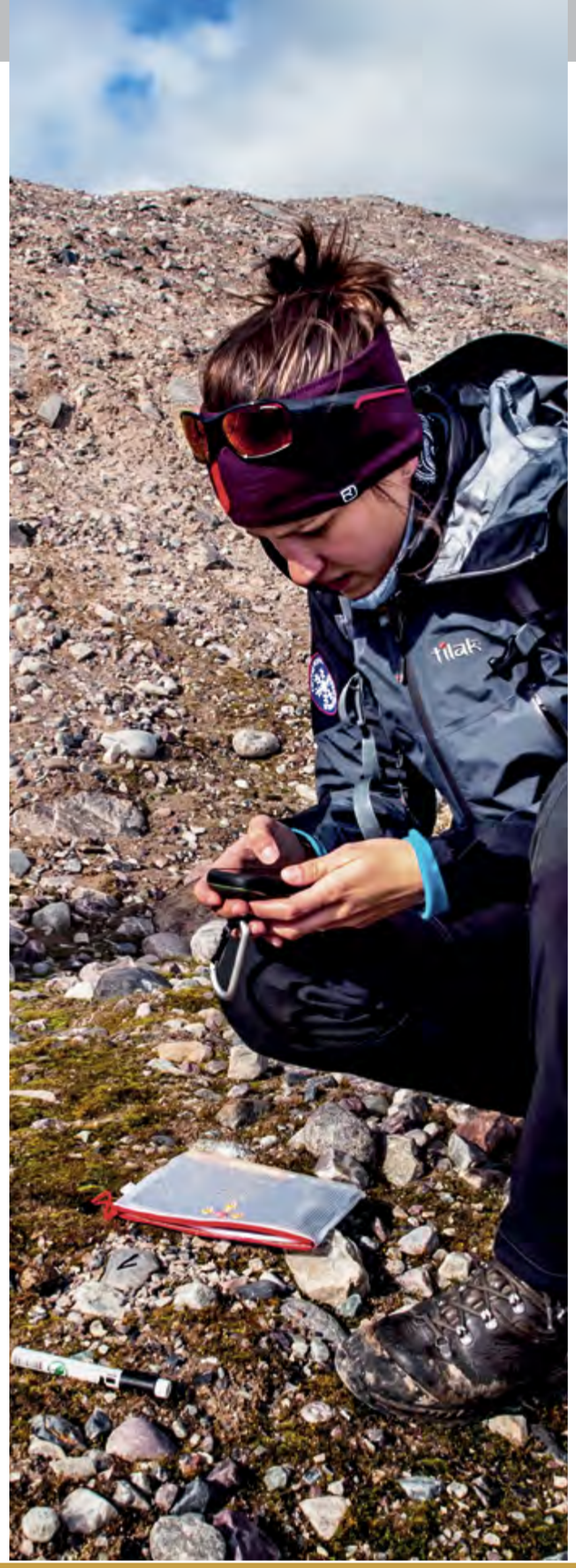
SAON's vision is a connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs. The mission of SAON is to facilitate, coordinate, and advocate for coordinated international pan-Arctic observations and mobilize the support needed to sustain them.

The SAON Board has approved a 10-year strategy and implementation plan for SAON in 2018 (https://www.arcticobserving.org/strategy) and adopted the following three goals:

1. Create a roadmap to a well-integrated Arctic Observing System;
2. Promote free and ethically open access to all Arctic observational data; and
3. Ensure sustainability of Arctic observing.

Create a roadmap to a well-integrated Arctic Observing System

One of the prime drivers for SAON activities are the Arctic Societal Benefit Areas (SBA) defined through the International Arctic Observations Assessment Framework process (https://www.arcticobserving.org/news/268-international-arctic-observations-assessment-framework-released). The Framework identifies value tree analysis as a methodology for identifying data and services that are required in order to support a specific SBA. The framework approach has been followed up by the European Commission's IMOBAR project. Follow-up initiatives are also ongoing in a number of SAON countries, including Finland, Japan, and the USA.



MARTIN LULAK
Tereza Hromadkova taking GPS coordinates of an Arctic tern (Sterna paradisae) nest on Retrettøya near Nordenskioldbreen (central Svalbard) in July 2017. This fieldwork is part of Hromadkova's Ph.D study to track the behavior of these birds on nests and also their movement around the globe; Arctic terns migrate annually between the Arctic and Antarctica.

The work within this goal is coordinated by the SAON Committee on Observations and Networks (CON).

Free and ethically open access to all Arctic observational data

This work is coordinated by the Arctic Data Committee (ADC) and involves a wide range of different programs and organizations active in Arctic data management.

The ADC co-organized the Polar Data Planning Summit and the Polar Data and Systems Architecture Workshop (https://arcticdc.org/meetings/conferences/polar-data-planning-summit). This followed on a series of related meetings focused on connecting Arctic data resources, improving interoperability, enhancing training and other priorities. The focus of the Summit was to generate detailed plans on how best to mobilize existing and soon-to-be initiated funded activities to develop a particular international data sharing case study or scenario.

These focused workshops have been held intersessionally between and as a result of the Polar Data Forum series of conferences. These conferences focus on improving how people and systems can share data in a meaningful way. The goal is to move towards open and connected systems based on a culture of trust and acknowledgement of data production and use. The ADC arranged the Polar Data Forum in cooperation with partners in 2015 and actively participated in 2013. A third Polar Data Forum is planned for November 2019.

Arctic Observing Summit

The Arctic Observing Summit (AOS) is SAON's outreach event and is organized in cooperation between the International Study of Arctic Change (ISAC), IASC, and SAON. AOS is a high-level, biennial summit that aims to provide community-driven, science-based guidance for the design, implementation, coordination and sustained long-term (decades) operation of an international network of Arctic observing systems (http://www.arcticobservingsummit.org/)

The theme of the 2018 AOS was The Business Case for a pan-Arctic Observing System. Recommendations from the 2018 AOS were fed into the 2nd Arctic Science Ministerial. The next AOS will be held in 2020 in the context of ASSW in Akureyri, Iceland.

2nd Arctic Science Ministerial (ASM2)

One of the themes of ASM2 in 2018 was "Strengthening, Integrating and Sustaining Arctic Observations, Facilitating Access to Arctic Data, and Sharing Arctic Research Infrastructure." In the statement from the Ministerial, support is expressed to "moving from the design to the deployment phase of an integrated Arctic observing system which also supports and includes community-based observatories, in cooperation with the Sustaining Arctic Observing Networks (SAON) initiative."

Website: https://www.arcticobserving.org/images/pdf/misc/asm-2-joint-statement.pdf

Organization

SAON is a joint initiative of the Arctic Council and IASC. The SAON process was established in 2011 via the AC Nuuk Declaration (https://www.arcticobserving.org/images/pdf/nuuk_declaration.pdf). This declaration recognizes the importance of the Sustaining Arctic Observing Networks (SAON) process as a major legacy of the International Polar Year for enhancing scientific observations and data-sharing.

PHOTO: IRENEUSZ SOBOTA
On the Waldemar Glacier in 2018, for the project, "Changes of north-western Spitsbergen glaciers as the indicator of contemporary transformations occurring in the cryosphere."

5. Capacity Building

» 5 Capacity Building

IASC Fellowship Program

IASC recognizes that the next generation of Arctic researchers are faced with emerging scientific and societal challenges due to the growing impacts of Arctic and global climate change. IASC therefore believes that it is of great importance to foster, promote, and involve young researchers working in the Arctic by:

- Striving to represent early career researchers within IASC;
- Providing support, endorsement, and dissemination of information on activities, projects and requests for participation; and,
- Supporting travel grants to early career scientists for participation in select Arctic conferences.

With these instruments, IASC aims to promote early career researchers within the organization by providing career building activities such as developing and organizing scientific workshops, planning international and interdisciplinary research activities and programs, and developing professional networks.

Since 2014, IASC has supported its Fellowship Program that matches early career scientists including graduate students, postdocs and junior faculty to each of IASC's WGs. As of 2019, a total of 35 early career researchers have participated in the IASC Fellowship Program. Fellows have the opportunity to participate as WG members for three years and are provided with funding to attend two consecutive ASSW meetings during their initial Fellowship years. This unique opportunity lets these early career researchers to become active members of their WGs, allowing them to develop research collaborations and professional networks with senior researchers across a range of disciplines.

The IASC Fellowship Program has become increasingly popular and competitive, as the recent call for applications for the 2019 IASC Fellowship Class received 108 applications for only 5 positions. During the selection process, APECS coordinated the review process to evaluate and recommend the highest quality candidates. The current IASC Fellows were involved in the initial review process and a final selection of the 2019 Fellows was made in consultation with each of the IASC WG chairs. The chairs and reviewers were certainly impressed by the number and excellent quality of applicants this year and offers were extended to the newest Fellowship class in January of 2019.

These new Fellows will join their WGs at the upcoming ASSW meeting in Arkhangelsk, Russia and will be IASC Fellows and WG members though 2021.

Earlier in 2018, the 2018 Fellow Class was introduced during the joint WG meeting at the POLAR 2018 meeting in Davos, Switzerland. The previous years' 2017 Fellows were deeply involved in both the WG and Council meetings, as well as in the ASSW science symposium. IASC Fellows co-convened scientific sessions, presented scientific research and participated in panel discussions at the POLAR 2018 meeting. Notably, fellows from the CWG, MWG and AWG organized a multi-day cross discipline discussion on "Extreme Events in the Arctic". This dialogue brought together fifteen expert scientists from a wide range of research fields to reconcile the gap between the existing needs and current efforts of the scientific community in understanding Arctic extremes (see Cross-cutting initiatives section of this bulletin).

Fellows also attend other important meetings including but not limited to the Arctic Circle Assembly held in Reykjavik, Iceland and the YOPP Arctic Science Workshop. During the Arctic Circle, 2018 Fellow Stanislav Ksenofontov was invited to give a talk about climate change from the perspective of his home region of Yakutia, NE Siberia. In addition to attending and speaking at notable meetings, IASC Fellows continue to engage significantly in Arctic programs and associations such as the Association of Polar Early Career Scientists (APECS). IASC Fellows currently serve on the APECS Council for the term 2018/2019 as co-chairs and ex-officio members.

On an ongoing basis, Fellows are involved as leaders in international research efforts such as the Year of Polar Prediction (YOPP), Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC), and the Air Pollution in the Arctic: Climate, Environment and Societies (PACES). One IASC Fellow has become particularly involved with the PACES initiative which fosters collaborative, interdisciplinary research on Arctic air pollution and its interactions with the Earth system and human societies. After starting the Fellowship Program, Gillian Young joined the PACES initiative and proposed a new scientific focus related to Arctic aerosol-cloud interactions. As a result, the QuIESCENT Arctic (Quantifying the Indirect Effect: from Sources to Climate Effects of Natural and Transported aerosols in the Arctic) initiative was born and she now serves as organizational lead and scientific steering committee member.

In 2019, IASC welcomes a new class of IASC Fellows and continues to be in awe of the 2017 and 2018 Fellows

PHOTO: SUSAN MÜHLEMEIER AND ROMANO WYSS
IASC Fellows 2018 at POLAR2018, in Davos, Switzerland.

for their successes and accomplishments through the Fellowship program. IASC is excited to witness the contributions they will bring to IASC's scientific activities and Arctic research as a whole in the coming years. We would like to acknowledge all that have supported the idea of the IASC Fellowship Program and outstanding early career researchers who have served as Fellows. Now in its sixth year, the benefits of the IASC Fellowship Program are clearly evident for the Fellows, for IASC, and for Arctic research.

Fellows' Voices

"Through the IASC Fellowship, I have met like-minded multi-disciplinary researchers from around the world and built an invaluable international network of world-leading atmospheric scientists. I can't easily summarize what I have gained through this experience, it has been truly invaluable for my scientific career going forward."

Gillian Young, 2018 Atmosphere Working Group Fellow

"I am happy and grateful to be an IASC Fellow because it has given me a wonderful opportunity as an early career researcher to develop as both a scientist and a leader. The Fellowship has also provided me, as an Indigenous individual, the unique opportunity to discuss issues from an Indigenous perspective and to serve as a bridge between science and Indigenous peoples, western and Indigenous knowledge."

Stanislav Ksenofontov, 2018 Social and Human Working Group Fellow

"I think the core benefits of being an IASC Fellow are access to the international community and IASC's support in making things happen. Fellows can propose cross-cutting initiatives, which are opportunities to forward research interests with new colleagues from around the world and across career levels."

Alice Bradley, 2018 Cryosphere Working Group Fellow

"As an IASC Fellow, I have learned a lot about how international scientific organizations work and how international scientific collaborations are promoted. The Fellowship has been an enriching experience to interact with researchers with diverse backgrounds. This experience has given me confidence in developing future research projects and collaborations."

Françoise Amélineau, 2018 Marine Working Group Fellow

"The best experience during my first IASC Fellowship was to meet my WG members and IASC Fellows who were eager to talk about new terrestrial research ideas, their knowledge, and tips for every-day life in the academia. It is inspiring to see and participate in these larger scientific efforts where researchers from across the entire globe work together on one topic, and I hope I can be part of many similar projects in the future."

Anna Virkkala, 2018 Terrestrial Working Group Fellow

PHOTO: MAREK KASPRZAK
An Arctic fox looks for adventures; photo taken during the project, "POROCO – Mechanisms controlling the evolution and geomorphology of rock coasts in polar climates."

Overview of Supported Early Career Scientists

166

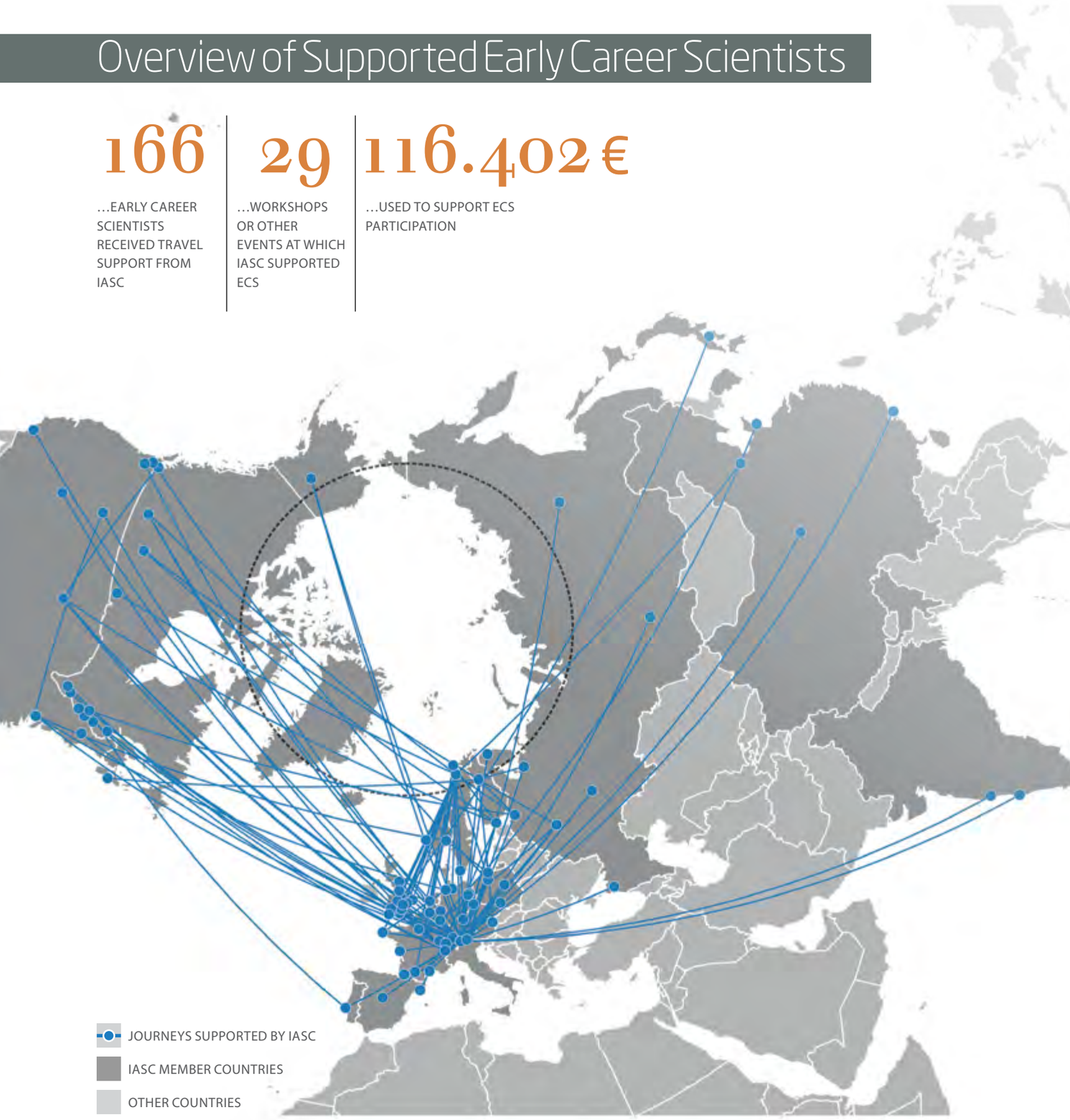
…EARLY CAREER SCIENTISTS RECEIVED TRAVEL SUPPORT FROM IASC

29

…WORKSHOPS OR OTHER EVENTS AT WHICH IASC SUPPORTED ECS

116.402 €

…USED TO SUPPORT ECS PARTICIPATION



Early Career Scientists' Quotes

1. Ingeborg Klarenberg

Email: ingeborg@unak.is | Affiliation: PhD Student University of Iceland & University of Akureyri)

Country of Residence: Iceland | Event for which you were allocated IASC Support: Open Science Conference POLAR2018

"I could never have imagined how useful this conference has been. There were a lot of people interested in my research during the poster session. I am very grateful for getting financial support to attend POLAR2018. It has exceeded all my expectations."

2. Hank Statscewich

Email: hank.stats@alaska.edu | Affiliation: University of Alaska Fairbanks

Country of Residence: United States | Event for which you were allocated IASC Support: IASC Marine Working Group POLAR2018

"I would not have been able to participate in the MWG meeting had I not received IASC support. With the additional travel funds, I was able to introduce myself to many senior scientists who are currently engaged in projects in the Chukchi And Beaufort Seas, areas where I have worked in the past few years. I would like to extend my deepest gratitude for the support that was provided to me for this incredible opportunity."

3. Yan Hu

Email: huyan@link.cuhk.edu.hk | Affiliation: The Chinese University of Hong Kong

Country of Residence: China | Event for which you were allocated IASC Support: the 5th EUCOP

"I had discussion with my collaborators and met possible new collaborators on the conference with the help of IASC support. It's a great opportunity for me to be part of the scientific community of my research field and learn from each other."

4. Mia Bennett

Email: mbennett8@gmail.com | Affiliation: The University of Hong Kong

Country of Residence: Hong Kong | Event for which you were allocated IASC Support: Calotte Academy

"I reconnected with several old colleagues and also met possible new collaborators. I got to travel in a region of the Arctic that I would not be able to see on my own, and it really opened my eyes to learning more about the Russian Arctic in particular."

5. Ivan Alekseev

Email: alekseevivan95@gmail.com | Affiliation: Saint Petersburg State University

Country of Residence: Russia | Event for which you were allocated IASC Support: 3rd T-MOSAiC workshop (within Arctic Net ASM 2018)

"Thanks to IASC support and its global mission "to encourage and facilitate cooperation in all aspects of Arctic research, in all countries engaged in Arctic research and in all areas of the Arctic region" I was able not only to attend 3rd T-MOSAiC workshop, but also participate in discussions, get knowledge on current activities and plans of the project, and also share my ideas and vision on its development in the near future."