IASC Bulletin 2017

IASC 2017
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 multi-disciplinary 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 bipolar cooperation through interaction with relevant science organizations.

Borgir, Norðurslóð, 600 Akureyri, ICELAND
Phone: +354 515 5824 I E-mail: info@iasc.info I www.iasc.info

[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	Canadian Polar Commission	www.polarcom.gc.ca
China	Chinese Arctic and Antarctic Administration	www.chinare.gov.cn
Czech Republic	Czech Centre for Polar Research	http://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	Institut Polaire Français	www.institut-polaire.fr
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	www.cnr.it
Japan	Science Council of Japan, National Institute of Polar Research	www.nipr.ac.jp
The Netherlands	Netherlands Organization for Scientific Research	www.nwo.nl
Norway	The Research Council of Norway	www.forskningsradet.no
Poland	Polish Academy of Sciences, Committee on Polar Research	www.kbp.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.micinn.es
Sweden	The Swedish Research Council	www.vr.se
Switzerland	Swiss Committee on Polar Research	www.polar-research.ch
United Kingdom	Natural Environment Research Council	www.nerc.ac.uk
USA	Polar Research Board	http://dels.nas.edu/prb/

PHOTO: MARIO HOPPMANN
Macro shot of snow crystals

IASC 2017

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INTERNATIONAL ARCTIC SCIENCE COMMITTEE

[IMPRINT]

International Arctic Science Committee

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Telegrafenberg A43
DE-14473 Postdam, GERMANY

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Borgir, Norðurslóð
600 Akureyri, ICELAND

Phone: +354 515 5824
E-mail: iasc@iasc.info
Website: www.iasc.info

Editors: Gunnar Gunnarsson, Mare Pit, Allen Pope, Volker Rachold and Federica Scarpa
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COVERPHOTO: ESTHER KOKMEIJE
Migration of Arctic Terns Ny-Ålesund, Spitsbergen

[CONTENT]

[PREFACE]

The turn of the year 2016/2017 ushers in a great change for the IASC administration, while at the same time maintaining the steady forward course of the positive development that has marked IASC since its inception 27 years ago. After ten years at the wheel of the IASC Secretariat, the Executive Secretary Volker Rachold has handed over to Allen Pope, who took up the challenge on January 1st 2017. Since the entire Secretariat has now left Potsdam, where it has been for the past nine years, Allen will be joined in Akureyri, Iceland by other new faces who will form the IASC Secretariat for the coming years.

On this occasion we express our deep appreciation not only to Volker, but also to Heike Midleja, Ursula Heidbach and Mare Pit who have staffed the Secretariat for the past years, and not least to the Alfred Wegener Institute for Polar and Marine Research in Potsdam, Germany and the German Research Foundation who have most generously hosted the Secretariat since 2009. It is a constant source of amazement that such a small secretariat can produce such a multitude of activities for our organisation.

We do not forget the fact that Secretariat Officers in Korea, Japan, Poland and Canada also contribute in an essential way to the running of IASC and we are delighted that international support for a dispersed secretariat will continue.

We are also grateful to Rannís, the Icelandic Centre for Research, for their commitment to hosting the IASC Secretariat at their offices in Akureyri for the next five years. The IASC office is from 1 January 2017 co-located here with the secretariats for CAFF and PAME and is thus in solid Arctic company.

The ASSW2016 was held in Fairbanks, Alaska in March and for the first time was combined with the Arctic Council Senior Arctic Officials meeting as well as the 2016 Arctic Observing Summit. This created a forum where it was possible for delegates to these different fora to mix and exchange views and

information. 200 young volunteers helped to keep the variety of meetings running smoothly.

The ICARP III process was a major commitment for the IASC community in 2014-2015 and the final results were presented at the ASSW2016. The report has now been published and presents the key messages that emerged from the 2-year process. The report identifies the most important Arctic research needs and provides a roadmap for research priorities and partnerships. The ICARP process points the way for scientists to take action, in cooperation with rights holders and stakeholders, to produce results that will have a global impact. It concludes that the role of the Arctic in the global system, the prediction of future climate dynamics and ecosystem responses, and improved understanding of the vulnerability and resilience of Arctic environments and societies must be prioritized.

With the ICARP III results in mind, the IASC Executive Committee decided to concentrate on developing a strategy document for IASC activities and priorities for the coming 5-year period. The initiative for a strategy was also a recommendation that emerged from the external review of IASC that was conducted during 2015-2016. The IASC Founding Articles call for a regular review of the organization and the first review was undertaken in 1996, with a second in 2006. The IASC Council decided that, ten years after the second review and after the completion of the third International Conference on Arctic Research Planning (ICARP III), it would be timely to conduct another review of IASC. An international group of experts was appointed to serve on the IASC Review Committee with the mandate to assess the organization as a whole, including the evaluation of IASC´s various groups and initiatives. The review was to be based on both the assessments of the committee members and, in addition to evaluating IASC´s activities over the 10-year period 2006-2016 the group was also to recommend strategies for the future. We were delighted that all six international experts who were invited to become the review panel agreed to the task, with Colin Summerhayes of the Scott Polar Research Institute, UK as the Chair. The results of the review can be found on the IASC website and we thank the panel for their excellent analysis and advice.

With both the IASC ExCom's own decision to develop a strategy for future work and the fact that this was also a recommendation from the review panel, two Think Tanks were held to assist formulation of the Strategy Document. The first was a combined Arctic/Antarctic Think Tank meeting held at the end of February 2016 in Potsdam, Germany. Here the ExComs of both polar organizations discussed the synergies to be gained from cooperation based on both the SCAR Horizon Scan and the IASC ICARP III process, and also on the reviews of both organizations that were being conducted at the time. In October a second Think Tank was held in Akureyri, Iceland with participation by the IASC ExCom, the Working Group chairs and two representatives of the IASC Fellowship Program. The proposed Strategy Document will be presented to the Council for discussion at the ASSW2017 in Prague, Czech Republic in March-April 2017.

We therefore step into 2017 confident that IASC will continue to fulfill its mandate of encouraging and facilitating all aspects of Arctic science and that our new Secretariat will build with the utmost enthusiasm and proficiency on the excellent work that our previous Secretariat has produced during the past years.

Susan Barr | IASC President

PHOTO: MARIO HOPPMANN
The Polarstern on station

PHOTO: ALLEN POPE
Juneau Icefield Research Program students contemplate the Gilkey Glacier, Alaska

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 multidisciplinary 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	Organization	Representative
Austria	Austrian Polar Research Institute	Wolfgang Schöner
Canada	Polar Knowledge Canada	Wayne Pollard
China	Chinese Arctic and Antarctic Administration	Huigen Yang, Vice-President
Czech Republic	Centre for Polar Ecology	Josef Elster
Denmark/Greenland	Agency for Science, Technology and Innovation	Naja Mikkelsen, Vice-President
Finland	Council of Finnish Academies	Kari Laine
France	Institut Polaire Français	Yves Frenot
Germany	Deutsche Forschungsgemeinschaft	Karin Lochte
Iceland	RANNÍS, The Icelandic Centre for Research	Þorsteinn Gunnarsson
India	National Centre for Antarctic and Ocean Research	M. Ravichandran
Italy	National Research Council	Carlo Barbante
Japan	Science Council of Japan	Tetsuo Ohata
The Netherlands	The Netherlands Organization for Scientific Research	Peter Jordan
Norway	The Research Council of Norway	Susan Barr, President
Poland	Polish Academy of Sciences, Committee on Polar Research	Jacek Jania
Portugal	Portuguese Foundation for Science and Technology	João Canario
Russia	The Russian Academy of Sciences	Vladimir Pavlenko, Vice-President
Republic of Korea	Korean National Committee on Polar Research	Yeadong Kim
Spain	Comité Polar Español	Manuel Catalan
Sweden	The Swedish Research Council	Magnus Friberg
Switzerland	Swiss Committee on Polar Research	Martin Schneebeli
United Kingdom	Natural Environment Research Council	Henry Burgess
USA	Polar Research Board	Larry Hinzman, Vice-President

TABLE: An overview of the IASC countries, organizations, and 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 (WGs) and Action Groups (AGs) that address and act on timely topics in Arctic science
- Recommending, in cooperation with the WGs, 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:

Susan Barr, President

Vladimir Pavlenko, Vice-President

Huigen Yang, Vice President

Larry Hinzman, Vice-President

Naja Mikkelsen, Vice-President

Allen Pope, IASC Executive Secretary

PHOTO: IASC FILE PHOTO
The IASC Council Meeting at ASSW 2016 in Fairbanks, Alaska (USA)

IASC 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 and the International Council for Science (ICSU)
- 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.

In the past two years, the IASC Secretariat has received growing international support from IASC member countries, especially addressing the support for the growing number of activities undertaken by the IASC Working Groups and early career researcher development.

Contact Information for the IASC Secretariat:

Borgir, Norðurslóð
600 Akureyri, ICELAND

Phone: +354 515 5824
E-mail: info@iasc.info

Website: **www.iasc.info**

Allen Pope
Executive Secretary
E-mail: allen.pope@iasc.info

Gunnar Gunnarsson
Executive Officer
E-mail: gunnar.gunnarsson@iasc.info

Federica Scarpa
Communications Manager
E-mail: federica.scarpa@iasc.info

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

Yoo Kyung Lee, IASC Officer, hosted by the Korea Polar Research Institute (KOPRI)
Email: yoo.kyung.lee@iasc.info

Tetsuo Sueyoshi, IASC Officer, hosted by the Japanese National Institute of Polar Research (NIPR)
Email: sueyoshi.tetsuo@nipr.ac.jp

Susan File, IASC Officer, hosted by Polar Knowledge Canada (POLAR)
Email: susan.file@polarcom.gc.ca

IASC Fellowship & Early Career Support:

Maja Lisowska, affiliated with the Polish Centre for Polar Studies and the Polish Polar Consortium.
Contact: maja.lisowska@us.edu.pl

PHOTO: KÁRI FANNAR LÁRUSSON
The new location of the IASC Secretariat is the city of Akureyri, Iceland

Allen Pope New IASC Executive Secretary

Dr. Allen Pope is IASC´s new Executive Secretary as of January 2017. Before coming to IASC, he held positions as a research scientist at the National Snow and Ice Data Center (University of Colorado Boulder) and the Polar Science Center (University of Washington) where he researched remote sensing of glaciers. Allen was also a visiting scientist at Dartmouth College where he taught a course on Polar remote sensing. He holds a Ph.D. and a M.Phil. in Polar Studies from Cambridge University where he worked on multispectral remote sensing of Arctic glaciers and conducted glaciological fieldwork in Antarctica, Iceland, Svalbard, Sweden, Alaska, Canada, and Nepal. Allen has worked extensively with a range of international scientific organizations, including as a council member of the American Geophysical Union and president of the Association of Polar Early Career Scientists.

PHOTO: COURTESY ALLEN POPE
Allen Pope is the new IASC Executive Secretary

IASC Secretariat Moves to Iceland

Iceland, which is represented in IASC by the Icelandic Research Council (RANNÍS), will host the IASC Secretariat in Akureyri for the next five years from the beginning of 2017. Since 2009, the IASC Secretariat has been located in Potsdam, Germany and financed by the Alfred Wegener Institute (AWI) and the German Science Foundation (DFG). Earlier it was located in Sweden and Norway. The decision on the relocation of the IASC Secretariat was taken at the IASC Council meeting held at ASSW 2016 in Fairbanks, Alaska. Akureyri hosts several institutions dealing with Arctic issues including the Stefansson Arctic Institute, the Arctic Council Working Groups PAME (Protection of the Arctic Marine Environment) and CAFF (Conservation of Arctic Fauna and Flora), the Iceland Arctic Cooperation Network, the Arctic Portal, and others.

PHOTO: KÁRI FANNAR LÁRUSSON
The new location of the IASC Secretariat is the city of Akureyri, Iceland

#01

IASC Future Strategy

The official outcomes of the Third International Conference on Arctic Research Planning (ICARP III) were presented at the ASSW 2016 International Arctic Assembly Day. The report, entitled "Integrating Arctic Research – A Roadmap for the Future" presents the key messages that emerged from the 2-year ICARP III process. Initiated by IASC with engagement from its partners, ICARP III provided a process for integrating priorities for forward-looking, collaborative, interdisciplinary Arctic research and observing, and for establishing an inventory of recent and current synthesis documents and major developments in Arctic research.

Following the outcome of ICARP III and based upon the recommendations of the IASC Review Committee, IASC started a discussion on its future strategy. An initial exchange of ideas took place during the Council meeting at ASSW 2016 and a two-day brainstorming retreat of the Executive Committee, Working Group Chairs and Fellows was held in Akureyri, Iceland on 10-11 October 2016. Recognizing that the ICARP III research priorities are IASC´s Grand Challenges defining the overarching strategy, the Executive Committee is developing an IASC Strategic Plan to be presented at the ASSW 2017. WG Strategic Plans will be built on this plan and address elements of the ICARP III priorities.

In addition, IASC and the Scientific Committee on Antarctic Research (SCAR) have a strong history of addressing joint challenges for both the Arctic and the Antarctic. In an effort to continue to work together to jointly address Polar issues, the two organizations held an Arctic and Antarctic Think Tank meeting in Potsdam, Germany to strategize future priorities.

SCAR recently completed a forward-looking vision of important Antarctic research questions (SCAR Horizon Scan) and IASC went through the ICARP III process. There are many overlapping issues that have arisen during these processes and to help advance Polar Science, SCAR and IASC agreed to establish a joint Polar Task Force. Other topics of the Think Tank meeting included the structure, composition, and goals of the joint SCAR/IASC conference POLAR 2018, which will be held in Davos, Switzerland in June 2018.

#02

#01 | PHOTO: IASC FILE PHOTO
Discussing the 2016 IASC Review

#02 | PHOTO: IASC FILE PHOTO
Participants of the IASC Strategy Think Tank Meeting in Akureyri, Iceland, October 2016

IASC Medal 2017

The IASC Medal is awarded in recognition of exceptional and sustained contributions to the understanding of the Arctic. This year, IASC recognizes Professor Terry Callaghan's outstanding contributions to international Arctic science collaboration.

Prof. Callaghan's research and impressive publication record has focused on Arctic environmental and terrestrial ecosystem processes. However, it is his networking and ability to connect large project teams internationally that has really set him apart. Prof. Callaghan has led and contributed to numerous international scientific syntheses. Through his work in the former Institute of Terrestrial Ecology (part of NERC), by setting up a field base in Ny Ålesund, Svalbard, as the Director of the Royal Swedish Academy of Science's Abisko Scientific Research Station, and coordinator of the INTERACT network, Prof. Callahan has been instrumental in bringing researchers from around the world to the Arctic. Many scientists realise the value of networking, but it takes a fiery spirit like Prof. Callaghan's to make it happen.

Prof. Callaghan will receive his medal and deliver an award lecture at Arctic Science Summit Week 2017 in Prague.

#01

#02

#01 | PHOTO: TOMSK STATE UNIVERSITY
2017 IASC Medallist, Professor Terry Callaghan

#02 | PHOTO: IASC FILE PHOTO
John Walsh received the 2016 IASC Medal during ASSW 2016, Fairbanks, Alaska

PHOTO: ALFRED WEGENER INSTITUT

An electromagnetic probe is pulled over sea ice in a kayak to measure the ice thickness

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 (i.e., the IASC member organizations).

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 disciplinary, they also address crosscutting science questions by initiating activities that involve at least three WGs.

PHOTO: ESTHER KOKMEIJER
A polar bear mom and her cub passing Ny-Ålesund, Spitsbergen

Cross-Cutting Initiatives

Symposium: Do we speak the same language of science?

When: 13 March 2016 | Where: ASSW, Fairbanks, Alaska

Among the numerous events supported by IASC during the ASSW 2016 was the Symposium "Do we speak the same language of science?" organized by one of IASC Fellows, Malgorzata (Gosia) Smieszek from IASC Social & Human Sciences Working Group (SHWG). In this well-attended event invited speakers from IASC Working Groups and beyond spoke on research methods, challenges and limitations of human, social, and natural sciences.

With the audience, the speakers discussed effective means of communication between disciplines as well as best practices for the pursuit of interdisciplinary research in the Arctic. In the first keynote speech of the session Louwrens Hacquebord, the founding chair of IASC SHWG, recalled beginnings and developments that led to recognition of social sciences as polar sciences within IASC. In the second keynote speech Thomas Armstrong, chair of the Arctic Council Adaptation Actions for a Changing Arctic (AACA) project, addressed means for effective connection of science and decision-making, essential in developing responses and adaptation actions in the Arctic. The Symposium served as a support for development of cross-cutting initiatives among IASC Working Groups.

Contact: Malgorzata Smieszek · malgorzata.smieszek@ulapland.fi

Arctic Flux Observation

When: 14 March 2016 | Where: ASSW, Fairbanks, Alaska
Working Groups: AWG, CWG, TWG

At ASSW 2016 in Fairbanks, Alaska, IASC, the Permafrost Carbon Network (PCN) and National Oceanic and Atmospheric Administration (NOAA) co-sponsored an initiative, "Advancing Integrated, Cross-cutting Practices for Arctic Flux Observations", bringing together ~25 researchers active in the physical and biological science of arctic flux observations. The primary purpose of the workshop was to facilitate a structured dialogue between individuals actively working in this field across the pan-Arctic and to promote further synthesis and upscaling on the topic of arctic flux observations. A secondary goal of the workshop was for the members of the newly formed scientific steering committee on Arctic flux observations to meet and discuss the logistics concerning the organization of a longer workshop on arctic fluxes.

Scientific Highlights

- Discussed developing and recommending best practices for energetic and chemical flux sampling in arctic environments, where rime ice and extreme cold often prohibit long-term accurate measurements.
- Discussed the drivers of carbon fluxes and how permafrost vulnerability may influence carbon emissions.

- For a better understanding of processes driving fluxes, it was also discussed that each flux measurement site also include measurements of soil temperature, soil moisture, soil type, and other related biophysical parameters within the footprint of the flux measurements.

Contact: Sandy Starkweather · sandy.starkweather@noaa.gov

Arctic Coastal Dynamics Network (ACD)

IASC network until 2016, now a cross-cutting activity

The Arctic Coastal Dynamics (ACD) project of the International Arctic Science Committee (IASC) and the International Permafrost Association (IPA) was created in 1999 to improve our understanding of circum-Arctic coastal dynamics under the influence of environmental changes and geologic controls. ACD unites researchers and inhabitants working and living in the circumpolar arctic coastal zone. Through international workshops that adopt a multidisciplinary approach and explicitly seek the inclusion of early career scientists and more recently, of residents of arctic coastal communities, key questions behind changes to arctic coastal dynamics are identified in a science plan, observations strategies and standards are developed and international data products are created. The ACD network seeks to represent and speak for arctic coastal issues at the international scale, both to science and the socio-political realm by integrating with and contributing to CACCON, a Future Earth supported activity.

Contact: **Paul Overduin** · paul.overduin@awi.de | **Nicole Couture** · ncouture@nrcan.gc.ca
Website: **http://arcticcoast.info**

Arctic in Rapid Transition (ART)

IASC network until 2016, now a cross-cutting activity

ART is an international scientific network focused on bridging time scales, science disciplines, and geographic regions to better understand the past, present and future response of Arctic marine ecosystems to sea ice transitions and global climate change. ART was conceived, developed and remains steered by early-career scientists, with ongoing intellectual support from dedicated senior scientists who serve an advisory role. The network is an international effort both in terms of the geographic scope (Pan-Arctic) and the nationalities of the founding and participating scientists. ART aims at improving our understanding of the response of the Arctic marine realm as a whole to changes in climate and Arctic sea ice through different approaches, and how this affects social, political and legal developments in different Arctic regions.

Contact: **Nathalie Morata** · nathalie.morata@gmail.com | **Monika Kedra** · kedra@iopan.gda.pl
Website: **https://sites.google.com/a/alaska.edu/arctic-in-rapid-transition/**

Arctic Freshwater System Synthesis (AFS)

IASC network until 2016, now a cross-cutting activity

The AFS has been the vehicle to produce a comprehensive and cross-component synthesis of the Arctic freshwater system during 2013-2016. The AFS network has involved over 40 scientists from at least ten IASC member countries across a number of scientific disciplines, including hydrology, meteorology, oceanography, ecology, and engineering. The AFS has produced an updated and comprehensive synthesis of the Arctic freshwater system, with a particular focus on interactions and linkages between different components of the hydrological cycle. This synthesis produced an overview of the state of the art of knowledge of freshwater circulation and dynamics in the Arctic and in the wider global climate system.

Website: **http://www.climate-cryosphere.org/activities/targeted/afs**

PHOTO: BORIS RADOSAVLJEVIC
GPS Survey of Retrogressive Thaw Slump Headwall, Herschel Island

PAST Gateways

IASC network until 2016, now a cross-cutting activity

The PAST Gateways network brings together European, North American and Russian researchers who have expertise in the entire range of methodologies essential to successfully investigate Arctic palaeoclimate; specifically glacial geology, palaeoceanography, marine geophysics, meteorology, palaeobotany, geomorphology and numerical modelling. The research focus and membership are definitively pan-Arctic and multidisciplinary in nature. Furthermore, many of the members are actively involved in research on Antarctic palaeoclimate and glaciation, thus giving the network considerable strength in bipolar climate change and teleconnections. The network thus promotes and supports leading-edge multidisciplinary research and so directly maps onto the IASC mission. We also place a strong emphasis on the involvement of early career scientists in the network through conference participation and organisation and contributions to special publications. One of our goals is to inspire and help train the next generation of Arctic scientists with cross-disciplinary competence and to provide them with a means to develop their research expertise. We utilise existing platforms to achieve this; for example we have strong links to the University of the Arctic and APECS. Members of the network, including Steering Committee members, also directly participate, or have participated, in several IASC Working Groups including the Marine, Cryosphere and Terrestrial groups.

Contact: **Colm O'Cofaigh** · colm.ocofaigh@durham.ac.uk
Website: **http://www.geol.lu.se/pastgateways/**

INTERACT

IASC network until 2016, now a cross-cutting activity

INTERACT is a circum-arctic network of 78 research stations in northern Europe, Russia, US, Canada, Greenland, Iceland, the Faroe Islands and Scotland as well as stations in northern alpine areas. INTERACT specifically seeks to build capacity for research and monitoring in the Arctic and in adjacent high alpine areas. INTERACT is multidisciplinary: together, the stations in INTERACT host thousands of scientists from around the world who work on natural science projects for example within the fields of glaciology, permafrost, climate, ecology, biodiversity and biogeochemical cycling. In addition, the stations host social science projects. The INTERACT stations also host and facilitate many international single-discipline networks (e.g. ITEX and CALM) and aid training by hosting summer schools. INTERACT is promoting multidisciplinary research by offering access to numerous research stations through the EU Transnational Access program. INTERACT is also heavily involved in outreach that ensures that new understanding of the Arctic systems are being communicated not only to scientists but to the general public and policy makers.

Contact: **Dr Margareta Johansson** (Coordinator) · margareta.johansson@nateko.lu.se
Professor Terry Callaghan (Scientific Coordinator) · terry_callaghan@btinternet.com
Website: **www.eu-interact.org**

PHOTO: ALFRED WEGENER INSTITUTE / ELKE LUDEWIG
AWI meteorologist Dr Elke Ludewig on her way to the meteorological observatory

Atmosphere Working Group (AWG)

Membership

Thomas Spengler – Norway, Chair | **Kathy Law** – France, Vice Chair | **Halldór Björnsson** – Iceland, Vice Chair
John Cassano – USA, Vice Chair | **James Overland** – USA, Past Chair (2011–2015)

Harald Rieder – Austria | **Leopold Haimberger** – Austria | **James Drummond** – Canada (began 2017)
G.W.K. (Kent) Moore – Canada (began 2017) | **Claude Labine** – Canada (until 2016) | **Ding Minghu** – China
Kamil Laska – Czech Republic | **Henrik Skov** – Denmark | **Kalevi Mursula** – Finland (began 2017)
Timo Vihma – Finland | **Eila Lehmus** – Finland (until 2016) | **Annette Rinke** – Germany (began 2017)
Klaus Dethloff – Germany (until 2016) | **Günther Heinemann** – Germany | **Guðrún Nína Petersen** – Iceland
Suresh Babu – India | **Nuncio Murukesh** – India | **Vito Vitale** – Italy | **Jun Inoue** – Japan | **Hiroshi Tanaka** – Japan
Young Jun Yoon – Korea | **Seong–Joong Kim** – Korea | **Peter van Velthoven** – The Netherlands
Kjetil Tørseth – Norway | **Tadeusz Niedzwiedz** – Poland (began 2017) | **Ewa Łupikasza** – Poland
Rajmund Przybylak – Poland (until 2016) | **Daniele Bortoli** – Portugal | **Alexander P. Makshtas** – Russia
Boris Vladimirovich Kozelov – Russia | **Angel Frutos Baraja** – Spain | **Michael Tjernström** – Sweden
Julia Schmale – Switzerland | **Manisha Ganeshan** – IASC Fellow 2017 | **Paul Zieger** – IASC Fellow 2016

AWG Secretary **Yoo Kyung Lee** – Korea

Scientific Foci:

The Atmosphere WG will address many of the direct large scale and regional climate change issues for IASC. We see our function as promoting science, including:

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

PHOTO: IASC FILE PHOTO
Group photo of the Atmosphere Working Group (AWG), 2016

Recent Activities

Air Pollution and Arctic Societies

When: 14 March 2016 | Where: ASSW, Fairbanks, Alaska
When: April 2017 | Where: ASSW, Prague, Czech Republic

In Cooperation with MWG, SHWG

The proposed initiative "Arctic Air Pollution and Societies" forms part of the larger PACES effort (air Pollution in the Arctic: Climate, Environment and Society) founded in 2015 which is supported by IASC (AWG) and the International Global Atmospheric Chemistry Project (IGAC) under Future Earth. It aims to create strong connections between the social and natural sciences as well as humanities to enable truly interdisciplinary Arctic research around the theme of Arctic air pollution. The initiative will bring together researchers from many countries – a first workshop was attended by 14 nations – and aims to work with communities within the Eastern and Western Arctic. Research prepared under this initiative shall be conducted with and benefit Arctic residents entailing information and data sharing between academic and non-academic communities. A 2-3 day workshop was initially planned to take place during fall 2016 but is postponed to be held during the Arctic Science Summit Week 2017 in Prague, Czech Republic for logistical reasons.

This workshop is embedded in a series of workshops that started with two general PACES meetings in 2015 (Boulder, Helsinki, see http://www.igacproject.org/PACES) and the "Air Pollution and Arctic Societies" workshop held in Fairbanks during ASSW 2016. Follow-up meetings will focus on research ideas, methodological development, and development of community-based monitoring approaches specific to the theme, as well as establishing connections to Arctic communities are planned for 2017 and 2018. This timeline is aligned with the schedule for dedicated atmospheric chemistry measurement campaigns under PACES.

Scientific Highlights:

- Developing ways to understand in-Arctic pollution sources and their trajectories through natural-social science collaboration
- Explore community-based monitoring (CBM) in pilot programs in key regions
- Developing an interdisciplinary working group under PACES (http://www.igacproject.org/PACES) to explore topics related to legal frameworks, service delivery, health impacts, communication, and broader issues of trust

Contact: **Kathy Law** · Kathy.Law@latmos.ipsl.fr

Polar Prediction Summer School

When: 5-15 April 2016 | Where: Abisko, Sweden

The polar regions are experiencing rapid changes that open new opportunities for the business sector and at the same time increases the risks of environmental disasters and impacts the life conditions of local communities including indigenous peoples. Prediction of weather and climate will be

the cornerstone of efficient environmental services systems that are urgently needed in the polar regions. Such regional prediction systems will be embedded in the corresponding global systems. However, the complexity of the polar climate system is high and the observing systems there are difficult to set up and maintain. The challenge of developing an effective seamless polar-prediction across timescales from days to decades should therefore involve training and development of a new generation of polar prediction researchers.

This WWRP/WCRP/Bolin Centre School on Polar Prediction provided training for 30 early career polar scientists, focusing on topics such as: polar mesoscale atmospheric processes, sea ice prediction, near term ensemble prediction, and seasonal-to-decadal climate variability and prediction in the polar regions. The program combined lectures on key areas relevant for polar prediction and a number of field observation and modelling exercises to foster an interactive learning environment.

The school was sponsored by PPP (WMO-WWRP), PCPI (WMO-WCRP), the Bolin Centre, IASC, and APECS.

Scientific Highlights

- Direct measurements of the wind stress and indirect estimates derived from near-surface profiles of wind speed were made to study variations in upwind topography with wind direction
- Radiosondes were released each day and the soundings uploaded to the GTS for operational forecasts. In order to study the diurnal cycle of the boundary-layer structure, radiosondes were released every 3 hours for a full 24 hour period
- All observations were drawn together and demonstrated a close link between the surface energy budget and albedo as snow cover on the ice varied over time

Contact: **Jonathan Day** · j.j.day@reading.ac.uk

PHOTO: LUCA BRACALI
Star-trail image as the result of 200 shots taken in half an hour (Sandsletta, Lofoten)

The Melting Arctic and Mid-Latitude Weather Patterns: Forced Chaos and the Way Forward

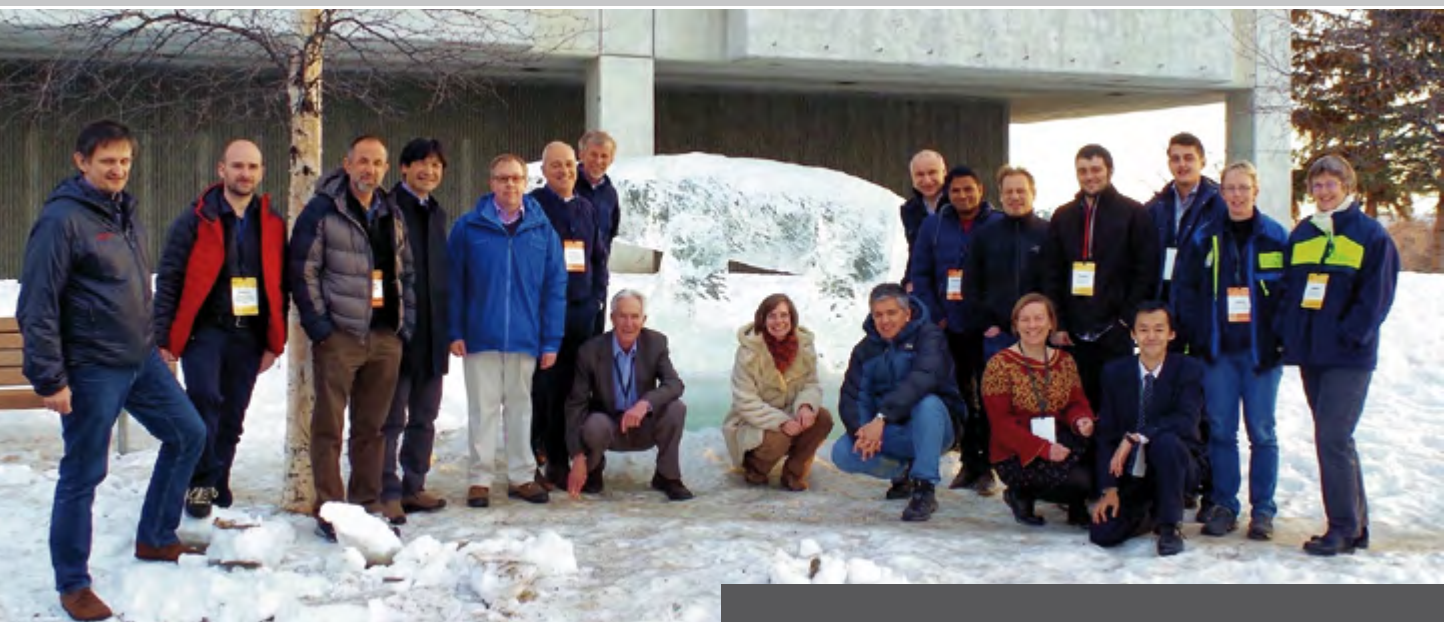
Various metrics of Arctic amplification indicate that the recent period of disproportionate Arctic warming, relative to mid-latitude temperatures, emerged from the noise of natural variability in the late 1990s, and this trend is expected to continue through the next decades. The assessment of the potential for these recent Arctic changes to influence broader hemispheric weather is complex and controversial. This topic is a major science challenge, as continued Arctic changes are an inevitable aspect of anthropogenic global change and is an opportunity for improved extended-range forecasts at mid-latitudes.

Four members of the AWG have been leading a group to assess and move the science of potential linkages forward on a disciplinary and international basis. While this group had originally planned to gather for a workshop, they ended up corresponding through a teleconference instead, having had considerable interaction during the summer for synthesis efforts. In 2016, the group produced papers in Science, Nature Climate Change and Polar Science and will continue their research in 2017, with an emphasis on atmospheric dynamics.

Scientific Highlights

- Advanced a more sophisticated understanding of Arctic-mid-latitude linkage mechanisms, identifying the need to shift away from a primarily deterministic perspective to probabilistic model forecasts that include chaotic multiple processes based on robust, high-resolution, ensemble solutions to the equations of motion and thermodynamics

Contact: **James E Overland** · James.E.Overland@noaa.gov



Cryosphere Working Group (CWG)

Membership:

Francisco Navarro – Spain, Chair | **Jon Ove Hagen** – Norway, Vice Chair
Martin Sharp – Canada, Past Chair (2011–2015)

Annett Bartsch – Austria | **Wolfgang Schöner** – Austria | **Shawn Marshall** – Canada | **Sun Bo** – China
Marek Stibal – Czech Republic | **René Forsberg** – Denmark | **Signe Bech Andersen** – Denmark
Jari Haapala – Finland | **Pentti Kujala** – Finland | **Michel Fily** – France | **Hugues Lantuit** – Germany
Lars Kaleschke – Germany | **Guðfinna Aðalgeirsdóttir** – Iceland | **Thorsteinn Thorsteinsson** – Iceland
Parmanand Sharma – India | **Hiroyuki Enomoto** – Japan | **Shin Sugiyama** – Japan | **Hyun Cheol Kim** – Korea
Soon Do Hur – Korea | **Carleen Tijm–Reijmer** – The Netherlands | **Elisabeth Isaksson** – Norway
Jacek Jania – Poland | **Krzysztof Migala** – Poland | **Gonçalo Vieira** – Portugal | **Dmitry Drozdov** – Russia
Sergei Verkulich – Russia | **Carolina Gabarro** – Spain (began 2017) | **Pedro Elosegui** – Spain (until 2016)
Veijo Pohjola – Sweden | **Martin Lüthi** – Switzerland | **Martin Schneebeli** – Switzerland | **Julian Dowdeswell** – UK
Elizabeth Hunke – USA | **Robert Hawley** – USA (began 2017) | **Regine Hock** – USA (until 2016)
Shridhar Jawak – IASC Fellow 2017 | **Alek Petty** – IASC Fellow 2016

CWG Secretary **Tetsuo Sueyoshi** – Japan

Scientific Foci:

- Atmosphere-glacier-ocean interactions: implications on the pan-Arctic glacier mass budget
- Causes, impacts and prediction of extreme cryospheric events
- Cutting barriers in snow knowledge

PHOTO: IASC FILE PHOTO
Group photo of the Cryosphere Working Group (CWG), 2016

Recent Activities

IASC Network on Arctic Glaciology Workshop

When: 25-27 January, 2016 | Where: Benasque, Spain

This workshop built on very successful meetings held in previous years in Obergurgl (Austria), Ottawa (Canada), and Zieleniec (Poland). It provided an excellent opportunity for participants in international Arctic projects, including the Network Tidewater Glacier initiative, to discuss the results emerging from these projects and to plan future initiatives. There was a special session on glacier-ocean interactions.

Scientific Highlights:

- Presented and discussed new results on observations and modelling of the dynamics and mass budget of Arctic glaciers
- Planned and coordinated field work on Arctic glaciers with the aim of using the available infrastructure and logistics in the most efficient way
- Developed ideas for future projects and collaboration

Contact: **Martin Sharp** · Martin.Sharp@ualberta.ca

Snow Science Winter School

When: 14-20 February 2016 | Where: Preda and Davos, Switzerland
When: 12-18 February 2017 | Where: Sodankylä, Finland

The 2nd Snow Science Winter School (SSWS) took place in Preda and Davos, Switzerland, from 14-20 February 2016 and brought together 26 students from 11 countries. Organized by the WSL Institute for Snow and Avalanche Research SLF and the Finish Meteorological Institute FMI, the snow school focused on modern snow measurement techniques. Traditional and modern field instruments (such as measurement of specific surface area by reflection and spectroscopy, near-infrared photography and high-resolution penetrometer) were available for the students to get hands-on experience at different field site, including a high-alpine site with a snowshoe hike. Introductory lectures and laboratory measurements complemented the experiences. The success motivated the lecturers to prepare a 3rd SSWS that will take place in Finland in 2017.

Contact: **Martin Schneebeli** · schneebeli@slf.ch

Observing and modelling meltwater retention processes on ice sheets and glaciers

When: 1-3 June 2016 | Where: Copenhagen, Denmark

Dr. Robert Fausto and Prof. Jason Box of the Glaciology and Climate department of the Geological Survey of Denmark and Greenland (GEUS) hosted a "Workshop on observing and modelling meltwater retention processes in snow and firn on ice sheets and glaciers" with 50 registered participants. Discussion framed how to approach a problem confronting this community for 40 years.

Scientific Highlights:

- Presented and discussed observations and modelling of meltwater retention processes in firn and snow, with emphasis on low-temperature 'polar' snow and firn
- Planned and coordinated meltwater retention model development
- Develop objectives and collaborations

Co-sponsor: Geological Survey of Denmark and Greenland

Contact: **Robert Fausto** · rsf@geus.dk

The importance of calving for the mass balance of Arctic glaciers

When: 15-17 October 2016 | Where: Institute of Oceanology, Polish Academy of Sciences, Sopot, Poland

The Centre for Polar Studies, together with the IASC Cryosphere Working Group and the IASC Network on Arctic Glaciology hosted a scientific seminar on the "Importance of Calving for the Mass Balance of Arctic Glaciers." The workshop brought together about 25 glaciologists working on ice-mass loss at the marine termini of Arctic glaciers and ice caps. The main objective was to initiate efforts of deriving the first measure of northern hemisphere ice discharge to the ocean over the period ~2000-2015 for all glaciers and ice caps (including the periphery of Greenland, but excluding the Greenland ice sheet). Methodology and data requirements were discussed and guidelines formulated in order to derive consistent estimates for the various Arctic regions.

Contact: **Jacek Jania** · jam.jania@gmail.com

Taking the next step in Svalbard snow research – Phase II

When: 9-11 November 2016 | Where: Gothenburg, Sweden

The aim of this workshop was to gather researchers working (or planning to work) directly or indirectly with snow on Svalbard, whether on the physical, chemical, biological or another point of view. This aims of the workshop were to improve the knowledge transfer and synchronization between different research disciplines involving snow science. The workshop discussed the outcomes from a spring 2016 pilot study where standardized sampling procedures and cross disciplinary snow surveys has been tested for the first time. Furthermore, the workshop focused on Phase II in the work of synchronizing snow science by including more disciplines and extending the current glacial focused network to snow covered soil and sea ice. This workshop was also a step in the establishment of a long-lasting research community dedicated to Svalbard snow science.

Contact: **Veijo Pohjola** · veijo.pohjola@geo.uu.se

Network on Arctic Glaciology (NAG)

IASC network until 2016, now a CWG activity

The objective of this network is to facilitate research on the dynamics and mass budget of Arctic glaciers. The network strives to make a significant contribution to assessments on climate change in the Arctic region, and to understand the links to changes in oceanic and atmospheric conditions. The Arctic region contains more than half of the world's glacier population, which together with the Greenland ice sheet contribute more than two-thirds of the currently observed eustatic sea-level rise. Changes in the delivery of freshwater and icebergs into fjords and oceans also have important implications on the thermohaline circulation, the marine ecosystem, as well as human activities in Polar waters, such as shipping and extraction of natural resources. The NAG is supported by leading researchers from 18 member countries within Europe, North America, and Asia.

Contact: **Thorben Dunse** (Chair) · thorben.dunse@geo.uio.no
Prof. Martin Sharp (Vice-Chair) · martin.sharp@ualberta.ca
Website: **http://nag.iasc.info/**

PHOTO: LUCA BRACALI
The Crystal Cave in Skaftafell National Park is one of the most suggestive places on earth
The cave is part of Vatnajökull, Iceland's largest ice cap

Marine Working Group (MWG)

Membership:

Lee Cooper – USA, Chair | **Heidi Kassens** – Germany, Vice Chair | **Hajime Yamaguchi** – Japan, Vice Chair

Gerhard Herndl – Austria | **Renate Degen** – Austria | **Humfrey Melling** – Canada | **Jinping Zhao** – China (until 2016)
Oleg Ditrich – Czech Republic | **Morten Holtegaard Nielsen** – Denmark | **Naja Mikkelsen** – Denmark
Jaakko Heinonen – Finland (began 2017) | **Hermanni Kaartokallio** – Finland (began 2017)
Kari Strand – Finland (until 2016) | **Michiel Rutgers Van Der Loeff** – Germany | **Guðrún Marteinsdóttir** – Iceland
Steingrímur Jónsson – Iceland | **K.P. Krishnan** – India | **Stefano Aliani** – Italy | **Koji Shimada** – Japan
Baek Min Kim – Korea | **Sung–Ho Kang** – Korea | **Anita Buma** – The Netherlands | **Marit Reigstad** – Norway
Randi Ingvaldsen – Norway | **Jan M. Weslawski** – Poland (began 2017) | **Monika Kędra** – Poland
Waldemar Walczowski – Poland (until 2016) | **Teresa Cabrita** – Portugal | **Sergey Viktorovich Pisarev** – Russia
Alexander Makshtas – Russia | **Franscisco Gordillo** – Spain | **Miquel Canals** – Spain
Pauline S. Leijonmalm – Sweden | **Jeremy Wilkinson** – UK | **Sheldon Bacon** – UK | **Karen Frey** – USA
Thomas Armitage – IASC Fellow 2017 | **Allison Fong** – IASC Fellow 2016

MWG Secretary **Yoo Kyung Lee** – Korea

Scientific Foci:

- Predicting and understanding rapid changes to the Arctic 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
- Enhancing and improving access to the paleo record of the Arctic Ocean through scientific Arctic drilling

PHOTO: IASC FILE PHOTO
Group photo of the Marine Working Group (MWG), 2016

Recent Activities

International cooperation in biogeochemical studies in the Siberian Shelves Seas (Transpolar)

When: 27-28 January 2016 | Where: Kiel, Germany

The workshop was hosted by GEOMAR Helmholtz Centre organized by the "Secretariat Laptev Sea System," following the conference of the Russian-German project "The Transpolar System of the Arctic Ocean." The workshop, attended by 31 scientists and 6 early career scientists from 10 countries, was held in order to bring together specialists working from widely different perspectives on biogeochemical studies in the Siberian shelf seas. The goals were to coordinate future efforts in preparation of expeditions to the Siberian shelf seas, to explore possibilities of cooperation in future studies by exchange of data and samples, and to develop a plan for engagement of young scientists.

Scientific Highlights

- Discussed observations of Upper Halocline distribution along the continental margin made from the international, multidisciplinary investigation of climate-cryosphere carbon interaction in the eastern Siberian Arctic Ocean, Swedish-Russian-US Research Cooperation (SWERUS)
- Discussed differences in oceanographic and biological responses to the dramatic loss in Arctic sea ice observed in the Pacific Arctic region via Japan Agency for Marine Earth Science and Technology (JAMSTEC)'s hydrographic and biogeochemical surveys
- Discussed the investigations of physical, chemical and biological processes and fluxes that control the distributions of key trace elements and isotopes (TEIs) in the Arctic Ocean carried out by GEOTRACES

Contact: **Michiel Rutgers van der Loeff** · mloeff@awi.de | **Heidemarie Kassens** · hkassens@ifm-geomar.de

Future of Arctic Climate Modelling (FAMOS)

When: 1 November 2016 | Where: Woods Hole, USA

The Arctic is rapidly changing and the Arctic amplification of global change has emerged from the background noise. The potential of Arctic freshwater export to perturb Atlantic northward heat fluxes is recognized and recent work has identified mechanisms whereby Arctic warming may impact mid-latitude, regional weather. Evidence from different sources, whether extrapolations, reanalysis products or satellite measurements, all indicate strongly increasing trends in temperature.

However, we still lack actual surface measurements of temperature with which to validate or to challenge these products. Similar problems beset the accurate estimation of freshwater fluxes, whether the lack of in situ measurements of humidity and precipitation or the issue of the ungauged fraction of total terrestrial

runoff. Surface measurements in the Arctic remain sparse, particularly over the ocean and sea ice.

The aim of the workshop was to use the advances in observational and analytical techniques and in instrumentation that were developed for and deployed in connection with the IPY to create an integrated observational approach.

Scientific Highlights

- Identified key parameters to be calculated for monitoring Arctic physical climate.
- Discussed the employment of Observing system Simulation Experiment (OSSE) when designing optimal distribution of measurement systems within the Arctic Ocean for interior in-situ monitoring of the Arctic interior
- Discussed a range of present technology, from fixed installations such as moorings to mobile instruments such as ice-tethered profilers to autonomous underwater vehicle (AUVS) such as gliders or Autosub for ice and ocean surface observations.

Atlantic Distributed Biological Observatory (DBO)

When: 16-17 November 2016 | Where: Tromsø, Norway

The Atlantic Distributed Biological Observatory (DBO) workshop was organized to facilitate a new initiative that would coordinate national and international Arctic marine ship-based observations in the Atlantic Arctic marine region. The aim of the initiative is to increase the number of observations that can be compiled and synthesized to build a larger and consistent data set in this remote, but rapidly changing region. Inspired by the successful implementation of this idea on the Pacific Arctic side through the project Distributed Biological Observatories (DBO) initiated in 2010, this initiative will allow for an advancement towards a Pan Arctic observational system, also on data that cannot be collected by automatic observational systems at present. The workshop gathered scientists from the most central European nations doing ship-based marine fieldwork in the Arctic Ocean to plan coordinated effort in data collection and handling.

Scientific Highlights:

- Established the timeline, team organization, station locations for common sampling for Atlantic DBO
- Identified issues needing agreement such as sampling protocols, data management, and project management
- Discussed how the Atlantic DBO could learn from, be harmonized to, and complementary to the Pacific DBO

PHOTO: ALEXEY PAVLOV
The RV Lance takes part in the Norwegian Young Sea Ice Cruise

Social and Human Working Group (SHWG)

Membership:

Gail Fondahl – Canada, Chair | **Peter Sköld** – Sweden, Vice Chair | **Hiroki Takakura** – Japan, Vice Chair (Until 2016)
Peter Schweitzer – Austria, Past Chair (2011–2015)

Gertrude Eilmsteiner–Saxinger – Austria | **Xu Shijie** – China | **Yang Lei** – China
Barbora Padrtova – Czech Republic (began 2017) | **Ludek Broz** – Czech Republic | **Pelle Tejsner** – Denmark
Robert Chr. Thomsen – Denmark | **Arja Rautio** – Finland | **Lassi Heininen** – Finland | **Béatrice Collignon** – France
Sylvie Blangy – France | **Alexander Proelss** – Germany | **Joachim O. Habeck** – Germany
Gísli Pálsson – Iceland (until 2016) | **Joan Nymand Larsen** – Iceland | **Dhurjati Majumdar** – India
Shinichiro Tabata (began 2017), Japan | **Akiho Shibata** – Japan | **Dongmin Jin** – Korea
Peter Jordan – The Netherlands | **Gunhild Hoogensen Gjørv** – Norway | **Halvor Dannevig** – Norway
Michał Luszczuk – Poland | **Ryszard Czarny** – Poland | **Andrei Golovnev** – Russia | **Andrey Podoplekin** – Russia
Elena Conde – Spain **Michael Bravo** – UK | **Andrey Petrov** – USA | **Lawrence Hamilton** – USA
Violetta Gassiy – IASC Fellow 2017 | **Justiina Dahl** – IASC Fellow 2016

SHWG Secretary **Susan File** – Canada

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

- 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

PHOTO: IASC FILE PHOTO
Group photo of the Social and Human Working Group (SHWG), 2016

**denotes a priority within the scientific foci

Recent Activities

Adaptation Options in the Barents Region – Synthesis and Feedback Workshop

When: 13-14 January 2016 | Where: Bodø, Norway

This workshop aimed to discuss a preliminary assessment of literature about climate change impacts, vulnerabilities, and adaptation in the Barents Region in order to inform a chapter about adaptation options in the Arctic Monitoring and Assessment Programme's assessment on Adaptation Actions for a Changing Arctic - Part C (AACA-C), which will be published in 2017. Participants also aimed to refine and apply the concepts of adaptation options and interactive drivers of change. Workshop participants were experts on climate change adaptation, from academic institutions in Norway, Sweden, Finland and Russia.

Scientific Highlights:

- The most significant trends that will require adaptation in the Barents Region include urbanization, unbalanced outmigration by gender from rural areas, consequences of climate change for primary industries, industrial activities, including shipping, public sector responsibilities (floods, health), and infrastructure
- Adaptation to cumulative and interrelated changes is taking place at various societal scales by different actors, sectors, and local governments and take different forms depending on among others the institutional capacity, access to knowledge and to human and economic resources. Such adaptation takes place with or without national guidelines
- Adaptation in practice is ahead of national developments and guidelines; in the primary industries adaptation is predominantly reactive and adaptation by local governments is predominantly proactive, such as spatial planning, regional and local climate strategies and programs, avalanche protection, adjusting the location of buildings to account for sea-level rise

Contact: **Halvor Dannevig** · hda@vestforsk.no

Infrastructure in the Arctic as a Social and Ecological Challenge

When: 15-16 January 2016 | Where: Vienna, Austria

Material infrastructure in the Arctic – for settlements, industry, transport, etc. – often means serious impacts on the fragile ecosystems of the North, some of which have been addressed by the ICARP III initiative Rapid Arctic Transitions due to Infrastructure and Climate Change (RATIC). The social and human impacts of infrastructure, however, require better understanding. In response, this workshop combined existing Arctic discourses and initiatives with non-Arctic perspectives to better integrate social and ecological perspectives in the study of Arctic infrastructures.

Scientific Highlights

- Infrastructure emerged as a critical unified topic of pan-Arctic relevance, bringing natural and social science concerns together

- While infrastructure is a critical component of industrial development (see the IASC-sponsored RATIC project), its relevance is much broader, as infrastructure is a necessary precondition of human dwelling and mobility
- While the workshop provided excellent examples of the social and ecological challenges of infrastructure, further holistic research regarding the socio-ecological dimensions of infrastructure is needed

Contact: **Peter Schweitzer** · peter.schweitzer@univie.ac.at

Gender Asymmetries in Northern Communities: Perspectives from the Margins

When: 25-28 January 2016 | Where: Lychen, Germany

In the indigenous and rural areas of the Nordic Countries, the Baltics and the Far North of Russia, there is a widely shared feeling that female and male identities and life-ways are increasingly out of pace with each other. This workshop identified the causes of spatial gender shifts and asymmetries, i.e., the separation of sexes in terms of work and residence, along with the predominantly female out-migration from rural to urban areas, with a particular focus on the Russian Far North.

Scientific Highlights

- In light of "the lure of the city", it is worthwhile to flip the perspective and discuss the ways in which small communities and tundra homes provide conditions for personal wellbeing
- Gender disparities in the Far North combine with other forms of social exclusion and marginalisation, as is often experienced by single (mostly female) parents; men who take to illegal hunting; or herdsmen and hunters that cannot find a life partner. The concept of intersectionality facilitates the exploration of such multiple forms of marginalisation
- A scientific domain of growing importance, Queer Studies, can offer valuable insights into gender disparities and muted identities, but it has thus far seldom been applied in circumpolar contexts

Contact: **J. Otto Habeck** · otto.habeck@uni-hamburg.de

Arctic Resilience Workshop: "Resilience Related to Sustainable Development in Globalization"

When: 30 May - 5 June 2016 | Where: Inari (Finland), Kirkenes (Norway) and Murmansk (Russia)

In 2016, an annual travelling scientific gathering and doctoral school, the Calotte Academy, focused on "Resilience Related to Sustainable development in Globalization", particularly in the globalized Arctic. The symposium sessions approached the overarching themes by addressing regionally important questions and concerns. They were discussed holistically from many angles and disciplinary approaches, and from the perspectives of past(s), present(s) and future(s), as well as globally. The presentations focused on topics such as mining, tourism, indigenous peoples' rights and alternative conceptualizations of sustainability,

and the globalized Arctic between (too) rapid resource development and growing need for sustainability or resilience.

Scientific Highlights

- The state-centric interpretation and usage of 'sustainable development' and narrow interpretation of 'resilience', as well as the strong links of the concept of resource-driven development in the Arctic region requires redefining how to describe regional and local challenges for sustainability
- Environmental concerns have been at the core of the Arctic security nexus for a few decades now, given that long-range pollution was already a growing concern for the state of the Arctic ecosystem during the Cold War period. One of the key questions concerning environmental and human security in the contemporary Arctic is whether industrial civilization is willing and able to slow down, or even abandon fossil fuels-based development, particularly offshore oil and gas drilling
- The recent migration waves and large numbers of asylum seekers in the European North did not seem to only affect the border regime between Finland and the Russian Federation, but also frequent Nordic travelers, too. This was the case during the 2016 Academy, when even on the usually open Finnish-Norwegian border, participants had to present their passports for a thorough border check. Consequently, border crossing issues and international migration was a reoccurring side-theme during this year's Academy

Contact: **Lassi Heininen** · lassi.heininen@ulapland.fi

A European Arctic Policy: The Role of EU Non-Arctic Member States

When: 10 June 2016 | Where: Madrid, Spain

As the European Union is increasingly becoming involved in Arctic affairs, the congress facilitated discussion regarding the role of the regional organization as a unitarian actor, while considering the priorities and strategies developed by its Member States which, in most cases, are already Observers to the Arctic Council and therefore represent the first contact point between the two organizations. Bearing in mind the European commitment to Arctic human and environmental sustainability, the congress was structured around three panel discussions aimed at fostering the debate among its participants: researchers, academics and experts from different fields of knowledge. It also served as a forum for early career researchers to present their contributions and strengthen their networks. Congress Proceedings will be made available. Select papers from the related call for papers will also be published in the Spanish Yearbook of International Law.

The interdisciplinary nature of the congress contributed to a strengthened understanding of the European Arctic policy and facilitated an analysis of the recently released document on integrated European Union Policy for the Arctic. It built on the work of previous scientific activities organized within the research project "The race for the Arctic: International Law issues considering climate change" (MEC, Ref. Num. DER2012-36026). The Congress also provided a forum for sharing knowledge regarding the new initiative EU-PolarNet, which involves a consortium of European polar research institutions that aims to develop an integrated EU Polar Research Programme.

Contact: **Elena Conde Pérez** · conde@der.ucm.es

10th Siberian Studies Conference, "Passion for Life: Emotions and Feelings in the North and Siberia"

When: 24-26 October 2016 | Where: St. Petersburg, Russia

The X Siberian Studies Conference brought together social science researchers and indigenous participants from across Europe, Russia, and North America. Work was partly conducted in small workshops. Especially successful were workshops on the borders of privacy in the North, on "Industrial and Emotional Development of the North" and on "Smells and Tastes." The final day of the conference was dedicated to the visual anthropology of the North, with the screening of two films made by Soviet ethnographers who had worked in the Arctic, "Samoyedic Diary" (1929-1930/2016, director Dmitry Arzyutov, camera by Georgii and Ekaterina Prokofievs) and "Nganasan Funeral Rituals" (1978, consultants: Galina Gracheva and Yuri Simchenko). The films provoked active discussion among the scholars and indigenous people in attendance. The conference opened and closed with lectures given by well-known Arctic anthropologists – Nikolai Ssorin-Chaikov (keynote address) and Andrei Golovnev (honorary lecture on Siberian Studies). The SHWG supported the participation of early career researchers from IASC countries to attend this conference and discuss future project proposals.

Contact: **Gail Fondahl** · Gail.Fondahl@unbc.ca | **Hiroki Takakura** · hrk@m.tohoku.ac.jp

PHOTO: ILYA ABRAMOV
Inhabitants of the Russian Arctic

Polar Archaeology Network (PAN)

IASC network until 2016, now a SHWG activity

The Polar Archaeology Network (PAN) is an international organization dedicated to issues pertaining to archaeology in the Arctic, Subarctic, and Subantarctic. Its main goals are:

1) Protection of cultural heritage
2) Promotion and support of research, particularly through the expansion of international networks and cooperation
3) Meaningful integration of archaeology with communities; and,
4) Dissemination of research results in both scholarly and popular forums

Since 2011, PAN has run a series of international workshops and conference sessions to bring together archaeologists from the international community working on similar issues and under similar constraints. Also, PAN has worked hard to bring together archaeologists with Polar scientists in other disciplines.

Contact: **Peter Jordan** (Chair) · p.d.jordan@rug.nl
Website: **https://en.uit.no/prosjekter/prosjekt?p_document_id=270892**

Terrestrial Working Group (TWG)

Membership:

Ingibjorg Svala Jonsdottir – Iceland, Chair | **Josef Elster** – Czech Republic, Vice Chair | **Phil Wookey** – UK, Vice Chair

Andreas Richter – Austria | **Birgit Sattler** – Austria | **Warwick F. Vincent** – Canada | **Luo Wei** – China
Mads Forchhammer – Denmark | **Torben Christensen** – Denmark | **Miska Luoto** – Finland (began 2017)
Otso Suominen – Finland | **Antero Järvinen** – Finland (until 2016) | **Thierry Boulinier** – France
Dirk Wagner – Germany | **Karsten Piepjohn** – Germany | **Jon S. Olafsson** – Iceland | **Manish Tiwari** – India
Ratan Kar – India | **Atsuko Sugimoto** – Japan | **Takayuki Nakatsubo** – Japan | **Yoo Kyung Lee** – Korea
Inger Greve Alsos – Norway | **Piotr Glowacki** – Poland | **Wieslaw Ziaja** – Poland | **João Canário** – Portugal
Olga L'vovna Makarova – Russia | **Alexander Makarov** – Russia | **Benjamin Vinegla Pérez** – Spain
Daniel Sanchez–Mata – Spain | **Hans Linderholm** – Sweden (begun 2017) | **Victoria Pease** – Sweden (until 2016)
Gabriela Schaepman–Strub – Switzerland | **Jelte Rozema** – The Netherlands | **Michelle Mack** – USA (began 2017)
Vladimir Romanovsky – USA | **Donald A. (Skip) Walker** – USA (until 2016) | **Alevtina Evgrafova** – IASC Fellow 2017
Scott Zolkos – IASC Fellow 2016

TWG Secretary **Yoo Kyung Lee** – Korea

Scientific Foci:

- Improving knowledge at multiple spatial scales of the current state of Arctic terrestrial geosystems and ecosystems
- Determining terrestrial and freshwater environmental and biosphere processes that amplify or moderate climate warming
- Understanding the interactions of species and their environment, and the biology of life in extreme environments
- Observation of changes in Arctic geo- and biodiversity
- Development of high spatial resolution models of terrestrial geo- and ecosystem change
- Determining the role of connectivity in the functioning of Arctic terrestrial systems, including connections within the Arctic and the global system

PHOTO: IASC FILE PHOTO
Group photo of the Terrestrial Working Group (TWG), 2016

Recent Activities

Global Terrestrial Network on Permafrost (GTN-P) Workshops

When: May 2016 | Where: Akureyri, Iceland
When: June 2016 | Where: Potsdam, Germany

This series of workshops was a follow-up to the successful 2nd GTN-P workshop associated with the 7th Canadian Permafrost Conference 2015 in Quebec, which was funded by IASC. During the last workshop, the next Thermal State of Permafrost report was planned. Since then the GTN-P Secretariat conducted a comprehensive collection and standardization of thermal borehole and active layer thickness data in Arctic, Antarctic and alpine permafrost regions in global coverage. In these workshops, the dataset was going to be completed, processed, quality checked, and statistically analysed in collaboration with leading permafrost scientists and the Arctic Portal data centre, where the data is organised in a data management system, as well as presented at the 11th International Conference on Permafrost and submitted to a high-profile scientific journal.

Scientific highlights:

- A specific outline of the numerical methods for calculation of global permafrost temperature change, its error, and correlations with global air temperature change
- Sound data and metadata quality check and documentation within the GTN-P database environment
- Interpretation of the results of the calculations on global to regional scale involving the leading permafrost experts from most important GTN-P / IASC member countries

Contact: **Boris Biskaborn** · boris.biskaborn@awi.de
Website: **www.gtnp.org**

Herbivory Network Meeting

When: 15-17 September 2016 | Where: Reykjavík, Iceland

Originally established in 2016 with the support of the IASC TWG, the Herbivory Network is a collaborative research initiative that investigates the role of herbivory in Arctic and alpine ecosystems. With the support from IASC, the FRAM Centre in Norway and Rannís in Iceland, we organised a 1.5-day meeting to form strategies for steering and research collaboration within the network, launch new collaborative projects and strengthen ongoing ones. It was agreed that the Herbivory Network should be organised in a flexible and open way that welcomes contributions on new members who want to take the lead in different activities. The meeting also discussed priorities for research and defined new initiatives, such as large-scale analyses of functional and phylogenetic diversity of herbivores in the Arctic, a systematic review on the effects of herbivores on tundra soils, and a systematic map of our knowledge of tundra herbivory, as well as further development of coordinated data collection and method standardization. A total of 35 participants from 9 different countries attended the meeting.

Scientific highlights

- The simple and flexible organization of the Herbivory Network invites contributions and involvement of

new members. This openness has been central to bringing together early career scientists so that they could take active roles in developing different initiatives

- New initiatives within the Herbivory Network include large-scale analyses of functional and phylogenetic diversity of herbivores in the Arctic, a systematic review on the effects of herbivores on tundra soils, and a systematic map of our knowledge of tundra herbivory, as well as continued efforts on the development of coordinated data collection and method standardization

Contact: **Isabel C Barrio** · icbarrio@gmail.com
Website: **http://herbivory.biology.ualberta.ca**

PHOTO: ILYA ABRAMOV
Reindeer-herders caravan in the Russian Arctic

PHOTO: TODD PARIS
The ASSW 2016 conference banquet in Fairbanks, Alaska

3. Arctic Science Summit Week 2016

» 3 Arctic Science Summit Week 2016

Since 1999, IASC and its partner organizations have convened the annual Arctic Science Summit Week (ASSW). With over 1000 participants from more than 30 different nations and more than 130 different institutions, the ASSW 2016 was the largest ever. The Summit, hosted by the University of Alaska Fairbanks on 12-18 March, included both the business meetings of the various ASSW partner organizations, including numerous side meetings and also the 3rd Arctic Observing Summit. For the first time, the Arctic Council decided to use the ASSW to hold the Senior Arctic Officials meeting back to back with the scientific meetings. The International Arctic Assembly Day in the middle of the week provided an excellent opportunity for a dialogue between scientists and policymakers to translate scientific research into specific plans and actions responding to a rapidly changing Arctic.

AOS 2016

The 3rd Arctic Observing Summit (AOS) was in conjunction with the ASSW 2016 in Fairbanks. More than 450 delegates from 30 countries met to identify a way to create an internationally supported Arctic observing system that meets the urgent information needs of those who are affected by and responding to rapid Arctic change from the local to the global level. The delegates included scientists, representatives from government, business and nonprofit organizations and indigenous leaders from throughout the Arctic. Seven major recommendations that emerged from the AOS are highlighted in the final Conference Statement: http://www.arcticobservingsummit.org/aos-2016-conference-statement-0

Upcoming ASSWs

ASSW 2017

When: 31 March - 07 April 2017
Where: Prague, Czech Republic

Following the ASSW Business Meetings, a Science Symposium entitled "A Dynamic Arctic in Global Change" will be held. The symposium will include three sub-themes: (1) Changes in the Arctic, (2) Global Implications of Arctic Changes, and (3) Impacts of Global Changes on the Arctic. In addition, a two-day MOSAiC (Multidisciplinary drifting Observatory for the Study of Arctic Climate) workshop will overlap with the science symposium.

Website: **www.assw2017.eu**

Polar2018

When: 15-27 June 2018
Where: Davos, Switzerland

Together, IASC and SCAR (the Scientific Committee on Antarctic Research) will jointly host Polar2018, "Where the poles come together." Located in Davos (Switzerland), this meeting will combine SCAR and IASC Business Meetings, an Open Science Conference, the SCAR Delegates Meeting, and the Arctic Observing Summit. The International Scientific Organizing Committee of the conference is co-chaired by Karin Lochte (Germany, SCAR Vice-President and IASC Council Member), Huigen Yang (China, IASC Vice-President and SCAR Delegate), and Martin Schneebeli (Switzerland, SCAR Delegate and IASC Council Member).

Website: **www.polar2018.org**

ASSW 2019

Where: Arkhangelsk, Russia

The ASSW 2019 meeting is currently scheduled to be held in Arkhangelsk, Russia (dates to be confirmed) and will include a science symposium. The theme of the symposium will be defined by the ASSW partner organizations.

PHOTO: TODD PARIS
A performance at the ASSW 2016 conference banquet in Fairbanks, Alaska

PHOTO: MARGOLIN
Conducting science out of the ice

4. Data and Observations

» 4 Data and Observations

Arctic Data Committee (ADC)

The Arctic Data Committee (ADC) was formed by IASC and SAON (Sustaining Arctic Observing Networks) late in 2014. The 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. The ADC and its members have contributed to the organization of major events such as the Second Polar Data Forum, Arctic Science Summit Week, and the 2016 Arctic Observing Summit.

More recently, the ADC partnered with the Standing Committee on Antarctic Data Management, the Southern Ocean Observing System, EU-PolarNet, Polar View Earth Observations, GEO Cold Regions Initiative, WMO. and a number of other organizations to host the Polar Connections Interoperability Workshop in Frascati, Italy, 7-10 November (see http://arcticdc.org/meetings/adc-meetings/interoperability-workshop). Held at ESRIN headquarters of the European Space Agency, the meeting focused on a number of themes including data discovery, data services, emerging virtual research environments ("cloud computing platforms"), governance, international partnerships and better inclusion of Indigenous and social science knowledge and data. Over 50 participants from 17 countries attended locally and through remote connection. Priorities were identified including the need to further develop a federated system that will enhance the ability of researchers and communities to find and access polar data. A report is under development and will be made available in 2017.

The third meeting of the ADC was held in conjunction with the Polar Connections workshop. The focus of the meeting was on establishing structures and partnerships to help address the priorities and needs identified through the Polar Connections workshop and other activities. Of note was the tentative establishment of a polar Interest Group under the international Research Data Alliance. 2017 stands to be a very active year for the ADC and its partners.

Contact: **Peter Pulsifer** · pulsifer@nsidc.org
Website: **http://arcticdc.org**

Sustaining Arctic Observing Networks (SAON)

The purpose of the Sustaining Arctic Observing Networks (SAON) is to support and strengthen the development of multinational engagement for sustained and coordinated pan-Arctic observing and data sharing. SAON has been established on the initiative of the Arctic Council and IASC.

SAON works through two Committees.

Arctic Data Committee (ADC)

As illustrated at the beginning of this chapter, 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. The work plan for ADC has the following tasks:

- Documenting and understanding the Arctic data management ecosystem
- Defining a polar metadata profile
- Defining persistent identifiers for data sets
- Updating the Terms of Reference and establishing MoUs with SCADM and SOOS

ADC is involved in the organization of the Polar Data Forum (http://www.polar-data-forum.org).

Committee on Observations and Networks (CON)

The committee advises the SAON Board on coordination/collaboration of Arctic observing activities and addresses questions regarding sustainability of

PHOTO: ALLEN POPE
Fieldwork on the Juneau Icefield Research Program in southeast Alaska 2016

observational platforms among nations and organizations (including indigenous peoples) to improve efforts on Arctic sustaining observing networks (i.e. identify synergies, gaps, duplication) and to enable effective planning (including funding) of current and future observational systems. It should also ensure the promotion of community-based monitoring within SAON and work on best practices for the utilization of traditional knowledge within Arctic observing activities.

CON has contributed to the compilation of the information underlying the EU-PolarNet inventory of existing polar monitoring and modelling programmes.

Arctic Science Ministerial meeting and US SAON Office

The White House Arctic Science Ministerial was held in September 2016, Washington, DC, USA. The joint statement mentions SAON as a critical contributor to "strengthening and integrating Arctic observations and data sharing." As a follow-up to the meeting, NOAA has opened a U.S. SAON Office on Boulder, Colorado.

Communication and outreach

SAON communication and outreach activities in 2016 include contributing to:

- Arctic Observing Summit (AOS), held in March in Alaska, Fairbanks. AOS is a joint effort of the International Study of Arctic Change (ISAC) and SAON. The next AOS will be held during ASSW in Davos, Switzerland, June 2018
- Arctic Circle: The Group on Earth Observations (GEO) had organized a plenary session on the status of observations in the Arctic
- GEO-XIII Plenary in St. Petersburg, Russian Federation in November 2016

SAON Board

Members of the SAON Board are the Arctic states, the Permanent Participants and Working Groups of the Arctic Council, and non-Arctic states and regional and international organisations with an interest in the Arctic. The SAON Board is led by Chair Christine Daae Olseng from the Norwegian Research Council on behalf of AMAP and Vice-Chair Larry Hinzman from University of Alaska on behalf of IASC.

Contact: **Christine Daae Olseng** · cdo@forskningsradet.no | **Larry Hinzman** · ldhinzman@alaska.edu
Jan René Larsen · jan.rene.larsen@amap.no
Website: **http://www.arcticobserving.org**

PHOTO: JASON BRINER
Flying a quadcopter for Arctic Research

PHOTO: RBB / VOLKMAR KOCHAN

German and Russian colleagues take a lunch break, under observation from a camera crew, from working together to understand changes to Siberian permafrost

5. Partnerships

» 5 Partnerships

With the goals to develop and stimulate shared initiatives that are of high interest to the broader Arctic research community, to make better use of limited financial resources, and to avoid a duplication of efforts, IASC strives for close cooperation with other groups interested in Arctic research. Today, IASC maintains an excellent relationship with many other polar and global science organizations. For example, in 2016, IASC renewed its Memorandum of Understanding with the Association of Polar Early Career Scientists.

IASC has been an accredited observer of the Arctic Council since its inception, and in this function IASC is in a position to provide independent scientific advice to the main political body for the Arctic. IASC supports the work of the Arctic Council, its Working Groups and Permanent Participants by providing scientific expertise from its members, including those from non-Arctic countries. IASC´s contributions have resulted in a number of very successful joint ventures.

As an International Scientific Associate of the overarching non-governmental science organization the International Council for Science (ICSU), IASC is well connected within the broader ICSU family. In particular, cooperation with its Antarctic sister organization, the Scientific Committee on Antarctic Research (SCAR), resulted in various polar science initiatives.

An excellent example of such polar cooperation is the Expert Group on Ice Sheet Mass Balance and Sea Level (ISMASS), which is co-sponsored by the World Climate Research Program (WCRP) Climate and Cryosphere Project (CliC), SCAR and IASC. In 2016 a new form of polar collaboration was formed with a formal partnership between IASC, SCAR, and the Asian Forum for Polar Sciences.

Asian Forum for Polar Sciences (AFoPS)

The Asian Forum for Polar Sciences (AFoPS) is an international organization of the national operators and research institutes in Asian countries. It was established in 2004 to encourage and facilitate cooperation for the advancement of polar sciences among countries in the Asian region. It has served as an important medium of collective endeavors in human and information exchange, research collaboration, and logistics cooperation among the Asian polar science institutions. At present, AFoPS

consists of five Members: China, India, Japan, Malaysia, and the Republic of Korea, with more Asian countries as observers.

With the signing of the MoU between IASC, SCAR, and AFoPS, all parties recognized the common goal of working internationally on polar science and technology to increase our understanding of Earth's Polar Regions and their connections to the global system. The purpose of the present MoU is to foster cooperation between IASC, SCAR and the AFoPS members, and to lay the foundation for a joint effort in developing international programs and initiatives based on scientific priorities, scientific excellence and shared use of Asian Antarctic and Arctic infrastructures for scientific and technological purposes, as well as increasing the engagement of Asian Scientists in both IASC and SCAR activities. The parties recognize their common interest to increase cooperation between IASC, SCAR and the Asian entities undertaking polar research and managing the research infrastructures, taking advantage of the complementarities of the three signatory organizations. AFoPS, through its member organizations, provides the "Asian dimension" with a polar approach, with a remit that covers terrestrial and marine infrastructure and the capacity to involve national scientific or funding agencies in Asia. Through their network of scientists and groups, IASC and SCAR provide scientific priorities, facilitate international cooperation, initiate, develop, and coordinate high quality international scientific research in the Arctic and Antarctic regions and on their role of in the Earth system. This MoU is without prejudice to the application of rights and obligations pursuant to the Antarctic Treaty System and Arctic Council and to former agreements, arrangements or letters of intent, which may bind the Signatories.

This MoU identifies the following commitments:

a. The signatory Parties recognize each other as key organizations for Polar research.
b. AFoPS will contribute to the identification and facilitate the implementation at the Asian level of those priority scientific topics identified by SCAR (in the South) and IASC (in the North) that are particularly relevant from the Asian perspective.
c. AFoPS will support the priorities identified by SCAR and IASC by development of joint scientific programs, by optimized participation of Asian scientists and by representation of polar issues within research programs of AFoPS Member institutions. In particular:
    i. Enhancing cooperation between relevant Asian and non-Asian countries involved in Polar research
    ii. Coordinating the Asian partnership to the Southern Ocean Observing System (SOOS), the Antarctic Near-shore and Terrestrial Observing System (ANTOSL), the Sustaining Arctic Observing Network (SAON), and other polar observing networks.
d. The signatory parties will cooperate and mutually support the development and implementation of concepts and best practices for joint use of polar infrastructure, of relevant interest for the Parties, recognizing the key roles of COMNAP (in the south) and FARO (in the north) in matters of operation.
e. The signatory parties will discuss initiating joint projects of mutual benefit, including cooperation in the management and mutual accessibility of databases and other IT facilities.
f. The signatory parties will reciprocally communicate updates, newsletters, and other information of interest. They will cooperate as well on relevant outreach and polar science communication activities.
g. The signatory parties will provide mutual assistance in identifying experts for scientific evaluations of proposals.
h. The signatory parties will collaborate in joint organization of workshops, conferences, and reports on topics of mutual interest.

i. The signatory parties endeavor to continue supporting the next generation of polar researchers.

A task group made by one member plus the Executive Directors/Secretaries of each party will meet on a regular basis to review joint initiatives. Representatives of the parties are invited to attend major meetings and activities of the other parties.

Website: **http://www.afops.org/**

Arctic Council

IASC has been an accredited observer of the Arctic Council from its very beginning and supports the work of the Arctic Council, its Working Groups (WGs) and Permanent Participants (PPs) by providing scientific expertise from all its members, including the non-Arctic countries. IASC´s contributions so far have resulted in a number of very successful joint activities, such as the Arctic Climate Impact Assessment (ACIA) and the Snow, Water, Ice and Permafrost in the Arctic (SWIPA) report. The biennial Arctic Observing Summit (AOS) is held in conjunction with the Arctic Science Summit Week (ASSW) and through SAON both IASC and the Arctic Council are contributing to the program.

The most recent joint activity was the ASSW 2016 in Fairbanks, which combined IASC´s scientific meetings, the third AOS, and the Arctic Council Senior Arctic Officials (SAO) meeting. An International Arctic Assembly Day in the middle of the week provided an excellent opportunity for a dialogue between scientists and policymakers to translate scientific research into specific plans and actions responding to a rapidly changing Arctic. Since 2013 the Arctic Council Indigenous Peoples Secretariat (IPS) is involved in the planning of the ASSW and IASC is providing travel support to enable the participation of PP representatives as session conveners and presenters. Supporting the work of the Arctic Council PPs, in particular with respect to traditional and local knowledge, is of high priority for IASC. IASC will continue to provide travel support for indigenous participants to attend the ASSW 2017 in Prague (Czech Republic) and future ASSWs.

The final report of the 3rd International Conference on Arctic Research Planning (ICARP III) "Integrating Arctic Research – A Roadmap for the Future" was presented at the ASSW 2016. ICARP III was an open process, with the opportunity for the wider Arctic community to contribute to the overall objectives. Arctic Council WGs (Arctic Monitoring and Assessment Programme (AMAP) and Conservation of Arctic Flora and Fauna (CAFF)) and PPs (through IPS) participated in the process. IASC provided additional funding to engage the PPs in the process and in addition to IPS, the Aleut International Association (AIA), the Inuit Circumpolar Council (ICC), the Russian Association of Indigenous Peoples of the North (RAIPON) and the Saami Council were represented at the final ICARP III Conference held in conjunction with the ASSW 2015 in Toyama (Japan).

IASC is in the position to provide scientific advice on all aspects of Arctic research and during the last

PHOTO: LUCA BRACALI
Icebergs

years Arctic Council WGs were making using of IASC´s broad expertise to ensure the scientific quality of their reports and assessments. IASC coordinated the peer-review process of the Arctic Resilience Report Interim Report (ARR), the Arctic Resilience Assessment (ARA), the second Arctic Human Development Report (AHDR II) and, still ongoing, the Adaptation Actions of the Changing Arctic (AACA) report.

IASC has participated in all Arctic Council SAO and Ministerial meetings, mostly through its Executive Secretary, and maintains very good relationships with those Arctic Council WGs addressing scientific questions, in particular AMAP, CAFF, and the Sustainable Development Working Group (SDWG). Several members of the IASC family are also involved in activities of these Arctic Council WGs in their national capacity, as experts from either Arctic Council member countries or Observer countries.

IASC has cooperated closely with AMAP for many years. Recent examples include the "The Arctic Freshwater System in a Changing Climate" which was initiated by IASC and the Climate and Cryosphere (CliC) project of the World Climate Research Programme (WCRP) and co-organized and co-funded by IASC, CliC and AMAP. The cooperation with CAFF is mainly through the Circumpolar Biodiversity Monitoring Program (CBMP) to which several IASC scientists are contributing. IASC is also well connected to SDWG and PAME and attended the last meetings. Closer links to the Arctic Contaminants Action Program (ACAP) are currently being established. In 2017, the IASC Secretariat moved to Akureyri (Iceland) where it is co-located with the PAME and CAFF Secretariats. This co-location will enable more cooperation in particular with these two Arctic Council WGs.

The Arctic Council initiative to develop a legally binding agreement to strengthen international scientific cooperation is of great interest to IASC and IASC representatives participated in all meetings of the Science Cooperation Task Force (SCTF). The Executive Secretary was invited to contribute to the work of the SCTF by providing an overview of the lessons learned from the International Polar Year. Arctic research is international and non-Arctic countries are making invaluable contributions both in terms of scientific expertise and research infrastructure.

IASC also participated in the meetings of the Task Force on Arctic Marine Cooperation (TFAMC). IASC´s Marine Working Group (MWG), comprising the marine expertise from all 23 IASC member countries, would be in the position to provide scientific input essential for marine stewardship.

Recently, IASC was invited to contribute to the Task Force on Telecommunications Infrastructure in the Arctic (TFTIA) in terms of inter-regional and pan-Arctic needs for science and environment.

Having IASC´s annual scientific summit back to back with an Arctic Council SAO at ASSW 2016 in Fairbanks has been very useful to facilitate the dialogue between science and policy. The next opportunity for such a joint conference would be in 2020 under the Icelandic Chairmanship of the Arctic Council and IASC would be interested in exploring this opportunity.

PHOTO: ALLEN POPE

Students on the Juneau Icefield Research Program rappel into a snow pit

6. Capacity Building

» 6 Capacity Building

IASC recognizes that the next generation of researchers will be faced with increasingly critical challenges due to the impacts of climate change on the Polar Regions and their global significance. IASC therefore believes that it is of great importance to foster young researchers and promote and involve early career scientists working in the Arctic by:

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

With these instruments, IASC aims to include more early career researchers in the organization of workshops, science planning activities and research programs. Last year, over 100 early career scientists received IASC travel stipends to attend and participate in conferences or workshops.

IASC Fellowship Program

The new 2016 IASC Fellows were welcomed during the joint WG meeting at the ASSW 2016 in Fairbanks, Alaska, and previous years' Fellows were enthusiastically involved in the WG meetings and beyond. Małgorzata (Gosia) Śmieszek (SHWG, 2014) organized a well-attended Symposium "Do we speak the same language of science?" held during the International Arctic Assembly Day and chaired the event together with Josefine Lenz (TWG, 2015). During this, invited speakers talked about a variety of topics including research methods, challenges and limitations of human, social and natural sciences and discussed with the audience effective means of communication between disciplines as well as best practices for interdisciplinary research in the Arctic. The Symposium served as a support for development of cross-cutting initiatives among IASC Working Groups. Also, Emily Choy (MWG, 2014) was an organizer for theme 5 'Arctic observations in the context of global observations' for the Arctic Observing Summit (AOS) held in conjunction with the ASSW 2016.

Following ASSW 2016, the Fellows have been actively involved in several conferences and workshops. During the 11th International Conference on Permafrost, Josefine Lenz (TWG, 2015), Elena Kuznetsova, Louis-Philippe Roy (both CWG, 2014), Robert Way (CWG, 2015), Kristina Brown (MWG, 2015) and Emily Choy organized a workshop session on "Community-based Research – Dos' and Don'ts in Arctic Research" as part of the Permafrost Young Researchers Workshop held over 18-19 June 2016. This session brought together Early Career Scientists and representatives from northern communities to discuss best practices in the exchange of traditional and modern knowledge when conducting research in, and in collaboration with, northern communities. The invited panel members, conveyors and participants all agreed that the session was a great success.

Andrian Vlakhov (SHWG, 2015) and Gosia Śmieszek participated in the IASC Think Tank Meeting on 10-11 October, 2016 in Akureyri, Iceland, where IASC Executive Committee together with WG Chairs discussed the future strategy of the organization.

Further, Emily Choy, Justiina Dahl (SHWG, 2016), Allison Fong (MWG, 2016), Elena Kuznetsova, Gosia Śmieszek, Paul Zieger (AWG, 2016) have all been heavily involved in preparation of ASSW 2017. In fact, almost one fourth of the sessions have a Fellow as a co-organizer! Emily and Allison are coordinating social media promotion of the ASSW 2017 on Twitter and Facebook.

Apart from the ASSW 2017, Justiina Dahl is a part of a SHWG project 'Multidisciplinary communication and the governance of evolving global dynamics in the Arctic' and will organize two workshops in the frame of this project: At the ASSW 2017 and at the IX Congress of Arctic Social Sciences in Umeå, Sweden. Kristina Brown and Jo Browse (AWG, 2015) are involved in a cross-cutting workshop 'Biogeochemical Exchange Processes at Sea-Ice Interfaces (BEPSII)' to be held on

PHOTO: IASC FILE PHOTO
2016 IASC Fellows – University of Alaska Fairbanks

2-5 April 2017 in Scripps, California, USA. Allison Fong serves as a Multidisciplinary drifting Observatory for the Study of Arctic Climate (MOSAiC) Ecosystems Team co-leader. Paul Suprenand (MWG, 2014) was awarded a Fulbright-Canada Postdoctoral Scholar grant in Northern Issues for his work in developing a spatial-temporal, whole-ecosystem model of the Beaufort Sea marine ecosystem.

Two of the Fellows serve in the Association of Polar Early Career Scientists (APECS) Leadership for the term 2016/2017. Josefine Lenz was elected as one of the Vice-Presidents in the ExCom, and Scott Zolkos (TWG, 2016) will continue his work on the APECS Council.

The IASC Review Committee listed the expansion of the IASC Fellowship program as "one of the IASC's very real achievements over the past decade" To further improve this successful program, several recommendations were made, including a communication strategy. In order to involve the voice of the Fellows in planning the future of the Fellowship Program, Justiina Dahl carried out a survey for the Fellows. Preliminary report indicates that for all the respondents the Fellowship has been a rewarding experience, and also points at some possible future improvements.

Table IASC Fellows

Working Group	2016/2017	2017/2018
Atmosphere WG	Paul Zieger	Manisha Ganeshan
Cryoshere WG	Alek Petty	Shridhar Jawak
Marine WG	Allison Fong	Thomas Armitage
Social & Human WG	Justiina Dahl	Violetta Gassiy
Terrestrial WG	Scott Zolkos	Alevtina Evgrafova

[QUOTES]

"The IASC Fellowship has helped me to establish new international collaborations, for example by being involved in various proposal activities and planned joint field experiments. I see forward for more in 2017!"

Paul Zieger (AWG, 2016)

"Overall, my Fellow activity during 2016 was entirely successful and brought many new contacts and a lot of positive experience to me. I hope that my involvement would continue during the upcoming period."

Andrian Vlakhov (SHWG, 2015)

"Through my affiliation with the Fellowship program and APECS I got a job as a data analyst for the external review of Sustaining Arctic Observing Networks. This work experience was a very rewarding."

Justiina Dahl (SHWG 2016)

"I would call IASC Fellowship a life changing experience. It was 2014 when I started as one of the first fellows, and where I am now in my career and networking is thanks to the opportunities I got through involvement in IASC."

Elena Kuznetsova (CWG, 2014)

"My experiences as an IASC Fellow and at Arctic Science Summit Week have taught me the importance of examining my current research in the Northwest Territories with an international perspective and mindset. In my current role as a Scientific Advisor (with the W. Garfield Weston Foundation), I will continue to place Canadian Arctic research and challenges into an international context."

Emily Choy (MWG, 2014)

"IASC Fellowship has been my best and most rewarding professional experience and I'm proud to be a part of the amazing crowd of IASC Fellows."

Gosia Śmieszek (SHWG, 2014)

We would like to acknowledge all the people who have been involved in creating, implementing and helping with IASC Fellowship Program. The success of the Program would not be possible without your belief that supporting, engaging and inspiring Early Career Researchers is worth the effort. Thank you!

PHOTO: KLEMENS WEISLEITNER
A water body with microbial mats in the forefi eld of the small glacier valley of Midre Lovénbreen (Svalbard).

Overview of Supported Early Career Scientists

Adaptation Options in the Barents Region – Synthesis and Feedback Workshop

Bodø, January 2016

NAME	INSTITUTION	COUNTRY
H. Amundsen	CICERO Center for International Climate and Environmental Research	Norway
H. Dannevig	Western Norway Research Institute	Norway

Infrastructure in the Arctic as a Social and Ecological Challenge

Vienna, January 2016

NAME	INSTITUTION	COUNTRY
M. Bennett	UCLA Department of Geography	USA
R. Dahlberg	University of Copenhagen	Denmark

Dynamics and Mass Budget of Arctic Glaciers

Benasque, January 2016

NAME	INSTITUTION	COUNTRY
B. Barzycka	University Silesia	Poland
J. Beckmann	Potsdam Institute for Climate Impact Research	Germany
L. Decaux	University Silesia	Poland
M. Hackett	University Ottawa	Canada
S. Jakobs	University Nijmegen	Netherlands
C. Jones	University of Southampton	UK
K. Lamsters	University of Latvia	Latvia
B. Sass	University Erlangen-Nuremberg	Germany
D. Slater	University of Edinburgh	UK
A. Uszczyk	University Silesia	Poland
H. Zekollari	Vrije Universiteit Brussel	Belgium

Gender Asymmetry in Northern Communities: Building a Research Network for the Nordic Countries, Baltics and Russia (NOR-GA)

Lychen, January 2016

NAME	INSTITUTION	COUNTRY
S. Dudeck	Arctic Centre, University of Lapland	Finland
Z. Tarasova	Scott Polar Research Institute	UK

International cooperation in biogeochemical studies in the Siberian Shelves Seas

Kiel, January 2016

NAME	INSTITUTION	COUNTRY
T. Shiozaki	University of Tokyo	Japan
S. Gdaniec	Museum of Natural History	Sweden

Arctic Science Summit Week (ASSW)

Fairbanks, March 2016

NAME	INSTITUTION	COUNTRY
E. Choy	University of Manitoba	Canada
R. Way	University of Ottawa	Canada
A. Vlakhov	European University at St. Petersburg	Russia
A. Petty	NASA Goddard Space Flight Center, University of Maryland	USA
A. Fong	Alfred Wegener Institute	Germany
J. Dahl	European University Institute	Italy
J. Lenz	Alfred Wegener Institute	Germany
S. Zolkos	University of Alberta	Canada
P. Zieger	Stockholm University	Sweden

Symposium: Do we speak the same Language of Science? at the Arctic Science Summit Week (ASSW)

Fairbanks, March 2016

NAME	INSTITUTION	COUNTRY
M. Smieszek	Arctic Centre, University of Lapland	Poland

International Science Initiative in the Russian Arctic (ISIRA) Meeting at the Arctic Science Summit Week (ASSW)

Fairbanks, March 2016

NAME	INSTITUTION	COUNTRY
T. Matveeva	Lomonosov Moscow State University	Russia
K. Kivva	Russian Federal Research Institute of Fisheries and Oceanohraphy	Russia

Arctic Air Pollution Workshop

Fairbanks, March 2016

NAME	INSTITUTION	COUNTRY
M. Rozanova-Smith	Institute of Applied Research	Russia
J. Schmale	Paul Scherrer Institute	Switzerland
H. Yocum	Cooperative Institute for Research in Environmental Sciences	USA

Advancing Integrated, Cross-cutting Practices for Arctic Flux Observations in Terrestrial Environments, Meeting at the Arctic Science Summit Week (ASSW)

Fairbanks, March 2016

NAME	INSTITUTION	COUNTRY
E. Jafarov	University of Colorado Boulder	USA
L. Belelli Marchesini	Free University Amsterdam	Netherlands

Abisko Polar Prediction School 2016

Abisko, April 2016

NAME	INSTITUTION	COUNTRY
J. Zhao	Ocean University of China	China
K. Sato	The Graduate University for Advanced Studies	Japan
D. Sergeev	University of East Anglia	UK
A. Bradley	University of Colorado Boulder	USA

Observing and Modelling Meltwater Retention Processes on Ice Sheets and Glaciers

Copenhagen, June 2016

NAME	INSTITUTION	COUNTRY
S. Buzzard	University of Reading	UK
M. Cooper	University of California	USA

A European Arctic Policy: The Role of EU Non-Arctic Member States

Madrid, June 2016

NAME	INSTITUTION	COUNTRY
M. Scopelliti	University Complutense of Madrid	Italy
J. Bull	University of Victoria	Canada
A. Alvarado	Université de Lyon	France
F. V. Thordurv	University of Reykjavìk	Iceland
C. Wood-Donnelly	University of Cambridge	UK

Community-based Research – Do`s and Don`ts in Arctic Research at the 11th International Conference on Permafrost 2016

Potsdam, June 2016

NAME	INSTITUTION	COUNTRY
A. Afanasieva	The Arctic University of Tromsø	Norway
J. Lenz	Alfred Wegener Institute	Germany
R. Way	University of Ottawa	Canada
E. Kuznetsova	Norwegian University of Science and Technology	Norway
L.-P. Roy	Yukon Research Center, Yukon College	Canada
K. Brown	Woods Hole Oceanographic Institution	USA

Herbivory Network Meeting

Reykjavik, September 2016

NAME	INSTITUTION	COUNTRY
G. Bueno	University of Tartu	Estonia
K. Christie	University of Alberta	Canada
K. Hoset	University of Turku	Finland
A. Kolstad	Norwegian University of Science and Technology	Norway
P. Macek	University of South Behemia	Czech Republic
S. Rheubottom	University of Alberta	Canada
I. Skjelbred	Norwegian University of Science and Technology	Norway

The importance of Calving for the Mass Balance of Arctic Glaciers

Sopot, October 2016

NAME	INSTITUTION	COUNTRY
E. Enderlin	University of Maine	USA
A. Dalton	University of Ottawa	Canada
D. Tetzner	University of Chile	Germany

10th Siberian Studies Conference, "Passion for Life: Emotions and Feelings in the North and Siberia"

St. Petersburg, October 2016

NAME	INSTITUTION	COUNTRY
B. Tsetsentsolmon	National University of Mongolia / Institute of Social Anthropology, Austrian Academy of Sciences	Mongolia
I. Abramov	Institute of History and Archaeology, Russian Academy of Sciences	Russia
E. Kaduk	Institute of Ethnology and Anthropology, Russian Academy of Sciences	Russia
A. Kaduk	Institute of Ethnology and Anthropology, Russian Academy of Sciences	Russia
K. Yakovleva	North-Eastern Federal University in Yakutsk	Russia
M.-K. Lang	Institute of Social Anthropology, Austrian Academy of Sciences	Austria
N. Galeeva	Shemanovsky Museum Salekhard	Russia

The Future of Arctic Climate Monitoring Workshop

Woods Hole, November 2016

NAME	INSTITUTION	COUNTRY
T. Armitage	University College London	UK

PHOTO: JASON BRINER
Cosmogenic nuclide sampling

7. Annex

» 7 Annex

Polar Acronyms

List of Acronyms and Abbreviations

A

Acronym	Full name
AAA	Astronomy and Astrophysics in Antarctica
AACA	Adaptation Actions for a Changing Arctic
ABC	Arctic Biodiversity Coalition
AC	Arctic Council
ACA	Arctic Change Assessment
ACAP	Arctic Contaminants Action Program
ACCE	Antarctic Climate Change and the Environment
ACCESS	Arctic Climate Change Economy and Society
ACCOnet	Arctic Circumpolar Coastal Observatory Network
ACD	Arctic Coastal Dynamics
ACIA	Arctic Climate Impact Assessment
ACSNet	Arctic Climate System Network
ACSYS	Arctic Climate System Study
ADAPT	Arctic Development and Adaptation to Permafrost
ADC	Arctic Data Committee
AFS	Arctic Freshwater System Synthesis
AFOPS	Asian Forum for Polar Sciences
AFWG	Arctic Fisheries Working Group
AG	Action Group

Acronym	Full name
A	
AGG	Action Group on Geosciences
AGU	American Geophysical Union
AHDR	Arctic Human Development Report
AIA	Aleut International Association
AIDA	Atmospheric Investigations on a Drifting observatory over the Arctic Ocean
AMAP	Arctic Monitoring and Assessment Programme
AnT-ERA	Antarctic Thresholds – Ecosystem Resilience and Adaptation
AntClim21	Antarctic Climate Change in the 21st Century
AntEco	State of the Antarctic Ecosystem
AntETR	Antarctic Ecosystems: Adaptations, Thresholds and Resilience
AOD	Aerosol Optical Depth
AODS	Arctic Ocean Drift Study
AOS	Arctic Observing Summit
AOSB	Arctic Ocean Sciences Board
APECS	Association of Polar Early Career Scientists
APEX	Arctic Palaeoclimate and its Extremes
APRI	Austrian Polar Research Institute
ARA	Arctic Resilience Assessment
ARCDIV NET	Network for ARCtic Climate and Biological DIVersity Studies
ARCHES	Arctic Hydrology and Earth System Processes
ARCUS	Arctic Research Consortium of the US
ARR	Arctic Resilience Report
ART	Arctic in Rapid Transition
ASI	Arctic Social Indicators
ASSW	Arctic Science Summit Week
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
ATCM	Antarctic Treaty Consultative Meeting
AVA	Arctic Vegetation Archive
AWG	Atmosphere Working Group
AWI	Alfred Wegener Institute for Polar and Marine Research
B	
BEST	Bering Ecosystem Study
BipAG	Bipolar Action Group
C	
C-GTOS	Coastal Global Terrestrial Observing System
CACCON	Circum-Arctic Coastal Communities KnOwledge Network
CAFF	Conservation of Arctic Flora and Fauna
CALE	Circum-Arctic Lithosphere Evolution
CALM	Circumpolar Active Layer Monitoring
CAML	Census of Antarctic Marine Life
CBMP	Circumpolar Biodiversity Monitoring Program
CCMVal	Climate – chemistry model validation

Acronym	Full name
C	
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CHARS	Canadian High Arctic Research Station
CHRN	Circumpolar Health Research Network
CliC	Climate and Cryosphere Project
CLIVAR	Climate Variability and Predictability Program
CMIP	Coupled Model Intercomparison Project
COMNAP	Council of Managers of National Antarctic Programs
CON	Committee on Observations and Networks
COP15	Fifteenth Conference of Parties
COPES	Coordinated Observation and Prediction of the Earth System
CPC	Canadian Polar Commission
CPE	Comité Polar Español
CryOS	Cryosphere Observing System
CSA	Canadian Space Agency
CSIC	Spanish National Research Council
CVII	Commission on Volcano Ice Interactions
CWG	Cryosphere Working Group
D	
DACA-13	Davos Atmospheric and Cryospheric Assembly 2013
DBO	Distributed Biological Observatory
E	
EAI	Exo-Atmospheric lunar Irradiance
ECORD	European Consortium for Ocean Research Drilling
ECS	Early Career Scientists
ECV	Essential Climate Variables
EEA	European Environmental Agency
EGU	European Geophysical Union
EIWG	Extractive Industries Working Group
EOC	Education, Outreach and Communication
EPB	European Polar Board
ERICON	European Research Icebreaker Consortium
ESA	European Space Association
ESF	European Science Foundation
ESM	Earth System Models
ESRI	European Strategy Forum on Research Infrastructures
ESSAS	Ecosystem Studies of Sub-Arctic Seas
EU	European Union
EUCOP	European Conference on Permafrost
F	
FAMOS	Forum for Arctic Modeling & Observational Synthesis
FARO	Forum of Arctic Research Operators
FMI	Finnish Meteorological Institute
FRISP	Forum for Research into Ice Shelf Processes

Acronym	Full name
G	
GAPHAZ	Glacier And Permafrost HAZards in mountains
GCI	Gwich'in Council International
GCM	Global Climate Model
GCOS	Global Climate Observing System
GDEM	Global Digital Elevation Model (GDEM)
GEO	Group on Earth Observations Geological Survey
GEOTOP	Quebec inter-university network on advanced studies and research in geosciences
GEUS	Geological Survey of Denmark and Greenland
GFCS	Global Framework for Climate Services
GGD	Global Geocryological Database
GIA	Glacial Isostatic Adjustment
GIC	Glacier and Ice Cap
GICAC	Glaciers and Ice Cap Assessment Consortium
GIN	Greenland-Iceland-Norwegian seas
GLACIODYN	Dynamic Response of Arctic Glaciers to Global Warming
GLIMS	Global Land Ice Measurements from Space
GOOS	Global Ocean Observing System
GRACE	Gravity Recovery and Climate Experiment
GRASP	The Greenland Analogue Surface System Project
GRISO	Greenland Ice Sheet-Ocean Interactions
GROCE	Greenland Ice Sheet / Ocean Interaction
GSR	Quaternary Science Reviews
GTN-G	Global Terrestrial Network for Glaciers
GTN-P	Global Terrestrial Network on Permafrost
GTOS	Global Terrestrial Observing System
H	
HERMIONE	Hotspot Ecosystem Research and Man's Impact On European Seas
I	
IACS	International Association of Cryospheric Sciences
IAI	International Antarctic Institute
IAMAS	International Association of Meteorology and Atmospheric Sciences
iAOOS	integrated Arctic Ocean Observing System
IAPSO	International Association for the Physical Sciences of the Oceans
IARC	International Arctic Research Center
IASC	International Arctic Science Committee
IASOA	International Arctic System for Observing the Arctic
IASSA	International Arctic Social Sciences Association
IAVCEI	Intern. Association of Volcanology and Chemistry of the Earth's Interior
ICAM	International Continental Arctic Margins
ICARP	International Conference on Arctic Research Planning
ICARPIII	3rd International Conference on Arctic Research Planning
ICC	Inuit Circumpolar Council

Acronym	Full name
ICEHUS	Ice Age Development and Human Settlement in Northern Eurasia
ICEMASS	Response of Arctic Ice Masses to Climate Change
ICES	International Council for the Exploration of the Sea
ICSIH	International Commission on Snow and Ice Hydrology
ICSU	International Council for Science
IG	Initiating Group
IGAC	International Global Atmospheric Chemistry
IGBP	International Geosphere-Biosphere Programme
IGS	International GPS Service
IGY	International Geophysical Year
IHP	International Hydrological Programme
IJCH	International Journal for Circumpolar Health
IMAU	Institute for Marine and Atmospheric research Utrecht
IMBIE	Ice sheet mass balance inter-comparison exercise
INAC	Indian and Northern Affairs Canada
INCHR	International Network for Circumpolar Health Research
INTERACT	International Network for Terrestrial Research and Monitoring in the Arctic
INVEST	New Ventures in Exploring Scientific Targets
IOC	Intergovernmental Oceanographic Commission
IODP	Integrated Ocean Drilling Program
IOPAN	Institute of Oceanology Polish Academy of Sciences
IPA	International Permafrost Association
IPCC	Intergovernmental Panel on Climate Change
IPD	International Polar Decade
IPI	International Polar Initiative
IPPI	International Polar Partnership Initiative
IPS	Arctic Council Indigenous Peoples Secretariat
IPY	International Polar Year
IPY IPO	International Polar Year International Programme Office
ISAC	International Study of Arctic Change
ISAR 3	3rd International Symposium on Arctic Research
ISIRA	International Science Initiative in the Russian Arctic
ISMASS	Ice Sheet Mass Balance and Sea Level
ISTAS	Integrating Spatial and Temporal Scales in the Changing Arctic System
ITEX	International Tundra Experiment
IUEM	European Institute for Marine Studies
IUGG	International Union of Geodesy and Geophysics
JAMSTEC	Japan Agency for Marine Earth Science and Technology
JC	Joint Committee
JSC	Joint Scientific Committee

Acronym	Full name
K	
KOPRI	Korea Polar Research Institute
L	
LAII	Land-Atmosphere-Ice Interactions
LANDSAT	Series of Earth-observing satellite missions jointly managed by NASA and the U.S.
LGGE	Laboratoire de Glaciology et Géophysique de L'environnement
LGM	Last Glacial Maximum
LoA	Letter of Agreement
LOICZ	Land-Ocean-Interactions in the Coastal Zone
LOMROG	Lomonosov Ridge off Greenland expedition
M	
MAGICS	Mass balance of Arctic Glaciers and Ice sheets in relation to the Climate and Sea level changes
MARUM	Centre for Marine Environmental Sciences
MOCA	Meltwater routing and Ocean-Cryosphere-Atmosphere response project
MOSAiC	Multidisciplinary drifting Observatory for the Study of Arctic Climate
MoU	Memorandum of Understanding
MWG	Marine Working Group
N	
NAG	Network on Arctic Glaciology
NCAOR	National Centre for Antarctic and Ocean Research
NcoE	Nordic Centre of Excellence
NERC	National Environment Research Council
NERI	National Environmental Research Institute
NOAA	US National Oceanographic and Atmospheric Administration
NPI	Norwegian Polar Institute
NRB	Northern Research Basins
NRC	National Research Council
NSF	National Science Foundation
NWP	Numerical Weather Prediction
NySMAC	Ny-Ålesund Science Managers Committee
O	
OGS	National Institute of Oceanography and Experimental Geophysics
OSC	Open Science Conference
OSL	Optically stimulated luminescence
P	
PACE	Past and Future Change of the Antarctic Environment
PAG	Pacific Arctic Group
PAIS	Past Antarctic Ice Sheet Dynamics
PAME	Protection of the Arctic Marine Environment
PAN	Polar Archeology Network
PAR	Pacific Arctic Region
PAST Gateways	Palaeo-Arctic Spatial and Temporal Gateways
PCSP	Polar Continental Shelf Program

Acronym	Full name
P	
PEI	Polar Educators International
PI	Principal Investigator
PIC	Polar Information Commons
PICES	The North Pacific Marine Science Organization
POLENET	Polar Earth Observing Network
PONAM	Polar North Atlantic Margin
PP	Permanent Participant
PROMICE	Programme for Monitoring of the Greenland Ice Sheet
PYRN	Permafrost Young Researchers Network
Q	
QUEEN	Quaternary Environment of the Eurasian North
R	
R/V	Research Vessel
RAIPON	Russian Association of Indigenous Peoples of the North
RANNIS	Icelandic Center for Research
RATIC	Rapid Arctic Transitions due to Infrastructure and Climate Change
RCM	Regional Climate Model
RCN	Research Coordination Network
RINK	Respons af Indlandsisen til Naturlige Klimaændringer
RRS	Royal Research ship
RSL	Relative sea-level
S	
SAC	State of the Arctic Coast
SAI	Stefansson Arctic Institute
SAO	Senior Arctic Official
SAON	Sustaining Arctic Observing Networks
SCAR	Scientific Committee on Antarctic Research
SCICOM	Science Committee of ICES
SCOR	Scientific Committee on Oceanic Research
SCTF	Scientific Cooperation Task Force
SDWG	Sustainable Development Working Group
SEARCH	Study of Environmental Arctic Change
SEI	Stockholm Environment Institute
SERCE	Solid Earth Response and influence on Cryosphere Evolution
SG	Steering Group
SHARE	Social Sciences and Humanities Antarctic Research Exchange
SHWG	Social and Human Working Group
SIOS	Svalbard Integrated Arctic Earth Observing System
SOOS	Southern Ocean Observing System
SPARC	Stratospheric Processes And their Role in Climate
SPICE	Space-borne Measurements of Arctic Glaciers and Implications for Sea Level
SRC	Stockholm Resilience Centre

Acronym	Full name
S	
SRP	Scientific Research Programme
SSG	Scientific Steering Group
SVALI	Stability and Variations of Arctic Land Ice
SWERUS	Swedish-Russion-US Research Cooperation
SWIPA	Snow, Water, Ice and Permafrost in the Arctic
T	
TFAMC	Task Force on Arctic Marine Cooperation
TFTIA	Task Force on Telecommunications Infrastructure in the Arctic
THAW	THermokarst Aquatic Ecosystem
THORPEX	The Observing System Research and Predictability Experiment
TICOP	Tenth International Conference on Permafrost
TRANSSIZ	Transitions in the Seasonal Sea Ice Zone
TSP	Thermal State of Permafrost
TWG	Terrestrial Working Group
U	
UAF	University of Alaska Fairbanks
UArctic	University of the Arctic
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIS	The University Centre in Svalbard
W	
WCC-3	Third World Climate Conference
WCRP	World Climate Research Program
WCRP/CliC	World Climate Research Program/ Climate and Cryosphere Project
WG	Working Group
WGMS	World Glacier Monitoring Service
WMO	World Meteorological Organization
WWF	World Wildlife Fund