Arctic Science Summit Week 2021
19-26 March | Online, Portugal

Arctic Science Summit Week 2021

19-26 March | Online, Portugal

Theme H: Observing the Arctic

Detailed session program

ID:13 - Advancing SAON's Roadmap etc. through Regional and Global capabilities

Observing the Arctic

24 March 2021 | 10:30 - 11:30 GMT | Room H

Conveners:
Sandy Starkweather | SAON Chair, NOAA, USA
Jan Rene Larsen | SAON Secretariat

A changing Arctic in recent decades, sustained observations of Arctic environmental and socio-economic systems have revealed a pace, magnitude, and extent of change that is unprecedented by many measures. These changes include rapid depletion of the cryosphere, shifts in ecological structures and increasing challenges to food security and resilience across northern communities.
The Sustaining Arctic Observing Networks (SAON) SAON is a joint initiative of the Arctic Council and the International Arctic Science Committee (IASC). It was created to strengthen multinational engagement in and coordination of pan-Arctic observing. SAON's intent is to unite Arctic and non-Arctic countries and Indigenous Peoples in support of a systematic network of activities through structured facilitation.
A Roadmap for Arctic Observing and Data Systems (ROADS) In its recent strategic plan, SAON identified the need for a Roadmap for Arctic Observing and Data Systems (ROADS) to set a course for the needed system and to specify how the various partners and players are going to collectively work towards getting it there. The purpose of ROADS is to stimulate multinational resource mobilization around specific plans with clear value propositions, to serve as a tool for the joint utilization of Indigenous Knowledge and science, to coordinate engagement and to ensure that maximal benefits are delivered.
Continuing multinational coordination through SAON was endorsed by the Second Arctic Science Ministerial in their Joint Statement with an emphasis on: "moving from the design to the deployment phase of an integrated Arctic observing system".
Advancing SAON's Roadmap etc. through Regional and Global capabilities the session will present speakers from Regional and Global observing initiatives. It will be a forum for a dialogue with these on how they can strengthen their activities in the Arctic and still meet local needs for observing.

24 March 2021 | 10:30 - 11:30 GMT | Room H | Oral Presentations

Time	Title	Presenting author
10:30	Introduction by the conveners	
10:35	Sustaining Arctic Observing Networks' (SAON) Roadmap for Arctic Observing and Data Systems (ROADS)	Sandy Starkweather
10:50	Framework for key Arctic sustainability monitoring and key variables identification	Tatiana Vlasova
11:05	Greenland Integrated Observing System (GIOS)	Lise Lotte Sørensen

ID:73 - Pollution of the Arctic Environment

Observing the Arctic

24 March 2021 | 11:30 - 12:30 GMT | Room H

Conveners:
Sergey GROMOV (Dr.) | Yu.A.Izrael Institute of Global Climate and Ecology (IGCE)
Alisa Trifonova-Yakovleva (Ms.) | Institute of Geography, Russian Academy of Sciences

Environmental pollution in Arctic region is one of the hot topics of scientific researches and policy-relevant actions in countries and throughout of northern hemisphere. Scientific community and international organizations discussed widely the vast scope of problems on regional pollution and its relations to climate change for many years. Since early 1980's the number of symposia, conferences and other scientific forums were held to discuss many important relevant themes such as investigation of pollutant threats and scales of their dispersion, identification of atmospheric emission source areas, outcomes of the experimental observation campaigns, a role of atmospheric transport onto Arctic air quality, inflow of accumulating toxics with river waters and many others.

The research activities and rising awareness on pollution impact on such sensitive nature under severe climate were promoted under the umbrella of international research programs (like AMAP and EMEP) and circumpolar intergovernmental cooperation (IASC, Arctic Council), as well as realized at scientific observation facilities.

After some successful achievements supported by efforts of many Arctic countries and their surrounds reached on atmospheric emission mitigation the warning appeal on chemical pollution within Arctic Circle had turned pale, and climate change issues got a bigger headline of public interests. However, the environmental pollution in many areas throughout Arctic became a re-new challenge due to the growth of technical armament, Arctic exploration programs being implemented in some countries as well as the potential of transport and industrial development in coastal zone and along the Northern Sea Route. Atmospheric emissions, sewage (sludge) of treatment waters and wastes could be a reason of increasing pollution in environmental media and threatening sensitive ecosystems. Transboundary atmospheric transport from lower latitudes brings also the pollutants with dual effects (such as black carbon, short-lived climate substances) in Arctic areas, both on ecosystem health and climate changes. The session will consider and discuss the general themes and particular topics related to current state of pollutant levels in air and precipitation, snow cover, surface water and other environmental objects based on regular monitoring of pollution, field campaigns, outcome of research studies and other measurement research programs. Global-wide results of satellite remote sensing could also be presented with focus to Arctic areas and surrounds as well as regions affecting arctic environment pollution with help of long range atmospheric transport. New outcomes of research on inter-latitude transport of pollutants into Arctic would be presented based on modeling or statistical analysis of contaminant pathways from surround areas and countries far out. The results on quantitative and specific (emission profile markers, element ratios) evaluations of anthropogenic source impacts are expected also to be presented based on the data of field campaigns. The problems of monitoring networks will be discussed with a view on new activities and exploration programs in Arctic. Information on session aims and topics will be disseminated to the research institutes in Europe, Russia and over Asia as well as to coordination centers of international programs and research initiatives (EMEP, AMAP, ACTRIS, EGU, etc.).

24 March 2021 | 11:30 - 12:30 GMT | Room H | Oral Presentations

Time	Title	Presenting author
11:20	Introduction by the conveners	
11:25	Black carbon and methane emissions from maritime transport in Russian arctic zone in 2018	Vladislav Lytov
11:40	Distribution, sources and risk assessment of PCBs and PAHs in the seawater of Arctic fjords (Hornsund, Kongsfjorden and Adventfjorden).	Anna Pouch
11:55	Monitoring mercury distribution at the Arctic and sub-Arctic Atlantic scale with the use of Arctic seabirds as bioindicators	Céline Albert
12:10	Open discussion on orals and posters	

E-Posters (ID:13) | View in the conference platform and discussion in the session

	Title	Presenting author
	A decade of contribution to the Greenland Ice Sheet Monitoring Network (GLISN)	Masaki Kanao
	Apps for the Who, What, Where, and When of U.S. Arctic Science and Observing: ARMAP & AOV	Craig E. Tweedie
	KEPLER: Improving the capacity of Copernicus for the Polar Regions	Nick Hughes

E-Posters (ID:73) | View in the conference platform and discussion in the session

	Title	Presenting author
	Atmospheric aerosol carbon isotope composition of 2018-2020 arctic expeditions	Kalashnikova Daria
	Input of terrestrial organic matter linked to deglaciation increased mercury transport to the Svalbard fjords	Haryun Kim
	Local and regional variability in snow concentrations of chosen POPs in Svalbard: lessons learned on field sampling protocols	Filip Pawlak
	Microplastic Pollution in Arctic Water: Evidence from Kongsfjord, Ny-Ålesund	E.V. Ramasamy
	Polymer Type Identification of Marine Plastic Litter in Arctic seas Using a Miniature Near-Infrared Spectrometer (MicroNIR)	Zhdanov Igor

ID:17 - The International Synoptic Arctic Survey (SAS) Activities

Observing the Arctic

25 March 2021 | 18:00 - 20:00 GMT | Room G

Conveners:
Jacqueline M. Grebmeier | University of Maryland Center for Environmental Sciences, Chesapeake Biological Laboratory, Solomons, Maryland, USA
Oyvind Paasche | Bjerknes Centre for Climate Research and NORCE Climate, Bergen, Norway
Christina Goethel | University of Maryland Center for Environmental Sciences, Chesapeake Biological Laboratory, Solomons, Maryland, USA

The Central Arctic Ocean remains profoundly understudied, particularly carbon cycling, ecosystem alteration, and associated changes in atmosphere, ice and ocean physics that influence those biological and biogeochemical systems. The region is expected to continue to make marked changes over the next decades, driven by ongoing climate warming, yet our understanding of key process is limited for this area. The international Synoptic Arctic Survey (SAS) seeks to quantify the present states of the physical, biological, and biogeochemical systems of the Arctic Ocean. Multiple countries have both confirmed and pending cruises as part of the 2020/2021 SAS networked activities. Key goals of the SAS are to establish the present state of the Arctic system, to document temporal changes where possible through comparison with historical data, and to quantify linkages between the adjacent shelves, slopes, and deep basins, objectives that are shared with the broader Pan-Arctic effort of the composite SAS. The SAS consists of regional shelf-to-basin ship-based surveys in 2020 and 2021 to obtain a Pan-Arctic understanding of essential ocean variables (EOVs) on a quasi-synoptic, spatially distributed basis in which no single nation bears the full burden of collecting the requisite data. The multi-country field effort will provide a strong basis for educational opportunities for early career scientists. This SAS session will outline the benchmark and important legacy for SAS activities to future, quasi-decadal assessments of rapid and evolving Arctic Ocean system change. Updates on the 2020 SAS field program results and upcoming national plans for 2021 activities will be provided during the session.

25 March 2021 | 18:00 - 20:00 GMT | Room G | Oral Presentations

Time	Title	Presenting author
18:00	Introduction by the conveners	
18:05	Preliminary results of the R/V Mirai Arctic Ocean cruise in 2020	Shigeto Nishino
18:20	Understanding the behavior of water masses in the Chukchi Borderland from the observation and reanalysis data	Kyoung-Ho Cho
18:35	The Swedish SAS-Oden expedition in 2021	Pauline Snoeijs-Leijonmalm
18:50	Norwegian contributions to the Synoptic Arctic Survey on the RV Kronprins Haakon in 2021	Mats A. Granskog
19:05	Taking the Pulse of the Arctic Ocean System, from the Shelves to the Pole – A US Contribution to the International Synoptic Arctic Survey	Carin Ashjian
19:20	The multidisciplinary expedition “Open Ocean: Arctic Archipelagoes – 2019. Severnaya Zemlya” (O2A2-2019)	Maria V. Gavrilo
19:35	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

Time	Title	Presenting author
	Long term variability of Barrow Canyon fluxes and its impact on subsurface warming in the western Arctic Ocean	Motoyo Itoh
	Long-term variability of carbonate parameters of the surface and bottom layers of the Kara sea	Julia Pronina
	Observation Plan of the R/V MiraiArctic Ocean Cruise in 2021	Amane Fujiwara

ID:31 - Aerosol observations in the Arctic from ground-based and satellite systems during T-MOSAIC

Observing the Arctic

26 March 2021 | 15:30 - 17:30 GMT | Room H

Conveners:
Mauro Mazzola | National Research Council, Institute of Polar Sciences (Italy)
Carlos Toledano | Universidad de Valladolid, Grupo de Óptica Atmosférica (Valladolid, Spain)
Liviu Ivanescu | Université de Sherbrooke (Québec, Canada)

T-MOSAiC aims to coordinate with other Arctic programs (e.g., Year of Polar Prediction) to utilize resources from a network of observatories and suite of satellites. In the context of aerosol studies, in situ and remotely sensed data, including aerosol optical depth from Sun, Star and Moon photometers and profiling using lasers, are required to evaluate their impact on climate. Using these data in conjunction with chemical transport and climate models, aerosol radiative forcing can be assessed. The session emphasizes the need for such coordination, with a focus on how the Polar-AOD community can contribute to ongoing research related to atmospheric composition, including polar-night monitoring techniques, validation of satellite retrievals and transport models, and provides a forum for such a coordination in relation to 2019-2020 aerosol measurements in the Arctic and sub-Arctic. We will seek input from other groups and stake holders as to how to coordinate activities going forward.

26 March 2021 | 15:30 - 17:30 GMT | Room H | Oral Presentations

Time	Title	Presenting author
15:30	Introduction by the conveners	
15:35	Advances in Polar night AOD retrieval	Mauro Mazzola
15:50	Long range transported aerosol events over Ny-Ålesund (Svalbard) in 2020 observed with Sun-sky-Moon photometry	Sara Herrero
16:05	Aerosol properties derived by Lidar and star photometer at Ny-Ålesund during the winter 2019 / 20	Christoph Ritter
16:20	Monitoring of long-range transported smoke in polar regions with remote sensing instruments	Ramiro González
16:35	Preliminary results on the third lunar/stellar AOD intercomparison campaign at Lindenberg's MOL-RAO Observatory	África Barreto
16:50	Analysis of gravity wave periodicities in starphotometry AOD data	Liviu Ivanescu
17:05	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

Sequence	Title	Presenting author
1	New methodology to calculate AOD from lunar photometer	R. Román
2	In situ eBC vertical profiles in the Arctic troposphere: a comprehensive analysis of 9 years (2011-2019) of tethered balloons experiments	David Cappelletti

ID:35 - Learning from Indigenous methodologies in collaborative Arctic science

Observing the Arctic

24 March 2021 | 16:30 - 18:30 GMT | Room H

Conveners:

Megan Sheremata | University of Toronto
Victoria Qutuuq Buschman | University of Washington
Stanislav Ksenofontov | Ammosov North-Eastern Federal University

Arctic Indigenous Peoples have called on scientists to revise research methodologies to reflect the importance of Indigenous perspectives of scientific research that takes place on their homelands and in their communities. There remains a persistent need for decolonizing and collaborative methodologies to supplant top-down approaches in Arctic research, and to discuss how natural scientists - who may be Indigenous scientists or allies - can learn from and apply Indigenous methodologies in research. This session will include presentations and a panel discussion on Indigenous methodologies in research involving the natural sciences, including approaches to building respectful and accountable research relationships at all stages of the research process. We invite Indigenous and non-Indigenous scholars, community researchers, local leaders, youth, knowledge-holders, and specialists from a variety of backgrounds, geographies, disciplines, and career stages. Limited funding will be available for presenters who are Indigenous community members and/or Indigenous scholars either leading or co-presenting in this session.

24 March 2021 | 16:30 - 18:30 GMT | Room H | Oral Presentations

Time	Title	Presenting author
16:30	Introduction by the conveners	
16:35	Forwarding Meaningful Indigenous Partnerships in Arctic Conservation	Victoria Qutuuq Buschman
16:50	Practicing from Indigeneity: Blending Indigenous and Science Methodologies	Margaret Anamaq Rudolf
17:05	Collaborative Research: Indigenous Methodologies in Arctic Sciences	Stanislav Ksenofontov
17:20	Towards a holistic evaluation of food security challenges: The work of the Indigenous Food Security Working Group	Food Security Working Group members
17:45	Multiple evidence base in practice: research outcomes and challenges. Presentation of preliminary findings from systematic review article	Maret J. Heatta
18:00	Building lasting research relationships	Megan Sheremata
18:15	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Qikiqtait: Progress on a Protected Area for the Belcher Islands Archipelago	Mick Appaqaq
	SIKU: The Indigenous Knowledge Social Network, a summary of progress a year since public launch	Candice Pedersen, Mick Appaqaq, Johnny Kudluarok, The Arctic Eider Society
	Reflections from Inuit and non-Indigenous researchers in practising decolonizing Arctic science	Katherine Wilson
	What does Food Sovereignty Have to do with understanding the Arctic?	Carolina Behe

ID:46 - Observing for Action: Outcomes of the 5th Arctic Observing Summit and Advances in Coordinated Observations

Observing the Arctic

24 March 2021 | 08:00 - 10:00 GMT | Room H

Conveners:
Maribeth S. Murray | Arctic Institute of North America, University of Calgary
Ravi D. Sankar | Arctic Institute of North America, University of Calgary
Peter Schlosser | Arizona State University

The Arctic Observing Summit (AOS) is a biennial event convened as part of the Sustaining Arctic Observing Networks (SAON) initiative – to guide the design, coordination, and long-term operation of an international network of observing systems that improves our understanding of and response to Arctic change. Arctic environmental change continues unabated. Sustained observations that enable us to track, understand, and project this change are essential. They are necessary to guide adaptation and mitigation responses from local to global scales. Recommendations from the AOS 2020 include, among others, that a pan-Arctic Observing System of Systems must be:

- Designed to reflect societal and scientific needs with design drawing on Essential and Shared Arctic Variables;
- Coordinated and where needed integrated with global observing systems;
- Relevant to people's lives, decision making, and policy;
- Supported with a networked, collaborative, interoperable digital system that is based on co-production and ethical data principles.

This session invites papers focused on any or all of these aspects of Arctic Observing with the goal of sharing and/or supplementing the work of the Summit and/or implementing these and other recommendations including the identification of Essential Arctic Variables using the SAON Roadmap for Arctic Observing and Data Systems. We also welcome papers that consider new and sustainable ways of supporting and expanding observing activities through collaboration with Indigenous People, creative and novel use of existing observational infrastructure and ways in which an observing system of system can be responsive to emerging issues. For example, the AOS 2020 was held as an online forum as a result of the circumstances introduced by Coronavirus disease 2019 (COVID-19). The pandemic highlights the need for an observing system that is responsive to arctic change as well as to unanticipated global events.

24 March 2021 | 08:00 - 10:00 GMT | Room H | Oral Presentations

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	Arctic Acoustic Environments – Federating observations and analyses with the International Quiet Ocean Experiment	Philippe Blondel
08:20	Harnessing the power of community science to address data gaps for Arctic observing: invasive species as case examples	Tobias Schwoerer
08:35	Marine mammal observing - analytical review of advanced technologies in monitoring and research of marine mammals and their feasibility for operations in the Arctic	Udovik Dmitry
08:50	Optimizing Arctic Observing Through Interoperable Information Sharing Across Networks	William Manley
09:05	Support of the SAON Roadmap for Arctic Observing and Data Systems as a key outcome of the Arctic Observing Summit 2020	Hajo Eicken
09:20	The long-term monitoring of bird population on Kolguev Island in the Barents Sea	Petr Glazov
09:35	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Arctic Risks and Resilience: Environment and human indicators as derived from DOPA and GHSL global products	Brigitte Koffi
	The Arctic Observing Summit - Emerging Challenges of co-ordinating pan-Arctic global observing activities.	Maribeth S. Murray

ID:60 - Integrating Arctic observing systems – results from the H2020 INTAROS project

Observing the Arctic

26 March 2021 | 08:00 - 10:00 GMT | Room G

Conveners:

Stein Sandven | Nansen Environmental and Remote Sensing Center
Alexandra Touzeau | University of Bergen
Roberta Pirazzini | Finnish Meteorological Institute

The INTAROS project is developing integrated observing systems in the Arctic, including improvement of data sharing and dissemination services (www.intaros.eu). INTAROS supports several systems providing data from ocean, atmosphere, cryosphere and terrestrial themes across the Arctic region. Ocean data are provided by bottom-mounted systems, ship surveys, Argo floats, ice platforms and Ferrybox systems. Terrestrial stations provide observations of meteorological, hydrological, and cryospheric variables, soil temperature and fluxes of climate gases. INTAROS also contributes to Community-Based Monitoring programmes, where data collected in local communities are provided and made available for users. A major challenge in Arctic data dissemination and data sharing is the heterogeneity and complexity in data collected in the difference scientific disciplines. INTAROS is therefore supporting work to build distributed and connected databases in agreement with the FAIR principles.

26 March 2021 | 08:00 - 10:00 GMT | Room G | Oral Presentations

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	Exploitation of existing observing systems	Roberta Pirazzini
08:20	Demonstrating applications of an Integrated Arctic Observing System towards selected, diverse stakeholder groups	Geir Ottersen
08:35	Enhancement of in situ observing systems in the Arctic	Agnieszka Beszczynska-Möller
08:50	Acoustic networks - in an Integrated Arctic Ocean Observing System	Hanne Sagen
09:05	Monitoring of an Arctic underwater soundscape (Kongsfjorden, Svalbard) and impact of shipping noise (INTAROS Project)	Gaëtan Richard
09:20	Communities and environmental monitoring	Finn Danielsen
09:35	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Actions towards maximizing dissemination and communication for an Integrated Arctic Observing System (INTAROS).	Ruth Higgins
	Building integrated Arctic observing systems from in situ platforms	Stein Sandven
	Data management in an integrated Arctic Observing System	Torill Hamre
	INTAROS Educational packages on terrestial and marine monitoring to enhance literacy of Arctic Observations and interest in scientific careers among secondary schools' students	Agata Goździk

ID:68 - Progress Towards Realizing Data Sharing for the Arctic Region and Beyond

Observing the Arctic

25 March 2021 | 11:30 - 13:30 GMT | Room G
25 March 2021 | 15:30 - 17:30 GMT | Room G

Conveners:
Peter L. Pulsifer | Carleton University, Ottawa, Canada
Kirsten Elger | GFZ German Research Centre for Geosciences, Potsdam, Germany
Mareike Wieczorek | Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Potsdam, Germany

Since the Fourth International Polar Year (2007-2009) the Polar Data Management Community has been collaborating to realize enhanced data management and long-term stewardship for the Arctic region. New human and technical resources and the recognition of the value of Indigenous data increase our abilities to discover, access, combine, and reuse the best data in an ethically open way for e.g. research, community well-being, and decision making. This session calls for papers on all aspects of data practice and theory. There is specific interest in papers reporting on initiatives that demonstrate FAIR data sharing and/or use of the CARE principles (https://www.gida-global.org/care) in particular: i) Community or Indigenous-driven projects; ii) Demonstrations from collaborative research initiatives (i.e. MOSAiC, T-MOSAiC, CCADI etc.); iii) Cutting edge methods, technology, policy or theory that address data challenges and interoperability in particular; iv) Results from early career researchers.

25 March 2021 | 11:30 - 13:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
11:30	Introduction by the conveners	
11:35	SIOS Data Management System for a regional observing system in and around Svalbard	Dariusz Ignatiuk
11:50	Shared Arctic Variable framework links global and Arctic observing system priorities and requirements	Polina Mikhaylyukova
12:05	The EMERGE Database: An interdisciplinary data management solution for ecosystems biology and environmental research	Suzanne B. Hodgkins
12:20	SIOS's response to COVID-19 and the strategy for future	Shridhar Jawak
12:35	Merged Observatory Data for Arctic Air Temperature (MODAAT): Under the hood of an interoperable system to mobilize automated weather station data	Etienne Godin
12:50	Streamlining disparate research data and analysis – The Ocean Acidification Use Case for the Canadian Consortium for Arctic Data Interoperability	Claire Herbert
13:05	Open discussion on orals and posters	

25 March 2021 | 15:30 - 17:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
15:30	Introduction by the conveners	
15:35	A new and simple protocol for data collection on permafrost thaw during the period of TMOSAiC (Terrestrial Multidisciplinary distributed Observatories for the Study of Arctic Connections)	Julia Boike
15:50	Building Globally Interoperable Data Infrastructure: contributions from the Arctic data community	Peter Pulsifer
16:05	Communication and Knowledge Transfer in the Canadian Consortium for Arctic Data Interoperability (CCADI)	Rebekah R. Ingram
16:20	Towards a collective vision for interoperable Canadian permafrost data management	Nick Brown
16:35	Analysis of Arctic Data Center Metadata using FAIR Principles Shows Increased Quality across Multiple Metrics	Christopher W. Beltz
16:50	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	ESA CCI Permafrost continues ESA GlobPermafrost product visualization and publication using GIS and WebGIS technology	Antonie Haas
	Progress of the Russian Arctic Vegetation Archive (AVA-RU)	Vitalii Zemlianskii
	QGreenland: Lessons from developing an open source Greenland GIS package	Twila Moon
	Two decades of mooring data across the Canadian Arctic available through the ArcticNet and Amundsen Science program	Tahiana Ratsimbazafy

ID:78 - The Distributed Biological Observatory: A Change Detection Array in the Arctic

Observing the Arctic

26 March 2021 | 11:30 - 13:30 GMT | Room G

Conveners:
Jacqueine M. Grebmeier | University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory, Solomons, Maryland, USA
Sue E. Moore | University of Washington, Seattle, Washington, USA
Chelsea Wegner Koch | University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory, Solomons, Maryland, USA

Variations in upper-ocean hydrography, light penetration, lower and upper trophic levels, pelagic-benthic coupling and carbon cycling are being evaluated through the Distributed Biological Observatory (DBO), which was initiated in 2010 in the Pacific Arctic. The DBO sampling approach emphasizes annual standardized sampling by an international suite of ships occupying agreed-to transect lines in order to measure the status and developing trends for the ecosystem. Continuous data are also obtained through mooring and satellite observations. The first decade of DBO sampling has revealed seasonal and interannual hydrographic changes are driving shifts in biological species composition and abundance, northward range expansions for some temperate species and negative impacts for some ice dependent species. This model of change detection is being expanded to other Arctic regions beyond the initial implementation in the Pacific Arctic. An Atlantic DBO is in development through coordination of ongoing international field activities in the Eurasian Arctic, and planning has started for an effort in Davis Strait/Baffin Bay. This session invites presentations on results related to ongoing and planned DBO activities in all Arctic regions.

26 March 2021 | 11:30 - 13:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
11:30	Introduction by the conveners	
11:35	Ecosystem Changes in the Pacific Arctic: Multi-Year Studies within the Distributed Biological Observatory	Jacqueline M. Grebmeier
11:50	Riverine and marine dissolved organic carbon in the Chukchi Sea	Jinyoung Jung
12:05	Seasonal and Interannual Variability of Nitrate in the Eastern Chukchi Sea: Transport and Winter Replenishment	Calvin W. Mordy
12:20	Late Season Observations of Productivity in the Northern Bering and Chukchi Seas: Initial Results from an October 2020 Research Cruise	Lee Cooper
12:35	Lingering Chukchi Sea sea ice and Chukchi Sea mean winds influence population age structure of euphausiids found in the bowhead whale feeding hotspot near Pt. Barrow, Alaska	Stephen Okkonen
12:50	Seasonal abundance, distribution, and growth of larval polar cod (Boreogadus saida) and saffron cod (Eleginus gracilis) in the US Arctic	Alison L. Deary
13:05	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Detecting wind-driven transport of planktonic biomass using moored acoustic instruments	Andrew Majewski
	Investigating water-column and sediment N2O cycling in the Western Arctic using stable isotopes	Annie Bourbonnais
	Multi-year ecosystem assessments of DBO 8: Physical drivers of benthic fishes, invertebrates and habitats in 2013, 2017-2019	Ashley Ehrman
	Ocean acidification in the Distributed Biological Observatory, 2017-2019	Jessica N. Cross
	Seasonal variations and effects of temperature on oxygen consumption rates within sediments and by dominant macrofauna in the Pacific Arctic	Christina L. Goethel

ID:85 - Use and Usability of Data and Information within Arctic Community-Driven Research

Observing the Arctic

26 March 2021 | 15:30 - 17:30 GMT | Room G

Conveners:

Noor Johnson | National Snow and Ice Data Center, University of Colorado Boulder
Finn Danielsen | Nordic Foundation for Development and Ecology
Roberta Glenn | University of Alaska Fairbanks
Lisbeth Iversen | Nansen Environment and Remote Sensing Centre

Responding to accelerating social and environmental change in the Arctic requires informed decision-making at the community scale that draws on both Indigenous knowledge and relevant and accessible research-based information. This session will address approaches to enhance and expand the use and usability of data and information within Arctic community-based research. Contributions will focus on efforts to advance Indigenous knowledge and data sovereignty, collaborative and user-driven research with Arctic communities, the development of community data management systems, and understanding Arctic community requirements for usable research. Lessons will be shared that highlight important considerations and strategies regarding technical approaches to community data stewardship, capacity building, development of user-tools, and evaluating the use and usability of research outputs. While this session will focus on information use at the community scale, we will also address the value, considerations, and opportunities for sharing community-based data and knowledge within regional to pan-Arctic observing networks.

26 March 2021 | 15:30 - 17:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
15:30	Introduction by the conveners	
15:35	A usability framework for community data management: Supporting knowledge mobilization through the Exchange for Local Observations and Knowledge of the Arctic (ELOKA)	Matthew Druckenmiller
15:50	Bridging Inuit knowledge and academic research to study a shifting marine ecosystem and Arctic Char fisheries in the Canadian High Arctic	Marianne C. Falardeau
16:05	Linking top down and bottom up initiatives and knowledge: Community-based monitoring and co-creation approaches for sustainable urban development in the Arctic	Lisbeth Iversen
16:20	The Coproduction of Unmanned Aircraft System Solutions in Support of U.S. Arctic Sustainability and Stewardship	Dr. Jessica Garron
16:35	Tracking changes in the coastal ecosystem of the Alaskan Arctic through a collaborative network of observers in coastal Indigenous communities	Roberta Glenn
16:50	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Connecting Top-Down and Bottom-Up Approaches in Environmental Observing: Lessons for the Arctic and a review of programs across the globe	Hajo Eicken
	Sharing observations of coastal Arctic Alaska in the Alaska Arctic Observatory and Knowledge Hub	Olivia Lee

ID:88 - Emerging technologies and their applications in the Arctic

Observing the Arctic

24 March 2021 | 10:30 - 12:30 GMT | Room G
24 March 2021 | 16:30 - 18:30 GMT | Room G
25 March 2021 | 11:30 - 13:30 GMT | Room H

Conveners:
Pavel Talalay | Polar Research Center, Jilin University, China
Elizabeth Bagshaw | School of Earth and Ocean Sciences, Cardiff University, UK
Claus Melvad | School of Engineering, Aarhus University, Denmark
Shridhar Jawak | Svalbard Integrated Arctic Earth Observing System (SIOS), Longyearbyen, Svalbard, Norway

Extremely harsh climate and polar geographical features, like sea ice, glaciers, permafrost, magnify operational and logistic problems in the Arctic and require unique engineering approaches. Submissions addressing the design, testing, and utilization of polar field techniques, equipment, facilities, vehicles, and instruments for research and use by local communities are invited. Themes to be investigated include: cold regions construction engineering; low-temperature materials development; alternative energy systems; innovations in ice coring and drilling technology in cold regions; ice and permafrost engineering; polar transport; and remote sensing techniques. Automated operations are one of the key areas for Arctic investigations. Thus, special focus of the session will be on autonomous profiling floats; under-ice gliders (AUV and ROV); deep-ocean rovers; automatic weather stations; unmanned aerial vehicles; robotic camera systems; in situ sensors and methods for collecting autonomous observations. In this inter-disciplinary session, we invite presentations that showcase how technologies have helped science and local communities in the Arctic.

24 March 2021 | 10:30 - 12:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
10:30	Introduction by the conveners	
10:35	Adapting the helicopter borne probe HELiPOD to the MOSAiC expedition – Technical challenges and system overview	Magnus Ole Asmussen
10:50	Autonomous measurements of an undisturbed epipelagic sound scattering layer at high latitudes	Muriel Dunn
11:05	Quantifying iceberg deterioration using UAV imagery and Structure from Motion photogrammetry software	Daniel F. Carlson
11:20	Topology and pressure distribution reconstruction of an englacial channel	Andreas Alexander
11:35	High spatial variability of aerosol particles observed with unmanned aerial systems at the coastal Arctic site Ny-Ålesund	Magnus Ole Asmussen
11:50	Development and Deployment of an Internet of Things (IoT) Network for Snow and Glacier Research in Svalbard	Simon Filhol
12:05	Open discussion on orals and posters	

24 March 2021 | 16:30 - 18:30 GMT | Room G | Oral Presentations

Time	Title	Presenting author
16:30	Introduction by the conveners	
16:35	ACUASI, the FAA Alaska Test site, and Arctic Operations	Peter William Webley
16:50	Deployment of UAS for Arctic Atmospheric Science	Gijs de Boer
17:05	Observing Cm-Scale Changes In Sea Ice Topography with Terrestrial Lidar	David Clemens-Sewall
17:20	The use of innovative pop-up floats to explore Arctic marine ecosystems	Sarah Donohoe
17:45	In situ exploration of ice microhabitats in deep glacial ice using Deep-UV fluorescence mapping	Michael Malaska
18:00	Optical Cryobots and Other Novel Methods for Deep Ice Penetration	William Stone
18:15	Open discussion on orals and posters	

25 March 2021 | 11:30 - 13:30 GMT | Room H | Oral Presentations

Time	Title	Presenting author
11:30	Introduction by the conveners	
11:35	BigRAID, a large diameter version of the BAS Rapid Access Isotope Drill	Chris Kerr
11:50	Recoverable autonomous sonde for subglacial lakes exploration: design and tests	China University of Geosciences
12:05	Subglacial bedrock drilling: recent experience and prospects in Arctic	Nan Zhang
12:20	TRIPLE-IceCraft - A Retrievable Melting Probe for Transporting Scientific Payloads	Dirk Heinen
12:35	Subglacial Sediment Sampling: Recent Experience and Ideas for the Future	Da Gong
12:50	Robotized inclinometer system for monitoring borehole deformation in ice and permafrost	Jialin Hong
13:05	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	Applications of Unmanned Vehicles in Svalbard	Richard Hann
	Arctic Vegetation Monitoring using Hyperspectral Remote Sensing under Glacier Environment and Global Climate Change	Keshav D Singh
	Hot water drill with near-bottom circulation: General concept and tests	Gaoli Zhao
	On-edge real-time classification of hazardous Arctic environments using small unmanned aircraft system and on-board deep learning systems	Peter William Webley
	Redevelopment of flexodrilling in Polar Regions	Bing Li
	Snow as construction material	Jialin Hong
	Unconventional ice drilling systems	Jilin University
	Vertical distribution and phenology of under-ice pelagic communities assessed with an ice-tethered observatory in Qikiqtarjuaq, Nunavut	Julek Chawarski

ID:91 - Arctic in Transition: Monitoring ecosystem change from the ground, air, and space

Observing the Arctic

24 March 2021 | 19:00 - 21:00 GMT | Room G
25 March 2021 | 08:00 - 10:00 GMT | Room G

Conveners:
Annett Bartsch | b.geos & Austrian Polar Research Institute
Sue Natali | Woods Hole Research Center
Ingmar Nitze | Alfred-Wegener-Institute for Polar and Marine Research
Jennifer Watts | Woods Hole Research Center

Climate change is causing far-reaching changes across the Arctic, including shifts in vegetation, permafrost, hydrology and disturbances regimes. In situ observations and local and Indigenous knowledge provide in-depth understanding of ecosystem change but can be spatially limited. Remote sensing offers an “eyes in the sky” approach, yet information from in situ networks and expert knowledge is necessary to interpret the satellite records. Integrating in situ and satellite data streams is key to detecting and understanding changing Arctic systems. Emerging remote sensing techniques and instrumentation, along with computational advances, have greatly expanded the spatio-temporal scales of remote observations, bridging the gap between point observations, landscape-scale remote sensing, and global-scale land surface models. This session will discuss approaches for characterizing Arctic landscape change, spanning scales of space and time. We specifically welcome examples of how information from remote sensing, in situ observations, and local and Indigenous knowledge can be integrated to better assess the impacts of Arctic ecosystem change.

24 March 2021 | 19:00 - 21:00 GMT | Room G | Oral Presentations

Time	Title	Presenting author
19:00	Introduction by the conveners	
19:05	Advancing global earth observations and science through NASA's Arctic Boreal Vulnerability Experiment	Scott Goetz
19:20	Examining Tundra Greening from Ground-based to Satellite Observations	Karl F. Huemmrich
19:35	Historic AVHRR-derived Burned Area for Siberia (1979 – 2000): Data and patterns of change	Amber Soja
19:50	Detecting and Mapping Gas Emission Craters on the Yamal and Gydan Peninsulas, Western Siberia	Greg Fiske
20:05	Ocean stratification and sea-ice cover in Arctic seas modulate sea-air methane flux: satellite evidence	Leonid Yurganov
20:20	Seismic detection of coastal sea ice stabilization	Alice Bradley
20:35	Open discussion on orals and posters	

25 March 2021 | 08:00 - 10:00 GMT | Room G | Oral Presentations

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	Performance of spectral vegetation indices to assess Arctic Browning	Murk.K.Memon
08:20	Monitoring changes in vegetation phenology at two contrasting Arctic tundra sites	Elise Gallois
08:35	Drones reveal sub-landscape insights about the 'greening of the Arctic'	Jeff Kerby
08:50	SiDroForest: Siberian Drone mapped Forest inventory	Femke van Geffen
09:05	Applicability of Sentinel-2 for Coloured Dissolved Organic Matter regimes in lakes of the Lena River Delta and central Yama	Birgit Heim
09:20	Persistence of turbid Freshwater Plumes in a High Arctic Fjord Ecosystem	Daniela Marianne Regina Walch
09:35	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	An archive for animal-borne sensor data supports ecological monitoring and collaboration across the Arctic	Sarah C. Davidson
	Appearing of desappeared	Anastasia Deyko
	Arctic change revealed by satellite - Data collections of ESA DUE GlobPermafrost and ESA CCI+ Permafrost	Annett Bartsch
	Deriving Canopy Heights of a Boreal Forest using NASA's IceSAT-2 Mission	Ravi Darwin Sankar
	Organization of monitoring of hazardous cryogenic processes in the Arctic	Vasily Tolmanov
	Recent impacts of climate change on the landforms and dynamics of Pingo Canadian Landmark (Northwest Territories, Canada): preliminary results	Daniel Batista
	Siberian High Latitude Lake Chemistry Data Collection	Birgit Heim
	The NorthSTAR field network: challenges in Arctic NDVI interpretation revealed by comparing field and satellite NDVI measurements	John A. Gamon
	Utilizing high resolution drone and satellite imagery to monitor changes in northern high latitude ecosystems	Hailey Webb

ID:101 - Sea, lake and river ice monitoring and modelling

Observing the Arctic

25 March 2021 | 18:00 - 20:00 GMT | Room H

Conveners:

Hyun-Cheol Kim | Korea Polar Research Institute
Seung Hee Kim | Korea Polar Research Institute
Shawn Marshall | University of Calgary and Environment and Climate Change Canada
Homa Kheyrollah Pour | Department of Geography & Environmental Studies, Cold Regions Research Centre, Wilfrid Laurier University, Ontario, Canada

25 March 2021 | 18:00 - 20:00 GMT | Room H | Oral Presentations

Time	Title	Presenting author
18:00	Introduction by the conveners	
18:05	First results of the L-band ARIEL radiometer measurement during the MOSAIC expedition	Carolina Gabarró
18:20	Fresh Eyes on Ice: Connecting Arctic Communities through a Revitalized and Modernized Freshwater Ice Observation Network	Chris Arp
18:35	Remote Sensing of Sea Ice on the MOSAiC Ice Floe	Gunnar Spreen
18:50	Sea ice type separability during melt conditions using C-band frequency compact-polarimetric synthetic aperture radar data	Aikaterini Tavri
19:05	Open discussion on orals and posters	

E-Posters | View in the conference platform and discussion in the session

	Title	Presenting author
	High Arctic lakes through the seasons: Under-ice limnology and instrument deployment to study the effect of ice phenology on freshwater biogeochemical dynamics	Yohanna Klanten
	Observing sea ice using scatterometers onboard MetOp/ASCATs series and CFOSAT scatterometer data	Ifremer