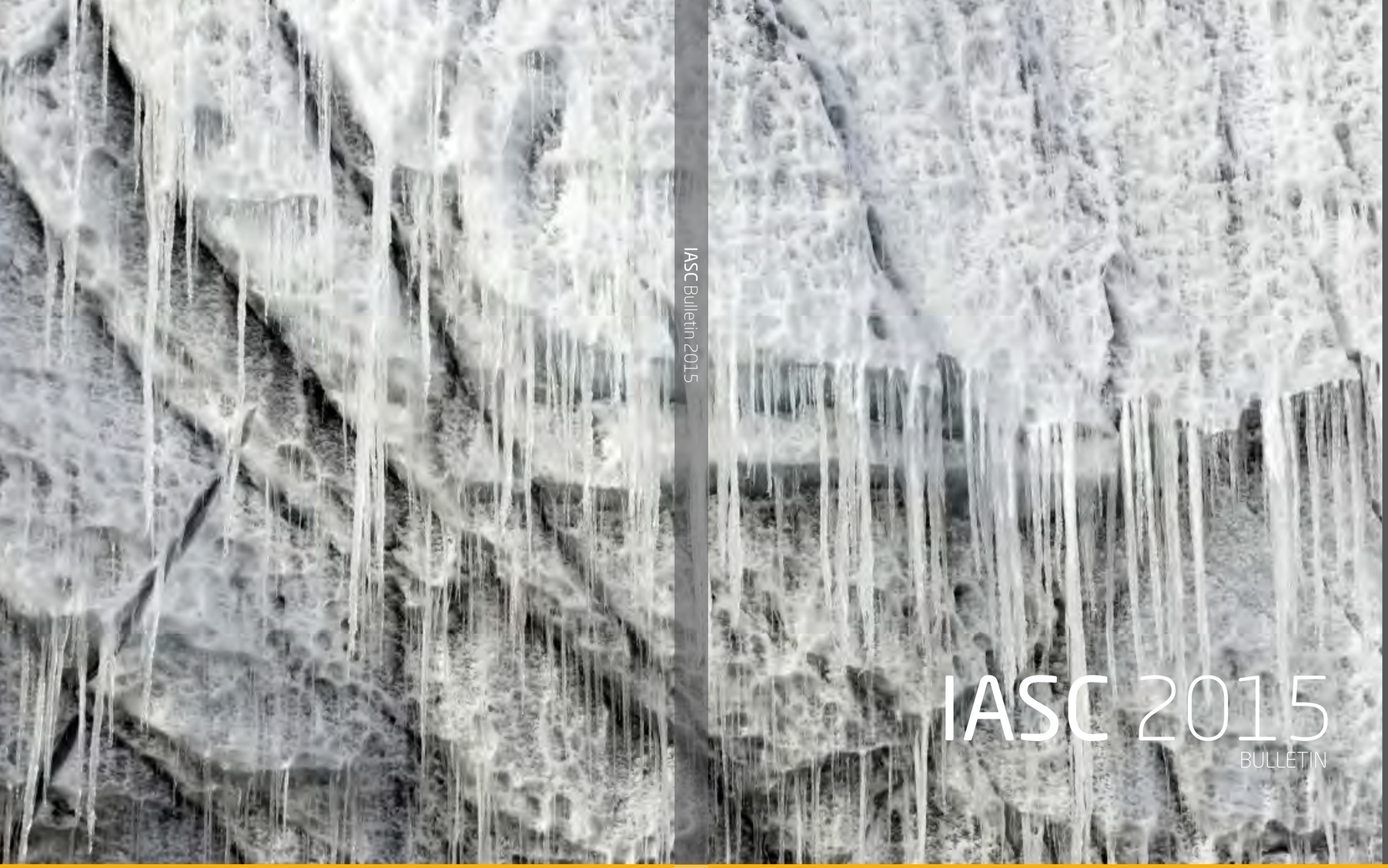

IASC Bulletin 2015

IASC 2015
BULLETIN

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INTERNATIONAL ARCTIC SCIENCE COMMITTEE
Telegrafenberg A43, DE - 14473 Potsdam, Germany
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.

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[IASC] · STRUCTURE

Representatives of national scientific organizations from all 22 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.fi.dk
Finland	Delegation of the Finnish Academies of Science and Letters	www.tsv.fi/international/akatemiat/
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 Organisation 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
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	www.dels.nas.edu/prb/

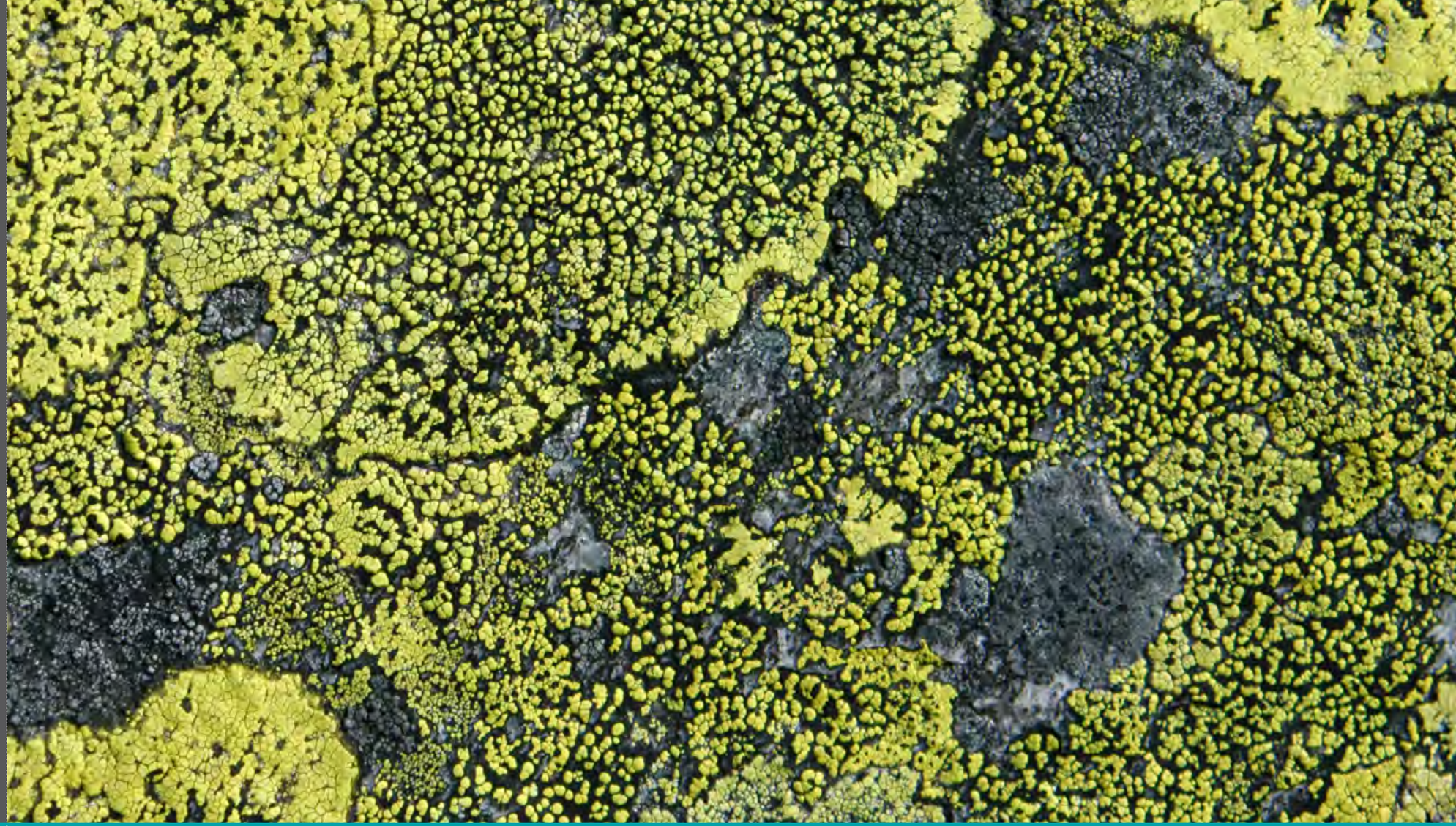
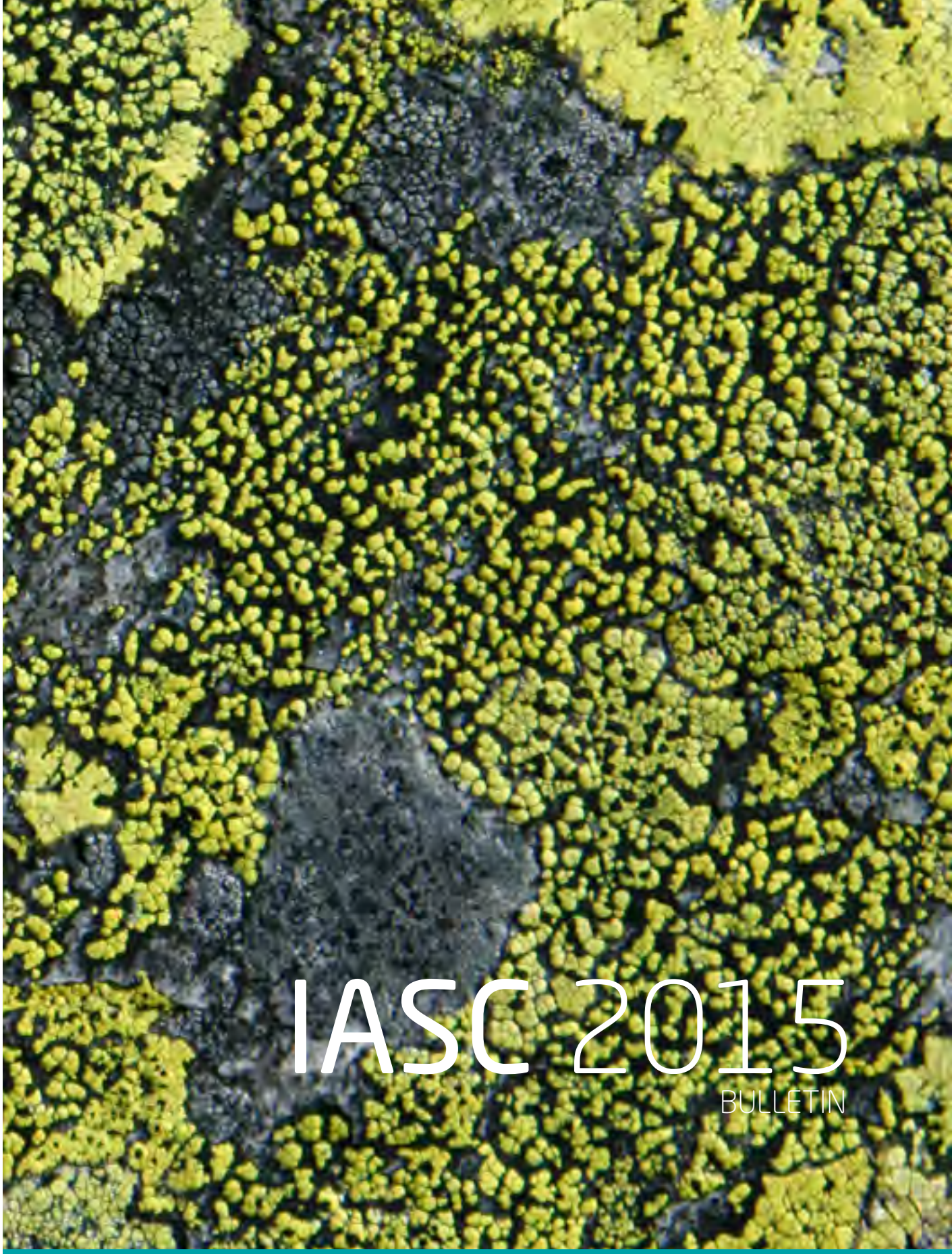


PHOTO: PETER PROKOSCH [www.grida.no]
Arctic map lichen is a species of lichen, which grows on rocks in mountainous areas of low air pollution. Each lichen is a flat patch bordered by a black line of spores. These patches grow adjacent to each other, leading to the appearance of a map or a patchwork field. Map lichen is a lichen widely used by climatologists in determining the relative age of deposits, e.g. moraine systems, thus revealing evidence of glacial advances. The process is termed lichenometry.



IASC 2015

BULLETIN

INTERNATIONAL ARCTIC SCIENCE COMMITTEE

[IMPRINT]

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COVERPHOTO: WITEK KASZKIN [Polish Polar Station]
The extra long icicles formed on the inactive front part of the Hans Glacier, Hornsund, Spitsbergen

[CONTENT]

[PREFACE]

Looking back over the past year, the 24th in IASC's history, we are extremely encouraged by the number of people who demonstrate an active interest in the progress of the Committee. This Bulletin is now distributed in 750 copies to people and institutions with interests ranging from the scientific to the political and diplomatic. In addition the Bulletin and our other news can be, and are, accessed on our website.

The Arctic Science Summit Week in Helsinki, Finland in April saw a change in the Executive of IASC. Susan Barr replaced David Hik as president, after David had served his four-year term with great excellence. Two of the vice presidents, Naja Mikkelsen from Denmark/Greenland and Huigen Yang from China, continue, while we were pleased to welcome Vladimir Pavlenko from Russia and Larry Hinzman from USA as new vice presidents.

As the interest in and activities of IASC increase and expand it became necessary to find ways to assist the small secretariat with the large variety of tasks they have to manage. Our Executive Secretary Volker Rachold continues to run the efficient group of four in total who man the central office in Potsdam, Germany. In addition we are extremely pleased that member countries have rallied to the need for more assistance and we now receive valuable secretariat support for the IASC Working Groups from officers based at their own institutes in Korea, Japan, Canada and from the beginning of 2015 also Poland. Other countries have also indicated a willingness to assist where necessary. Not least we sincerely thank the Alfred Wegener Institute and the German Science Foundation for continuing to fund the central secretariat in Potsdam.

Continuing the spirit of the IPY 2007-2008 IASC has fully supported, financially and otherwise, the inclusion of Early Career scientists and indigenous representatives in scientific meetings and projects. In 2014 we were pleased to take another step in promoting the new generation of arctic scientists with the establishment of a Fellowship Program. Through this program early career scientists can apply to support and integrate with a Working Group by providing extra secretariat assistance at the same time as they are able to join in the meetings and email exchanges. In this way they will be able to gain a network within their own discipline and interact with established scientists in the development of new scientific projects and activities. Each Fellow will be able to attend two consecutive Arctic Science Summit Weeks.

2014 saw yet another increase in membership as Austria was welcomed as the 22nd member country of IASC. The Austrian Polar Research Institute (APRI) represents both Austria's current research program as well as its long history in arctic research – not least its involvement in both the first exploration of Franz Josef Land/Zemlja Frantsa Iosifa 1872-74 and the original idea and the implementation of the First International Polar Year 1882-83.

In 2013 the Data Policy Action Group of IASC developed a "Statement of Principles and Practices for Arctic Data Management". At the same time IASC was also represented in the Sustaining Arctic Observing Networks (SAON) data management committee. In November 2014 it was decided to merge both committees to form a single Arctic Data Committee (ADC) to drive the work forward. To this end the ADC will also interact with other relevant data management bodies, such as the Standing Committee on Antarctic Data Management.

Interaction and cooperation between IASC and the Scientific Committee on Antarctic Research (SCAR) continues to grow in line with the increasing scientific cooperation between scientists and institutions concerned with both polar areas. The Executive Committees of IASC and SCAR now have regular contact and discussions on matters of common interest. In 2018 a second Joint Conference on polar research will be held in Davos, Switzerland ten years after the first, which was held in St Petersburg, Russia.

Finally, two major activities have filled much of 2014 for IASC and have involved a considerable number of dedicated individuals. The ICARP III – Third International Conference on Arctic Research Planning – has been prepared through a large number of events that include workshops, seminars, Working Group activities, town hall meetings and other information opportunities, all of which will culminate in the Conference itself during the Arctic Science Summit Week 2015 in Toyama, Japan. Secondly the book that documents the first 25 years of IASC 1990-2015 has been produced through the hard work of a team of former and current persons who have been central to the Committee in various ways throughout these years. The book is available from early 2015 in a digital version and will be presented as a paper edition during the ASSW in April 2015. We are certain that both these events will emphasize the important position that IASC has gained within arctic research during these 25 years, and will spread the word to an even larger audience than that which currently follows our activities.

Susan Barr | IASC President

PHOTO: PETER PROKOSCH
A flock of red knots (Calidris canutus) in flight. In Europe these birds are simply know as knots.

PHOTO: LUCA BRACALI
A researcher rides the first "anti-polar bear" bike on Svalbard, Norway. The bike is outfitted with spike tires, an electric engine and a special battery that is able to work at 40° C below zero and is able to push the bike up to a speed of 40 km/h.

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 22 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	Canadian Polar Commission	David Hik
China	Chinese Arctic and Antarctic Administration	Huigen Yang, Vice-President
Czech Republic	Centre for Polar Ecology	Josef Elster
Denmark/Greenland	The Danish Agency for Science, Technology and Innovation	Naja Mikkelsen, Vice-President
Finland	Delegation of the Finnish Academies of Science and Letters	Kari Laine
France	Institut polaire français	Yves Frenot
Germany	Deutsche Forschungsgemeinschaft	Karin Lochte
Iceland	RANNÍS, The Icelandic Centre for Research	Thorsteinn Gunnarsson
India	National Centre for Antarctic and Ocean Research	Sivaramakrishnan Rajan
Italy	National Research Council	Carlo Barbante
Japan	Science Council of Japan	Tetsuo Ohata
The Netherlands	The Netherlands Organisation for Scientific Research	Louwrens Hacquebord
Norway	The Research Council of Norway	Susan Barr, President
Poland	Polish Academy of Sciences, Committee on Polar Research	Jacek Jania
Russia	The Russian Academy of Sciences	Vladimir I. Pavlenko, Vice-President
Republic of Korea	Korean National Committee on Polar Research	Byong-Kwon Park
Spain	Comité Polar Español	Manuel Catalan
Sweden	The Swedish Research Council	Mats Andersson
Switzerland	Swiss Committee on Polar Research	Martin Lüthi
United Kingdom	Natural Environment Research Council	Cynan Ellis-Evans
USA	Polar Research Board	Larry Hinzman, Vice-President

TABLE: An overview of all IASC Council members, including the countries and organizations they represent.

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) 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.

PHOTO: IASC SECRETARIAT
The IASC Council Meeting at ASSW 2014 in Helsinki, Finland.

Austria is Welcomed as IASC's 22nd Member Country

IASC Council welcomed Austria as the 22nd IASC member country at Arctic Science Summit Week 2014. Austria is represented in IASC through the recently established Austrian Polar Research Institute (APRI). The APRI Executive Secretary, Wolfgang Schöner, is serving as an IASC Council member. The IASC Council recognized not only Austria´s long history in Arctic research, but also its current research program, which is facilitated through APRI.

#01

New Member Country: Arctic Research in Austria

Austria has a long-standing tradition in polar research. A past outstanding milestone was the Austrian-Hungarian Polar Expedition which aimed to explore the Northeast passage in the early 1870s. Although the expedition was unsuccessful in its original aim, it resulted in the discovery and mapping of the Franz Josef Land archipelago. Expedition leader Karl Weyprecht also identified and articulated the need for an international polar research effort, which was subsequently known as the "International Polar Year." Since then, Austria and its renowned scientists have made contributions to each International Polar Year and to polar research in general. Norbert Untersteiner, an Austrian geophysicist at the University of Washington, for example, started with the famous sea ice drifting station "Alpha" during the International Geophysical Year (IGY) 1957/58 and significantly influenced international sea ice research. During that time, the Institute of Meteorology and Geophysics at Innsbruck University was a particular nucleus of the Austrian contribution to international polar research.

Despite these international polar science contributions, Austria had not, until now, succeeded in the formal establishment of an independent polar research institute. Such an institution is essential in order to facilitate Austria's contribution to international networks such as IASC and the Scientific Committee on Antarctic Research (SCAR), to represent Austrian polar research at an international level; support, stimulate and consolidate Austria's polar research activities at a national level; and motivate and support the next generation of polar researchers and to inform the public on results of polar research and its relevance. Thus, in 2012, scientists of the Universities of Vienna and Innsbruck and the Austrian weather service "Central Institute of Meteorology and Geodynamics" worked together to found the Austrian Polar Research Institute (APRI), a cooperative institute among the founding partners. At the opening ceremony at the University Vienna on April 8th, 2013, the Austrian Minister of Science and Research, the Rector of the University of Vienna, the Director of the Central Institute of Meteorology and Geodynamics, the Executive Secretary of IASC and about 200 ceremony guests, together with the representatives of APRI, celebrated this milestone for Austrian polar research.

The new Austrian Polar Research Institute has a light management structure that promotes and coordinates research and education in the area of polar sciences at the participating organizations. APRI currently comprises about 50 researchers (14 research groups) from the University of Vienna, the University of Innsbruck, the Vienna University of Technology and the Central Institute of Meteorology and Geodynamics, which cover three major research fields: polar ecology; cryosphere and climate; and social and cultural systems.

The main tasks of the Austrian Polar Research Institute are to:

- Facilitate cooperation and enhance synergies in polar research at the national level;
- Foster international cooperation in polar research and represent Austrian research in polar scientific organizations;
- Initiate, develop and support interdisciplinary research at the national and European level;
- Support early career scientists in polar research; and,
- Increase the visibility of Austria in polar research and encourage a dialogue between polar scientists and the public.

More information on the Austrian Polar Research Institute is available from the website **www.polarresearch.at.**

#02

#03

PHOTO: IASC SECRETARIAT
Austria joins IASC as its 22nd member country. From left to right: Susan Barr (IASC President), David Hik (IASC Council), Wolfgang Schöner (APRI Executive Secretary), Volker Rachold (IASC Executive Secretary) and Andreas Richter (APRI Director)

PHOTOS: AUSTRIAN POLAR RESEARCH INSTITUTE
#01 | IPY 2007/08 was the starting point of Austrian activities in support of an Austrian Polar Research Institute: Austrian research group at Zackenberg station (Greenland) in August 2007

#02 | Prof. Andreas Richter, Director of the Austrian Polar Research Institute (APRI), (University of Vienna)

#03 | Inaugural address of the Austrian Minister of Science and Research, Dr. Karlheinz Töchterle, at the Austrian Polar Research Institute (APRI) opening ceremony in 2013

IASC Data Standing Committee

The recently established data management committees of IASC and the Sustaining Arctic Observing Networks (SAON) jointly met on 10-11 November 2014 in Potsdam, Germany. During this inaugural meeting, members of each committee agreed to merge to form a single Arctic Data Committee (ADC).

The ADC will include representatives appointed by IASC and SAON national bodies, but will be open to all interested and engaged individual and organizational participants. Additionally, relationships will be established between the ADC and other relevant data management bodies including, for example, the Standing Committee on Antarctic Data Management, GEO Cold Regions and other regional initiatives. The ADC will engage with the broader community while continuing to report to the IASC and SAON Executive bodes.

Four focus areas were identified by the ADC for further action:

i) Establishing a network map of the arctic data management "ecosystem" for use in system design, policy formulation, and network development;

ii) Development of recommendations on a common set of metadata elements relevant across Arctic research, including community driven research;

iii) An instructive report on development and implications of new data publication and citation models; and

iv) An interoperability experiment aiming to tie together existing data services in support of research addressing selected societal priority areas. Preliminary results of these efforts will be reported during Arctic Science Summit Week in Toyama, Japan in April of 2015.

Contacts:

Volker Rachold, IASC (volker.rachold@iasc.info)

Jan René Larsen, SAON (jan.rene.larsen@amap.no)

Peter Pulsifer, ADC Chair (peter.pulsifer@colorado.edu)

PHOTO: IASC SECRETARIAT
During a joint meeting of the IASC and SAON data management committees in Potsdam, Germany it was agreed that they will merge to form a single Arctic Data Committee (ADC).

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.

The current IASC Executive Committee members are:

Susan Barr, President

Vladimir I. Pavlenko, Vice-President

Huigen Yang, Vice President

Larry Hinzman, Vice-President

Naja Mikkelsen, Vice-President

Volker Rachold, IASC Executive Secretary

At ASSW 2014, Susan Barr (Norway) was elected the new IASC President. She took over the presidency from David Hik (Canada), following the end of his four-year term. Susan Barr has been involved in polar matters since 1979, within the fields of cultural heritage management and polar history. She was the first full-time cultural heritage officer for the Norwegian Arctic, followed by sixteen years at the Norwegian Polar Institute. Since 1998, she has been the senior advisor on polar heritage at the Norwegian Directorate for Cultural Heritage. She was the Founding President of the International Council on Monuments and Sites' Polar Heritage Committee and was IASC Vice-President for four years before being elected President. She sits on the editorial board of several polar journals and is a board member of the Fram Museum in Oslo and the Norwegian Polar Club. She has considerable polar field experience and has authored books and articles concerning polar history and cultural heritage.

David Hik will continue to work with the Executive Committee in his function as Chair of the 3rd International Conference on Arctic Research Planning (ICARP III), Vice-Chair of Sustaining Arctic Observing Networks (SAON) and Co-Chair of the International Polar Partnership Initiative (IPPI).

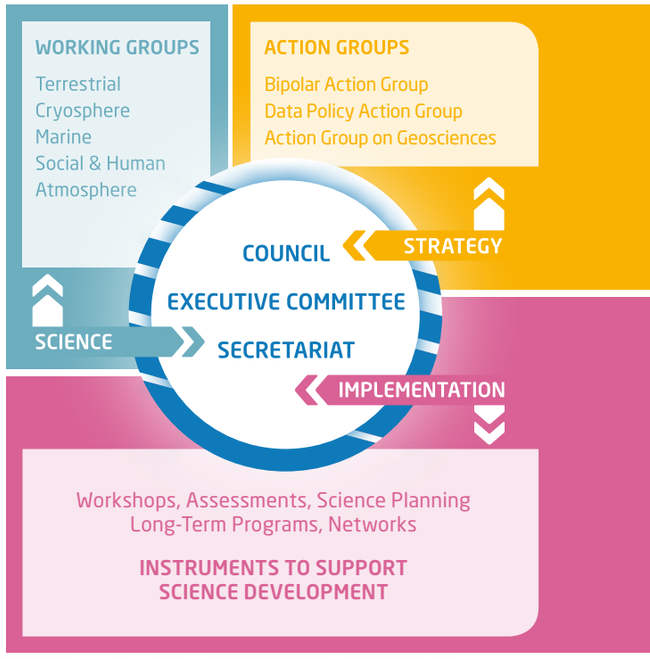

FIGURE:
Diagram representing key elements of the IASC organizational structure.

The IASC Council re-elected Vice-President Naja Mikkelsen from the Geological Survey of Denmark and Greenland for another four years. Vladimir I. Pavlenko from the Russian Academy of Sciences, and Larry Hinzman from the International Arctic Research Center in Fairbanks AK were elected as new Vice-Presidents. The Executive Committee is complemented by the fourth Vice-President Huigen Yang from the Polar Research Institute of China, and the Executive Secretary Volker Rachold.

PHOTO: IASC SECRETARIAT
IASC Executive Committee, from left to right: Larry Hinzman, Susan Barr, Vladimir I. Pavlenko, Naja Mikkelsen and Volker Rachold. (not on photo: Vice-President Huigen Yang.)

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);
- Publishing the IASC Bulletin and IASC material as required;
- Providing support for the IASC Working Groups;
- Maintaining the IASC website, preparing the IASC newsletter Progress, 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 considering the support for the growing number of activities undertaken by the IASC Working Groups and early career development. The following colleagues have joined the IASC Secretariat:

Yoo Kyung Lee, IASC Officer, hosted by the Korea Polar Research Institute (KOPRI)

Yoo Kyung has been supporting the IASC Cryosphere, Atmosphere and Terrestrial Working Groups since January 2013 and she will continue as an IASC Officer for the Atmosphere and Terrestrial WGs until the end of 2015.

Contact: yoo.kyung.lee@iasc.info

Tetsuo Sueyoshi, IASC Officer, hosted by the Japanese National Institute of Polar Research (NIPR)

Tetsuo recently began supporting the Cryosphere WG and has been appointed for two years. After finishing a PhD on permafrost modeling, Tetsuo joined glaciology research groups in Zurich and Hokkaido and worked on climate modeling at the University of Tokyo. Last April, he started in his current position at the Japanese National Institute of Polar Research.

Contact: sueyoshi.tetsuo@nipr.ac.jp

Susan File, IASC Officer, hosted by the Canadian Polar Commission (CPC)

Susan has been supporting the Social and Human WG since summer 2014 and has been appointed for two years. Susan is a Research Analyst at the Canadian Polar Commission. Most recently, she was a lead researcher for the Commission's recent Report on the State of Northern Knowledge in Canada, which highlights research gains since the beginning of International Polar Year in 2007 and identifies remaining knowledge gaps most critical to Northerners and the Canadian North. She has a background in public policy with a Master's degree from Queen's University.

Contact: susan.file@polarcom.gc.ca

Maja Lisowska joined the IASC Secretariat in January 2015 and coordinates the IASC Fellowship Program and other mechanisms to support Early Career Scientists. Maja is affiliated with the Polish Centre for Polar Research and the Polish Polar Consortium. She is a botanist and has worked as a research assistant in the Institute of Botany at Jagiellonian University for the past three years. Recently, she has filled a new position at the Secretariat of the Polish Polar Consortium. Maja has been a member of the Association of Polar Early Career Scientists (APECS) since 2009 and she has been involved in the APECS Council since 2011. She also led the secretariat for Arctic Science Summit Week (ASSW) in 2013.

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PHOTO: WITEK KASZKIN [Polish Polar Station]
The Aurora Borealis stretches out above the Polar Research Station in Hornsund, Svalbard.

2. IASC Working Groups

» 2 IASC Working Groups

Encouraging and supporting science-led international 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: GHISLAINE MEICLER
The Icelandic Kerlingarfjöll, which translates as mountains of the witch, cover an area of almost 150 km².

Atmosphere Working Group (AWG)

Membership

Jim Overland - USA, Chair | **Hiroshi L. Tanaka** - Japan, Vice Chair | **Michael Tjernström** - Sweden, Vice Chair
Kathy Law - France, Vice Chair

Harald Rieder - Austria | **Leopold Haimberger** - Austria | **Claude Labine** - Canada | **Bian Lingen** - China
Kamil Láska - Czech Republic | **Henrik Skov** - Denmark | **Eila Lehmus** - Finland | **Timo Vihma** - Finland
Klaus Dethloff - Germany | **Günther Heinemann** - Germany | **Gudrun Nina Petersen** - Iceland
Halldór Björnsson - Iceland | **Nuncio Murukesh** - India | **Suresh Babu** - India | **Vito Vitale** - Italy
Kaoru Sato - Japan | **Seong-Joong Kim** - Korea | **Young Jun Yoon** - Korea | **Peter van Velthoven** - Netherlands
Kjetil Tørseth - Norway | **Thomas Spengler** - Norway | **Rajmund Przybylak** - Poland
Tadeusz Niedźwiedź - Poland | **Angel Frutos Baraja** - Spain | **John Cassano** - USA

AWG Secretariat: **Yoo Kyung Lee** - Korea

Scope

- Polar climate predictability
- Long-term, international sea ice observatory
- Historical data retrieval and reanalysis
- Atmospheric chemistry

PHOTO: IASC SECRETARIAT
Group photo of the Atmosphere WG at ASSW 2014 in Helsinki, Finland.

Recent Activities

Linkage between Arctic Climate Change and Mid-Latitude Weather Extremes

When: 3-5 September 2014
Where: Seattle (USA)

Partners: IASC Marine, Cryosphere and Terrestrial WGs, Climate and Cryosphere (CliC), Association of Polar Early Career Scientists (APECS)

Arctic/mid-latitude weather linkages will be a major topic of research through the next decade and beyond. Rapid Arctic warming continues to emerge, along with improved understanding of its effects on large-scale atmospheric circulation. Together with other known large-scale atmospheric forcings, such as sea-surface temperature variability in the tropical Pacific, these changes may provide valuable information for the improvement of seasonal forecasts of hemispheric weather patterns. Discerning causality and attribution of Arctic forcing from natural variability in mid-latitude flow is, however, difficult. The data record is too short to provide rigorous evidence of impacts. Studies based on correlation analysis, physical reasoning, and/or model simulations have yielded contrasting results, fostering major controversy and skepticism.

The AWG has assembled a team to compare and contrast regional mechanisms. After completing an initial draft for a paper on northern polar jet-stream dynamics including high-latitude blocking highs, large meridional meanders, and local teleconnections, the authors met at a writing workshop to critique each other's sections and coordinate the synthesis effort. Following an introduction to set the stage, the team of authors will address regional studies focusing on European teleconnections with sea ice conditions in the Barents and Kara Seas, links between sea ice conditions and the enhancement of the Siberian high and east Asian trough, the eastern North American response to Greenland blocking, and southern displacement of the North Atlantic jet stream. This will be followed by a summary of the team's contribution to answering the main linkage question.

Planning for MOSAiC – the Multidisciplinary Drifting Observatory for the Study of Arctic Climate

When: 2014/2015
Where: Various locations

Partners: IASC Cryosphere and Marine WGs, various partner organizations

Multi-year, detailed, and comprehensive measurements, extending from the atmosphere through the sea ice and into the ocean of the central Arctic Basin are needed to improve our understanding and modeling of the changing Arctic climate and weather, and enhance Arctic sea ice predictive capabilities. The Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MOSAiC) initiative aims to address this fundamental need through crosscutting, observational and modeling activities. The program is organized around the central science question: "What are the causes and consequences of an evolving and diminished Arctic sea ice cover?" Scientific emphasis is placed on processes that transfer heat, moisture, density, momentum, and nutrients through the Arctic climate system. To address the science objectives, the program will include an intensive observational component designed to provide a process-level understanding of interdependent atmosphere, sea ice, ocean, and biological processes that are leading to, and responding to, drastic changes in sea ice. Observations will be made from a manned, transpolar drifting observatory, wherein an ice-hardened ship will serve as a central hub for comprehensive, interdisciplinary observations over the period of 1 to 2 years. Information on spatial variability and heterogeneity in the system will be obtained using a coordinated network of distributed measurements from buoys, unmanned aerial systems, autonomous underwater vehicles, additional ships, aircraft, and satellites. A hierarchy of modeling activities will capitalize on these observations to study detailed climate processes, evaluate and improve model parameterizations, facilitate regional model intercomparisons, and better understand the impacts of Arctic processes on hemispheric circulation patterns. IASC is helping to facilitate and coordinate this international activity.

www.mosaicobservatory.org

Arctic Air Pollution

When: February 2015
Where: Toronto (Canada)

Arctic warming is leading to new local sources of Arctic pollution with poorly quantified local emissions. The Arctic Air Pollutions workshop reviewed the many results on this topic, building on past and ongoing activities to study the combined impacts of local and remote Arctic air pollutions and to improve chemical-aerosol models and impacts. The workshop was co-sponsored by the International Geosphere-Biosphere Programme (IGBP) core project on International Global Atmospheric Chemistry (IGAC).

Workshop on Dynamics of Atmosphere-Ice-Ocean Interactions in High Latitudes

When: 23-27 March 2015
Where: Bergen (Norway)

Building on results from The Observing System Research and Predictability Experiment (THORPEX), which is a World Weather Research Program (WWRP), and in an effort to contribute to the WWRP Polar Prediction Project, a workshop on the Dynamics of Atmosphere – Ice – Ocean Interactions in High Latitudes was held in March 2015. The main objective of the workshop, which was organized by the University of Bergen, was to bring together international scientists to explore the connections between their areas of expertise, encompassing operational forecasting, observational and theoretical research, climate dynamics, predictability and the impact of severe weather events in the Polar Regions. A specific focus of the workshop was on the processes occurring in the coupled atmosphere-ocean-ice system and state of the art modeling and understanding.

Arctic Climate Change and Mid-Latitude Weather Phenomena

When: 12-17 April 2015
Where: Vienna (Austria)

In recent years, the issue of possible linkages between mid-latitude winter weather and Arctic sea ice reduction has gained prominence. Following a very successful workshop on this issue, and to continue the focused scientific debate, the AWG organized and sponsored a session on this issue at the 2015 European Geosciences Union General Assembly.

Upcoming Activities

Travel Support for the 2nd International Conference on "Polar Climate and Environmental Change in the Last Millennium"

When: 24-26 August 2015
Where: Torun (Poland)

The AWG will provide travel support for conference participation from IASC member countries. The objectives and scope of the conference are to summarize the current state of climate and environmental changes in the Polar Regions, and to broaden knowledge about Arctic and Antarctic climate systems.

Lunar Photometry Workshop

When: 2015
Where: Valladolid (Spain)

Nighttime measurements of aerosol optical depth (AOD) are needed to fill gaps in climatology and to improve understanding of processes that impact the Arctic surface radiation budget through direct and indirect aerosol effects. Currently, with the availability of high-precision exo-atmospheric lunar irradiance (EAI), lunar photometry is an emerging technology that can fill in gaps regarding Arctic AOD climatology. A lunar photometer network is being established. A program has been established in Barrow, Alaska (US) and more recently in Ny-Ålesund, Svalbard (Norway), with others planned for winter 2014/15 in Eureka, Nunavut (Canada) and at the Alomar Observatory (Norway). The proposed workshop will bring the community together to further establish the network, develop calibration and data processing protocols and optimize the use of limited resources.

For more information regarding AWG activities, please visit:

http://www.iasc.info/index.php/home/groups/working-groups/atmosphere

PHOTO: LUCA BRACALI
Measuring chemical-physical parameters in the low troposphere on top of the Amundsen-Nobile Climate Change Tower on Svalbard. Built in 2009 by a team from the Italian National research Council (CNR), the tower has 18 floors and is 34 meters high.

PHOTO: TOMMY ROENNINGEN
An arctic tern settling down to mate, spotted approximately 1300 meters above sea level, up in the mountains in the middle of Norway in July, 2014.

Cryosphere Working Group (CWG)

Membership:

Martin Sharp - Canada, Chair | **Julian Dowdeswell** - UK, Vice Chair | **Walter Meier** - USA, Vice Chair
Jon Ove Hagen - Norway, Vice Chair

Annett Bartsch - Austria | **Wolfgang Schöner** - Austria | **Sun Bo** - China | **Jan Kavan** - Czech Republic
René Forsberg - Denmark | **Signe Bech Andersen** - Denmark | **Jari Haapala** - Finland | **Pentti Kujala** - Finland
Michel Fily - France | **Hugues Lantuit** - Germany | **Lars Kaleschke** - Germany | **Gudfinna Adalgeirsdottir** - Iceland
Thorsteinn Thorsteinsson - Iceland | **Arun Chaturvedi** - India | **Parmanand Sharma** - India
Hiroyuki Enomoto - Japan | **Shin Sugiyama** - Japan | **Hyun Cheol Kim** -Korea | **Soon Do Hur** - Korea
Elisabeth Isaksson - Norway | **Carleen Tijm-Reijmer** - Netherlands | **Jacek Jania** - Poland
Krzysztof Migala - Poland | **Francisco Navarro** - Spain | **Pedro Elosegui** - Spain | **Veijo Pohjola** - Sweden
Martin Lüthi - Switzerland | **Martin Schneebeli** - Switzerland | **Elizabeth Hunke** - USA

CWG Secretariat: **Tetsuo Sueyoshi** - Japan

Scope

- Sea ice boundary layer dynamics
- Permafrost
- Tidewater glacier dynamics

PHOTO: IASC SECRETARIAT
Group photo of the Cryosphere WG at ASSW 2014 in Helsinki, Finland.

Recent Activities

Intercomparison of Snow Grain Size Measurements Workshop

When: 9-14 March 2014
Where: Davos (Switzerland)

The workshop gathered 25 snow researchers with expertise in different methods to measure snow grain size. The goal of the workshop was to compare all currently used direct and indirect methods of measuring snow grain size, including modern as well as traditional methods. A further objective was to develop protocols to establish future international standards. In two field days and two days in the cold laboratories of the WSL Institute for Snow and Avalanche Research, hundreds of snow grain size measurement could be gathered. The first step to develop protocols to establish future international standards could be reached. An evaluation workshop followed in August 2014 in Reading (UK). The results will be made available to the public through upcoming publications.

International Workshop on Arctic Glacier and Ice-Stream Calving

When: 1-2 June 2014
Where: Grenoble (France)

The International Workshop on Calving was organized by Martin Sharp from the University of Alberta (Canada) and Jean Krug and Olivier Gagliardini from the Laboratoire de glaciology et géophysique de l'environnement (LGGE), University of Grenoble (France). During two days, 34 participants from 11 countries worked around the question of the calving of icebergs, from a modelling and observational perspective.

The main objective of the workshop for observers was to learn whether they are observing what it is that the modelers think needs to be observed, and if not, to determine what changes are needed. The main objective of the workshop for modellers was to learn whether they are simulating what is being observed and, if so, how successfully they are doing this. While there may not be an immediate answer, a numerical benchmarking experiment linked to both simple experiments and attempts to replicate observations could be a big step forward.

http://www-lgge.obs.ujf-grenoble.fr/calving2014/

Quantifying Albedo Feedbacks and Their Role in the Mass Balance of the Arctic Terrestrial Cryosphere

When: 21-23 September 2014
Where: Bristol (United Kingdom)
Partners: IASC Atmosphere WG

Changes in the mass balance of the terrestrial cryosphere are currently the major contributor to global sea level change. Prediction of future sea levels for the purposes of coastal defence planning, coastal zone land use management, and emergency response, therefore, demands an ability to predict the future evolution of the mass balance of the Arctic terrestrial cryosphere. Most energy balance-based mass balance models include some parameterization of the albedo of snow and ice, but these parameterizations are typically empirical rather than physical, and often neglect processes and feedbacks that are now thought to be important. Through this workshop, organizers and participants conducted a comprehensive assessment of current knowledge

of the atmospheric and terrestrial feedbacks that influence the spatio-temporal evolution of the albedo of terrestrial snow and ice, and how they appear to have contributed to recent changes in the mass balance of the Arctic terrestrial cryosphere. The final goal was to propose a research agenda to (a) determine how these feedbacks can be better represented in albedo models/parameterizations that are used to compute cryospheric mass balance; and, (b) attempt to quantify the importance of albedo-related feedbacks in changes of the terrestrial Arctic cryosphere. The workshop was attended by 23 participants from 11 countries, including 9 early career researchers. The national meteorological services of Canada, Finland, and Denmark and the Swiss Avalanche Research Centre and the Danish Geological Survey were represented at the workshop.

Upcoming Activities

Workshop at the 6th International Conference on Polar and Alpine Microbiology

When: 6 – 9 September 2015
Where: České Budějovice (Czech Republic)

The CWG will organize a workshop at the International Conference on Polar and Alpine Microbiology. This meeting is a continuation of the highly successful meetings previously held in Rovaniemi in 2004 (Finland), Innsbruck in 2006 (Austria), Banff in 2008 (Canada), Ljubljana in 2011 (Slovenia) and Big Sky in 2013 (USA). The conference will bring together the scientific community to discuss the latest developments in all aspects of cold-living microorganisms and their role in polar and alpine environments. The 2015 conference will provide an opportunity to share ideas and build research collaborations addressing the latest developments in microbiology in polar and alpine habitats.

Tidewater Glacier Initiative

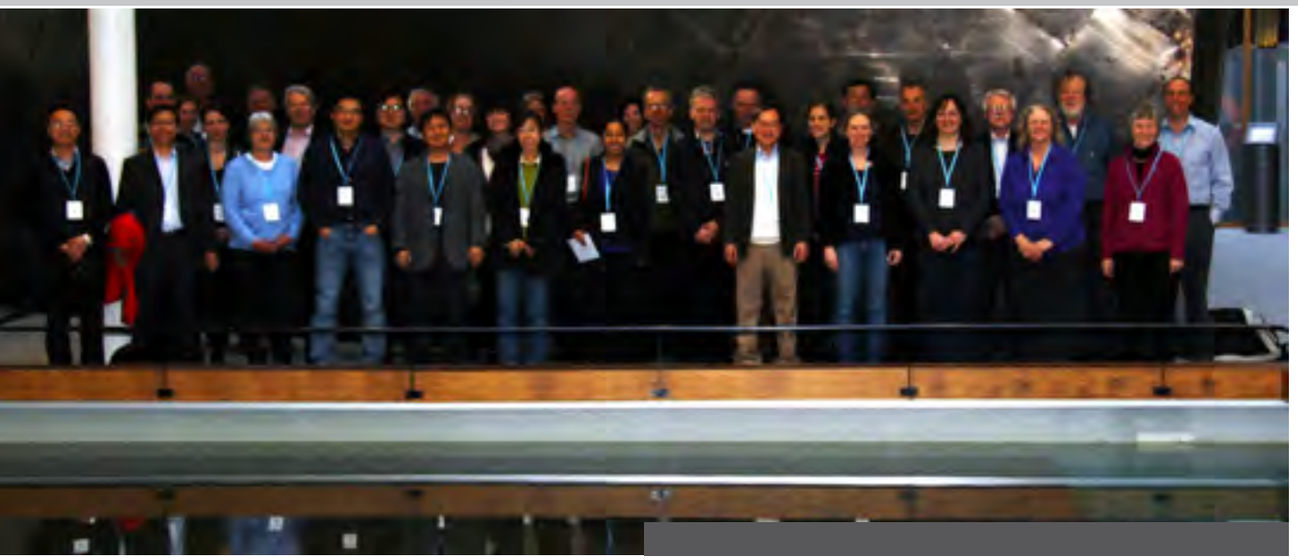
The CWG will continue the previously initiated study on tidewater glaciers to examine the difficulty of obtaining regional scale estimates of glacier mass balance for areas outside the ice sheets, especially during periods when there are gaps in satellite records or when available sensors change.

The CWG will also continue its support of the Ice Sheet Mass Balance and Sea Level (ISMASS) group that is now co-sponsored by IASC, the Scientific Committee on Antarctic Research (SCAR) and the Climate and Cryosphere (CliC) project.

For more information regarding CWG activities, please visit:

http://www.iasc.info/index.php/home/groups/working-groups/cryosphere

PHOTO: GÜNTHER HEINEMANN
Photograph taken during the March 2014 LEAST campaign of the University of Trier (Germany). During the campaign, researchers measured the building up of sea ice and its interaction with the atmosphere.



Marine Working Group (MWG)

Membership:

Bert Rudels - Finland, Chair | **Jinping Zhao** - China, Vice Chair | Open position - Vice Chair

Gerhard Herndl - Austria | **Humfrey Melling** - Canada | **Oleg Ditrich** - Czech Republic
Morten Holtegaard Nielsen - Denmark | **Naja Mikkelsen** - Denmark | **Kari Strand** - Finland
Heidi Kassens - Germany | **Michiel Rutgers van der Loeff** - Germany | **Gudrun Marteinsdottir** - Iceland
Jónsson Steingrimur - Iceland | **K.P. Krishnan** - India | **Stefano Aliani** - Italy | **Hajime Yamaguchi** - Japan
Koji Shimada - Japan | **Baek-Min Kim** - Korea | **Sung-Ho Kang** - Korea | **Hein J.W. de Baar** - The Netherlands
Marit Reigstad - Norway | **Randi Ingvaldsen** - Norway | **Jan Marcin Weslawski**- Poland
Waldemar Walczowski - Poland | **Francisco Gordillo** - Spain | **Miquel Canals** - Spain
Pauline Snoeijs Leijonmalm - Sweden | **Jeremy Wilkinson** - UK | **Sheldon Bacon** - UK | **Lee Cooper** - USA
Mary-Louise Timmermans - USA

AWG Secretariat: **Yoo Kyung Lee** - Korea

Scope

- Predicting and understanding rapid changes to the Arctic Ocean system
- Understanding biological and ecosystem processes in the Arctic and Subarctic seas
- Understanding sea ice structure dynamics and the Arctic system
- Understanding geochemical processes in the Arctic and Subarctic seas
- Enhancing and improving access to the palaeorecord of the Arctic Ocean through scientific Arctic drilling

PHOTO: IASC SECRETARIAT
Group photo of the Marine WG at ASSW 2014 in Helsinki, Finland.

Current Activities

Ecology of Circumpolar Arctic Gadids Workshop

When: 8-9 April 2014 | Where: Copenhagen (Denmark)

An international workshop on the ecology of circumpolar Arctic gadids (Boreogadus saida and Arctogadus spp.) was convened during the Ecosystem Studies of Sub-Arctic Seas (ESSAS) Annual Science Meeting on April 8-9 in Copenhagen, Denmark. The workshop was attended by over 60 scientists from ten countries. Contributions highlighted recent advances in our understanding of the ecology of these important species, which occupy a central role in Arctic marine food webs. Abstracts and selected presentations will be available on the ESSAS website. The goal of the workshop was to bring together scientists from around the circumpolar Arctic to focus exclusively on the ecology of Arctic gadids and, by all accounts, it was an unqualified success thanks to the thoughtful contributions of all presenters and other participants. The POLARISATION project (Research Council of Norway) and the MWG provided travel support. The workshop was hosted by the Natural History Museum of Denmark. A workshop summary will be published in the IMBER Newsletter. A special issue in Polar Biology (Guest Editors: Franz Mueter, Jasmine Nahrgang, John Nelson, and Jorgen Borge) is in preparation and expected to be published in late 2015. **www.imr.no/essas**

PHOTO: KRISTINA BÄR
Scientists of the Heincke expedition identify and sort the by catch.

Seasonal Ice Cover in the Arctic Ocean: Changes and Consequences

When: 20-21 October 2014
Where: Woods Hole (USA)

Partners: IASC Cryosphere and Atmosphere WGs

In connection with the ICARP III conference, the Marine Working Group arranged a workshop in Woods Hole on the theme: „Towards a seasonal ice free Arctic Ocean". Workshop organizers attempted to identify different areas that will be affected if the Arctic Ocean becomes ice free in summer. Each topic was introduced by a speaker that highlighted open and relevant questions, which were followed by discussions.

A preliminary list of themes included:

- Why do we have ice cover in the Arctic Ocean and what would a change in seasonal ice cover imply?
- Why do we have Polar (Arctic) amplification?
- What are the freshwater sources for Polar surface water and could their strengths be affected by a loss of the summer ice cover? If yes, how?
- Mixing and entrainment into the surface layer
- What drives the inflow of Atlantic water and could the advent of seasonal ice cover cause this forcing to change?
- Is upwelling at the continental slope more efficient to bring heat to the surface than instabilities of the boundary current, leading to injection of warm water into the basins?
- What changes could occur on the shelves?
- Will Arctic primary productivity increase, remain the same or decrease?
- Why are marginal ice zones more productive?
- What will be the effects on the higher trophic levels?
- What observational strategies are needed to answer these questions?
- What modeling approaches are necessary to answer these questions?

The workshop received additional support from the Woods Hole Oceanographic Institution, the Finnish Meteorological Institute and the North Atlantic Climate (NACLIM), which is financed by the European Commission through the 7th Framework Programme for Research NACLIM

2nd Distributed Biological Observatory (DBO) Data Workshop

When: 29-31 October 2014
Where: Seattle (USA)

The 2nd Distributed Biological Observatory (DBO) Data Workshop involved the evaluation of continued international data collections on up to five DBO lines seasonally, discussion of the current submission of data to the DBO data sharing sites, the development of publication plans, and coordination of future activities. The workshop provided a forum to present findings from the 2010-2014 DBO field program, discuss the results of data being posted to the Alaska Ocean Observing System (AOOS) workspace site for collaborative evaluation while data is prepared for national archives, and determine next steps for conveying the results of the DBO activities to the broader scientific community.

Network and Workshop on Greenland Ice Sheet / Ocean Interaction

When: 8-9 December 2014
Where: Bremerhaven (Germany)

Partners: IASC Cryosphere and Atmosphere WGs, Ice Sheet Mass Balance and Sea Level (ISMASS)

The mass loss from the Greenland ice sheet has increased rapidly over the last few decades. It accounts for about a quarter of the global sea level rise, and represents an increasing input of freshwater to the ocean, which has consequences for the overturning circulation. One candidate for the ice sheet mass loss is the dynamics of marine terminating outlet glaciers that have a direct link to warming ocean waters. Uniting national and disciplinary studies towards a better understanding of the interaction between the Greenland ice sheet and the ocean will, therefore, be one challenge of future Arctic research.

Investigating the interactions between ice sheet, ocean, sea ice, atmosphere and land represents a new research frontier that requires a highly integrated approach. In particular, the field work required for studying such a complex system in an extremely harsh environment (e.g. at the northern Greenland glaciers that (still) encounter sea ice at their outlet) presents a huge challenge to be mastered in the coming decades, demanding efficient combination of resources, expertise, infrastructure and logistics of different international institutions. Given limitations of infrastructure and funding, a very high degree of international coordination and cooperation is mandatory.

The first task was to establish a network of experts in different fields to develop different hypotheses and evaluate how they can be tested. The network will build on the experience of the US Climate Variability and Predictability Program (CLIVAR) workshop called Greenland Ice Sheet-Ocean Interactions (GRISO). At the supported workshop, concepts and ideas were distilled into a detailed proposal for the ICARP III conference in 2015. Relevant field observations were identified, planned and, hopefully, carried out. The proposed concepts will be further developed into numerical models, which better bring out the interaction between different ocean, glacier/ice sheet and atmosphere processes in the Arctic, and the effects of different drivers. With these models, predictions of glacier behavior can be improved.

PHOTO: PAULINE SNOEIJS LEIJONMALM
Very little is known of the microbial communities that dominate the Arctic sea ice habitat. During the 2012 Arctic expedition with icebreaker Oden, scientists studied the diversity of these microbial communities and their roles in global biogeochemical cycles.

Upcoming Activities:

MWG Workshop "Towards an ice free Arctic Ocean?" at the ICARP III Conference

When: 23-30 April 2015
Where: Toyama (Japan)

Five keynote speakers will participate in the ICARP III conference in Toyama by providing a talk on the gradually diminishing ice cover of the Arctic Ocean over the recent decades.

Big Black Box

When: 2015
Where: Bremerhaven (Germany)

Arctic marine environments may experience darkness for up to ten months a year depending on sea ice cover and snow depth. The extended period of darkness, known as the polar night, may limit organism survival and reproductive success because of the associated food limitation. A long overwintering period and a brief growing season are likely the main barriers for "temperate/lower latitude" species to sustain populations in the Arctic because they lack the life history adaptations of high-Arctic species that allow them to cope with such extreme conditions. However, our knowledge on winter ecology is extremely poor in comparison to ecological processes during the growing season. Gathering additional information on polar night ecology and processes is crucial, especially in light of expected impacts of climate change on Arctic marine ecosystems. This three-day workshop will convene an international group of experts to develop a white paper on the existing winter ecology knowledge of Arctic marine organisms, to identify the most critical knowledge gaps, and to prepare a proposal for a new international initiative/program focusing on polar night ecology and winter processes.

For more information regarding MWG activities, please visit:

http://www.iasc.info/home/groups/working-groups/marineaosb/activities

PHOTO: ROSS MACKENZIE
A polar bear cub lost its balance walking along the spine of a whale's carcass in a sheltered bay on the northwest corner of Svalbard.

Social and Human WG (SHWG)

Membership:

Peter Schweitzer - Austria, Chair | **Peter Sköld** - Sweden, Vice Chair | **Gail Fondahl** - Canada, Vice Chair

Gertrude Eilmsteiner-Saxinger - Austria | **Long Wei** - China | **Ludek Broz**- Czech Republic
Lone Dirckinck-Holmfeld - Denmark | **Robert Thomsen** - Denmark | **Arja Rautio** - Finland
Lassi Heininen - Finland | **Béatrice Collignon** - France | **Sylvie Blangy** - France| **Alexander Proelss** - Germany
Joachim O. Habeck - Germany | **Gisli Palsson** - Iceland | **Joan Nymand Larsen** - Iceland
Dhurjati Majumdar - India | **Hiroki Takakura** - Japan | **Dongmin Jin** - Korea
Louwrens Hacquebord - Netherlands | **Gunhild Hoogensen Gjorv** - Norway | **Halvor Dannevig** - Norway
Michal Luszczuk - Poland | **Ryszard Czarny** - Poland | **Elena Conde** - Spain | **Philippe Geslin** - Switzerland
Michael Bravo - UK | **Sven D. Haakanson** - USA | **Andrey Petrov** - USA

SHWG Secretariat: **Susan File** - Canada

Scope

- The Arctic in a global context
- Natural resources, use, exploitation and development: past, present, future
- Histories and methodologies of Arctic sciences and arts
- Human health, wellbeing and ecosystem change
- Perceptions and representations of Arctic science
- Arctic residents and change: dynamics of mitigation and sustainability
- Security, governance and law
- Collaborative community research on climate change
- Competing forms of resource use in a changing environment

PHOTO: IASC SECRETARIAT
Group photo of the Social and Human WG at ASSW 2014 in Helsinki, Finland.

Current Activities

Permafrost Dynamics and Indigenous Land Use

When: 6-7 April 2014
Where: Helsinki (Finland)

This workshop was convened during Arctic Science Summit Week on April 6th to 7th, 2014 in Helsinki, Finland. Focusing on the Central Yakutian Lowlands, it brought together scholars from various disciplines to explore how local communities have made use and are making use of permafrost dynamics for subsistence activities; assess how climate change is likely to change permafrost dynamics and indigenous land use in this part of the Subarctic; and explore to what extent humans have appropriated and actively shaped the thermokarst landscapes of Northeast Siberia.

ICARP III Town Hall Meeting at the International Congress of Arctic Social Sciences (ICASS) VIII

When: 23 May 2014
Where: Prince George (Canada)

An ICARP III Town Hall was held at the Eighth International Congress of Arctic Social Sciences (ICASS VIII) on May 23rd, 2014. The purpose of the event was to provide an opportunity to solicit input from social scientists, humanities scholars and other participants at the Congress to inform the Third International Conference on Arctic Research Planning (ICARP III). ICASS, convened triennially, is the premier gathering of Arctic and Subarctic social sciences and humanities scholars, attracting academics from a wide range of disciplines, as well as a significant number of indigenous northerners, government and NGO representatives and other participants. ICASS VIII attracted 468 delegates from 26 countries and at least 15 northern indigenous groups. Over 350 delegates attended the ICARP III Town Hall, which was hosted by the IASC SHWG. The event was live-streamed, to ensure its availability to members of the International Arctic Social Sciences Association (IASSA) who were not able to attend ICASS VIII. After a short welcome by Gail Fondahl (IASSA President and IASC SHWG Co-Vice Chair), ICARP III Chair David Hik presented an overview of the aims and goals of ICARP III. Peter Schweitzer, Chair of the IASC SHWG, described the Working Group's ICARP III initiatives, both recent and planned. Chris Southcott provided a short summary of the University of the Arctic Community Consultation on Arctic Research Planning (UCCARP) initiative on behalf of UArctic, and Gerlis Fugmann, Executive Director of the Association of Polar Early Career Scientists (APECS), described APECS involvement in ICARP III. Peter Sköld (IASC SHWG Co-Vice Chair) then moderated a 45-minute discussion period. Participants highlighted a number of areas that they felt were important and/or potentially lacking from the outlined activities, addressing both particular focus areas of importance to social sciences and humanities, and the outlined process for ICARP III. The input from this Town Hall, along with the input from similar events over the next months, will inform a White Paper for ICARP III, which will take place during Arctic Science Summit Week (ASSW) 2015.

Social & Human Working Group Meeting at the International Congress of Arctic Social Sciences (ICASS) VIII

When: 24 May 2014
Where: Prince George (Canada)

A meeting was held to inform Arctic social science and humanities scholars who attended the Eighth International Congress of Arctic Social Sciences

(ICASS VIII) about the activities of the Working Group and some of its future plans, including the review of its scientific foci in 2015, with discussions taking place during ASSW 2015. Those who attended the meeting were given an opportunity to provide their comments and ask questions.

Culture and Arctic Climate Change – Integration of Long-Term Perspectives from Archeology and the Environmental Sciences

When: May 2014 and December 2014
Where: New Haven and San Francisco (USA)

Partners: IASC Marine, Atmosphere, Terrestrial, Cryosphere WGs, Polar Archeology Network, Association of Polar Early Career Scientists

The overarching goal of this initiative is to launch a new program of research that examines the long-term role of humans in the pan-Arctic environmental system. Much current research and debate is focused on understanding contemporary climate change and its impacts on modern society. Other important efforts are directed at studying interactions between climate, oceans, the cryosphere and biosphere, with a focus on understanding present and future, but also the past states of the dynamic Arctic system.

The development of an explicitly long-term perspective into human adaptations to the dynamic Arctic environment is a remaining gap in current Arctic research activities. The goal of these activities is to convert this gap into a strategic research opportunity. These activities have been designed to ensure that new work on the topic starts promptly and effectively by: (a) holding a focus workshop in May 2014; (b) running a major conference session in December 2014; (c) producing a new interdisciplinary synthesis focusing on culture and long-term climate change in the Arctic (journal special issue); and, (d) preparing a strategic general report that feeds directly into the planning goals of ICARP III.

Town Hall Meeting at the 54th Congress of the European Regional Science Association

When: 29 August 2014
Where: St. Petersburg, Russia

As part of the ICARP III process, the SHWG hosted a Town Hall meeting to offer an opportunity to solicit input from social scientists and humanities scholars. It encouraged all researchers interested in the Arctic and Subarctic to attend and find out more about ICARP III and provide ideas and views on research/science priorities for the next decade.

The meeting notes were added to that which was learned at the Town Hall meeting at ICASS VIII. Both records will inform the SHWG ICARP III process. The working languages of the Town Hall meeting were English and Russian.

Support for the Early Career Scholars (ECS) Workshop on Arctic Sustainability

When: 18-20 September 2014
Where: Anchorage (USA)

An Early Career Scientists Workshop on Arctic Sustainability was held in Anchorage (USA). Workshop participants were given the opportunity to present their research at the Arctic Sustainability: Meanings and Means Conference and interact with leading scientists and emerging researchers involved in the study of Arctic social-ecological systems and sustainability. Following this Conference, early career scientists were given the opportunity to discuss their research papers with appointed mentors at the workshop and learn more about career paths.

Participation in the Arctic Council's 'Gender Equality Issues in the Arctic' Conference

When: 30-31 October 2014
Where: Akureyri (Iceland)

The SHWG supported the participation of a SHWG member in the conference on "Gender Equality Issues in the Arctic", which was organized by the Sustainable Development Working Group (SDWG) of the Arctic Council. The conference was part of a SDWG project, "Gender Equality in the Arctic: Current Realities and Future Challenges". The project's purpose is to "promote extensive, policy-relevant dialogue on gender equality issues in the Arctic in the context of current realities in terms of economic and social development, as well as current and future challenges, inter alia relating to climatic and environmental changes." The conference brought together government representatives, policy makers, academics and a wide range of other stakeholders. It focused on the diverse and differentiated situations of men and women throughout the Circumpolar North and how to meet associated societal challenges.

Support of the Thematic Network on Geopolitics and Security's Panel on Security of the Arctic at the 2nd Arctic Circle

When: 31 October – 2 November 2014
Where: Reykjavik (Iceland)

The Thematic Network on Geopolitics and Security - a joint network by the University of the Arctic and the Northern Research Forum - organized an international academic panel on "Security of the Arctic", in cooperation with the Northern Research Forum, in Reykjavik, Iceland from October 31 – November 2, 2014 as a part of the 2nd Arctic Circle. The panel, which was led and coordinated by Prof. Lassi Heininen from University of Lapland, consisted of one plenary and four breakout sessions.

Workshop on Extractive Industries & Indigenous Peoples in the Arctic: Past, Present & Future

When: 26-27 November 2014
Where: Umeå (Sweden)

Extractive industries have had an extensive impact on indigenous communities in the Arctic. While resource exploitation and megaprojects may offer a critical source of income for advancing economic development and innovation, they also raise critical questions on best practices forward to achieving sustainability, reduce risks, and to further local human and not just economic development and quality of life, especially for the indigenous peoples of the north. This workshop explored extractive industries and the impacts on indigenous peoples in the past, present, and future with presentations by Indigenous representatives, students, and scholars from ten countries. This included aspects of governance, economy, legal systems, demography, health, and environment, as well as indigenous comparisons to Australia.

Support for the preparation of the 2nd Arctic Human Development Report (AHDR II)

When: 2014

The SHWG is supporting the Arctic Human Development Report (AHDR) II by providing financial assistance for SHWG members to participate in the meetings of the writing teams. IASC has also assumed responsibility for the review process of the AHDR II, which is coordinated by the IASC Executive Secretary.

http://www.svs.is/en/ahdr-ii-en

Upcoming Activities:

Workshop on Improved Health Monitoring in the Arctic: The Question of Missing Data

When: 8-12 June 2015
Where: Oulu (Finland)

It is important to have accurate information related to health development in the Arctic. Generally, official registers present information about the inhabitants of the Arctic regions that is of equal quality compared to the non-Arctic parts of a respective country. There are, however, two major deficiencies; parameters that are compatible between the Arctic countries and data that has the capacity to illustrate the indigenous peoples separately. A panel on missing health data will be organized during the upcoming 16th International Congress on Circumpolar Health from June 8 – 12, 2015 in Oulu (Finland).

Support for the Special Session "Resources, Quality of Life and Sustainable Development in the Arctic" at the International Geographical Union Regional Conference

When: 17 – 22 August 2015
Where: Moscow (Russia)

The session will be a part of the International Geographical Union (IGU) Conference in Moscow. IGU is a worldwide association of geographers that meets once a year in a designated location. This will be the first time since 1976 that IGU meets in Russia. As a result, this is a unique opportunity to engage Russian scholars and ensure considerable participation and interest from Russian scientists. Five key themes of the IGU 2015 meeting include: (1) Urban environment; (2) Polar studies; (3) Climate change; (4) Global conflicts; and, (5) Regional sustainability. The proposed session will directly respond to three of these themes (2, 3 and 5). The papers invited to the session will focus on the connection between the use of natural resources and human well-being in the Arctic in the context of sustainable development in different regional and institutional contexts. Effort will be made to ensure methodological and regional diversity, as well as achieve a combination of conceptual papers and case studies that represent community-based and community-relevant approaches.

For more information regarding SHWG activities, please visit:

http://www.iasc.info/index.php/home/groups/working-groups/socialahuman

PHOTO: WITEK KASZKIN [Polish Polar Station]
The IASC Social and Human WG supported a workshop on extractive industries and indigenous peoples in the Arctic.

Terrestrial Working Group (TWG)

Membership:

Ingibjörg Svala Jónsdóttir - Iceland, Chair | **Warwick F. Vincent** - Canada, Vice Chair
Torben Christensen - Denmark, Vice Chair

Andreas Richter - Austria | **Birgit Sattler** - Austria | **Josef Elster**- Czech Republic | **Wei Luo** - China
Mads Forchhammer - Denmark | **Antero Järvinen** - Finland | **Otso Suominen** - Finland
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 | **Jelte Rozema** - The Netherlands | **Inger Greve Alsos** - Norway
Steve Coulson - Norway | **Piotr Glowacki** - Poland | **Wieslaw Ziaja** - Poland | **Benjamin Vinegla Pérez** - Spain
Daniel Sanchez-Mata - Spain | **Victoria Pease** - Sweden | **Phil Wookey** - UK | **Donald A. (Skip) Walker** - USA
Vladimir Romanovsky - USA

Scope

- Improving knowledge at multiple spatial scales of the current state of Arctic terrestrial geo-systems 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-system 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 SECRETARIAT
Group photo of the Terrestrial WG at ASSW 2014 in Helsinki, Finland.

Current Activities

Global Change, Arctic Hydrology and Earth System Processes (ARCHES) Workshop

When: 24-25 February 2014
Where: Edinburgh (Scotland)

The role of changing hydrology and active layer moisture regimes for ecosystems, biogeochemical and biophysical processes in the Arctic terrestrial realm (including surface waters) has been overlooked relative to the much clearer emphasis on climate warming as a key driver of change. This likely partly reflects (i) the weaker consensus regarding the magnitude and direction of precipitation changes predicted by General Circulation Models (GCMs) compared with the strong consensus regarding polar warming; and, (ii) the sheer complexity of the linkages, at hill slope to pan-Arctic scale, between soil and sediment moisture regimes, macroclimate, permafrost status, biodiversity and biological processes, both above- and below-ground. The lack of understanding of these processes, their spatial expression and temporal development, is limiting the ability of the science community to model and predict the consequences of global change for the Arctic terrestrial realm, including for arctic residents. Furthermore, without a more robust consideration of hydrology, the potential biogeochemical (i.e., net fluxes of radiative forcing trace gases) and biophysical (i.e., albedo and surface roughness) feedbacks between the Arctic and the broader earth system cannot be quantified and modelled. In short, an overemphasis on Arctic warming, at the expense of explicitly considering the role of hydrology, will not deliver the required step-change in Arctic system science.

Workshop organizers therefore proposed a scoping initiative to (a) draft a position/review paper for possible publication in a high-impact international journal on the consequences of changing hydrology in the Arctic terrestrial realm for biodiversity, biogeochemical and biophysical processes and their coupling with the broader earth system; and, (b) strengthen the links between key actors/ organizations in the research community.

This scoping exercise brought together a small group (6-8) of experts and 2-3 early career scientists in a two-stage workshop at Heriot-Watt University to review the current state of knowledge on Arctic hydrological change, identify research gaps, and conduct a horizon scan based on best available predictions of change in the Arctic terrestrial realm.

Thermokarst Aquatic Ecosystem (THAW) Workshop

When: March 2014
Where: Quebec City (Canada)

The TWG co-sponsored the THAW (THermokarst Aquatic ecosystem) Workshop, which was held in Quebec City from 11 - 14 March 2014. The workshop, which included a study on "freshwater ecosystems in changing permafrost landscapes," was closely linked to the Arctic Freshwater Synthesis and the Global Change, Arctic Hydrology and Earth System Processes workshop.

Herbivory in Changing Northern and Alpine Environments Workshop

When: 9 April 2014
Where: Helsinki (Finland)

The aim of this workshop was to bring together researchers to investigate the role of herbivory in

changing northern and alpine ecosystems across large spatial scales, with the goal of laying the foundation for a plant-herbivore interaction-focused research network. Thirty-two researchers from different circumpolar Arctic regions attended this meeting. Overall, there was broad agreement on the need to consolidate such a research network that, in addition to serving as a platform for communication and exchange among researchers, should be focused on developing common research interests. Significant time was devoted during the workshop to work to define a common conceptual model, identify knowledge gaps of the field and formulate an overarching research question that a collaborative effort may be able to answer. In order to address this question, a common, standardized protocol is needed that is based on a well-replicated, relatively simple experimental design. The first steps towards this protocol were defined during the workshop. Other points were also discussed at the meeting, including the possibility of writing a multi-authored opinion paper on the workshop outcomes, further developing a manuscript that was presented at the meeting, and preparing a joint funding application.

Arctic Snow Cover Changes and their Consequences - Organized in cooperation with INTERACT

When: 16-17 October 2014
Where: Copenhagen (Denmark)

Partners: IASC Marine, Atmosphere, Social and Human and Cryosphere WGs, Association of Polar Early Career Scientists

This workshop, which evolved from an IASC cross-cutting activity to plan input on snow to the ICARP III meeting was motivated at a meeting of the IASC Terrestrial Working Group meeting in Krakow in 2013. The motivation was largely based on the fact that snow is a critically important and rapidly changing characteristic of the Arctic, but has too often been overlooked in major environmental assessments.

The main aims of the workshop were to:

- Bring together researchers from each IASC Working Group and others who represent a range of disciplines related to snow per se and the multiple consequences of changes in Arctic snow cover;
- Assess current knowledge and identify gaps and challenges in existing data and models including those relevant to facilitating adaptation;
- Develop a research agenda that represents each discipline but also extends across disciplines using an Arctic system approach while addressing adaptation needs at local scales;
- Identify mechanisms to implement the research agenda;
- Identify mechanisms to implement improved, standardized monitoring of snow conditions and their effects;
- Construct a road map that combines the agendas and implementation plans for research and monitoring; and,
- Present the road map for snow studies at ICARP III.

Herbivory Network Workshop

When: 2 – 4 December 2014
Where: Trondheim (Norway)

To advance the development of a general, standardized protocol for measuring herbivory in tundra ecosystems in Arctic and alpine environments, a scientific session was chaired and a side meeting was organized during the Arctic Biodiversity Congress. The session included expert talks and a final round table discussion. Invited talks focused on main groups of herbivores in these systems (i.e., mammals, birds, insects), on ongoing monitoring efforts such as the one in Hudson Bay (http://www.cen.ulaval.ca/bylot/intro.htm) and on comprehensive monitoring programs proposed by the Circumpolar Biodiversity Monitoring Program http://www.caff.is/terrestrial/terrestrial-monitoring-plan.

Rapid Arctic Transitions due to Infrastructure and Climate Change (RATIC)

When: December 2014
Where: Ottawa (Canada)

Partners: IASC Cryosphere and Social and Human WGs

The consequences and prediction of land-use changes in the Arctic, including the extensive networks of infrastructure needed for exploration and development of mineral resources, are not adequately addressed in any of the IASC Working Groups, nor the Arctic scientific community as a whole. Recent studies indicate that combinations of climate change and industrial development have resulted in major changes to local ecosystems, including permafrost, hydrology, vegetation, wildlife, and livelihoods. The effects of resource development on broad regions are difficult to assess, but are more keenly felt by indigenous peoples of the Arctic than those of climate change, which has received the majority of scientific study to date. These consequences must first be quantified for the circumpolar Arctic. Methods must also be developed to predict future consequences so that governments, industry and local people can anticipate and adapt to the coming changes.

The workshop entitled "Rapid Arctic transitions due to infrastructure and climate change (RATIC)" addressed the combination of Arctic infrastructure-related and climate-related changes, their consequences for permafrost and social-ecological systems, and approaches for a sustainable future using adaptive scientific, engineering, educational and management approaches.

PHOTO: IÑIGO GARCIA ZARANDONA
Series of old aerial tramways, early May, Longyearbyen , Spitsbergen (Svalbard)

Upcoming Activities:

The IASC TWG is in the process of developing a proposal for a crosscutting IASC Action Group that would consist of members of the Social and Human, Cryosphere, and Terrestrial Working Groups that would address the synergistic consequences of a combination of rapid industrial expansion and climate change in the Arctic. Currently, the consequences and prediction of land-use changes in the Arctic, including the extensive networks of infrastructure needed for exploration and development of mineral resources, are not adequately addressed in any of the IASC Working Groups. Recent studies indicate that combinations of climate change and industrial development have resulted in major changes to local ecosystems, including permafrost, hydrology, vegetation, wildlife, and local people. The effects of resource development on broader regions are more difficult to assess, but are apparent and in many regions are more keenly felt by the indigenous people of the Arctic than those of climate change. The effects are both positive and negative with respect to biological resources and local communities. These consequences first of all need to be quantified at several scales for the circumpolar Arctic and then methods developed for predicting future consequences, so that policy makers, governments, industry and local people can develop adaptive-management approaches to adjust to and mitigate the coming changes. The initial activity would be a request to IASC to help support a Network Workshop entitled "Cumulative effects of infrastructure development and climate change in the Arctic." Maximum synergy for the workshop would be achieved by holding it in conjunction with another major meeting such as ICARP III.

For more information regarding TWG activities, please visit:

http://www.iasc.info/index.php/home/groups/working-groups/terrestrial

PHOTO: ALLAN BURAS
Dendro-ecological investigations on dwarf shrubs in Kobbefjorden, Greenland (close by Nuuk)

PHOTO: THIERRY BOULINIER
Black-legged kittiwakes (Rissa tridactyla) on their cliff nests on the island of Hornøya, Eastern Finnmark, Norway. Long-term monitoring of the populations of this widespread arctic seabird species tells us about how populations respond to environmental changes.

3. IASC Networks

» 3 IASC Networks

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. One way in which IASC fosters the development of thematic groups is by supporting and endorsing networks. IASC networks, which are international, address specific scientific issues on a circumarctic scale and strive to involve early career scientists. Networks may be established by IASC or may apply for affiliation with IASC. Once accepted as an IASC network, they may use the IASC logo.

Please see Annex 2 for more information about the Terms of Reference for IASC Networks.

More information can be found on the website for each network.

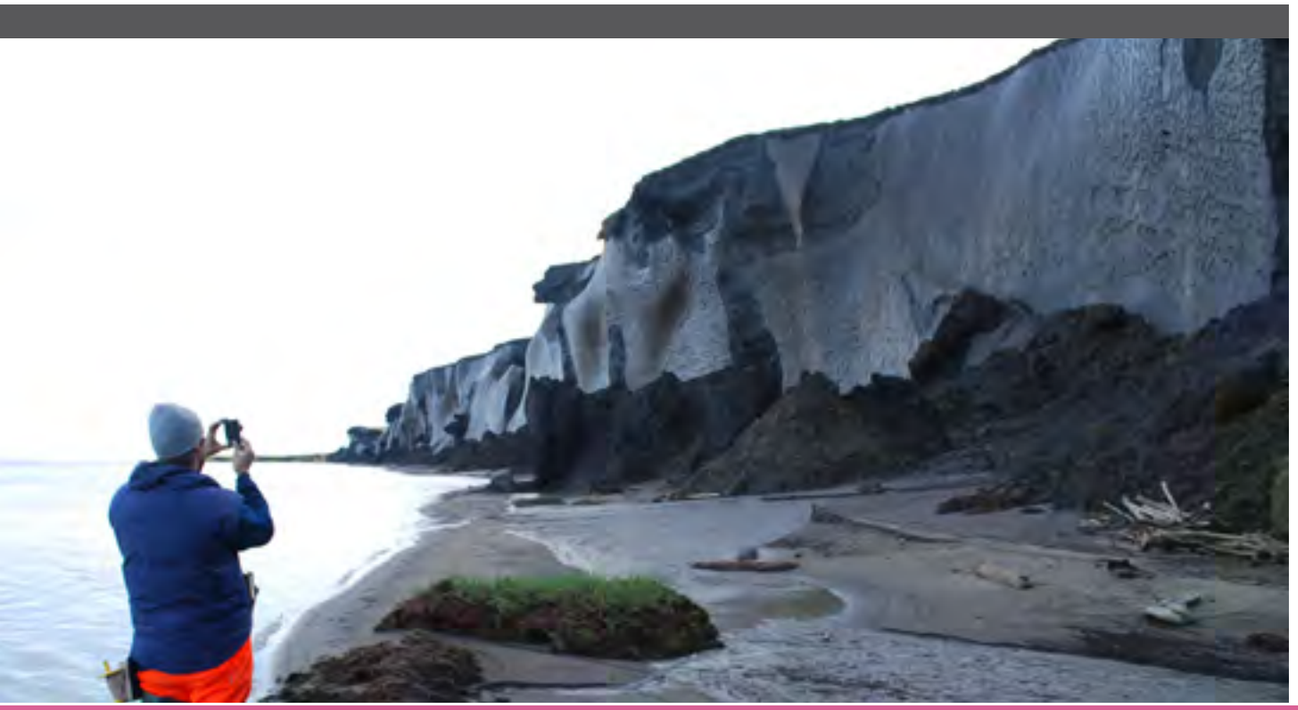


PHOTO: THOMAS OPEL
A Pleistocene ice complex cliff at Sobo-Sise Island in the Lena Delta of the Siberian Arctic.

Arctic Coastal Dynamics (ACD)

Arctic continental shelves comprise 30% of the area of the Arctic Ocean and contribute about 20% of the world's continental shelf area. This extensive circum-Arctic coastal margin, about 200,000 km long, is the interface through which land-shelf exchanges are mediated. Sediment input to the Arctic shelf resulting from erosion of ice-rich, permafrost-dominated coastlines may be equal to or greater than input from river discharge. Determining sediment sources and transport rates along high latitude coasts and inner shelves is critical for interpreting the geological history of the shelves and for predictions of future behavior of these coasts in response to climatic and sea level changes.

Though generally only a few kilometers wide (except in the vicinity of large deltas), the coastal zone of the Arctic Ocean is the site of dramatic changes in not only the land and ocean but also in the cryosphere and biosphere. The Arctic coastlines are highly variable, can be stable or extremely dynamic and are the site of most of the human activity that occurs at high latitudes. Extraction of natural resources occurs in many locations around the Arctic Ocean creating the need for port facilities and the potential for pollution. These pressures are only likely to increase with time

The Arctic Coastal Dynamics (ACD) program is a multi-disciplinary, multi-national forum to exchange ideas and information. The overall objective of ACD is to improve our understanding of circum-Arctic coastal dynamics as a function of environmental forcing, coastal geology and cryology and morphodynamic behavior.

An important challenge facing Arctic coastal research is creating and maintaining monitoring capabilities in order to detect changes in this sensitive region. A key recommendation of the State of the Arctic Coast (SAC) Report (Forbes, 2011) was the establishment of a circumpolar coastal observatory network, as an offshoot of ACD and its International Polar Year (IPY) activities.

Recommended steps include:

- creating an inventory of existing coastal stations, actors, and networks.
- developing common mapping tools for circumpolar data.
- improving communication about Arctic coastal issues.
- enlisting the critical support of government agencies for monitoring.
- involving coastal communities as important proponents and players in monitoring.

A modular approach to building a monitoring network could capitalize on support from national agencies, research funding bodies, academia, and communities.

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Arctic Climate System Network (ACSNet)

The ACSNet, established in June 2011, aims through the coordination and networking of existing or emerging fieldwork to implement an intensive cross-disciplinary study of the role of the polar seas in climate. In particular special reference is made to the Western Arctic as a site of demonstrable global importance and to the research questions identified as of key importance by the 2011 iAOOS plan of the IASC Marine Working Group.

The essential aim of ACSNet is to devise a common space-time framework for individual research projects arguing for the combining of disparate efforts to form an intensive, international and multidisciplinary research effort initially with its focus on the Greater Canada Basin and its marginal ice zone, later on a pan-Arctic scale. If this is effective, the combined effect could approach the intensity of the IPY itself in these sea areas. It will be of mutual benefit by adding a worthwhile depth and context to the original programs while generating the intensity and variety of coverage needed to understand the complex workings of the ocean-cryosphere-atmosphere system and its role in climate.

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http://iasc.info/index.php/home/networks/arctic-climate-system-network-acsnet

Arctic Freshwater System Synthesis (AFS) Network

There is increasing scientific and societal recognition that changes to Arctic freshwater systems have produced, and could produce even greater changes to the Arctic environment, society and economy. A healthy environment and a balanced socioeconomic structure are of special importance to northern residents. Changes in these systems affect not only the Arctic but also other areas and these impacts will have consequences at the global level. To address such concerns, the Arctic Freshwater Synthesis will produce a circumarctic review of the sources, fluxes, storage and effects of changes in freshwater resources to be used by the scientific community and develop policy recommendations for local, regional and national governments.

The AFS is structured around five major components: atmosphere, ocean, terrestrial hydrology, terrestrial ecology and resources, with modeling as a sixth crosscutting component. The AFS is currently being developed with scientific and financial support from the World Climate Research Program's Climate and Cryosphere Project (CliC), IASC, the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP), the Norwegian Ministry of Foreign Affairs and the Norwegian Ministry of Climate and Environment.

Publication plans for the AFS include a number of reports tailored to the scientific foci of the individual participating organizations, and to a suite of scientific journal review papers. A second meeting of component lead authors was held in Stockholm on May 4-6 2014, at which breakout meetings were held between all co-leads to ensure component integration and a common synthesis approach. Complete writing teams have now been formed, and smaller component meetings have taken place during the fall. Final versions of all papers are to be ready and submitted by early 2015.

In the remaining process of finalizing papers, the lead authors of the components will work together and iteratively provide feedback to each other's manuscripts. Synergies and linkages will be revisited throughout the manuscripts and cross-references between components will be highlighted. A final meeting of co-leads to work on integration took place in Tromsö, Norway, on November 24-25. Results from some components of the synthesis, as well as output from an overarching paper combining insights from across components, have been submitted as abstracts to a session of the ASSW and ICARP III conference in Toyama, Japan in April 2015.

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AFS website:
http://www.climate-cryosphere.org/activities/targeted/afs

PHOTO: KAMIL JAGODZINSKI
The Arctic Freshwater Synthesis produces a circumarctic review of the sources, fluxes, storage and effects of changes in freshwater resources to be used by the scientific community and develop policy recommendations for local, regional and national governments.

Arctic in Rapid Transition (ART) Network

ART is a pan-Arctic scientific network developed and steered by early career scientists, which aims to study the impact of environmental changes on the Arctic marine ecosystem. ART has a focus on bridging timescales by incorporating paleo-studies with modern observations and modeling, science disciplines and geographic regions to better understand past and present responses of Arctic marine ecosystems to sea ice transitions and climate change and to improve our predictive capability of future scenarios. Initially endorsed by the IASC marine working group, ART transitioned to a new status by becoming an official IASC Network in 2013.

The ART cruise proposal TRANSSIZ (Transitions in the Arctic Seasonal Sea Ice Zone) is included in the cruise plan of the German research vessel Polarstern. It will take place in spring 2015, starting in Bremerhaven on May 19 and end in Longyearbyen on June 28, 2015. During the TRANSSIZ expedition, multidisciplinary process-based studies on productivity, ecosystem dynamics and biogeochemical cycling along two shelf-to-basins transects will be carried out. During the TRANSSIZ preparation workshop in Bremerhaven in April 2014, specific research questions for the cruise were discussed and logistics planned. The specific focus of the TRANSSIZ expedition includes investigations of cryo-pelagic-benthic coupling, development and validation of sea ice and water mass proxies, quantification of environmental preconditions to improve predictions of potential primary productivity under changing ice conditions, and the transition of spring to summer on ecosystem functioning and biogeochemical cycles as well as transitions in productivity, sea ice and ocean circulation across the last glacial cycle.

The ART Special Issue on "Interdisciplinary and multi-scale approaches to understanding and modeling the Arctic in Rapid Transition" as a long-term outcome of the ART-APECS Science Workshop 2012 in Sopot, Poland, is planned to be published as part of the peer-reviewed journal Polar Research by the beginning of 2015.

In cooperation with the Association of Polar Early Career Scientists (APECS) and the European Institute for Marine Studies (IUEM, Brest, France), ART organized the international science workshop "Integrating spatial and temporal scales in the changing Arctic system: towards future research priorities" (ISTAS), in October 21-24 2014 in Brest, France. During this multidisciplinary workshop, changes in the Arctic Ocean were discussed by 76 participants from 13 different countries, sixty percent of them being early career scientists. The natural variability in the Arctic marine system was reviewed over various spatial and temporal scales in order to better understand the presently changing Arctic marine system as a whole. Invited plenary speakers provided overviews of their respective research topics, hereby presenting their newest findings and points of view on future Arctic research priorities on biological and physical oceanography, sea ice, marine biodiversity, land-ocean interactions, paleo-reconstruction and biological archives, and law and economics. In addition, plenary presentations about Arctic sustainability and resources and a discussion about multidisciplinarity itself provided transdisciplinary linkages on the Arctic region integrating nature with human society. During parallel sessions, participants presented newest results of their ongoing research, which eventually fed into comprehensive discussions on future Arctic research priorities during the second half of the workshop. Results of the workshop in the form of priority sheets fed into the ICARP III process.

ART had a session during the ASLO Ocean science meeting in Hawaii in 2014. The ART session was one out of eight high latitude sessions and had two oral and one poster section covering a wide range of multidisciplinary research from various core regions of the Arctic. The individual abstracts can be accessed at http://www.sgmeet.com/osm2014/sessionschedule.asp?SessionID=050.

During ASSW 2015, ART convened a session "Arctic in Rapid Transition - future research directions from the perspective of early career scientists". The goal of this session was to integrate studies from various Arctic research fields in order to better understand the changing Arctic system beyond its regional variability and across multiple timescales. The session also included outcomes from the former ART science workshop held in Sopot in 2012 and in Brest in 2014, as well as the session of the Permafrost Young Researchers Network (PYRN; http://pyrn.arcticportal.org/index.php/en/) at the 4th European Conference on Permafrost (EUCOP-4) in Portugal (http://www.eucop4.org/).

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PHOTO: ART
Group photo taken during the ART ISTAS Workshop in Brest, France

Circum-Arctic Lithosphere Evolution (CALE) Network

Circum-Arctic Lithosphere Evolution (CALE) is a multinational and multidisciplinary research program investigating important questions associated with understanding circumarctic lithosphere evolution. The CALE project was launched in 2011 and concludes at the end of 2015. CALE consists of seven regional teams of on-shore geologists and off-shore geophysicists. Each team meets on an individual basis annually, and all teams join together once a year for a project meeting.

2014 highlights

- Teams A & B: N. Greenland and Canada working meeting in May 2014 at the Geological Survey of Canada, Ottawa, Canada.
- Team C: Bering Strait working meeting in June 2014 at Stanford University, US.
- Teams E, F, & G: Combined Barents/Kara shelf working meeting in Sept 2014 at Spetsgeofizika, Moscow, Russia.
- 1.5 day scientific session at the Geological Society of America (GSA) Annual meeting in Vancouver, Canada.

Future activities and developments

- As the direct result of the GSA CALE session, a special volume will be published in 2015.
- Team meetings are being planned for 2015.
- The final annual CALE project meeting will be held in September 2015 on Svalbard.

Important 2014 publications

Gottlieb, E., Meisling, K.E., Miller, E.L., Mull, C.G. Detrital zircon U-Pb geochronology linkages between Mississippian to Jurassic age strata in northern Alaska and the Franklinian mobile belt of Arctic Canada: Implications for plate tectonic reconstruction of the Canada Basin of the Arctic Ocean. Geosphere 10(6), 1-19, 2014.

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Schiffer,C., Balling, N., Jacobsen,B.H., Stephenson, R.A., Nielsen, S.B. Seismological evidence for a fossil subduction zone in the East Greenland Caledonides. Geology, 42, 311-314, doi: 10.1130/G35244.1, 2014.

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PHOTO: JAKOB SIEVERS
Northern lights over Nuuk

Network on Arctic Glaciology (NAG)

The IASC Network on Arctic Glaciology aims to make a significant contribution to assessments on the impact of climate change in the Arctic region. The focus is on the effect of glaciers on sea level change and on the freshwater input into fjords and embayments. The Network initiates scientific programs and facilitates international cooperation between glaciologists and climate modelers.

In order to facilitate international cooperation, the Network annually organizes the Workshop on the "Dynamics and mass budget of Arctic glaciers," which includes the Network's annual open forum meeting. In 2014, the annual workshop took place in Ottawa, Canada, from 3-5 February 2014. The meeting focused on topics related primarily to Arctic glaciology and climatology, linking climate change through changes in the ocean and atmosphere to changes in the dynamics and mass budget of Arctic glaciers. A diverse array of topics were presented at this workshop, which provided a multidisciplinary perspective on glaciology. This year's meeting also marked the 20th anniversary of the Network, formed out of the Working Group on Arctic Glaciology, which held its first formal meeting in Wisla, Poland, in September 1994. The Workshop on the "Dynamics and mass budget of Arctic glaciers" and the IASC Network on Arctic Glaciology annual meeting, will take place from 23-25 March 2015 in Obergurgl, Austria. This meeting will include a special session on snow albedo processes and firn processes, modeling and observations. This special session is linked to the ICARP III workshop on "The role of albedo feedbacks in the mass balance of the Arctic terrestrial cryosphere" that was held in Bristol, UK from 21-23 September 2014. The report from that meeting is available on the IASC website.

As part of the effort started in 2012 by the Network and the IASC Cryosphere Working Group to develop an ongoing research and training program on tidewater glacier research, a very successful workshop titled "Glacier and ice-stream calving – observations and modeling" was held from 2-3 June 2014, in Grenoble, France. Presentations from this workshop were recorded and can be accessed at: http://www-lgge.obs.ujf-grenoble.fr/calving2014/

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NAG website: http://www.projects.science.uu.nl/iceclimate/iasc-nag/index.html

PHOTO: MARTIN SHARP
GPS observations near Belcher Glacier, Devon Ice Cap, Nunavut.

Polar Archaeology Network (PAN)

The Polar Archaeology Network (PAN) is an international organization dedicated to issues impacting 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.

In May 2014, the International Polar Heritage Committee and PAN jointly organized a workshop that focused on the impacts of modern climate change on polar archaeological and other heritage resources. The three-day meeting in Copenhagen, hosted by the National Museum of Denmark, brought together experts from both polar regions, and dealt with the full range of heritage resources from ephemeral prehistoric sites to industrial sites and exploration camps of the past few centuries. Common ground was explored relating to identifying, documenting, and excavating heritage sites threatened by rising temperatures, melting permafrost, increasing storminess, and other factors. Before the main meeting, PAN held a closed organizational meeting for all members attending the conference.

Two major PAN events are currently on the horizon. First, with funding from IASC, PAN is organizing an initiative that brings together environmental and geological scientists with archaeologists to discuss past climate-culture interactions in the Arctic. This initiative, led by Peter Jordan (University of Groningen) in collaboration with Max Friesen (University of Toronto) and Mary-Louise Timmermans (Yale University), has led to a conference session at the American Geophysical Union (AGU) meeting in San Francisco. Papers from this session will be published in a thematic journal issue, and issues raised will lead to a policy paper on the future of climate-culture interactions research in the Arctic.

In May 2015, PAN will formally participate in the Canadian Archaeological Association annual meeting in St. John's, Newfoundland. At this meeting, several sessions relating to polar archaeology will draw an international range of scholars. Confirmed topics include past climate-culture interactions (linked to the previously mentioned AGU session), and impacts of modern climate change on the archaeological record. In addition, PAN will hold a full general meeting to discuss policy and future initiatives.

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PHOTO: WITEK KASZKIN [Polish Polar Station]
The International Polar Heritage Committee and PAN jointly organized a workshop that brought together experts from both polar regions, and dealt with the full range of heritage resources from ephemeral prehistoric sites to industrial sites and exploration camps of the past few centuries.

Palaeo-Arctic Spatial and Temporal Gateways (PAST Gateways) Network

The scientific goal of PAST Gateways is to understand Arctic environmental change during the period preceding instrumental records and across decadal to millennial timescales. The focus of the six-year program is on the nature and significance of Arctic gateways, both spatial and temporal, with an emphasis on the transitions between major Late Cenozoic climate events such as interglacials to full glacials and full glacial to deglacial states, as well as more recent Holocene fluctuations. There are three major themes to the program:

1) Growth and decay of Arctic ice sheets;
2) Arctic sea ice and ocean changes; and,
3) Non-glaciated Arctic environments.

The Network is interdisciplinary in nature and seeks to bring together field scientists and numerical modelers to advance understanding about Arctic climate change. The network involves scientists from across Europe, Russia, Canada and the USA, and is led by a Steering Committee comprising members from participating countries.

The second PAST Gateways International Conference and Workshop was held in Trieste, Italy, from May 19–23, 2014. Over seventy international delegates attended the meeting. A mix of senior Arctic scientists and early career researchers delivered presentations. The wide range of the presentations and discussion emphasized the interconnectedness and importance of a multidisciplinary, integrated approach to Arctic palaeoclimate. A special issue of Quaternary Science Reviews comprising papers related to the meeting will be published in 2015/16. The Third PAST Gateways International Conference and Workshop will be held in Potsdam, Germany, from May 18-22, 2015.

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PAST Gateways website:
http:// www.geol.lu.se/pastgateways/

International Study of Artic Change (ISAC)

The International Study of Arctic Change (ISAC) is an arctic environmental change program initiated in 2003 by the IASC and the Arctic Ocean Sciences Board. ISAC's vision is one of timely, relevant, and accessible scientific information for responding to rapid arctic change. ISAC is an open ended, international, interdisciplinary arctic environmental change program. To succeed ISAC requires observation and tracking of arctic changes, understanding their nature and causes, and the feedbacks and connections among them. ISAC encompasses pan-Arctic, system-scale, multidisciplinary observations, synthesis and modeling to provide an integrated understanding of arctic change and projections of future change. The ISAC Science Plan provides a vision for integrating research among diverse fields and varied users and stakeholders. ISAC is motivated by environmental changes that are already large enough to affect life in the Arctic. Future system states are uncertain and the lack of predictability hinders efforts to develop strategies for adapting to and managing a changing Arctic.

Executive Director I **Maribeth S. Murray**
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ISAC website:
http://www.arcticchange.org

PHOTO: JAKOB SIEVERS
Landlocked icebergs on the shoreline outside of Nuuk.

PHOTO: NASA / KATHRYN HANSEN

Scientists on the sea ice in the Chukchi Sea off the north coast of Alaska disperse equipment as they prepare to collect data on and below the ice. The research is part of NASA's ICESCAPE mission onboard the U.S. Coast Guard icebreaker Healy.

4. Arctic Science Summit Week

» 4 Arctic Science Summit Week

ASSW 2014

Arctic Science Summit Week (ASSW) 2014 and the 2nd Arctic Observing Summit (AOS), were held at the University of Helsinki and the Finnish Meteorological Institute in Helsinki, Finland. A total of 470 scientists, students, policymakers and other professionals from 32 countries attended ASSW. The 16th ASSW was the largest ever and the business meetings of IASC and ASSW partner organizations, as well as several side meetings, attracted 330 participants. For the first time, the AOS was held in conjunction with ASSW and was attended by 220 participants.

http://www.assw2014.fi/

PHOTO: IASC SECRETARIAT
ASSW 2014 in Helsinki attracted close to five hundred participants from 32 countries

IASC Medal awarded to Julian Dowdeswell

The 2014 IASC Medal was awarded to Julian Dowdeswell, a world leader in the field of Arctic glaciology, recognizing his outstanding and unique contributions to the understanding of glacier dynamics and ocean-ice sheet interactions. The Medal Lecture "A view from the sea: the marine-geophysical signature of past ice sheets" was presented on the ASSW 2014 Common Day.

Arctic Observing Summit 2014

Arctic Observing Summit (AOS) is a high-level, biennial summit that aims to provide community-driven, science-based guidance for the design, implementation, coordination and sustained long-term (decades) operation of an international network of Arctic observing systems. The AOS provides a platform to address urgent and broadly recognized needs of Arctic observing across all components of the Arctic system, including the human component. It fosters international communication and coordination of long-term observations aimed at improving understanding and responding to system-scale change. The AOS will be an international forum for optimizing resource allocation through coordination and exchange among researchers, funding agencies, and others involved or interested in long-term observing activities, while minimizing duplication and gaps. The AOS is a contribution to the Sustaining Arctic Observing Network (SAON) initiative.

The inaugural AOS was held in Vancouver, Canada, on 29 April to 2 May 2013. The second AOS took place in Helsinki, Finland, from 5 to 11 April, 2014

PHOTO: JULIAN DOWDESWELL
Julian Dowdeswell was the recipient of the 2014 IASC Medal Award

Background

AOS is led by the International Study of Arctic Change (ISAC). AOS 2014 was co-organized by the Finnish Meteorological Institute and the Thule Institute. It is a Sustaining Arctic Observing Networks (SAON) initiative that is part of the broader SAON implementation process, which is led by the Arctic Council, jointly with IASC and the World Meteorological Organization (WMO). Organizing partners include the United States Interagency Study of Environmental Arctic Change Program (SEARCH), the ArcticNet Network of Centres of Excellence Canada (ArcticNet), the European Union Arctic Climate Change Economy and Society project (ACCESS), the International Arctic Research Center (IARC), the Swedish Polar Research Secretariat (SPRS) and International Network for Terrestrial Research and Monitoring in the Arctic (EU-INTERACT). Together, these groups engage a wide range of national institutional and research communities to help organize AOS.

Deliverables

The key outcome of AOS is an assessment of the alignment between stakeholder needs, science objectives and observing networks. The tangible products will include, but will not be restricted to, the following:

- Synthesis of the present status of the observing system, recommendations for improved international coordination including synchronization of funding mechanisms, and a roadmap for the future observing system.
- Established long-term AOS goals (e.g. unify data access, distribution and archiving practices, and improve international access to the Arctic).
- Succinct policy briefs for the optimization, coordination and operation of existing systems.
- Definition and operationalization of one or more AOS projects that will integrate two or more existing or new observing activities or networks to achieve common objectives. These objectives may be scientific, agency or mission oriented, stakeholder driven or some combination thereof.
- One or more collections of peer-reviewed articles related to the AOS themes in special journal edition(s), as well as the publication of reviewed AOS proceedings.

The 2nd Summit was the first AOS that was held in conjunction with an ASSW and the feedback received and the high number of participants clearly showed that this integration was well received. Following this model, the 3rd AOS will be held in conjunction with ASSW 2016 in Fairbanks, Alaska. Discussions at the 2nd Summit were based on the outcome of the first AOS that was held in Vancouver, but also included new topics. The first draft of recommendations, which concluded the five AOS sessions, were presented at a high-level panel of decision makers on the last day of the summit by Peter Schlosser, who co-chaired the AOS Organizing Committee along with Eva Krümmel and Mikko Strahlendorff. They are as follows:

Stakeholders and Arctic Observation

- Create more inclusive and iterative communications platforms for planning Arctic observations;
- Establish improved dialogue between holders of traditional knowledge and science;
- Example from European Arctic: need for land-use studies using Arctic observing.

Coordination for Improved Arctic Observing

- Establish internationally coordinated funding with common calls for, and common reviews of proposals;
- Use the Belmont Forum as a pilot for multi-nation project funding;
- Establish funding mechanisms for research and stakeholder observations;
- Identify funding sources for sustained, operational observations.

PHOTO: LUCA BRACALI
Arctic observing in Ny-Ålesund, Svalbard at 78°55′ N.

Technology and Innovation

- Share technology and technology development to reduce cost;
- There has to be high-risk investments into technology and there has to be room for failure in the development of new technology;
- Enhance cooperation between industry and the scientific community in technology development.

Remote Sensing Solutions

- Arctic user requirements should be included in prioritizing low Earth orbit missions and in the motivation of specific polar missions;
- Start preparing for real-time service;
- Priority: carbon cycle, permafrost, and snow cover monitoring.

Data Management

- Open access to data in and of itself is not sufficient. Data uptake should be increased through appropriate easy-to-use data interfaces;
- Data system designers have to be better informed by the needs of data holders and data users;
- Build on knowledge and data systems that already exist;
- Develop interoperable data infrastructure to save cost.

Recommendations of the first AOS included:

- Improve cross-sectoral and collaborative approaches to the collection and maintenance of data;
- Create a stakeholder advisory group to provide advice on observational need;
- Better utilize and adopt modern technology for observing system design and cooperate more closely with global systems observation initiatives during the design phase.

http://www.arcticobservingsummit.org/

Upcoming ASSWs

ASSW 2015 Japan

ASSW 2015, including the Fourth International Symposium on the Arctic Research (ISAR-4) and the Third International Conference on Arctic Research Planning (ICARP III), will be held in Toyama (Japan) on 23-30 April 2015.

http://assw2015.org

ASSW 2016 United States

The US Polar Research Board will host ASSW in 2016, including the third Arctic Observing Summit in Fairbanks, Alaska. ASSW and AOS will take place from March 12-18, 2016.

http://www.assw2016.org/

ASSW 2017 Czech Republic

The regular ASSW business meetings and the biennial science symposium will be held in Prague, Czech Republic in 2017.

2018 SCAR/IASC Conference

Celebrating 10 years of fruitful collaboration in facilitating international research in both Polar Regions, the Scientific Committee on Antarctic Research (SCAR) and IASC have decided to arrange a second joint conference. Building on the success of the 2008 SCAR/IASC Conference in St. Petersburg (Russia) and two subsequent conferences within the International Polar Year, the 2018 SCAR/IASC Conference will be hosted by the Swiss Committee on Polar and High Altitude Research in Davos, Switzerland on 15-27 June, 2018. The Conference will include SCAR, IASC and other business and satellite meetings, an Open Science Conference and the SCAR Delegates Meeting.

PHOTO: IASC SECRETARIAT
The 2008 SCAR/IASC Open Science Conference was a benchmark event in bipolar cooperation. A second joint conference is scheduled for 2018 in Davos, Switzerland.

PHOTO: LUCA BRACALI
Dr. Andrea Spolaor is collecting samples on Svalbard to better understand the influence of sea ice dynamics on the halogen deposition.

5. Third International Conference on Arctic Research Planning (ICARP III)

» 5 Third International Conference on Arctic Research Planning (ICARP III)

Integrating Arctic Research – A Roadmap for the Future

The third International Conference on Arctic Research Planning (ICARP III) was formally launched at the ASSW 2014 Common Day on April 8. All ICARP III partner organizations and the five IASC Working Groups presented their activities and initial plans for the next year. The ICARP III symposium, held during ASSW 2015, marks the closure and culmination of the ICARP III process. It includes the presentation and discussion of the outcome of the planning process, namely a consensus statement identifying the most important Arctic research needs for the next decade and a roadmap for research priorities and partnerships.

http://icarp.iasc.info

PHOTO: VILLE MIETTINEN
An iceberg off the coast of East Greenland.

ICARP III Workshop Activities

Climate System and Transformations

Arctic Freshwater Synthesis - Network and science integration
Stockholm, Sweden | 5-6 May 2014
Writing Team Workshops organized by IASC Network Arctic Freshwater Synthesis (AFS), Partners: Climate and Cryosphere (CliC), All IASC WGs, Arctic Monitoring and Assessment Programme (AMAP)

Linkage between Arctic Climate Change and Mid-latitude Weather Extremes
Seattle, USA | 3-5 September 2014
Workshop organized by IASC Atmosphere WG, Partners: IASC Marine, Cryosphere and Terrestrial WGs, Climate and Cryosphere (CliC), Association of Polar Early Career Scientists (APECS)

Greenland Ice Sheet / Ocean Interaction
Bremerhaven, Germany
8-9 December 2014
Workshop organized by IASC Marine WG, Partners: IASC Cryosphere and Atmosphere WGs, Ice Sheet Mass Balance and Sea Level (ISMASS)

Palaeo-Arctic Spatial and Temporal Gateways (PAST Gateways): a multidisciplinary, pan-Arctic network researching Arctic palaeoclimate
Trieste, Italy | May 2014
Conference organized by IASC Network PAST Gateways, Partners: IASC Marine, Cryosphere, Terrestrial and Atmosphere WGs, University of the Arctic, Association of Polar Early Career Scientists (APECS)

Arctic snow cover changes and their consequences
Copenhagen, Denmark
16-17 October 2014
Workshop organized by INTERACT and IASC Terrestrial WG, Partners: All IASC WGs, Climate and Cryosphere (CliC), Association of Polar Early Career Scientists (APECS)

Planning for MOSAiC – the Multidisciplinary drifting Observatory for the Study of Arctic Climate
various locations | 2014/2015
Planning meetings organized by IASC Atmosphere WG, Partners: IASC Cryosphere and Marine WGs and various partner organizations

Geology of the Arctic – A new synthesis
Special Publication of the Geological Society of London
organized by IASC Action Group on Geosciences, Partners: IASC Marine, Terrestrial and Social & Human WGs

Integrating spatial and temporal scales in the changing Arctic System: towards future research priorities (ISTAS)
Plouzané, France | 21-24 October 2014
Workshop organized by IASC Network Arctic in Rapid Transition (ART), Partners: All IASC WGs, Association of Polar Early Career Scientists (APECS), Permafrost Young Researchers Network (PYRN)

Permafrost Research - A Roadmap for the Future
Consultation Process organized by the International Permafrost Association (IPA)
Partners: Climate and Cryosphere Project (CliC), Scientific Committee on Antarctic Research (SCAR), United Nations Environment Program (UNEP), IASC Cryosphere WG

Quantifying Albedo Feedbacks and Their Role in the Mass Balance of the Arctic Terrestrial Cryosphere
Bristol, UK | September 2014
Workshop organized by IASC Cryosphere WG, Partners: IASC Atmosphere WG

Seasonal Ice Cover in the Arctic Ocean: changes and consequences
Woods Hole, USA | 22-24 October 2014
Workshop organized by IASC Marine WG, Partners: IASC Cryosphere and Atmosphere WGs

Observing, Technology, Logistics, Services

4th European Marine Board Forum Arctic 2050 – Toward ecosystem-based management in a changing Arctic Ocean
Brussels, Belgium | 12 March 2014
Symposium organized by European Marine Board / European Polar Board (EMB/EPB)

Technology and Innovation Session at Arctic Observing Summit
Helsinki, Finland | 10 April 2014
Session organized by Forum of Arctic Research Operators (FARO)

ESA-CliC Earth Observation and Arctic Science Priorities
Tromsø, Norway | 20 January 2015
Workshop organized by ESA (European Space Agency) and CliC (Climate and Cryosphere Project)

Societies and Ecosystems

Permafrost Dynamics and Indigenous Land Use
Helsinki, Finland | 6-7 April 2014
Workshop organized by IASC Social & Human WG, Partners: IASC Cryosphere and Terrestrial WGs

Arctic Biodiversity Congress
Trondheim, Norway | 2-4 December 2014
Congress organized by Conservation of Arctic Flora and Fauna (CAFF)

Community Consultation on Arctic Research Priorities
2014/2015
Consultation Process organized by the University of the Arctic

Circumpolar Arctic Coastal Communities Observatory Network (CACCON)
Copenhagen, Denmark | 14-16 April 2014
Workshop organized by IASC Network Arctic Coastal Dynamics (ACD), Partners: All IASC WGs, Land-Ocean Interactions in the Coastal Zone (LOICZ), International Arctic Social Sciences Association (IASSA)

Rapid Arctic Transitions due to Infrastructure and Climate Change (RATIC)
Ottawa, Canada | 8-12 December 2014
Workshop organized by IASC Terrestrial WG, Partners: IASC Cryosphere and Social & Human WGs

Understanding Sustainability in the Arctic
Charleston, USA | 6-11 February 2015
Transdisciplinary workshop organized by International Arctic Social Sciences Association (IASSA)

Arctic Science in Globalization: Beyond IPY 2007-2008
Reykjavik, Iceland | 31 October 2014
Session at Arctic Circle Conference organized by Northern Research Forum (NRF)

Culture and Arctic Climate Change - Integrating Long-Term Perspectives from Archaeology and the Environmental Sciences
San Francisco, USA | 15 December 2014
AGU Conference Session organized by IASC Social and Human WG, Partners: All IASC WGs, IASC Polar Archeology Network, Association of Polar Early Career Scientists (APECS)

Outreach and Capacity Building

Arctic Science Summit Week: Common Day ASSW 2014
Helsinki, Finland | 8 April 2014
Symposium organized by IASC and ICARP III Partner Organizations

Townhall at 8th International Congress of Arctic Social Sciences
Prince George, Canada | 23 May 2014
Townhall meeting organized by International Association of Social Sciences (IASSA)

APECS - CliC – Where are they now?
Tromsø, Norway | May/June 2014
Writing Team Workshop organized by Association of Polar Early Career Scientists (APECS), Partner: Climate and Cryosphere (CliC), IASC

Permafrost Young Researchers Workshop
Evora, Portugal | 18 June 2014
Workshop organized by Permafrost Young Researchers Network (PYRN), Partners: Association of Polar Early Career Scientists (APECS), International Permafrost Association (IPA), Climate and Cryosphere (CliC)

Townhall at 4th European Conference on Permafrost
Evora, Portugal | 19 June 2014
Townhall meeting organized by International Permafrost Association (IPA)

ICARP III FrostBytes - Soundbytes of Cool Research
2014/2015
Communication Activity organized by the Climate and Cryosphere (CliC) project, Partner: Association of Polar Early Career Scientists (APECS), Permafrost Young Researchers Network (PYRN), Arctic Development and Adaptation to Permafrost in Transition (ADAPT), Changing permafrost in the Arctic and its Global Effects in the 21st Century (PAGE21), IASC

Goals of ICARP III – the future of Arctic research from the early career researchers' point of view
Toyama, Japan | April 2015
Workshop organized by Association of Polar Early Career Scientists (APECS) , Partners: All IASC WGs, IASC Network Arctic in Rapid Transition (ART), Permafrost Young Researchers Network (PYRN)

National Contributions to ICARP III

National Reports

- Canadian Polar Commission: "The State of Northern Knowledge in Canada"
- Japan Consortium for Arctic Environmental Research: "Future Plan for Arctic Research"

ICARP III Events and Sessions at National and Thematic Conferences

Inuit Circumpolar Council – General Assembly
Inuvik, Canada | 21-24 July 2014

Competitive Potential of the Northern and Arctic Regions
Arkhangelsk, Russia | 8-10 October 2014

Arctic Biodiversity Congress
Trondheim, Norway
2-4 December 2014

11th Conference of Parliamentarians of the Arctic Region
Whitehorse, Canada | 9-11 September 2014

China Symposium on Polar Science (CSPS)
Qingdao, China | 14-16 October 2014

Arctic Change 2014
Ottawa, Canada | 8-12 December 2014

Czech Polar Ecology Conference
České Budějovice, Czech Republic
21-24 September 2014

Arctic Circle
Reykjavik, Iceland | 31 October – 2 November 2014

Arctic Frontiers
Tromsø, Norway | 18-23 January 2015

List of ICARP III Partners as of 2013

Arctic Research Consortium of the US
(ARCUS)

Arctic Council Indigenous Peoples
Secretariat (IPS)

Arctic Monitoring and Assessment
Programme (AMAP)

Association of Polar Early Career Scientists
(APECS)

Climate and Cryosphere
(CliC)

Conservation of Arctic Flora and Fauna
(CAFF)

European Polar Board
(EPB)

Forum of Arctic Research Operators
(FARO)

International Arctic Science Committee
(IASC)

International Arctic Social Sciences
Association (IASSA)

International Association of Cryospheric
Sciences (IACS)

International Council for the Exploration of
the Sea (ICES)

International Institute for Applied Systems
Analysis (IIASA)

International Permafrost Association
(IPA)

International Study of Arctic Change
(ISAC)

Northern Research Forum
(NRF)

Ny-Ålesund Science Managers Committee
(NySMAC)

Pacific Arctic Group
(PAG)

Polar Educators International
(PEI)

Scientific Committee on Antarctic Research
(SCAR)

University of the Arctic
(UArctic)

PHOTO: MARIO HOPPMANN
A view of „North Pole-38," a Russian drift station, in the summer of 2011.

6. International Science Initiatives

» 6 International Science Initiatives

To promote Arctic science at a global level, IASC is involved in science planning and the initiation and development of international initiatives, from major research programs to thematic workshops. Although IASC is not a funding organization, it does make its connections, expertise, and secretarial support available for select international science initiatives. Initiatives are usually carried out in cooperation with other Arctic and international organizations.

PHOTO: KARSTEN PIEPJOHN
Base camp of the 2014 geological expedition CASE 16 on Ellesmere Island.

Sustaining Arctic Observing Networks (SAON)

(Jan Rene Larsen)

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 systems. SAON promotes the vision of well-defined observing networks that enable users to have access to free, open and high quality data that will realize pan-Arctic and global value-added services and provide societal benefits. SAON has been established on the initiative of the Arctic Council and IASC

In 2014 SAON established two committees. The first, the Arctic Data Committee, defined the following short-term goals for its work:

- Establishing a map of the arctic data management "ecosystem" or "universe". This will be both a concept map indicating projects, services and relationships as well as a geographic map indicating location;
- Develop recommendations on a common set of metadata elements relevant across Arctic sciences, to facilitate interoperability and sharing between Arctic data repositories and online portals;
- Provide a report and guide on data publication and citation for Arctic researchers; and,
- An interoperability experiment for presentation at the Arctic Science Summit Week / ICARP III meeting in Toyama in April 2015.

Peter Pulsifer from the US National Snow and Ice Data Center is the chair of the Committee.

The second committee, the SAON Committee on Observations and Networks (CON) met in December 2014 and is currently developing plans for its future activities. Lisa Loseto from Fisheries and Oceans Canada is the chair of the Committee.

SAON is involved in organizing the 2016 Arctic Observing Summit (AOS). The Summit is the third and will be held in conjunction with the Arctic Science Summit Week in Fairbanks, Alaska.

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International Polar Partnership Initiative (IPPI)

(Vladimir Ryabinin and Michael Sparrow)

The International Polar Year 2007-2008 (IPY) resulted in significant progress in establishing scientific foundations for polar observing systems and environmental services. It also catalyzed integration between the natural and social sciences for the Arctic. In April 2011, a meeting was organized by the World Meteorological Organization and Roshydromet at the Arctic and Antarctic Research Institute in St. Petersburg, Russian Federation to discuss the best way forward to preserve the most important legacies of IPY. Based on the recommendations of that meeting, a Group of Experts nominated by leading international organizations with polar interests, was formed to analyze the status of polar research and review the merits of proposing a potential long-term polar initiative as a means of supporting perspective polar activities after the conclusion of IPY.

The Group of Experts emphasized two major motivations for the continuation of polar research and observations, namely that the Polar Regions are undergoing very rapid regional change, and that processes at the poles exert a strong influence on the entire globe. However, the Group also recognized a fundamental structural problem. Due to the truly bottom-up nature of the IPY organization and its exclusive focus on science, the question of how to practically implement the scientific achievements of IPY has remained largely unresolved. While almost every IPY project had an objective that was practical, implementation of operational systems and services was outside the scope of IPY. As a rule, almost no funding arrangements existed for creating operational services based on the IPY outcomes and even less for ensuring their sustainability. Without vibrant transformation of research results into tangible and recognized products of societal value, it has become more and more difficult to maintain motivation for considerable investments in polar research.

At present, the networks of polar observing systems remain sub-optimal. Our ability to assess and predict environmental changes in these regions does not create a solid foundation for environmental protection and provision of services. Overall, the pressing polar issues do not seem to be addressed at present as effectively and systemically as required.

The Group of Experts believes that the urgent need to address polar issues requires a change in the organization of various types of polar activities. Not only is there a need for a coordinated interagency plan for interdisciplinary scientific research and observations in the Polar Regions, there is also a need to directly link them to the development of regional environmental service and protection systems that provide direct benefits to the local population and the entire planet. This is only possible in the spirit of true partnership between various stakeholders. The Group, therefore, proposed an International Polar Partnership Initiative (IPPI) and developed its initial concept.

The concept of IPPI is now being discussed in various international forums. After an initial period of hesitation, the merit of the initiative is starting to be better understood and appreciated. In 2015, IPPI will be on the agendas of the 17th World Meteorological Congress and the 28th Assembly of the Intergovernmental Oceanographic Commission (IOC). It will be considered at the Third International Conference on Arctic Research Planning and will feature on some other forums, for example in the discussions of the Arctic Council Task Force on Scientific Cooperation. The Group also intends to start developing the first elements of an IPPI Implementation Plan. The main challenge there is to find effective approaches to align various individual activities towards maximizing their contribution to sustainable development of the Arctic and conservation of the Antarctic environment. One of the next steps will be to discuss the IPPI and possible contributions to it at the national level. IPPI, if it is eventually approved, will start in 2017-2018.

PHOTO: IASC SECRETARIAT
Members of the IPPI Steering Committee met in Paris, France in February 2014.

International Science Initiative in the Russian Arctic (ISIRA)

(Yulia Zaika)

The International Science Initiative in the Russian Arctic (ISIRA) is a Russian and international cooperative initiative to assist Russian Arctic science and sustainable development in the Russian Arctic by:

- Initiating planning of multinational research programs that address specific key problems in the Russian Arctic;
- Providing a forum for linking ongoing or planned bilateral projects;
- Facilitating improved scientific access to the Russian Arctic; and,
- Advising on funding and organizing the implementation of projects.

The most recent ISIRA meeting, held on the 7th of April during ASSW 2014 in Helsinki, Finland, brought together all the national members and fourteen early career scientists to share information on ongoing and planned international and bilateral research projects in the Russian Arctic. The introductory report presented by the ISIRA Chair Arkady Tishkov highlighted the perspectives of ISIRA beyond International Polar Year. His report was complemented by a presentation on the integration of social sciences projects and ideas given by Tatiana Vlasova.

The new open format of the meeting allowed the participation of over fifty attendees in the discussion. Young scientists from all member countries had a chance to introduce themselves and their research projects to the group. The national members of ISIRA gave brief introductions to their countries´ ongoing research activities in the Russian Arctic, which have also been reported to the IASC Secretariat in detailed inventories. In the concluding remarks of the meeting, the future activities of the ISIRA group, including the development of a website and the group's contribution to ICARP III, were discussed.

All inventories and relevant information about ISIRA can be found at: **http://iasc.info/index.php/home/groups/advisory-groups/isira**

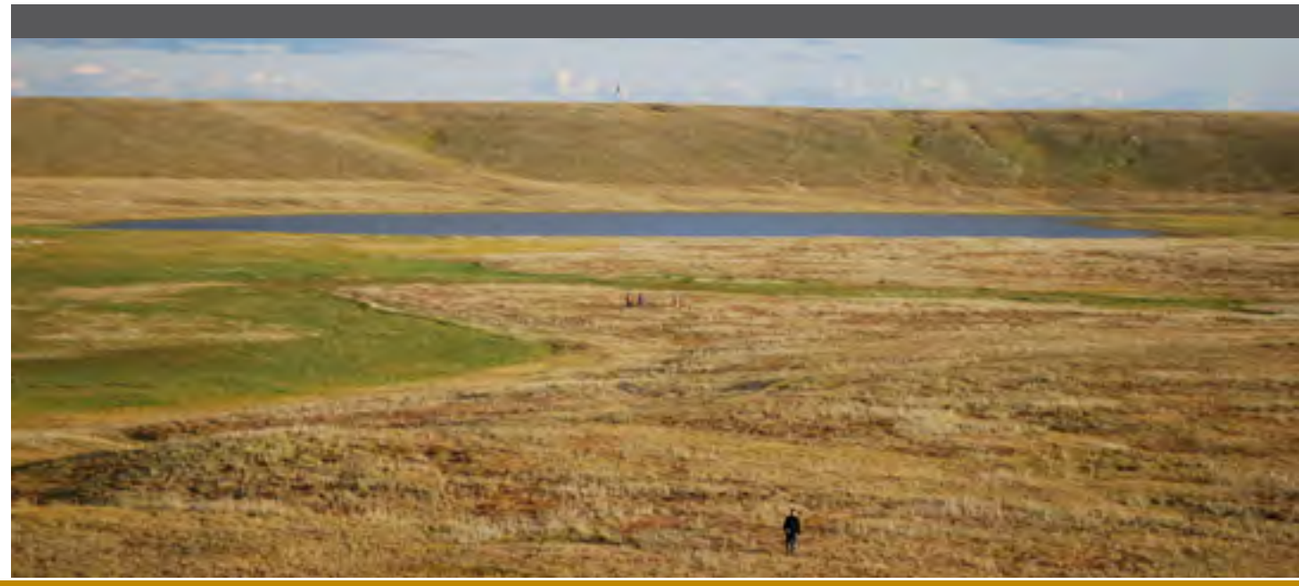

PHOTO: THOMAS OPEL
Thermokarst depression within a thermokarst lake at the Bykovsky Peninsula in the Siberian Arctic.

Arctic Human Development Report (AHDR II)

(Gail Fondahl, Joan Nymand Larsen)

Regional Processes and Global Linkages

The second Arctic Human Development Report: Regional Processes and Global Linkages (AHDR-II) identifies key trends in Arctic human development and well-being in the first decade of the 21st century, and notes critical gaps in knowledge. The AHDR-II will be available for downloading and book ordering at the homepage of the Nordic Council of Ministers http://www.norden.org/en/publications in January 2015.

The Table of Contents is presented in the following, and further below we summarize the findings and gaps for policy makers at higher level, with more detail to be found in the report. Addressing the gaps will contribute to moving the agenda of human development forward, promoting well-being for individuals, societies and cultural groups. The production of AHDR-II on the tenth anniversary of the first AHDR makes it possible to move beyond the baseline assessment to make valuable comparisons and contrasts across a decade of persistent and rapid change in the North. It addresses critical issues and emerging challenges in Arctic living conditions, quality of life in the North, global change impacts and adaptation, and Indigenous livelihoods.

AHDR-II Table of Contents:

PHOTO: LAWRENCE HISLOP
In the Arctic, interest in economic diversification, within and beyond extractive industries, is growing. (www.grida.no)

Summary of Key Policy Relevant Conclusions and Moving Forward

Arctic populations and migration

After decades of population growth, the size of the population of the Arctic appears to have stabilized at just over 4 million. At the same time, the booms and busts in the Arctic economy associated with the discovery and depletion of resources have always had, and will continue to have, a large influence on the size of regional populations. "Climigration" is a new dimension of Arctic mobility, and concentration of the Arctic population in urban places a continuing trend. Aging of the Arctic population brings concomitant changes in dependency ratios.

Cultures and identities

Interest in the Arctic has burgeoned, resulting especially from climate change and perceived resource development opportunities. Northern identities and especially Indigenous cultures are increasingly seen as assets, and the Arctic as more marketable. At the same time, cultural variation and complexity evermore characterize the Arctic.

For Arctic Indigenous peoples the challenge is not of choosing between "modernity" and "tradition," but to find a fulfilling combination of the two.

Economic systems

The Arctic will remain a high cost region. The effects of environmental changes in the Arctic may in some cases benefit economic development, but in others will make resource development more costly. Natural resource production will continue as a driving force of the Arctic economy, although expectations of higher prices and lower costs for Arctic resources may be overly optimistic. Interest in economic diversification, within and beyond extractive industries, is growing.

Political systems

Devolutionary pressures continue to be a defining feature of political systems in the Arctic, with increasing local participation in Arctic decision-making. This entails ever-mounting demands on local and Indigenous representatives. Human and financial capacity challenges persist. Whether and how these basic concerns of governance can be addressed will determine outcomes regarding social issues, economic opportunities, infrastructure, and land and environmental management.

Legal systems

While there is a trend towards the increased adoption of Arctic-specific norms, global norms will continue to play a dominant role. Arctic states will continue to rely on international law and norms, Arctic-specific and global, to resolve territorial delimitation disputes in the Arctic.

Resource governance

Arctic resource governance continues to be innovative, while growing in complexity, and with increasing attention to the adoption of best practices. We observer the broadening of informal resource governance institutions and the elaboration of their relationships with more formal institutions

Human health and well-being

Among emerging threats for human health and well-being are the direct and indirect impacts of climate change, including worsening food and water security, changes in the pattern of infectious diseases, and impacts on health care infrastructure. Continuing threats to well-being also include mental health problems, high levels of suicide, accidents and domestic violence. The well-being of an aging Arctic population demands attention.

Education and human capital

Lower levels of formal educational achievement persist in education outcomes across the North, although opportunities for formal education in the North have increased. Disparities in educational achievement are notable along axes of gender and 'race'. Lower educational achievement perpetuates and exacerbates difficulties in meeting the ever-increasing demands for an educated workforce in the North. The development of human and especially creative capital is crucial to the future of Arctic societies and economies.

An increasing incorporation of Indigenous language instruction and the inclusion of traditional knowledge in formal schooling is counterpoised against a continuing erosion of Indigenous languages and traditional knowledge.

Globalization

In many instances globalization means increased dependency of local interests on external powers and unstable markets. At the same time, the forces of globalization bring many economic opportunities to northern areas, including increased resource development and employment. Globalization brings greater cultural diversity, augmenting but also potentially attenuating local cultural traditions and institutions.

Community viability and adaptation

Community connections are being transformed by increasing globalization, with responses varying widely across the Arctic. Differences exist in gender, age and ethnicity with respect to outmigration, vulnerability, risk exposure, and coping ability.

A continuing and intensifying trend of urbanization characterizes the Arctic, with continued outmigration from local communities toward larger settlements, especially by women. Such forces challenge the viability of smaller Arctic settlements, while communities increasingly involve elements of 'diaspora' populations.

AHDR II Co-leads
Gail Fondahl (Canada)
Joan Nymand Larsen (Iceland)
Henriette Rasmussen (Greenland)

Arctic Resilience Report (ARR)

Interactions and Change Dynamics in Focus

(Marcus Carson)

Arctic Resilience Report – Phase II

While it is widely understood that the Arctic is changing rapidly, it remains a significant challenge to accurately project the timing and shape of that change – especially at regional and local scales. Most discussions of the Arctic focus on ecosystems, economics and people separately, and rarely examine how they interact. Given that Arctic change is driven by bio-geophysical and social forces which interact in complex, non-linear ways and thereby entail considerable uncertainties, determining how best to respond presents an even greater challenge. The Arctic Resilience Report (ARR) takes aim at these difficulties by applying resilience analysis as an integrative approach to better understand the dynamics of change in coupled social-ecological systems.

Initiated as a priority of the Swedish Arctic Council Chairmanship (2011-2013), this Arctic Council project is co-chaired by Sweden and the United States in its second phase. The Stockholm Environment Institute (SEI) and the Stockholm Resilience Centre at Stockholm University (SRC) lead the work of the ARR with broad circumpolar collaboration. The work of the ARR involves experts representing diverse scientific disciplines and traditional knowledge. In addition to those who contribute to the writing, a review process organized by IASC helped ensure a broad input of perspectives into the interim report that was delivered in May 2013. The final scientific report – an Arctic Resilience Assessment – is slated for delivery in May of 2016. A Synthesis for Policymakers (focusing on actionable, policy relevant insights) will be delivered at the conclusion of the US Chairmanship in the spring of 2017. In addition, the ARR is exploring collaboration with Arctic Council working groups with which there are significant synergies. Opportunities for cooperation with the Sustainable Development Working Group (SDWG) are being actively explored to determine how the resilience assessment can be linked with the important work of the SDWG to establish an adaptation portal, and to more fully integrate the insights offered by different knowledge traditions. ARR is already engaged in collaboration with AMAP's Adaptation Actions for a Changing Arctic Part C (AACA-C) to explore ways in which a focus on resilience can usefully inform adaptation strategies. Efforts to build bridges between various disciplines aim to assist in filling knowledge gaps that cannot be addressed solely with discipline-guided approaches.

Current research demonstrates that under conditions in which significant change is expected, where the timing and consequences of that change remain uncertain, preparation for change is needed. Such preparation entails strengthening resilience. Resilience was pegged as the "Environmental Buzzword of 2013" and with the resilience focus of the upcoming US Arctic Council Chairmanship, it may well become the Arctic catchword of 2015-2017. As such, it is likely to carry many varied meanings. The ARR defines social-ecological resilience as "the capacity of a social-ecological system to both cope with disturbances and respond or reorganize in such a way as to maintain its essential structure, function, and identity, while also maintaining the capacity for adaptation, learning and transformation". Only

PHOTOS: GHISLAINE MEICLER
ARR invites contributions that help find ways of safeguarding or even enhancing social-ecological resilience in the Arctic.

PHOTOS: GHISLAINE MEICLER
Portrait of a young girl from the village of Kulusuk on the east coast of Greenland.

the social side of the system has the capacity to organize itself to learn and make use of accumulated knowledge in an effort to successfully navigate the future. Efforts are, therefore, underway to define resilience as the capacity of communities (at different scales) to learn and make use of shared knowledge of social-ecological systems functions and feedback to consciously engage in adaptive or transformative change – whether in response to disturbances, in efforts to minimize unwanted changes, or in the pursuit of improved outcomes.

One key characteristic of resilient systems is diversity, which enhances the capacity to adapt to unanticipated circumstances by making available a variety of tools for coping with change that cannot be fully anticipated. Importantly, diversity of options is part of the toolkit that has enabled many indigenous communities in the Arctic to be resilient to a constantly changing and often harsh Arctic environment. Fostering such diversity may sometimes be at odds with current policy trends toward promoting efficiency under conditions that are assumed to be predictable. Under these kinds of circumstances, choosing among policy options often requires explicit, sometimes difficult choices between incommensurables – options that cannot easily be compared and weighed against one another. It means prioritizing goals favoured by some Arctic communities over goals supported by others. It also entails balancing preferences for the near future against needs set in the more distant future. In each of these instances, good knowledge is essential, but it is often not knowledge gaps that generate the greatest challenges, but rather gaps between knowledge and action.

The ARR's phase 2 work is drawing on case studies that can contribute to a better understanding of the mechanisms of resilience and transformation in social-ecological systems: What are the social and ecological feedbacks that maintain certain important features? What interactions between different external drivers of change and internal processes are likely to cause instabilities or radical shifts that affect ecosystems services and people's well-being? The effort is elaborating on the methods applied in a regime shifts database at the Stockholm Resilience Centre – but with emphasis on including the social processes. As the assessment depends on work that is ongoing or already published, contributions of case studies and other relevant efforts are welcome. Potential contributors are also welcome to contact us about their work, particularly work that highlights communities at various scales as they grapple with the array of forces driving change in the Arctic and engage in policy processes that might play a role for safeguarding or even enhancing social-ecological resilience.

PHOTO: PAULINE SNOEIJS LEIJONMALM
View over the ice during the 2012 Arctic expedition with icebreaker Oden, studying the diversity of microbial communities and their roles in global biogeochemical cycles.

PHOTO: PAUL WILLIAMS
A view on the mountains from the Sassendalen valley on Spitsbergen, Svalbard.

7. Relationships with other organizations

» 7 Relationships with other organizations

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.

IASC is 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 is supporting 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 bipolar science initiatives.

An excellent example of such bipolar cooperation is the Expert Group on Ice Sheet Mass Balance and Sea Level (ISMASS), which is co-sponsored by the World Climate Research Programme (WCRP) Climate and Cryosphere Project, SCAR and IASC. The goals of ISMASS are to:

- Promote research on the estimation of the mass balance of ice sheets and its contribution to sea level;
- Facilitate coordination among the different international efforts focused on this field of research;
- Propose directions for future research in this area;
- Integrate observations and modelling efforts, as well as distribution and archiving of the corresponding data;
- Attract a new generation of scientists into this field of research, and;
- Contribute to the dissemination to society and policy makers of current scientific knowledge and main achievements in this field of science.

Over the past years, IASC signed formal partnership agreements with several other Arctic or Polar organizations, which resulted in numerous joint scientific and outreach activities. Table 1 provides an overview of the organizations with which IASC has formalized cooperation. At ASSW 2014, a new Memorandum of Understanding (MoU) was signed with the European Polar Board (EPB) and SCAR, which recognizes their common goal of working internationally on polar science and technology to increase our understanding of the Earth's Polar Regions and their connections to the global system. Taking advantage of the complementarities of the three signatory organizations, this MoU aims to increase cooperation between IASC, SCAR and the entities managing the European polar infrastructure, with the EPB providing the "European dimension" (see Annex 3.1).

In addition, two existing agreements were renewed. SCAR and IASC agreed to continue their partnership with the International Permafrost Association (IPA). The renewed MoU recognizes a joint commitment to excellence in the field of permafrost and polar research, the pursuit of scientific advances, public awareness and advice to policymakers, as well as professional development of young researchers. SCAR, IASC and IPA intend to combine their efforts in particular in the field of permafrost research to raise the level of impact of all three organizations (see Annex 3.2).

With a renewed Letter of Agreement (LoA), the Pacific Arctic Group (PAG) and IASC agreed to continue their partnership. Recognizing the common interests in science related to the Arctic Ocean and its peripheral seas, PAG and IASC intend to work together to advance scientific knowledge, jointly support education and outreach efforts, and provide joint advice to policy- and decision-makers who require scientific information as the basis for their decisions (see Annex 3.3).

PHOTO: IASC SECRETARIAT
At the ASSW 2014, the MoU between IPA, SCAR and IASC was renewed. From left to right: Jerónimo López-Martínez (SCAR), David Hik (IASC), Vladimir E. Romanovsky (IPA)

ORGANIZATION	TYPE	SIGNED	COMMENT
Association of Polar Early Career Scientists (APECS)	MoU	2008 (renewed 2013)	Jointly with SCAR
Circumpolar Health Research Network (CircHNet)	LoA	2011	
European Polar Board (EPB)	MoU	2014	Jointly with SCAR
Forum of Arctic Research Operators (FARO)	MoU	2013	
International Arctic Social Sciences Association (IASSA)	LoA	2008 (renewed 2013)	
International Association of Cryospheric Sciences (IACS)	LoA	2008 (renewed 2013)	Jointly with SCAR
International Council for the Exploration of the Sea (ICES)	MoU	2011	
International Permafrost Association (IPA)	MoU	2009 (renewed 2014)	Jointly with SCAR
Pacific Arctic Group (PAG)	LoA	2009 (renewed 2014)	
Scientific Committee on Antarctic Research (SCAR)	LoA	2006 (renewed 2011)	
University of the Arctic (UArctic)	LoA	2011	Jointly with IASSA
Climate and Cryosphere (CliC)	MoA	2008 (renewed 2013)	Jointly with SCAR

TABLE:
List of formal partnership agreements

PHOTO: ALLAN POPE
Crevasses in the Wrangell Mountains, Alaska

PHOTO: MATTHEW SHUPE
A Radiosonde is launched from icebreaker Oden in the East Siberian Sea during the SWERUS-C3 expedition in 2014.

8. Capacity Building

» 8 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 150 early career scientists received IASC travel stipends to attend and participate in conferences or workshops.

IASC Fellowship Program

During ASSW 2014 in Helsinki, IASC launched the IASC Fellowship Program for early career scientists. The idea behind this initiative was to combine travel support that IASC has been providing to young researchers to attend ASSWs with more substantial involvement of these young professionals in the activities works of the IASC Working Groups (WGs). As such, in collaboration with the Association of Polar Early Career Scientists (APECS), a group of early career scientists from different countries and backgrounds was selected and invited to serve as rapporteurs for IASC WG meetings. In addition to drafting minutes to provide support to the IASC Secretariat, young scholars had a chance to not only observe, but also actively contribute to the proceedings of the WGs and engage in discussions with representatives from IASC member countries and organizations. Throughout the year, fellows actively participated in the activities of the WGs in both a scientific and organizational capacity. They also had the opportunity to gain valuable insights into the workings of IASC and enhance their own skills and scientific network.

"I feel very fortunate to have had the opportunity to meet so many outstanding scientists, staff members, and students. I was incredibly impressed with the level of international collaboration and sense of community apparent throughout the Working Groups and meetings. In visiting Helsinki, Finland, it was my hope to identify potential collaborators, funding sources, and methods to plan for successful research projects in the Arctic Ocean. As one of my proposed projects combines Arctic Ocean ecology, marine animal physiology, ecological modelling, deleterious anthropogenic influences (oil spills and/or loss of sea ice extents), and social sciences of indigenous communities, I could not have asked for a better opportunity to meet and talk with the collection of talent and intellectual resources at the Marine WG meeting at ASSW 2014, and the APECS workshop. I was immersed in ideas."

Paul Suprenand, IASC Fellow 2014/2015, Marine Working Group

Table IASC Fellows

WORKING GROUP	2014/2015	2015/2016
Atmosphere WG		Jo Browse
Cryoshere WG	Elena Kuznetsova,Louis-Philippe Roy	Robert Way
Marine WG	Emily Choy, Paul Suprenand	Kristina Brown
Social & Human WG	Candice Lys, Małgorzata Śmieszek	Andrian Vlakhov
Terrestrial WG	Noemie Boulanger-Lapointe, Jeffrey Ross	Josefine Lenz

Table 2. Recipients of the IASC Fellowship Award

For more background information on the IASC Fellowship Program see Annex 3.

TABLE: Recipients of the IASC Fellowship Award

PHOTO: IASC SECRETARIAT
IASC Fellows 2014/2015. From left to right: Yoo Kyung Lee (IASC Secretariat), Elena Kuznetsova, Volker Rachold (IASC Secretariat), Paul Suprenand, Louis-Philippe Roy, Noemie Boulanger-Lapointe, Candice Lys, Emily Choy and Małgorzata Śmieszek. Not in photo: Jeffrey Ross

Association of Polar Early Career Scientists (APECS)

Jean-Sébastien Moore
(APECS President 2014-2015)

Ruth Hindshaw
(APECS Vice-President 2014-2015)

Trista Vick-Majors
(APECS Vice-President 2014-2015)

Yulia Zaika
(APECS Executive Committee ex-officio 2014-2015)

Gerlis Fugmann
(APECS Executive Director)

The Association of Early Career Polar Scientists (APECS) continues to build on and strengthen its collaboration with IASC. A key focus of this collaboration is identifying and facilitating opportunities for early career researchers in diverse situations, for example, co-chairing conference sessions or contributing to IASC Working Groups.

APECS has been involved in a number of projects contributing to the 3rd International Conference on Arctic Research Planning (ICARP III). A key contribution to ICARP III has been the "Where are they now?" project coordinated by APECS, together with the Climate and Cryosphere (CliC) Project of the World Climate Research Program (WCRP). The project has received support and funding from IASC. The overarching goal of the project is to document how funding received since the most recent International Polar Year (IPY) (2007-2008) impacted the careers of early career researchers. The project will also highlight examples of successful careers of early career researchers and thus provide a legacy and make an interconnection between generations. Results will provide suggestions on how funding can be best used to support and enhance the careers of early career researchers in the interdisciplinary field of Arctic science. In particular, these suggestions will focus on the best ways to prepare early career researchers for: (1) international and interdisciplinary Arctic research; and, (2) the communication of this research to policy makers, people living in the Arctic and the broader global community.

A second project for ICARP III, which is also jointly organized with CliC and supported by IASC, is the ICARP III FrostBytes Project. FrostBytes are 60-second voice recordings succinctly summarizing research findings or important moments during events. Being short, FrostBytes can easily reach a broad audience. ICARP III participants are strongly encouraged to create FrostBytes showcasing their contributions to this important planning process. All FrostBytes will be published on the CliC website (http://www.climate-cryosphere.org/albums/icarp3-frostbytes) and will be part of the FrostBytes podcast channel on iTunes.

In addition, APECS has also been involved in several workshops preparing for ICARP III. In June, APECS co-organized a workshop at the 4th European Conference on Permafrost (EUCOP4) in Portugal, together with the Permafrost Young Researchers Network (PYRN), the PAGE21 project and the Arctic Development and Adaptation to Permafrost in Transition (ADAPT) program. One aim of this workshop was to set future priorities for permafrost research from an early career researcher perspective. In October, APECS was a partner in IASC's early career researcher network Arctic in Rapid Transition (ART) workshop entitled "Integrating spatial and temporal scales in the changing Arctic" (ISTAS). During the ISTAS workshop, priority sheets were formulated which will feed directly into ICARP III. At ASSW 2015, APECS co-organized a workshop on "The future of Arctic research from the early career researcher's point of view".

Another major project undertaken by APECS this year was the APECS Nordic Project "Bridging Early Career Researchers and Indigenous Peoples in Nordic Countries" funded by the Nordic Council of Ministers. The aim of this project is to identify ways to enhance engagement between early career researchers and Indigenous peoples and northern community members in Nordic regions. A website has been set up together with a database of interested parties, fostering collaboration and a Nordic network. A successful webinar series was organized at the end of last year (http://www.apecs.is/en/research/apecs-norden/apecs-nordic-webinars) and a survey was conducted. The results are currently being collated and will contribute to and guide meaningful and effective communication and research collaboration in Nordic Polar communities. In addition, as part of ASSW 2014 in Helsinki, a two-day workshop on "Connecting early career researchers and community-driven research in the North" was attended by 60 participants from 11 countries. The workshop consisted of a number of talks and breakout sessions where specific themes such as "Guidelines/policies for working with indigenous groups" could be discussed in more detail (http://www.apecs.is/en/research/apecs-norden/apecs-norden-workshop). Feedback from the workshop was very positive, with 75% of the participants responding that the workshop would or could have an impact on their future research projects and collaborations. In addition to funding from the Nordic Council of Ministers, funding was also provided for travel for workshop participants by IASC, the US National Science Foundation and the Swedish Polar Research Secretariat.

APECS is also collaborating with IASC on the IASC Fellowship Program that aims to engage early career researchers in the five IASC Working Groups and provide the opportunity to become involved in leading-edge scientific activities at a circumarctic and international level, build an international network of contacts, and develop management skills. This program enables one early career researcher to participate in each of the IASC Working Groups for 12 months and receive funding to attend two consecutive ASSWs in order to participate in the annual meetings of the Working Groups. In 2014, the program began successfully with 10 early career researchers and in the future, five new fellows will be selected on an annual basis.

This past year, APECS has been involved in either organizing or co-organizing with other partners several workshops and panel discussions associated with larger conferences and meetings including: the American Geophysical Union (AGU) Fall Meeting 2013; Arctic Frontiers 2014; the European Geosciences Union (EGU) Meeting 2014; the 8th International Congress of Arctic Social Sciences (ICASS VIII); and, the Scientific Committee on Antarctic Research (SCAR) Open Science Conference 2014.

APECS also has a number of upcoming events planned. An APECS webinar series is planned for fall and winter 2014/2015, with an online conference in March 2015. APECS and its National Committees have planned, and are continuing to plan events for larger initiatives such as Antarctica Day 2014 and the International Polar Weeks in March and September 2015. Workshops, panel discussions and networking events were also planned during the Arctic Change 2014 conference, the AGU Fall Meeting 2014, Arctic Frontiers 2015 and ASSW 2015. APECS is also planning its first APECS World Summit "The Future of Polar Research" in June 2015 in Sofia, Bulgaria that will include a workshop on "Data sharing and open science in Polar research" as well as discussions on "Science communication" and "The APECS network and the future of APECS".

APECS continues work with IASC and its many partners to create the opportunities that enable early career researchers to help shape the future of polar research.

To learn more about APECS activities, please visit **www.apecs.is**

Overview of supported early career scientists

IASC Network on Arctic Glaciology annual Meeting (NAG)

Ottawa, February 2014

NAME	INSTITUTION	COUNTRY
E. Bernard	CNRS-Université de Franche Comté	France
E. Enderlin	University of Maine	USA
K. Langley	University of Oslo	Norway
E. Majchrowska	University of Silesia	Poland
C. Papasodoro	University of Sherbrooke	Canada
K. Poinar	University of Washington	USA
A. Pope	Dartmouth College	USA

Global Change, Arctic Hydrology and Earth System Processes Workshop (ARCHES)

Edinburgh, February 2014

NAME	INSTITUTION	COUNTRY
J. Lessels	University of Aberdeen	UK
D. Olefeldt	University of Guelph	Canada

Thermokarst Aquatic Ecosystem Workshop (THAW)

Quebec, March 2014

NAME	INSTITUTION	COUNTRY
O. Brobova	Saint-Petersburg State University	Russia
L. Lebedeva	Nansen International Environmental and Remote Sensing Centre; State Hydrological institute	Russia
T. Schoengassner	Max-Planck Institute for Meteorology	Germany
J. Vonk	Utrecht University	Netherlands

Arctic Science Summit Week (ASSW)

Helsinki, April 2014

NAME	INSTITUTION	COUNTRY
N. Boulanger-Lapointe	University of British Columbia	Canada
C. Lys	University of Toronto	Canada
E. Choy	University of Manitoba	Canada
E. Kutznetsova	The Norwegian University of Science and Technology	Norway
J. Ross	University of Utah	USA
L.-P. Roy	Yukon Research Center	Canada
M. Śmieszek	Arctic Centre, University of Lapland	Finland
P. Suprenand	University of South Florida, College of Marine Science	USA

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

Helsinki, April 2014

NAME	INSTITUTION	COUNTRY
E. Kaparulina	Thule Institute, University of Oulu	Finland
C. Elvestad	Bodø Science Park	Norway
N. Filimonova	Russian State Hydrometeorological University	Russia
M. Ivanov	Faculty of Geography, Lomonosov Moscow State Uni	Russia
H. Link	Institute for Ecosystem Research, Kiel University	Germany
C. Logvinova	Clark University	Russia
A. Maslakov	Faculty of Geography, Lomonosov Moscow State Uni	Russia
A. Medvedev	Institute of Geography, Russian Academy of Sciences	Russia
A. Medvedkov	Faculty of Geography, Lomonosov Moscow State Uni	Russia
A. Nikonova	Institute of Geography, Russian Academy of Sciences	Russia
R. Rouillard	Scott Polar Institute, University of Cambridge	UK/Canada
S. Tei	Hokkaido University	Japan
A. M. Trofaier	Scott Polar Institute, University of Cambridge	UK
A. Varfolemeeva	Uppsala Centre for Russian and Eurasian Studies	Sweden

Permafrost Dynamics and Indigenous Land Use Workshop at Arctic Science Summit Week (ASSW)

Helsinki, April 2014

NAME	INSTITUTION	COUNTRY
S. Ksenofontov	University of Zurich	Switzerland
M. Ulrich	University of Leipzig	Germany

Herbivory in Changing Northern and Alpine Environments Workshop at Arctic Science Summit Week (ASSW)

Helsinki, April 2014

NAME	INSTITUTION	COUNTRY
I. Barrio	University of Alberta	Canada
G. Bueno	University of Alberta	Canada
J. M. Falk	University of Lund	Sweden
M. Gartzia	Pyrenean Institute of Ecology	Spain
T. Horstkotte	University of Turku	Finland
K. Hoset	University of Turku	Finland
E. Kaarlejärvi	University of Umeå	Sweden
E. Lægreid	University of Tromsø	Norway
K. M. Mathiesen	Hedmark University College	Norway
M. Moersdorf	University of Iceland	Iceland
V. Ravolainen	University of Tromsø	Norway
E. Soininen	University of Tromsø	Norway
M. Tuomi	University of Turku	Finland
M. Väisänen	University of Lapland	Finland
H. Ylänne	University of Oulu	Finland

Biology and Ecology of Arctic Cods Workshop

Copenhagen, April 2014

NAME	INSTITUTION	COUNTRY
M. Geoffroy	Université Laval	Canada
J. Marsh	University of Alaska Fairbanks	USA

Circumpolar Arctic Coastal Communities Observatory Network (CACCON) Initial Design Workshop

Copenhagen, April 2014

NAME	INSTITUTION	COUNTRY
H. Amundsen	CICERO and University of Oslo	Norway
G. Kraev	Moscow State University	Russia
R. Riedlsperger	Memorial University	Canada

Arctic Freshwater Synthesis - Network and Science Integration (AFS)

Stockholm, May 2014

NAME	INSTITUTION	COUNTRY
C. Lique	University of Oxford	UK
J. Screen	University of Exeter	UK
M. Yamamato-Kawai	Tokyo University	Japan

2nd PAST Gateways Network International Conference and Workshop

Trieste, May 2014

NAME	INSTITUTION	COUNTRY
A. M. Auriac	Durham University	UK
F. Colleoni	Centro Euro-Mediterraneo Cambiamenti Climatici	Italy
M. Dragosics	Institute of Earth Sciences, University of Iceland	Iceland
A. Flink	University of Svalbard	Norway
O. Fransner	University of Svalbard	Norway
E. Grimoldi	Durham University	UK
J. Lea	University of Aberdeen	UK
J. Müller	Alfred Wegener Institute	Germany
T. Opel	Alfred Wegener Institute	Germany
C. Sheldon	Aarhus University	Denmark
A. Spolaor	Ca Foscari University of Venice	Italy
M. Staerz	Alfred Wegener Institute	Germany
K. Streuff	Durham University	UK
L. Syrykh	Alexander Herzen State Pedagogical University	Russia
K. Werner	Byrd Polar Research Center	USA

ICARP III Town Hall Meeting at the 8th International Congress of Arctic Social Scientists (ICASS VIII)

Prince George, May 2014

NAME	INSTITUTION	COUNTRY
G. Baikie	Dalhousie University	Canada
D. Brandisauskas	Vilnuis University	Lithuania
J. Feuer	University of Nottingham	UK
S. Huusko	University of Oulo	Russia
E. Kuligina	European University at St. Petersburg	Russia
I. Medby	Durham University	UK
L. M. Nilsson	Umeå University	Sweden

Permafrost Young Researchers Workshop (PYRW) at the 4th European Conference on Permafrost (EUCOP4)

Evora, June 2014

NAME	INSTITUTION	COUNTRY
P. Bonnaventure	Queen's University	Canada
K. Davies	University of Southampton	UK
A. Demidova	Institute of Physicochemical and Biological Problems of Soil Science of the Russian Academy of Science	Russia
G. L. Gilbert	University of Oslo, The University Centre in Svalbard	Norway
P. Gorbachev	Moscow State University	Russia
A. Haberkorn	WSL Institute for Snow and Avalanche Research SLF	Switzerland
F. Hrbácek	Masaryk University	Czech Republic
V. Kapralova	Sergeev Institute of Environmental Geoscience Russian Academy of Sciences (IEG RAS), Moscow	Russia
F. Magnin	University of Savoie	France
E. Makarycheva	Sergeev Institute of Environmental Geoscience, Russian Academy of Science	Russia
A. Malhotra	McGill University	Canada
S. Muster	Alfred Wegener Institute	Germany
G. Oblogov	Institute of Earth Cryosphere Siberian Branch of Russia Academy of Science	Russia
A. Onaca	West University of Timisoara	Romania
B. Radosavljevic	Alfred Wegener Institute	Germany
J. Stanilovskaya	Sergeev Institute of Environmental Geoscience Russian Academy of Sciences (IEG RAS), Moscow	Russia
S. Stettner	Alfred Wegener Institute	Germany
I. Szuman	Adam Mickiewicz University, Institute of Geoecology and Geoinformation	Poland

ICARP III Townhall Meeting at the 54th Congress of the European Regional Science Association

St. Petersburg, August 2014

NAME	INSTITUTION	COUNTRY
A. Petrov	University of Northern Iowa	USA

Workshop on Quantifying Albedo Feedbacks and Their Role in the Mass Balance of the Arctic Terrestrial Cryosphere

Bristol, September 2014

NAME	INSTITUTION	COUNTRY
K. Anttila	Finnish Meteorological Institute	Finland
T. Goelles	The University Centre in Svalbard	Austria
K. Naegeli	University of Fribourg	Switzerland
P. Nielsen-Englyst	Danish Meteorological Institute	Denmark
A. Riihela	Finnish Meteorological Institute	Finland
M. Stibal	Geological Survey of Denmark and Greenland	Denmark
C. Thackeray	University of Waterloo	Canada

Arctic Snow Cover Changes and Their Consequences Workshop

Copenhagen, October 2014

NAME	INSTITUTION	COUNTRY
L. Brucker	NASA Goddard Space Flight Center	USA
H. Mariash	National Wildlife Research Center	Canada
A. Sokolov	Russian Academy of Sciences, Science Center for Arctic Studies	Russia
S. Terzago	Institute of Atmospheric Sciences and Climate	Italy
M. Wiese	WSL Institute for Snow and Avalanche Research SLF	Russia
S. Williamson	Edmonton University	Canada

Integrating Spatial and Temporal Scales in the Arctic Changing System: Towards Future Research Priorities (ISTAS)

Plouzane, October 2014

NAME	INSTITUTION	COUNTRY
M. Bartels	Center for Marine Enviromental Sciences, University of Bremen	Germany
C. David	Alfred Wegener Institute	Germany
R. Degen	Alfred Wegener Institute	Germany
J. Frederick	Desert Research Institute	USA
D. Kaverin	Institute of Biology Komi SC RAS	Russia
D. Kirievskaya	University of Utah	USA
M. Nicolaus	Alfred Wegener Institute	Germany
M. Paar	Alfred Wegener Institute	Germany
A. Pienkowski	Bangor University	UK
A. Preußer	University of Trier	Germany
I. Sudakov	University of Utah	USA

Distributed Biological Observatory (DBO) 2nd Data Meeting

Seattle, October 2014

NAME	INSTITUTION	COUNTRY
C. Lalande	University of Laval	Canada
C. Nobre	Woods Hole Oceanographic Institution	USA

Thematic Network on Geopolitics and Security's Panel on Security of the Arctic at the 2nd Arctic Circle

Reykjavik, October 2014

NAME	INSTITUTION	COUNTRY
H. Exner-Pirot	University of Saskatchewan	Canada
M. Humpert	The Arctic Institute	Germany
J. Huotari	University of Lapland	Finland
H. Lempinen	Arctic Centre, University of Lapland	Finland
B. Padrtova	Centre for European and North Atlantic Affairs	Slovak Republic
J. Plouffe	School of Public Administration	Canada
G. Yarovoy	Petrozavodsk State University	Russia

Workshop on Extractive Industries & Indigenous Peoples in the Arctic: Past, Present and Future

Reykjavik, October 2014

NAME	INSTITUTION	COUNTRY
F. Angell	UIT Arctic University of Norway	Norway
P. Graczyk	UIT Arctic University of Norway	Norway
R. Paulusson	UIT Arctic University of Norway	Norway

How to Approach Collaborative Research on Herbivory: An Ecological Interaction of Key Importance Meeting at Arctic Biodiversity Congress

Trondheim, December 2014

NAME	INSTITUTION	COUNTRY
L. Arsaelsdottir	University of Iceland	Iceland
E. Liebig	University of Iceland	Iceland

Network and Workshop on Greenland Ice Sheet/ Ocean Interaction (GROCE)

Bremerhaven, December 2014

NAME	INSTITUTION	COUNTRY
T. Bartholomaus	Institute for Geophysics, University of Texas	UK
R. Carr	School of Geography, Politics and Sociology, Newcastle University	UK
K. Kjellerup Kjeldsen	Statens Naturhistoriske Museum	Denmark
A. Prominska	Institute of Oceanology of the Polish Academy of Sciences	Poland
R. Rosenau	Technische Universität Dresden	Germany

Rapid Arctic Transitions related to Infrastructure and Climate Change (RATIC) Workshop at the Arctic Change Conference

Ottawa, December 2014

NAME	INSTITUTION	COUNTRY
B. Blair	University of Alaska Fairbanks	USA
A. Bobrik	Moscow State University	Russia
Y. Dvornikov	Earth Cryosphere Institute	Germany
O. Ogneva	Lomonosov Moscow State University	Russia
M. Verpaelst	University of Montreal	Canada

Culture and Arctic Climate Change: Integrating Long-Term Perspectives from Archaeology and the Environmental Sciences Session at the American Geophysical Union Fall Meeting (AGU)

San Francisco, December 2014

NAME	INSTITUTION	COUNTRY
M. M. Manninen	University of Helsinki	Finland

PHOTO: COURTESY OF PACIFIC NORTHWEST NATIONAL LABORATORY
An aerial photo showing open water and floating ice on ponds, lakes and river channels in the Sagavanirktok River Delta in Alaska's North Slope, USA. Scientists employed satellite technology to characterize the impacts of oil development activities on the environment.

PHOTO: JEAN-BAPTISTE STROBEL
Ornithologists are counting a Brünnich's guillemots' colony at Isfjorden, Svalbard.

9. Annex

» 9 Annex

Content

Annex 1

List of Acronyms and Abbreviations // Bulletin 2014

Acronym	Full name
A	
AACA	Adaptation Actions for a Changing Arctic
AC	Arctic Council
ACCESS	Arctic Climate Change Economy and Society
ACD	Arctic Coastal Dynamics
ACSNet	Arctic Climate System Network
ADAPT	Arctic Development and Adaptation to Permafrost
ADC	Arctic Data Committee
AFS	Arctic Freshwater System Synthesis
AGU	American Geophysical Union
AHDR	Arctic Human Development Report
AMAP	Arctic Monitoring and Assessment Programme
AOD	Aerosol Optical Depth
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
ARR	Arctic Resilience Report
ART	Arctic in Rapid Transition
ARCHES	Arctic Hydrology and Earth System Processes
ARCUS	Arctic Research Consortium of the US
ASSW	Arctic Science Summit Week
AWI	Alfred Wegener Institute for Polar and Marine Research
AWG	Atmosphere Working Group
C	
CAFF	Conservation of Arctic Flora and Fauna
CALE	Circum-Arctic Lithosphere Evolution
CHRN	Circumpolar Health Research Network
CliC	Climate and Cryosphere Project
CLIVAR	Climate Variability and Predictability Program
CON	Committee on Observations and Networks
CPC	Canadian Polar Commission
CWG	Cryosphere Working Group
D	
DBO	Distributed Biological Observatory
E	
EAI	Exo-Atmospheric lunar Irradiance

Acronym	Full name
ECS	Early Career Scientists
EGU	European Geophysical Union
EOC	Education, Outreach and Communication
EPB	European Polar Board
ESSAS	Ecosystem Studies of Sub-Arctic Seas
ESF	European Science Foundation
EUCOP	European Conference on Permafrost
FARO	Forum of Arctic Research Operators
GRISO	Greenland Ice Sheet-Ocean Interactions
GROCE	Greenland Ice Sheet / Ocean Interaction
IACS	International Association of Cryospheric Sciences
IAI	International Antarctic Institute
IARC	International Arctic Research Center
IASC	International Arctic Science Committee
IASSA	International Arctic Social Sciences Association
ICARP	International Conference on Arctic Research Planning
ICARPIII	3rd International Conference on Arctic Research Planning
ICASS	International Congress of Arctic Social Sciences
ICC	Inuit Circumpolar Council
ICES	International Council for the Exploration of the Sea
ICSU	International Council for Science
IGAC	International Global Atmospheric Chemistry
IGBP	International Geosphere-Biosphere Programme
IGY	International Geophysical Year
INTERACT	Intern. Network for Terrestrial Research and Monitoring in the Arctic
IOC	Intergovernmental Oceanographic Commission
IPA	International Permafrost Association
IPCC	Intergovernmental Panel on Climate Change
IPA	International Permafrost Association
IPPI	International Polar Partnership Initiative
IPS	Arctic Council Indigenous Peoples Secretariat
IPY	International Polar Year
ISAC	International Study of Arctic Change
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
KOPRI	Korea Polar Research Institute
LGGE	Laboratoire de Glaciology et Géophysique de L'environnement
LoA	Letter of Agreement

Acronym	Full name
MOSAiC	Multidisciplinary drifting Observatory for the Study of Arctic Climate
MWG	Marine Working Group
MoU	Memorandum of Understanding
NAG	Network on Arctic Glaciology
NERC	National Environment Research Council
NPI	Norwegian Polar Institute
NRC	National Research Council
NSF	National Science Foundation
NySMAC	Ny-Ålesund Science Managers Committee
PAG	Pacific Arctic Group
PAN	Polar Archeology Network
PAST Gateways	Palaeo-Arctic Spatial and Temporal Gateways
PEI	Polar Educators International
PYRN	Permafrost Young Researchers Network
RANNIS	Icelandic Center for Research
RATIC	Rapid Arctic Transitions due to Infrastructure and Climate Change
SAC	State of the Arctic Coast
SAI	Stefansson Arctic Institute
SAON	Sustaining Arctic Observing Networks
SCAR	Scientific Committee on Antarctic Research
SDWG	Sustainable Development Working Group
SEARCH	Study of Environmental Arctic Change
SEI	Stockholm Environment Institute
SG	Steering Group
SHWG	Social and Human Working Group
SRC	Stockholm Resilience Centre
SWIPA	Snow, Water, Ice and Permafrost in the Arctic
THAW	THermokarst Aquatic Ecosystem
THORPEX	The Observing System Research and Predictability Experiment
TRANSSIZ	Transitions in the Seasonal Sea Ice Zone
TWG	Terrestrial Working Group
UAF	University of Alaska Fairbanks
UArctic	University of the Arctic
WCRP	World Climate Research Programme
WG	Working Group
WMO	World Meteorological Organization

Annex 2:

Terms of Reference for IASC Networks

Networks are IASC-endorsed, thematic groups with a specific scientific mission enhanced by affiliation with IASC. IASC networks are international, address specific scientific issues on a circum-arctic scale and strive to involve early career scientists. IASC Networks do not have an annual budget from IASC, but they are entitled to apply for IASC workshop and early career scientist funding. Networks may be created by IASC or may apply for affiliation with IASC. Once accepted as IASC networks, they carry the IASC logo.

1 Endorsement and Review of Network Activities

1.1 IASC endorsement for Networks may be granted or withdrawn by decision of the IASC Executive Committee in consultation with the Steering Groups of the five IASC Working Groups.

1.2 Network activities will be reviewed by the Steering Groups of the five IASC Working Groups every three years.

2 The responsibilities of a Network are to:

2.1 Conduct a science-led international program;

2.2 Offer opportunities for planning and coordination;

2.3 Ensure the exchange and dissemination of information and data they produce;

2.4 Ensure interaction with related IASC Working Groups;

2.5 Initiate workshops and educational events;

2.6 Promote future generations of arctic scientists.

3 Membership of Networks

3.1 The membership shall be decided at the discretion of the Network. Members should be experts in the thematic field of the Network. Consideration should be given to a mix of gender and seniority.

4 Functioning

4.1 The Network will organize itself as appropriate to its mission and membership.

4.2 The Network may develop collaborative initiatives with other IASC groups and with other scientific groups outside of IASC.

4.3 The Network may organize IASC-sponsored workshops and apply for IASC workshop and early career scientist support.

4.4 Correspondence between the Network and IASC shall be through the IASC Secretariat.

4.5 The Network shall have access to IASC services provided by the Secretariat, including IASC conference call facilities, announcement through the IASC mailing list and website.

5 Reporting

5.1 The Network shall develop and maintain a web page linked to IASC's web site.

5.2 The Network shall maintain a record of publications and workshops.

5.3 The Network shall provide an end-of-year report to IASC for inclusion in the IASC Bulletin and, on occasion, contributions to the IASC Newsletter or other IASC outreach materials.

Annex 3:

IASC Partnership Agreements

Annex 3.1

Memorandum of Understanding (MoU) between the European Polar Board (EPB), the Scientific Committee on Antarctic Research (SCAR), and the International Arctic Science Committee (IASC)

1 The Parties

The Parties to this MoU are the European Polar Board (EPB), the International Arctic Science Committee (IASC), and the Scientific Committee on Antarctic Research (SCAR).

1.1 European Polar Board

The European Polar Board (EPB) has a mission to coordinate European Arctic and Antarctic research, optimize the use of European research infrastructures, foster multilateral collaboration between European national funding agencies, national polar institutes and research organizations and to represent polar issues within European research framework programmes. Bringing together 24 Members from national operators and research institutes in 17 countries and managing over 40 Polar Stations in the Arctic and Antarctica, the EPB plays a central role in the coordination and management of polar initiatives at a European level; it is the gateway to European Polar Institutions and Programmes. EPB creates and maintains strong links to European and international decision makers and funding agencies, in order to provide timely and relevant information on strategic scientific issues and forward-looking perspectives on polar research in a multitude of environmental domains. Furthermore, the EPB is actively liaising with major polar programmes outside Europe including those in the USA, Russia and Canada.

1.2 International Arctic Science Committee

The International Arctic Science Committee (IASC) is an International Scientific Associate of ICSU, and was established in 1990. IASC's mission is to initiate, develop and co-ordinate leading edge scientific research in the Arctic region, and on the role of the Arctic region in the Earth system. It also provides objective and independent scientific advice to the Arctic Council and other organizations on issues of science affecting the management of the Arctic region. The decision-making bodies of IASC are the Council and the Executive Committee. The day-to-day operations of IASC are supported by its Secretariat headed by the Executive Secretary. IASC's geographical remit covers the Arctic Ocean and the surrounding landmasses.

1.3 Scientific Committee on Antarctic Research

The Scientific Committee on Antarctic Research (SCAR) is an Interdisciplinary Body of ICSU. It was established in 1958 during the International Geophysical Year of 1957 -58. Its mission is to initiate, develop, and coordinate high quality international scientific research in the Antarctic region and on the role of the Antarctic region in the Earth system. In addition, it provides objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organizations on issues of science and conservation affecting the management of Antarctica, such as the UNFCCC and IPCC. SCAR's

remit covers Antarctica and the surrounding Southern 0cean including the Antarctic Circumpolar Current and subantarctic Islands.

2 Rationale for the MoU

The Parties to the MoU share 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 EPB members, and to define the corresponding terms and conditions for a joint effort in developing international programmes and initiatives based on scientific priorities, scientific excellence and use of European Antarctic and Arctic infrastructures for scientific and technological purposes.

The Parties recognize their common interest to increase cooperation between IASC, SCAR and the entities managing the European polar infrastructures, taking advantage of the complementarities of the three signatory organizations. EPB, through its member organizations, provides the "European dimension" with a bi-polar approach, with a remit that covers terrestrial and marine infrastructure and the capacity to involve national agencies (scientific or funding agencies) in Europe. Through its 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.

3 Terms of Agreement

This MoU identifies the following commitments:

a. The signatory parties recognize each other as key organisations for European (EPB), Arctic (IASC) and Antarctic (SCAR) Polar research.

b. The EPB will contribute to the identification and facilitate the implementation at the European level of those priority scientific topics identified by SCAR (in the South) and IASC (in the North) that are particularly relevant at the European level.

c. The EPB will support the priorities identified by SCAR and IASC by development of joint scientific programmes, in optimized use of European research infrastructures and in representation of polar issues within European research framework programmes.

In particular:

i. Developing a transatlantic, alliance with USA and Canada, including the settlement of distributed marine and terrestrial observatories

ii. Improving cooperation with relevant non-European countries involved in Polar research

iii. Coordinating the European partnership to SOOS, SAON and other 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 IASC and SCAR activities, as well help in the access and use of some infrastructures of the EPB Members, recognising 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.

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 meetings and activities of the other Parties.

4 Financial implications of the Agreement

Parties to this Agreement will continue to be responsible for the costs of their own activities, but this does not preclude one party meeting or contributing to the occasional or on-going costs of another if they so wish.

5 Duration, Revision and Termination of this MoU

This MoU remains in force for 5 years, at which time it will be reviewed for possible extension.. The MoU may be revised at any time by mutual agreement between the Parties. Any of the parties may propose alterations to the MoU. Parties wishing to withdraw from this agreement should do so by a formal letter signed by the President and head organizational manager (i.e. Executive Secretary or Director) of their respective organization.

Signed, 7 April 2014
Harald Loeng I Chairman, EPB
David Hik I President, IASC
Jerónimo López-Martínez I President, SCAR

Annex 3.2

Renewed Memorandum of Understanding (MoU) between the International Permafrost Association (IPA), the Scientific Committee on Antarctic Research (SCAR), and the International Arctic Science Committee (IASC)

Preamble

Recognizing that there is much to be gained from developing a synergy in permafrost research, in March 2009 the International Permafrost Association (IPA), the International Arctic Science Committee (IASC), and the Scientific Committee on Antarctic Research (SCAR) formalized their relationship in a tripartite agreement.

With the present Memorandum of Understanding IPA, IASC and SCAR agree to continue this partnership, taking into account the development of the three organizations during the last five years.

1 The Parties

1.1 International Permafrost Association

The International Permafrost Association (IPA), founded in 1983, has as its objectives to foster the dissemination of knowledge concerning permafrost and to promote cooperation among persons and national or international organizations engaged in scientific investigation and engineering work related to permafrost and seasonally frozen ground. The Association's primary responsibilities are to convene International Permafrost Conferences, undertake special projects such as preparing databases, maps, bibliographies, and glossaries, and coordinate international field programs and networks. Membership is through adhering national organizations or as individual members. The IPA is governed by an Executive Committee and a Council. The day-to-day operations of IPA are supported by

its International Secretariat headed by the Executive Director.

1.2 International Arctic Science Committee

The International Arctic Science Committee (IASC) is an International Scientific Associate of ICSU, and was established in 1990. IASC's main aim is to initiate, develop, and co-ordinate leading edge scientific activity in the Arctic region, and on the role of the Arctic region in the Earth system. It also provides objective and independent scientific advice to the Arctic Council and other organizations on issues of science affecting the management of the Arctic region. The decision-making organs of IASC are the Council and the Executive Committee. The day-to-day operations of IASC are supported by its Secretariat headed by the Executive Secretary. IASC's geographical remit covers the Arctic Ocean and the surrounding landmasses.

1.3 Scientific Committee on Antarctic Research

The Scientific Committee on Antarctic Research (SCAR) is an Interdisciplinary Body of ICSU. It was established in February 1958 to continue the international coordination of Antarctic scientific activities that had begun during the ICSU-led International Geophysical Year of 1957- 58. Its main aim is to initiate, develop, and coordinate high quality international scientific research in the Antarctic region, and on the role of the Antarctic region in the Earth system. In addition it provides objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organizations on issues of science and conservation affecting the management of Antarctica. The decision-making organs of SCAR are the Meeting of Delegates and the Executive Committee. The day-to-day operations of SCAR are supported by its Secretariat headed by the Executive Director. SCAR's remit covers Antarctica, the surrounding offshore islands, and the Southern Ocean including the Antarctic Circumpolar Current.

2 Rationale for the MoU

The Parties share common goals of working internationally and across disciplines to increase our understanding of permafrost and Earth's polar regions and their connections to the global system. There are strong grounds for a closer linkage between these three bodies to bring benefits to all parties, not least in an exchange of views and experience on important scientific topics.

The three organisations have agreed that the tripartite link between them should be continued by means of this Memorandum of Understanding, which will be signed during the IASC Council Meeting at the Arctic Science Summit Week in Helsinki, Finland, on 7 April 2014.

The three organisations share a number of common interests and practices, which will make it relatively easy for them to work together, for example in arranging workshops, conferences, and reports on topics of mutual scientific interest, in developing integrated plans for permafrost and polar research as well as the linkages between the inner aspects of polar research, and in providing advice to policy makers.

3 Terms of Agreement

This MoU identifies a joint commitment to the excellence in the field of permafrost and polar research, to the pursuit of scientific advances, public awareness and advice to policy makers as well as professional development of young researchers.

SCAR, IASC and IPA intend to combine their efforts in permafrost and/or polar activities (to be decided by mutual agreement) so as to raise the level of impact of all three organizations. To facilitate the process, SCAR, IASC and IPA agree:

i. to invite each other to attend the meetings of their major bodies (SCAR Delegates' Meeting, IASC Council and IPA Council);

ii. to encourage representation of each organization in their relevant working committees;

iii. to encourage appropriate linkages between the relevant existing SCAR, IASC and IPA science projects and to develop joint projects and approaches in appropriate fields;

iv. to work together in arranging workshops, conferences, and reports on topics of common scientific interest;

v. to exchange ideas on best practices in data and information management; and to foster involvement of the parties in their respective data management committees;

vi. to foster and promote integration of observing efforts lead by each organization (SCAR Pan-Antarctic Observing System, IASC Sustaining Arctic Observing Networks, IPA Global Terrestrial Network for Permafrost) by ensuring adequate representation of each party in these entities;

vii. to exchange members updates, newsletters, publications and advertise each other's newsletters, publications and web sites on their own web sites;

viii. to develop a combined approach to communicating the relevance of permafrost and polar research to societal issues with the wider community, including providing advice to political entities such as the Arctic Council and Antarctic Treaty bodies; and

ix. to work together through their respective young researcher organizations to encourage involvement of young researchers to participate in participating in business, strategy, planning, and other meetings and activities.

4 Financial Implications of the Agreement

Parties to this Agreement will continue to be responsible for the costs of their own activities, but this does not preclude one party meeting or contributing to the occasional or ongoing costs of another if they so wish.

Actual financial contributions to the activities and other implications of this MoU will be considered and agreed to by representatives of the Parties as they arise, and may be changed in accordance with the Parties requirements without any effect on the substance of this Agreement.

5 Non-binding Implications of the Agreement

This agreement is between IPA, IASC, and SCAR. It does not preclude the Parties agreeing to other MoUs with other programs and organizations, or bilaterally between the Parties.

6 Duration, Revision and Termination of this MoU

This MoU remains in force for 5 years, at which time it will be reviewed for possible extension. No action by any of the parties will result in the cancellation of this MoU. The MoU may be revised at any time by mutual agreement between the Parties. Any of the parties may propose alterations to the MoU. Parties wishing to withdraw from this agreement should do so by a formal letter signed by the President and head organizational manager (i.e. Executive Secretary, Executive Director or Secretariat) of their respective organization.

Signed, 7 April 2014

Antoni G. Lewkowicz I President, IPA

David Hik I President, IASC

Jerónimo López-Martínez I President, SCAR

Annex 3.3

Renewed Letter of Agreement (LoA) between the Pacific Arctic Group (PAG) and the International Arctic Science Committee (IASC)

General Introduction

The IASC was founded in 1990 in the context of post-perestroika renewal of international Arctic cooperation. Initial members included the eight Arctic states - Canada, Denmark, Finland, Iceland, Norway, Russia (at that time Union of Soviet Socialist Republics), Sweden and the United States of America - USSR and several European and North American nations. Over time membership evolved and grew to accommodate the changing status of original member nations and the growing interests in Arctic science in many other nations, including several from Asia, who joined the IASC. To provide a focal point for discussion of science of particular interest to the new Asian members, and also to enhance discussion of Arctic science issues from a Pacific perspective, IASC agreed in 1999 to create the Pacific Arctic Group (PAG) as a subset of the IASC, with its own leadership and secretariat. In 2008, the IASC acknowledged that the PAG had developed sufficient strength that it could stand on its own as a separate organization, and the PAG members agreed. Yet the scientific interests of PAG and IASC retain much in common, and it is in the interests of both groups to maintain strong coordination and collaboration. A Letter of Agreement that set forth the rationale and objectives for continued strong interaction between the two groups was signed in 2009.

With the present Letter of Agreement, PAG and IASC agree to continue their partnership, taking into account the development of the two organizations during the last five years.

PAG

Introduction

The Arctic marine environment is of significant scientific concern to the nations on the Pacific side of the Arctic. PAG is currently focused on sea ice, atmosphere, ocean and Arctic observing topics, with overall themes ranging from climate, contaminants, human dimensions and structure and function of Arctic ecosystems.

Definition of the Pacific Arctic Region

The Pacific Arctic Region is loosely defined as the area lying between Russia and Alaska (Bering Strait) and extending northward including the Beaufort Gyre and Arctic Ocean and southward including the Bering Sea. The area also includes seasonally ice-covered seas. PAG activities may extend beyond these boundaries based on project objectives.

PAG Objectives

The PAG has four basic objectives: 1) To facilitate and coordinate science operations among PAG member countries; 2) To promote and facilitate data accessibility and integrated data bases for the region; 3) To serve as a forum for information exchange on Pacific Arctic Region (PAR) science programs; and 4) To establish and maintain a direct link between PAG and other relevant science organizations.

PAG General Membership

The PAG general membership consists of at least one member from each country or institution represented by the PAG area of interest. The membership consists of both Scientists and Program Managers and should reflect an appropriate balance between the principal PAG science themes.

PAG Chair and Executive Committee

The PAG Executive Committee consists of a Chair, 2 Vice Chairs, and the leads of the core science projects within the organization that serve as a resource to provide scientific support for consensus and assist in promoting approved PAG projects. As members rotate off the committee, nominations for membership to the Executive Committee are evaluated by the Committee and PAG general membership. In addition, the Executive Committee may, from time to time, strike an "ad hoc" committee to deal with a specific issue.

PAG Secretariat

The functions of the PAG are supported by a small Secretariat, the location of which will rotate among member countries. The Secretariat will be directed by the Executive Committee and work closely with the leads of the project groups as appropriate.

IASC

IASC was established in 1990, began operations in 1991 and today comprises 21 member countries. The IASC member organizations are national science organizations covering all fields of Arctic research. Each national member organization has a mechanism to provide ongoing contact between its IASC council member and its Arctic science community.

IASC draws on its structure to identify scientific priorities, members of working groups, etc. An international science program planned or recommended by IASC should be of high priority to Arctic or global science. The organizational needs of IASC are served by the IASC Secretariat currently located in Potsdam, Germany. IASC is an international associate of the International Council for Science (ICSU) and an observer in the Arctic Council. IASC also has connections to numerous international Arctic organizations. Representatives of national scientific organizations from all 21 member countries form the IASC Council. Council usually meets once a year during the Arctic Science Summit Week (ASSW). The President of IASC is elected by Council, who also elects 4 Vice-Presidents to serve on the Executive Committee, which operates as a board of directors and manages the activities of IASC between Council meetings. The Chair is the President of IASC.

IASC is engaged in all fields of Arctic research. Its main scientific working bodies are five Working Groups (WGs): Atmosphere, Cryosphere, Marine, Social & Human and Terrestrial. The main 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. The members are experts in their field, with an international reputation and from different scientific disciplines so that the full range of Arctic research is represented in the WGs. Though the WGs are disciplinary, they also work together to address cross-cutting and broadly interdisciplinary research activities.

Common Interests

During its brief history, the PAG has demonstrated a strong interest in science related to the Arctic Ocean and its peripheral seas, including physics of the ocean and sea ice, ecology and biogeochemistry, geology, and environmental modeling. The IASC has demonstrated its strong interest in these areas by establishing a Marine Working Group which inherited the function of the former Arctic Ocean Sciences Board (AOSB) after the merger with IASC.

Declaration of Intent

Recognizing the large area of common interests, the PAG and the IASC intend to work together to advance scientific knowledge in mutually agreed areas, to jointly support education and outreach efforts, and to jointly provide advice to policy- and decision-makers who require scientific information as the basis for their actions. By working closely together, the IASC and the PAG can avoid costly duplication of efforts, and identify opportunities for sharing to reduce costs on each individually.

This Letter of Agreement does not alter the terms of reference or organizational structure of either group and carries no financial implication.

To facilitate coordination and collaboration, the PAG and the IASC agree in particular:

- To consult each other regularly regarding science interests and priorities and to develop collaborative or synergistic efforts whenever appropriate;
- To involve the PAG in the preparation and participation of the annual ASSW;
- To invite each other to meetings, including the IASC Marine Working Group; and
- To link each other's web sites.

This Letter of Agreement remains in force for 5 years, at which time it will be reviewed for possible extension. It may be revised at any time by mutual agreement between the Parties. Any of the parties may propose alterations to the Letter of Agreement.

Signed, 7 April 2014
Jacqueline M. Grebmeier I Chair, PAG
David Hik I President, IASC

Annex 4:

IASC Fellowship Program

Promoting and involving the next generation of scientists working in the Arctic is of major importance for IASC towards achieving its mission of encouraging and facilitating cooperation in all aspects of Arctic research, in all countries engaged in Arctic research and in all areas of the Arctic region. The IASC Fellowship Program is a mechanism to engage Early Career Scientists (ECS) in the work of the IASC Working Groups (WGs). The five WGs (Atmosphere, Cryosphere, Marine, Social & Human and Terrestrial) are IASC´s scientific core elements and their main function is to encourage and support science-led international programs by offering opportunities for planning and coordination, and by facilitating communication and access to facilities.

The Program

IASC Fellows are doctoral or postdoctoral (up to 5 years after completion of PhD) researchers who actively participate in selected activities of the IASC WGs. IASC Fellows are expected to scientifically contribute but also to help organizing specific activities, including reporting to the IASC Secretariat. Thus, the Fellowship program provides the opportunity for ECSs to become involved in leading-edge scientific activities at a circumarctic and international level, to build an international network of contacts and also to develop management skills. IASC supports one Fellow per WG for a period of one year, from one Arctic Science Summit Week (ASSW) to the next. The coordinator of IASC´s mechanisms to promote Early Career Scientists is overseeing the program.

Selection Process

The selection process is managed by the IASC coordinator and conducted in close cooperation with the Association of Polar Early Career Scientists (APECS). A call for applications is released each year in October through the IASC and APECS mailing lists, websites and Facebook. Any doctoral or postdoctoral researcher from IASC member countries can apply. The required qualifications include demonstrated scientific interest and skills within a field that is relevant to the respective WGs and good command of English. The selection process will be coordinated with the APECS Secretariat, in consultation with the WG Steering Groups.

IASC Support

The annual meetings of the IASC WGs are held at the ASSW. To enable the participation in two consecutive WG meetings, IASC Fellows receive travel support to attend two ASSWs, so that at each WG meeting there is one outgoing and one incoming IASC Fellow. Additionally, IASC Fellows can receive travel funding to participate in selected workshops or other meetings of the WG, provided that they facilitate the meeting and follow-up activities, including reporting.

IASC Fellows will be introduced on the IASC website and will receive appropriate certificates confirming their positions.