

ASSW2027 ISAR-9 Call for Abstracts

The Call for Abstracts for oral and poster presentations is now open. **The deadline of abstract submission will be October 16, 2026.** The science symposium organizers invite you to submit abstracts for consideration. The symposium will consist of 12 Regular Sessions and 41 Special Sessions. Abstracts must be submitted via the symposium website*. During submission, you may indicate up to two preferred sessions. Please prepare your abstract using the template available for download from the symposium archive (https://confit-sfs.atlas.jp/customer/isar9/abstract/Abstract_template_ISAR9.docx).

Each presenting author may submit a maximum of two abstracts; however, different sessions must be selected for the two abstracts. Session conveners are also eligible to submit their own abstracts to their respective sessions. Abstracts will be reviewed by the session conveners based on scientific relevance, quality, and suitability for the selected session. The final decision on acceptance and the presentation format (oral or poster) will be made by the session conveners. Authors will be notified of the acceptance decision, assigned session, and presentation format by early December.

All abstracts accepted for the symposium will be available only for participants on the symposium website*. Presentation titles and author information will also be included in the symposium program. A co-author may present on behalf of the first author. Outstanding presentations by Early Career Researchers who nominate via the submission process will be recognized through the "Presentation Awards". Early Career Researchers are defined as persons within five years after receiving their final degree (e.g., PhD), as well as the graduate/undergraduate students, as of March 1, 2027.

No abstract submission fee is charged; however, submission of an abstract does not constitute symposium registration. All participants must complete the symposium registration process with the required payment by the "Early-bird" deadline (will be early February) via the ASSW2027 website (<https://www.assw.info/registration>). Failure to complete registration with payment by this deadline will result in withdrawal of the abstract from the final program.

*<https://isar.confit.atlas.jp/en>

Important Dates

September 1, 2026: Opening of Abstract Submission

October 16, 2026: Deadline of Abstract Submission

Early December, 2026: Notification of Acceptance or Rejection

Early February, 2027: Early-bird Deadline of Registration

March, 2027: Regular Deadline of Registration

April 17–20, 2027: Oral Sessions

April 17–18, 2027: Poster Sessions



ASSW2027 ISAR-9 Session List

(last update : Aug. 30, 2026)

--- Session Title ---

Regular Session

R1: Atmosphere

R2: Ocean and Sea Ice

R3: Rivers, Lakes, Permafrost, and Snow Cover

R4: Ice Sheets, Glaciers, and Ice Cores

R5: Terrestrial Ecosystems

R6: Marine Ecosystems

R7: Geospace

R8: Governance, Security, Law, and Economy

R9: Culture, Indigenous Knowledge, and Co-production

R10: Engineering for Sustainable Development

R11: Education, Outreach, and Science Communication

R12: Geology and Geophysics

Special Session

S1: Arctic-Midlatitude Linkages and Atmosphere-Ocean-Sea Ice-Land Interactions: Impacts on Atmospheric Circulation, the Hydrological Cycle, and Extreme Events

S2: Stratospheric Modulation of Polar Ice Dynamics: Observations, Processes, and Future Projections

S3: Atmospheric Aerosols and Gases and the Arctic Changes: New Understanding, Capabilities, and Challenges

S4: Advancing Sea Ice Research and Prediction through AI, Observations, Modeling, and Process Understanding

S5: Sea Ice and Snow Properties and Dynamics: Bridging Remote Sensing, Field Observations, and Process/Climate/Earth System Models in the Arctic

S6: Environmentally Friendly Development of the Arctic Ocean - Observations and Modeling of the Ice-covered Sea and Ice-breaker

S7: Arctic Primary Producers under Rapid Environmental Change: Observations, Mechanisms, and Biogeochemical Consequences

S8: The Changing Biogeochemistry of the Arctic Ocean

S9: Toward the Second Synoptic Arctic Survey

S10: Snow and Glacier Ice Algae: Ecology, Distribution, and Climate Feedbacks

S11: Terrestrial Environmental and Biogeochemical Dynamics in the Eastern Eurasian Arctic: Integrating Observations, Remote Sensing, and Modeling

S12: Understanding a Changing Arctic through Land-Ocean-Sea Ice Linkages: Integrating Observations, Environmental Archives, Tracers, and Models

S13: The Central Arctic Ocean: Progress in Research and Governance

S14: Arctic Shipping: Trends, Impacts, and Governance Pathways

S15: Deep-Sea Mining in the Arctic: Forging out Transdisciplinary Research Insights for Sustainable Arctic Futures

S16: Arctic Geoengineering Risks and Governance Roundtable

S17: Contested Frontiers: Constitutional Conflict in Settler-State Arctic Territories

S18: Governing the Arctic from Within: Arctic Institutions, Indigenous Governance, and Community-Centered Policy

S19: The Geoeconomic Transformation of the Russian Arctic in the Era of War and Sanctions

S20: Beyond the Post-Cold War Order: Diplomatic and Geoeconomic Dimensions of Arctic Governance

S21: Blue Diplomacy in a Fractured Arctic: New Paradigms for Ocean Governance

S22: Bridging the Governance Gap, Seabed to Orbit: Strategic Studies, Security, Law, and Economy in the Post-Cooperation Arctic (Toward IPY-5)

S23: Transdisciplinary Collaboration and Research Diplomacy for the Fifth International Polar Year (2032-2033)

S24: Commoning the Cryosphere: Strengthening Collective Decision-Making for Frozen Commons in a Changing Climate

S25: Food Security, Food Sovereignty, and Heritage in the Arctic

S26: Contemporary Economic Activities of Indigenous Peoples in North American Pacific Coast, Influence of Climate Change, and Measures to Address the Impacts

S27: Technologies as Intermediaries in Human-Dog Relations in the Arctic and North Asia

S28: Voicing the Crisis: More-than-human Acoustemologies in the Circumpolar North

S29: Embodied Community-Based Responses to Arctic Energy Transitions: Indigenous Knowledge, Health and Resource Development

S30: The Importance of Inheriting Indigenous Knowledge in Modern World Facing Climate Change in North America: Politics, Education, and Identity

S31: From Co-Production to Action: Community-Driven Arctic Research, Knowledge Exchange, and Actionable Science

S32: Pathways for Co-creating Biocultural Solutions for Climate-resilient Future

S33: Co-producing Arctic Futures: Participatory Mapping, Indigenous Knowledge, and Geospatial Science towards IPY-5

S34: Decolonial and Indigenous Approaches to Arctic Research

S35: Humanizing Arctic Research: Bridging Commitments and Practices

S36: Co-producing Arctic Knowledge across Borders, Knowledge

Systems, and Disciplines

S37: Reshaping the Study of Communities amid a Changing World: Centering Community Well-being through an Ethnographic Approach

S38: Art-Science Collaborations in the Circumpolar North

S39: Education in Rural Communities of the Circumpolar Arctic

S40: Arctic Riverine Systems and Communities: Interdisciplinary Perspectives on Environmental Change, Resilience, and Adaptation

S41: Arctic Environmental Observing in Challenging Times: Coordination, Data Systems, Funding, Co-creation and the Path Forward to IPY-5

--- Session Details ---

Regular Session

R1: Atmosphere

Conveners:

Kenta Tamura *National Research Institute for Earth Science and Disaster Resilience*

Xiling Zhou *Hokkaido University*

Jeong-Hun Kim *The University of Tokyo*

Pavla Dagsson-Waldhauserova *Agricultural University of Iceland*

R2: Ocean and Sea Ice

Conveners:

Daiki Nomura *Hokkaido University*

Satoshi Kimura *Japan Agency for Marine-Earth Science and Technology*

Tsubasa Kodaira *The University of Tokyo*

R3: Rivers, Lakes, Permafrost, and Snow Cover

Conveners:

Takahiro Abe *Nagoya University*

Yuto Tashiro *Akita Prefectural University*

Kazuyoshi Suzuki *Japan Agency for Marine-Earth Science and Technology*

R4: Ice Sheets, Glaciers, and Ice Cores

Conveners:

Motoshi Nishimura *Shinshu University*

Takumi Suzuki *Japan Aerospace Exploration Agency*

Kino Kobayashi *National Institute of Polar Research*
Naoko Nagatsuka *Japan Agency for Marine-Earth Science and Technology*

R5: Terrestrial Ecosystems

Conveners:

Shota Masumoto *Tsukuba University*
Jun Uetake *Hokkaido University*
Hirohiko Nagano *Niigata University*

R6: Marine Ecosystems

Conveners:

Irene Alabia *Hokkaido University*
Kohei Matsuno *Hokkaido University*
Takafumi Hirata *Hokkaido University*
Yuri Fukai *Japan Agency for Marine-Earth Science and Technology*

R7: Geospace

Conveners:

Takanori Nishiyama *National Institute of Polar Research*
Satoshi Kurita *Kyoto University*
Ekaterina Vorobeva *Norwegian Climate and Environmental Research Institute*
Shengyang Gu *Wuhan University*

R8: Governance, Security, Law, and Economy

Conveners:

Tomohiko Kobayashi *Otaru University of Commerce*
Yoshinobu Takei *Keio University*
Elana Wilson Rowe *Norwegian University of Life Sciences / Norwegian Institute of International Affairs*

R9: Culture, Indigenous Knowledge, and Co-production

Conveners:

Yuka Oishi *Kobe University*
Anita Lafferty *University of Alberta*
Vera Kuklina *University of Maryland*

R10: Engineering for Sustainable Development

Conveners:

Kazutaka Tateyama *Kitami Institute of Technology*
Takuji Waseda *The University of Tokyo*
Akihisa Konno *Kogakuin University*

R11: Education, Outreach, and Science Communication

Conveners:

Yoshihiro Niwa *National Institute of Polar Research*

Akiko Mohri *National Institute of Polar Research*

Ryo Kusaka *Hokkaido Museum of Northern People*

R12: Geology and Geophysics

Conveners:

Masakazu Fujii *National Institute of Polar Research*

Shinya Iwasaki *Hokkaido University*

Wolfram Geissler *Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research*

Jonathan Snow *Louisiana State University*

Hakkyum Choi *Korea Polar Research Institute*

Special Session

S1: Arctic-Midlatitude Linkages and Atmosphere-Ocean-Sea Ice-Land Interactions: Impacts on Atmospheric Circulation, the Hydrological Cycle, and Extreme Events

Keywords:

Arctic Amplification, Arctic-Midlatitude Linkages, Atmosphere-Ocean-Land Interactions, Hydrological Cycle, Extreme Events

Conveners:

Masakazu Yoshimori *The University of Tokyo*

Ayumi Kotani *Nagoya University*

Yu-Chiao Liang *National Taiwan University*

Baek-Min Kim *Pukyong National University*

Muyin Wang *University of Washington*

Description:

This special session aims to advance understanding of Arctic-midlatitude interactions and how they shape atmospheric circulation, the hydrological cycle, and extreme weather events. The session provides an opportunity to broaden Arctic research from a predominantly atmospheric perspective to hemispheric and coupled perspectives encompassing the atmosphere, ocean, sea ice, and land surface. Contributions addressing present-day mean states and variability, as well as past and future changes, are welcome. Topics may include, but are not limited to, mechanisms underlying Arctic amplification and its impacts within and beyond the Arctic, Arctic-midlatitude linkages, atmosphere-ocean-sea ice-land coupling, and drivers of hydroclimatic and thermal extremes. Studies employing diverse approaches - including observations, data analysis, high-resolution modeling, large-ensemble simulations, and machine-learning - are encouraged.

S2: Stratospheric Modulation of Polar Ice Dynamics: Observations, Processes, and Future Projections

Keywords:

Stratosphere-troposphere interactions, Anthropogenic impacts, Cryosphere

dynamics and modelling

Conveners:

Busnur Rachotappa Manjunatha *Dayananda Sagar College of Engineering, India*
H.K. Ramaraju *Dayananda Sagar College of Engineering, India*

Description:

The Arctic is warming about four times faster than the global average, resulting in profound changes in sea-ice thickness and extent, glaciers, and Northern Polar continental ice sheets. While surface warming and oceanic processes are well-established drivers of Arctic change, the influence of stratospheric variability on the cryosphere remains comparatively less understood. Changes in the polar vortex, sudden stratospheric warming (SSW) events, stratospheric ozone, and associated stratosphere-troposphere coupling can modify atmospheric circulation, temperature, precipitation, and surface energy balance, with important consequences for sea-ice dynamics and ice-sheet evolution. This session invites contributions from satellite observations, field measurements, climate re-analyses, numerical simulations, and Earth system models. Particular emphasis is placed on mechanisms linking stratospheric variability with atmospheric circulation, ocean-ice interactions, surface energy exchange, sea-ice thickness and extent, glacier and ice-sheet mass balance, anthropogenic impacts and extreme Arctic climate events. The session will bring together researchers from atmospheric science, cryosphere science, oceanography, remote sensing, climate dynamics, and numerical modelling. By integrating observations and modelling approaches, the session aims to improve understanding of atmosphere-ocean-ice interactions, identify mechanisms through which stratospheric variability affects the Arctic cryosphere, and strengthen projections of future Arctic climate change and its regional and global consequences.

S3: Atmospheric Aerosols and Gases and the Arctic Changes: New Understanding, Capabilities, and Challenges

Keywords:

Related disciplines of the sessions: (R1) Atmosphere, (R5) Terrestrial Ecosystems, (R3) Rivers, Lakes, Permafrost, and Snow Cover, (R6) Marine Ecosystems
Keywords: SLCF, GHGs, wildfire

Conveners:

Fumikazu Taketani *Japan Agency for Marine-Earth Science and Technology*
Yugo Kanaya *Japan Agency for Marine-Earth Science and Technology*
Kenjiro Toyota *Environment and Climate Change Canada*
Julia Schmale *Extreme Environments Research Laboratory*
Saehee Lim *Chungnam National University*

Description:

Atmospheric aerosols and trace gases, originating from human activities and natural systems, are the drivers of climate and environmental changes from regional to global scales. Feedbacks among these changes may have intensified overall consequences such as through increased wildfires, shrinking sea ice, and other changes in physical and biogeochemical processes across high-latitude atmosphere, land surfaces, oceans, and ecosystems. In this session, we will review recent studies that advance our understanding of the behavior and role of greenhouse gases and short-lived climate forcers (SLCFs), including aerosols, reactive gases, and their

precursors, in the Arctic and other regions impacting the Arctic. We solicit presentations from long-term and campaign-based observations, new technological developments, and numerical simulations. Discussions will also address: 1) the potential use of the newly built Arctic research vessel Mirai-II in international collaborations, and 2) the expanded observational and modeling capabilities for vertical profiles, as promoted by the PACES (Air Pollution in the Arctic: Climate, Environment and Societies) activity under IGAC and IASC.

S4: Advancing Sea Ice Research and Prediction through AI, Observations, Modeling, and Process Understanding

Keywords:

Sea ice, Artificial intelligence, Numerical modeling, Observations, Process Studies

Conveners:

Jun Ono *National Institute of Polar Research*

Gaelle Veyssiere *British Antarctic Survey*

Michael Thorne *British Antarctic Survey*

Louisa Van Zeeland *Alan Turing Institute*

Hironori Yabuki *National Institute of Polar Research*

Description:

Sea ice is a key component of the Earth's climate system and plays a critical role in shaping the climate by influencing the global energy, heat, and water budgets. Recent changes in Arctic and Antarctic sea ice have highlighted the need for improved understanding and prediction. Advances in Artificial Intelligence (AI)/Machine Learning (ML), data-driven approaches, observations, remote sensing, numerical modeling, and process studies are opening new opportunities for sea ice research and forecasting. This session welcomes contributions on sea ice observations, remote sensing, AI/ML, numerical modeling, process understanding, forecasting, predictability, data assimilation and stakeholder applications. We encourage studies that use one or more of these approaches, as well as studies that integrate them to improve understanding and predictive capability. We also encourage contributions from operational, interdisciplinary, humanities, and social science perspectives that address the scientific and societal challenges of a changing polar environment.

S5: Sea Ice and Snow Properties and Dynamics: Bridging Remote Sensing, Field Observations, and Process/Climate/Earth System Models in the Arctic

Keywords:

Sea ice, Snow, Satellite Observations, Process and climate modelling

Conveners:

Carolina Gabarró *Institute of Marine Science, CSIC & Barcelona Polar Lab*

Yufang Ye *Sun Yat-sen University*

Cheng Bin *Finnish Meteorological Institute*

Rigen Shimada *Japan Aerospace Exploration Agency*

Description:

This session aims to foster stronger interactions between the snow and sea ice remote sensing and numerical modelling communities. By bringing together experts across multiple disciplines, it seeks to bridge observational advances and model

development to address the following themes: i) Advanced snow and sea ice remote sensing: novel retrieval algorithms, new satellite missions, and enhanced observational capabilities for sea ice and snow properties. ii) Snow and sea ice processes and climate modelling: modelling of snow and sea ice dynamics and thermodynamics, radiative transfer, and the role of sea ice and snow in the climate system. iii) Integrating remote sensing and modelling: assimilation of satellite-derived snow and sea ice products into short-term forecasting systems, reanalysis, and Earth system models, including key challenges related to observation-model consistency and coupled system development. The overarching goal is to improve the quality, consistency, and use of snow and sea ice observations, advance process understanding, and strengthen data assimilation capabilities. The session also aims to identify priorities and recommendations for future observing systems and coordinated international efforts, contributing to scientific and policy frameworks addressing rapid polar environmental change.

S6: Environmentally Friendly Development of the Arctic Ocean - Observations and Modeling of the Ice-covered Sea and Ice-breaker

Keywords:

Marginal Ice Zone, Arctic Shipping Route, Ice breaker, wave-ice-ocean coupled processes, prediction

Conveners:

Takuji Waseda *The University of Tokyo*

Akihisa Konno *Kogakuin University*

Takatoshi Matsuzawa *National Maritime Research Institute*

Description:

The summer sea ice in the Arctic Ocean has receded considerably over the past 25 years, and a vast open-water area of 1400 square km has emerged. The area encompasses the polar cyclone that generates high waves reaching 5 m to 6 m significant wave height. Swells propagate under the sea ice for hundreds of kilometers and create a vast Marginal Ice Zone (MIZ) where waves vigorously interact with sea ice. With stronger seasonality, Arctic sea ice consists of first-year and multi-year ice. For ships navigating in the MIZ, high waves and thick multi-year ice floes impose a hazard. Moreover, the loss of coastal fast ice leaves the coastal area unprotected from waves; coastal erosion accelerates, leading to the loss of coastal infrastructure, and the loss and instability of land-fast ice affect the maintenance of on-ice traffic routes. Arctic coasts and indigenous populations are particularly vulnerable to the loss of sea ice. On the other hand, there is high demand for future development in the Arctic region, such as resource development, despite the impact of political uncertainty that temporarily slowed the development of the Arctic Shipping Route (ASR). The proposed session aims to present research outcomes from the ArCSIII (Arctic Challenge for Sustainability III) group: monitoring and predicting changes and variability in ice-covered seas for environmentally friendly development of the Arctic Ocean. The research is interdisciplinary. The group consists of three subgroups focusing on predicting ice-covered seas, monitoring ships and their surrounding environments, and advancing the development of icebreakers and technologies for environmental protection. The research is conducted in three subgroups. Relevant keywords are listed below: (Subgroup 1: Prediction of the ice-covered sea variation and its social implementation) Wave-ice interaction, wave and sea ice prediction, navigation support for the ASR, short and long-term coastal prediction (Subgroup 2:

Monitoring the variation of the ice-covered sea) Observing ice-covered sea for scientific and engineering objectives, navigation support, automated sea ice monitoring, sea ice properties, including material properties, and ship motion (Subgroup 3: Environmentally friendly technology for the utilization of ice-covered sea) Improving wave-ice-ship response models, developing digital twin models of icebreaker and surrounding environment, zero-emission for environmental protection, and economic assessment The session is open to everyone who is interested in related topics and is not restricted to the members of the ArCSIII research group.

S7: Arctic Primary Producers under Rapid Environmental Change: Observations, Mechanisms, and Biogeochemical Consequences

Keywords:

phytoplankton, ice algae, carbon export, climate change, marine ecology

Conveners:

Rafael Gonçalves-Araujo *Technical University of Denmark*

Alexander Hayward *Danish Meteorological Institute*

Description:

The Arctic is undergoing rapid environmental transformation driven by climate warming, declining sea ice, altered stratification, changing nutrient dynamics, and increasing freshwater inputs. Phytoplankton and ice algae, as the foundation of marine food webs and key mediators of carbon cycling, provide an early indicator of ecosystem change. This session invites contributions examining temporal and spatial shifts in phytoplankton and ice algae biomass, productivity, phenology, and community composition, and their coupling to grazers (e.g., *Calanus*). We welcome studies based on field observations, long-term monitoring, autonomous platforms, remote sensing, experiments, and modelling. Particular emphasis will be placed on linking observed changes to biogeochemical processes, carbon export, trophic transfer, ecosystem resilience, and climate feedbacks. The session aims to identify emerging patterns, knowledge gaps, and priorities for future Arctic observing and prediction systems.

S8: The Changing Biogeochemistry of the Arctic Ocean

Keywords:

Marine chemistry, climate change, biogeochemistry, ecosystem impacts

Conveners:

Melissa Chierici *Institute of Marine Research, Norway*

Agneta Fransson *Norwegian Polar Institute*

Naomi Harada *The University of Tokyo*

Kumiko Azetsu-Scott *Bedford Institute of Oceanography*

Mariko Hatta *Japan Agency for Marine-Earth Science and Technology*

Description:

The Arctic Ocean is changing at unprecedented rates such as warming, loss and thinning of sea ice, and freshening. In addition to the physical changes, there is the less investigated consequence of the marine chemical systems and biogeochemical

drivers of chemical change such as the ocean acidification, changes in nutrients stoichiometry, calcification, deoxygenation, redox processes that exert bioavailability of micronutrients, heavy metal dynamics and toxicity, methane production/consumption etc. This session welcomes contributions targeting increased knowledge on this little explored topic of chemical change and its effects on biogeochemical processes. Observational studies, results from laboratory experiments and modelling including basin scale chemical distribution to chemical speciation models to explore potential effects of changing chemistry on the Arctic marine ecosystem are encouraged to participate.

S9: Toward the Second Synoptic Arctic Survey

Keywords:

Arctic hydrography, carbon cycling and ocean acidification, marine ecosystems, International initiative, pan-Arctic research

Conveners:

Shigeto Nishino *National Institute of Polar Research*

Mariko Hatta *Japan Agency for Marine-Earth Science and Technology*

Øyvind Paasche *Norwegian Research Centre*

Description:

The Synoptic Arctic Survey (SAS) is a pan-Arctic research program that coordinated the efforts of more than 25 cruises from 11 nations during late summer and fall of 2020-2022 (SAS-I). The SAS-I provided new insights into Arctic hydrography, carbon cycling and ocean acidification, and marine ecosystems through basin-scale observations. Now, SAS is planning a second coordinated survey (SAS-II) for 2030 to assess decadal changes in the Arctic Ocean. This session will highlight scientific advances from the SAS-I, including integrated syntheses, remaining knowledge gaps, and lessons learned, while discussing how these findings can help refine the scientific objectives and implementation strategy for the SAS-II. Contributions on collaborations with other international initiatives, including the Distributed Biological Observatories (DBOs), links to the Fifth International Polar Year (IPY 2032-33), and national programs such as the Arctic Ocean 2050 and ArCS III are welcome. We also encourage contributions on engaging and supporting early-career researchers.

S10: Snow and Glacier Ice Algae: Ecology, Distribution, and Climate Feedbacks

Keywords:

Snow and glacier ice algae, Biological darkening, Greenland, Glacier, Cryoconite

Conveners:

Yukihiko Onuma *Meteorological Research Institute, Japan Meteorological Agency*

Alia Lauren Khan *University of Colorado Boulder*

Elena Plekhanova *University of Zurich*

Kino Kobayashi *National Institute of Polar Research*

Description:

Blooms of snow and glacier ice algae (SGA) reduce surface albedo and accelerate melt through biological darkening. As polar and alpine regions rapidly warm, understanding SGA biogeography, growth dynamics, nutrient requirements, and climate impacts is increasingly important for predicting cryospheric change. This

session brings together glaciology, microbial ecology, remote sensing, and Earth system modeling to explore the lifecycle, distribution, and impacts of SGA. We welcome submissions addressing, but not limited to, the following themes:

- Physiological, metabolic, and nutritional factors affecting SGA ecology and distribution.
- Radiative forcing, Earth system feedbacks, and impacts on glacier melt and albedo.
- Detection of biological blooms using multi-scale remote sensing (UAV, airborne, satellite).
- Numerical modeling of biologically-driven darkening.
- In-situ / remote sensing databases of SGA occurrence and environmental conditions.

S11: Terrestrial Environmental and Biogeochemical Dynamics in the Eastern Eurasian Arctic: Integrating Observations, Remote Sensing, and Modeling

Keywords:

Environmental change, permafrost degradation, biogeochemical cycles, multi-source data integration

Conveners:

Yoshihiro Iijima *Tokyo Metropolitan University*

Hotaek Park *Japan Agency for Marine-Earth Science and Technology*

Ji Young Jung *Korea Polar Research Institute*

Man Jae Kwon *Korea University*

Description:

The Eastern Eurasian Arctic and northern boreal regions are experiencing unprecedented environmental changes, including permafrost degradation, shifts in hydrological and biogeochemical cycles, and increased disturbances such as wildfires. Long-term monitoring in these remote areas faces unique logistical and geopolitical challenges, making international data integration, remote sensing, and Earth system modeling more vital than ever. This session aims to bring together researchers specializing in field observations, satellite remote sensing, and climate-ecosystem modeling. We welcome contributions on: 1. Long-term hydro-meteorological and permafrost monitoring in northern Eurasia. 2. Field-based investigations of biogeochemical processes and greenhouse gas dynamics (CO₂, CH₄, N₂O) across diverse permafrost ecosystems. 3. Advanced remote sensing and spatial analysis of land surface dynamics (e.g., thermokarst, greening/browning). 4. Integrated terrestrial modeling and multi-source data synthesis. 5. Future trajectories of Eurasian Arctic ecosystems and their global climate feedbacks.

S12: Understanding a Changing Arctic through Land-Ocean-Sea Ice Linkages: Integrating Observations, Environmental Archives, Tracers, and Models

Keywords:

Land-ocean linkages, Paleoceanography, Paleoclimatology, Sea ice, Ice sheets and glaciers

Conveners:

Yusuke Suganuma *National Institute of Polar Research*

Jean-Carlos Montero-Serrano *Université du Québec à Rimouski / The University of*

Tokyo

Xiaotong Xiao *Ocean University of China, China*

Yu-Hyeon Park *Pusan National University, Korea*

Zhengquan Yao *First Institute of Oceanography, China*

Description:

The Arctic environment is changing rapidly, and understanding these changes requires examining the linkages among land, ocean, and sea ice. This session welcomes studies that reconstruct, observe, monitor, or model Arctic environmental changes and the interactions among these interconnected components across timescales ranging from seasonal to geological. Topics include, but are not limited to, sea ice dynamics, ocean circulation and acidification, riverine and atmospheric pollutant transport, wildfire frequency and intensity, mercury biogeochemical cycling, permafrost thaw, hydrological change, river discharge, vegetation change, and their interactions. We welcome studies based on multi-proxy paleoenvironmental archives (e.g., ice cores, marine and lake sediments, tree rings), geochemical and isotopic tracers, historical records, field and remote-sensing observations, environmental monitoring, and numerical modelling. Contributions addressing past, present, and future Arctic change are particularly encouraged. By bringing together diverse topics, timescales, and methodological approaches, this session aims to foster interdisciplinary dialogue, advance process-based understanding, and highlight the connections linking the Arctic land-ocean-sea ice system. The session aligns closely with the ISAR-9 theme, 'Expanding and Connecting Arctic Research Diversity'.

S13: The Central Arctic Ocean: Progress in Research and Governance

Keywords:

High-seas governance, marine management, oceanography, ecology

Conveners:

Alex Shahbazi *Ocean Conservancy*

Naomi Harada *The University of Tokyo*

Shigeto Nishino *National Institute of Polar Research*

Juha Saunavaara *Hokkaido University*

Henry Huntingon *Ocean Conservancy*

Description:

Interest is growing in the Central Arctic Ocean (CAO), an understudied-yet-integral part of the Arctic, global ocean, and planetary climate system. The CAO Fisheries Agreement broke new ground, both as a precautionary measure that facilitates research and as the first agreement focused on the Arctic's high seas. However, activities beyond fisheries including shipping, seabed mining, and subsea cables have also been discussed, motivating the need for improved understanding and governance of the CAO. This session will address the CAO broadly, considering the degree to which existing governance mechanisms are adequate while highlighting research contributions. We welcome presentations examining the present and future governance of the CAO and those that consider the research implications of increasing interest. New findings about the region are especially welcomed from field research, and submissions that address the role of Indigenous knowledge are encouraged.

S14: Arctic Shipping: Trends, Impacts, and Governance Pathways

Keywords:

Arctic shipping, governance, impact, environment, Indigenous Peoples

Conveners:

Julia Olsen *Nord University, Norway*

Henry P. Huntington *Ocean Conservancy*

Alex Shahbazi *Ocean Conservancy*

Alexandra Middleton *University of Oulu, Finland*

Description:

This session explores current and future trends in Arctic shipping and the associated impacts for socio-ecological systems. Since 2013, the number of vessels operating in the Polar Code waters increased by 40%, reflecting the expanding role of the Arctic as a region for commercial shipping, fisheries, tourism, and resource-related activities. The potential impacts of increased shipping on Arctic ecosystems, Indigenous Peoples, and local communities remain incompletely understood. At the same time, Arctic shipping governance has evolved considerably in recent years, seeking to address known risks through cross-scale regulation, and precautionary approaches to environmental management. This session invites contributions that examine Arctic shipping trends, their consequences, and potential governance pathways. Relevant topics include, but are not limited to:

- The integration of diverse knowledge systems in Arctic shipping governance
- Future scenarios for shipping in the Central Arctic Ocean
- Comparative analyses of mitigation and adaptation measures
- Socio-ecological impacts of maritime activities

S15: Deep-Sea Mining in the Arctic: Forging out Transdisciplinary Research Insights for Sustainable Arctic Futures

Keywords:

1) Transdisciplinary research across, i.a., marine ecosystems; governance, security, law and economy; engineering for sustainable development; culture, Indigenous knowledge and co-production; terrestrial ecosystems; geology and geophysics. 2) Transdisciplinary aspects of marine health and resources 3) Transdisciplinary aspects of sustainable Arctic futures 4) Anthropology, law and other social science interaction with natural science disciplines 5) Building transdisciplinary collaboration on deep-seabed mining in Arctic contexts

Conveners:

Karin Buhmann *Copenhagen Business School*

Astrid Oberborbeck Andersen *Aalborg University*

Brigt Dale *Nordland Research Institute Bodø*

Description:

Special Session Proposal ISAR 9 Session title: Deep-Sea Mining in the Arctic: Forging out transdisciplinary research insights for sustainable Arctic futures Session description The impacts of deep seabed Mining (DSM) on complex ocean ecosystems, and on land-based ecologies and socio-economic structures remain understudied and uncertain. The fragile Arctic ecosystems pose particular challenges and call for transdisciplinary research. If Norway proceeds with its currently paused DSM plans, the activity will take place in Arctic waters, as close to East Greenland as to mainland Norway, with unknown but likely implications for the ocean-based flora, fauna and wider environment and related income-generation

and culture in both countries. This exemplifies the impacts of DSM and highlights the need for transdisciplinary research to understand ecosystemic and societal impact interconnectedness, and how DSM impacts may interact with already felt and fast-evolving climate-change-induced changes in the Arctic. Cutting across multiple regular ISAR themes, this session explores these issues and considers how research may respond to the DSM challenges across the social, natural and technical sciences.

Conveners:

- Professor Karin Buhmann, Copenhagen Business School, PI for Frontiers of Natural Resource and Sustainability Governance for a Just Energy Transition (FRONTIERS); Lead, UArctic Thematic Network on Arctic Sustainable Resources and Social Responsibility.
- Dr Astrid Oberborbeck Andersen, Associate Professor, Aalborg University, PI for Deep Seabed Mining across Arctic Communities: Investigating knowledge production, regulation, and environmental justice impacts of a new resource frontier (SEABED)
- Dr. Brigit Dale, Research Director, Nordland Research Institute, Bodø, Norway.

S16: Arctic Geoengineering Risks and Governance Roundtable

Keywords:

geoengineering intervention risk climate change

Conveners:

Tommy Moore *British Antarctic Survey*
Jeremy Wilkinson *British Antarctic Survey*

Description:

The Arctic is warming four times faster than the global average, while summer sea-ice cover continues to decline. As interest grows in geoengineering as a response to climate change in the Arctic and beyond, important questions remain about the potential ecological and socio-economic impacts of these approaches. At present, there is no pan-Arctic governance framework for geoengineering research or potential deployment. This session will feature talks on the risks posed by geoengineering research and large-scale interventions, governance challenges, and potential options for the Arctic community. The talks will be followed by an expert panel discussion and an open dialogue, providing an opportunity for session attendees to engage with these issues and contribute their perspectives. Abstracts focusing on aspects of geoengineering risks, governance, Indigenous perspectives, and other related topics are welcomed.

S17: Contested Frontiers: Constitutional Conflict in Settler-State Arctic Territories

Keywords:

frontiers, self-determination, settler-colonialism, rights, territories, borders

Conveners:

Aaron Spitzer *Mariel Kieval*
Mariel Kieval *The Arctic Institute, Center for Circumpolar Security Studies*

Description:

Between Indigenous (or local) self-determination and settler colonization lie contested frontiers - the Yukon and Northwest Territories in Canada, Finnmark in Norway, Lapland in Finland, and maybe even Alaska, Greenland, and Svalbard. Such frontiers are pulled between 'us' and 'them', 'theirs', and 'ours'. As such, they are subject to constitutional contestation - to fights over the framing of the polity. In the past, settlers used force to ingest frontiers. Recent decades have seen an Indigenous resurgence, rekindling contestation, particularly on the few frontiers that remain, especially in the Arctic. With the advent of the rights revolution, contestation is increasingly pursued through appeals to 'constitutive principles': Is the frontier domestic or foreign? Is its demos universal or divisible? Should individual or collective rights prevail? Should democracy or self-determination decide? This panel will promote discussion of such contestation, reaching across circumpolar borders and across disciplines (political science, constitutional law, political theory, and beyond).

S18: Governing the Arctic from Within: Arctic Institutions, Indigenous Governance, and Community-Centered Policy**Keywords:**

Arctic Institutions, Indigenous governance, community-centered policy, institutional partnerships, institutional kindness

Conveners:

Marya Rozanova-Smith *Columbian College of Arts & Sciences*
Andrey N. Petrov *University of Northern Iowa*

Description:

Governance systems across the Arctic are highly diverse, complex, and multilayered. They involve interactions among national, regional, Tribal, and municipal governments, non-governmental organizations, healthcare and economic development Native corporations, private-sector actors, and community-based institutions. Their responsibilities often overlap, creating opportunities for collaboration as well as challenges related to authority, accountability, representation, and coordination. Effective governance in this context requires more than cooperation among public institutions and other stakeholders. It depends on a nuanced understanding of differences among Arctic communities, local contexts, community priorities, and culturally appropriate approaches, particularly in relation to Indigenous governance systems, and the ethical principles that should guide decision-making. This session invites policymakers, Indigenous leaders and knowledge holders, researchers, community representatives, and practitioners to examine how Arctic governance systems function in practice and how they can become more coordinated, inclusive, accountable, and responsive to community needs. Suggested topics for discussion include but not limited to the following topics: community participation, representation, and accountability in governance processes; Indigenous leadership and participation in decision-making; regional approaches to long-term resilience-building in the Arctic; institutional partnerships and cooperation among Tribal, municipal, regional, and national institutions and international entities; institutional kindness as a guiding principle for policy development in the Arctic.

S19: The Geoeconomic Transformation of the Russian Arctic in the Era of War and Sanctions

Keywords:

Political Economy, Economic Geography, Arctic Studies, Transport, Natural Resources

Conveners:

Michitaka Hattori *Hokkaido University*

Shinichiro Tabata *Hokkaido University*

Description:

Russia's Arctic has undergone profound geoeconomic transformation since 2022. War and sanctions have reshaped Arctic energy development, maritime transport, logistics, investment, and international economic cooperation, while accelerating Russia's economic reorientation toward non-Western partners and the Northern Sea Route. This session examines these changes from the perspective of the political economy of the Russian Arctic. Contributions are invited on topics including natural resources, transport and logistics, Arctic shipping, industrial development, sanctions and economic adaptation, regional development, and changing international economic relations. The session particularly welcomes empirical studies that enhance understanding of how geopolitical change is transforming the economic geography of the Russian Arctic.

S20: Beyond the Post-Cold War Order: Diplomatic and Geoeconomic Dimensions of Arctic Governance

Keywords:

Arctic Governance, Great Power Competition, Militarization, Geoeconomics, Global Order

Conveners:

Florian Vidal *The Arctic University of Norway*

Fujio Ohnishi *Hokkaido University*

Timo Mohr *University of Munich*

Henry P. Huntington *Ocean Conservancy*

Description:

The convergence of geopolitical and planetary changes has exposed the Arctic, as regional governance enters crisis and the post-Cold War cooperative framework loses relevance. Russia treats the Arctic as vital national territory, which is hosting its Northern Fleet, Soviet-era military infrastructure, and the backbone of its global energy ambitions. China, though not a coastal state, claims 'near-Arctic' status, projecting influence via strategic investments and alliances with Russia, rather than territorial claims. The United States views the region as a security frontier beginning at Greenland, and a stage for preserving alliances, naval dominance, and resource interests. These actors embody competing world-order visions: Russia pursues territorial control and geoeconomic integration; China expands influence into a 'new' frontier; the US insists on strategic access and a 'rules-based' order. The Arctic thus becomes a theater for decisive global-order questions, not only for middle powers like Japan: whose governance rules prevail, whether the region

militarizes, and whether institutions foster cooperation or confrontation.

S21: Blue Diplomacy in a Fractured Arctic: New Paradigms for Ocean Governance

Keywords:

Blue Diplomacy, Arctic Ocean Governance, Climate Change, Indigenous Participation, Science Diplomacy

Conveners:

Ole Øvretveit *University of Bergen*

Lise Øvreås *University of Bergen*

Florian Vidal *The Arctic University of Norway*

Description:

Abstract: This special session is convened by the UArctic Thematic Network Blue Diplomacy Lab, under the stewardship of the University of Bergen, Norway. The Arctic Ocean stands at the nexus of accelerating climate change and resurgent great-power competition. Melting sea ice opens new shipping routes and resource frontiers, while simultaneously straining the cooperative frameworks that have defined the region since the Cold War. This special session confronts a critical question: How can Arctic oceanic governance evolve to remain resilient, inclusive, and effective amid this polycrisis? We argue that diplomacy itself must be reimagined as an adaptive, multi-stakeholder process that integrates scientific uncertainty, economic interests, and security realities. Our panel aims to debate possible novel diplomatic instruments, such as a science-advice mechanism for crisis decision-making and a stronger institutional role for Indigenous peoples. The session invites contributions from interdisciplinary perspectives and aims to foster discussion on a possible roadmap for future research and policy engagement.

S22: Bridging the Governance Gap, Seabed to Orbit: Strategic Studies, Security, Law, and Economy in the Post-Cooperation Arctic (Toward IPY-5)

Keywords:

Arctic governance, Strategic studies, Space-cyber security, Arctic law and economy, Post-cooperation geopolitics

Conveners:

Sandra Balão *Universidade de Lisboa*

Mario Pontes *Universidade de Lisboa*

Description:

This session examines governance, security, law, and economy in a post-cooperation Arctic, where the Arctic Council's exclusion of hard security and NATO's parallel deterrence architecture have left an unresolved institutional gap. Applying a strategic studies lens, it extends the analysis 'seabed to orbit', treating space and cyberspace assets as integral to Arctic strategic stability rather than adjacent domains. Panels address unresolved UNCLOS-based legal disputes, the securitization of Arctic economic activity, and emerging space-cyber vulnerabilities affecting circumpolar governance. The session positions contributions within the

ICARP IV research agenda, aiming toward the Fifth International Polar Year, and invites theoretically grounded, policy-relevant papers that integrate these four pillars as one interdependent strategic system rather than parallel silos.

S23: Transdisciplinary Collaboration and Research Diplomacy for the Fifth International Polar Year (2032-2033)

Keywords:

Research Diplomacy, Polar Studies, Geopolitics, Environmental Governance, Transdisciplinary Research

Conveners:

Alexandra Middleton *University of Oulu*

Kamrul Hossain *University of Lapland*

Nicholas Parlato *The Arctic University of Norway*

Zia Madani *University of Tsukuba*

Susana Hancock *International Cryosphere Climate Initiative, Vermont*

Description:

This session explores research diplomacy, and transdisciplinary knowledge co-creation to advance Polar cooperation amidst geopolitical fragmentation. Looking to the 5th International Polar Year (IPY-5, 2032-2033), we welcome contributions on how transdisciplinary research fosters dialogue, elevates Global South and Indigenous perspectives, and enhances stability. Bridging knowledge systems requires uniting researchers, policymakers, Indigenous knowledge holders, artists, and youth. We invite conceptual, empirical, and policy contributions on:

- Research diplomacy for governance and cross-border cooperation
- IPY-5 as a vehicle for global trust-building
- Indigenous diplomacies and knowledge co-production
- Informal and non-state networks in Polar governance
- Equitable funding, shared infrastructure, and capacity building for ECRs
- Observer states and Mid/Low-Latitude research diplomacy

By uniting diverse stakeholders, this session aims to demonstrate how collaborative research networks support IPY-5 and secure a sustainable future.

S24: Commoning the Cryosphere: Strengthening Collective Decision-Making for Frozen Commons in a Changing Climate

Keywords:

Indigenous Knowledge, Worldviews, Governance, Climate Resilience, Environmental Anthropology

Conveners:

Leah Shaffer *Northern Arizona University*

Vera Kuklina *University of Maryland*

Andrey N. Petrov *University of Northern Iowa*

Shauna BurnSilver *Arizona State University*

Description:

The cryosphere encompasses all perennially and seasonally frozen water and ground on Earth (snow, ice, permafrost). Growing threats to these systems have implications for human-environment relations, infrastructure, and economic activities, prompting calls for action from scholars and policymakers. Some argue for top-down governance structures to steward the changing cryosphere, while

others propose innovative governance that recognizes existing multi-level and polycentric networks and knowledge grounded in cold regions. This session centers discussion of frozen commons - rapidly changing cryosphere elements with long-standing norms around use, Indigenous stewardship, and care that overlap nation-state regulatory frameworks emphasizing infrastructure development, resource extraction, and engineering solutions. We invite contributions that reflect on multiple dimensions of frozen commons relationality, where alignments and tension emerge around shared worldviews, responsibilities, development aspirations, narratives of change, and decision-making.

S25: Food Security, Food Sovereignty, and Heritage in the Arctic

Keywords:

subsistence hunting, Indigenous food systems, marine mammal hunting, food sharing networks, public health

Conveners:

Jun Akamine *Hitotsubashi University*

Sidney Cheung *The Chinese University of Hong Kong*

Description:

The Arctic is a region of profound ecological, cultural, and geopolitical significance that is undergoing rapid transformation as a result of climate change, globalization, increased connectivity, and shifting political landscapes. These transformations are reshaping food and foodways across the region, affecting access to subsistence resources, food distribution and affordability, nutritional health, cultural practices, and the transmission of Indigenous and local knowledge. This Special Session examines the interconnected yet distinct concepts of food sovereignty and food security. Food sovereignty concerns the rights of peoples and communities to define and control their own food systems, with an emphasis on local decision-making, culturally appropriate practices, and ecological sustainability. For Arctic Indigenous Peoples, it is closely connected to Indigenous knowledge, subsistence hunting, fishing, gathering, food sharing, cultural identity, and self-determination. Food security, by contrast, concerns reliable access to sufficient, safe, nutritious, and culturally appropriate food and is commonly considered in terms of availability, accessibility, utilization, and stability. Bringing together perspectives from anthropology, food studies, public health, nutrition, Indigenous studies, environmental research, political economy, and governance, the session will explore how food sovereignty and food security interact under changing environmental, economic, and political conditions. It welcomes comparative and community-engaged research from different parts of the Arctic, as well as studies that connect Indigenous and local knowledge with diverse scientific approaches. By connecting disciplines, regions, and knowledge systems, the session contributes directly to the ISAR-9 theme, 'Expanding and Connecting Arctic Research Diversity', and seeks to advance discussions of sustainability, equity, resilience, and community autonomy in Arctic food systems.

S26: Contemporary Economic Activities of Indigenous Peoples in North American Pacific Coast, Influence of Climate Change, and Measures to Address the Impacts

Keywords:

Indigenous Peoples, North America, Pacific Coast, Climate Change, (Marine)
Resource Management

Conveners:

Akihito Tachikawa *Mie University*

Natalie Ban *University of Victoria*

Nobuhiro Kishigami *National Museum of Ethnology*

Description:

Indigenous peoples in the northern Pacific coastal regions of North America have long relied on salmon fishing and marine mammal hunting, but environmental changes now threaten these activities. This session discusses the current state of these economic activities, the impacts of environmental change, and adaptive responses and policy measures. Through these discussions, the session examines issues specific to Indigenous communities along the North American Pacific coast and considers how environmental pressures are reshaping their traditional livelihoods and future prospects.

S27: Technologies as Intermediaries in Human-Dog Relations in the Arctic and North Asia

Keywords:

Multispecies Ethnography, Environment and Sustainability, Human-Canine Relationship, Social Sciences, Humanities

Conveners:

Victoria Peemot *University of Helsinki*

Mikko Äijälä *University of Lapland*

Description:

This session examines technologies as active intermediaries in human-dog relations across the Arctic and North Asia. Dogs have long been central to Arctic/North Asian life through sledding, hunting, and herding practices. These partnerships have always been mediated by technology - from collars, harnesses, and leashes to GPS trackers and heart-rate sensors. Such tools promise richer communication and more 'humane' relationships between human and dog. Yet mediation cuts both ways: smart technologies can also objectify dogs and other animals involved, such as hunted prey, freeing humans from the embodied, knowledge-based bonds with animals and landscape that once anchored these relationships. Technologies, in short, are never neutral. We welcome conceptual, empirical, and methodological contributions situated in the Arctic and engaging with human-dog relations as sites where technology actively shapes, rather than simply transmits, interspecies connection.

S28: Voicing the Crisis: More-than-human Acoustemologies in the Circumpolar North

Keywords:

Acoustemology, traditional ecological knowledge, Indigenous epistemologies, Humanities, Social Sciences

Conveners:

Nicola Renzi *University of Helsinki*

Victoria Peemot *University of Helsinki*

Description:

This session asks how changes in Arctic acoustic environment reveal transformations and disruptions in more-than-human relationships. We take a critical stance toward the concept of 'voice' by foregrounding Indigenous relational ways of knowing and situated listening practices across diverse Arctic contexts. We welcome contributions that attend to: more-than-human voices as messengers of climate change, whose shifting presence, absence and temporality make ecological disruptions perceptible; acoustic changes in hunting grounds and pasturelands affected by enclosure and extraction; sound, listening and musicking as indexes of ethical attitudes toward Arctic beings. Bringing soundscape ecology into dialogue with Indigenous relational acoustemologies, this session seeks to unsettle dominant, often colonially imposed frameworks for studying acoustic phenomena and foster the co-production of locally grounded approaches to ecoacoustic research amid accelerating ecological loss in the Arctic.

S29: Embodied Community-Based Responses to Arctic Energy Transitions: Indigenous Knowledge, Health and Resource Development

Keywords:

Embodied practices, Energy transition, Indigenous health, Mining, Community wellbeing

Conveners:

Nadezhda Mamontova *University of Birmingham*

Léopold Beyaert *University of Birmingham*

Jean-Sébastien Boutet *University of Birmingham*

Description:

This panel examines how Arctic Indigenous communities experience and respond to energy transitions through embodied cultural practices, including storytelling, songs, craft and ceremony. It explores how these practices sustain health and wellbeing while carrying and transmitting knowledge about environmental transformation, maintaining relationships with affected places and enabling communities to articulate responses to mining and energy projects as critical-mineral resource extraction expands across the Arctic. The panel is particularly interested in how these practices change across the mining and energy-transition life cycle, including exploration, construction, operation, closure and post-closure landscapes. How do Indigenous embodied practices register environmental and social changes that may not be captured by conventional socio-environmental assessments? How are knowledge and wellbeing affected when access to particular places, animals, waters or materials is disrupted? And how can embodied forms of knowledge shape Indigenous participation in debates over mining and renewable-energy development? We also welcome papers from Indigenous community members, scholars and artists working with Indigenous communities that examine how embodied cultural practices contribute to community resilience and resistance in energy transitions, and how the knowledge they generate can inform policy and

more just and sustainable approaches to energy development.

S30: The Importance of Inheriting Indigenous Knowledge in Modern World Facing Climate Change in North America: Politics, Education, and Identity

Keywords:

North America, Indigenous Knowledge (IK), Politics (Governance), Education, Identity

Conveners:

Kenichiro Hirose *Kagoshima Immaculate Heart University*

Mikako Yamaguchi *Hokkaido University*

Naoko Kagata *Mie University*

Description:

Indigenous Peoples in Canada today live with scientific knowledge and modern technologies, while also inheriting Indigenous Knowledge (IK) from periods when their livelihoods depended on hunting and gathering. This session examines how IK is being inherited under the politics surrounding IK and how IK functions in daily life, including subsistence activities. Through these examinations, we discuss the kinds of political approaches needed to support the transmission of IK, how IK and scientific technologies can coexist, and the importance of sustaining IK in a modern world grounded in scientific ways of knowing.

S31: From Co-Production to Action: Community-Driven Arctic Research, Knowledge Exchange, and Actionable Science

Keywords:

Coastal hazards, co-production of knowledge, youth leadership, actionable science, community resilience

Conveners:

Chris Maio *University of Alaska Fairbanks*

Tatiana Degai *University of Victoria*

Davin Holen *Alaska Sea Grant*

Tobias Schwoerer *University of Alaska Fairbanks*

Andrey Petrov *University of Northern Iowa*

Description:

Co-production of knowledge is increasingly recognized as an essential approach for advancing Arctic research, yet significant questions remain regarding which approaches are most effective for building lasting partnerships and translating collaborative research into meaningful scientific and community outcomes. This session highlights the successes, challenges, and lessons learned from co-developed community-driven research that weaves together Indigenous knowledge, local priorities, and western science to produce actionable outcomes. The Alaska Coastal Cooperative's (ACC) ACTION Project is an NSF-funded initiative that connects rural coastal communities across Alaska and the Canadian Arctic to strengthen collaboration, advance community-prioritized research, and build local technical capacity through workforce development and youth leadership. This topical session builds on the experiences of ACTION and related initiatives to explore how co-production has advanced Arctic science while generating tangible benefits for

communities. We welcome presentations that highlight scientific advances made possible through collaborative partnerships, new synergies among communities and researchers, innovative co-produced activities, and research that has directly informed decision-making and is contributing towards meaningful solutions. We also encourage contributions that critically examine the co-production process itself, including barriers encountered, approaches that were less successful, and lessons that can strengthen future collaborations across the Circumpolar North.

S32: Pathways for Co-creating Biocultural Solutions for Climate-resilient Future

Keywords:

biocultural heritage, nature-based solutions, green infrastructure, knowledge co-creation, climate resilience

Conveners:

Vera Kuklina *University of Maryland*

Olga Povoroznyuk *University of Vienna*

Olga Shirokostup *ArtScience Institute*

Peter Schweitzer *University of Vienna*

Victoria Miles *Nansen Environment for Remote Sensing Center*

Description:

Biocultural heritage, a concept offered by Indigenous Peoples, emphasizes the inseparability of natural and cultural heritage. Current responses to the climate crisis increasingly recognize this interdependence of biological and cultural diversity and can create biocultural solutions applicable in resource management, conservation, health, food, energy and infrastructure systems. However, emerging technologies, such as AI, are often implemented without sufficient consideration of Indigenous and local rights, needs and land-based practices. Meanwhile, traditional ecological knowledge prioritizes reciprocal, respectful, and responsible human-environment relationships while artistic research methodologies for sensing, documenting, and collectively interpreting environmental change alongside scientific and Indigenous knowledge systems contribute to a just and equitable future. Together, material (natural and industrialized urban spaces and architecture) and immaterial (practices and knowledge) aspects of this heritage can form a nature-based infrastructure for addressing climate change. The session explores how artistic research, Indigenous and local knowledge, and scientific inquiry can co-create new understandings of climate change and climate resilient strategies through long-term relationships with place and community. It invites contributions from scholars, artists, engineers, knowledge and rightsholders and practitioners to co-envision such community-driven nature-based infrastructure for a climate-resilient future.

S33: Co-producing Arctic Futures: Participatory Mapping, Indigenous Knowledge, and Geospatial Science towards IPY-5

Keywords:

Knowledge co-production, Indigenous Knowledge, Transdisciplinarity, Earth Observation; IPY-5

Conveners:

Marina Tonkopeeva *International Centre for Reindeer Husbandry*

Mary Blair *American Museum of Natural History*

Description:

As preparations begin for the Fifth International Polar Year (IPY-5, 2032-2033), Arctic research must strengthen equitable partnerships with Indigenous Peoples by connecting Indigenous knowledge with geospatial science, Earth observation, and community-based monitoring. This session explores knowledge co-production through participatory GIS, remote sensing, mobile mapping, and Indigenous-led monitoring to address climate change, land fragmentation, biodiversity loss, and other pressures affecting the Circumpolar North. We welcome contributions from researchers, Indigenous knowledge holders, agencies, and international initiatives on participatory mapping, environmental monitoring, Indigenous data sovereignty, CARE principles, and ethical geospatial practices. The session will highlight Indigenous Mapping initiatives and research collaborations, including the Reindeer Herding and Resilience (RHR) project, and work at the AMNH and Woodwell Climate Research Center on Earth observations and monitoring, fostering partnerships and research priorities for IPY-5.

S34: Decolonial and Indigenous Approaches to Arctic Research

Keywords:

Indigenous studies, social sciences, human geography, decolonial studies

Conveners:

Stanislav Saas Ksenofontov *University of Northern Iowa*

Andrey N. Petrov *University of Northern Iowa*

Description:

Decolonization of research in academia has become an agenda for many scholars globally and one of the most discussed topics especially among the Indigenous scholars actively advocating for decolonized research. Historically, researchers from dominant societies extracted knowledge from Indigenous communities, often without appropriate consideration of local perspectives, people's agency, and their consent. Western science thus has often been a tool to colonize Indigenous Peoples and their homelands around the world, including the Arctic. The process of decolonization in academia enables Indigenous communities to center their own knowledge systems and perspectives in research, allowing Indigenous scholars to propose their research methodologies and epistemologies. This Indigenous-led session, focusing on Indigenous and decolonial approaches to Arctic research, invites scholars to share their research approaches and methodologies, which assist decolonization processes, actively challenge dominant perspectives in research, prioritize the inclusion of marginalized voices and Indigenous knowledge systems, and avoid perpetuating colonial power dynamics. Presentations from Indigenous scholars and knowledge holders are especially welcome.

S35: Humanizing Arctic Research: Bridging Commitments and Practices

Keywords:

humane social science research, institutional practices, a care-centered approach

Conveners:

Description:

This session invites reflections on how research conducted with Arctic communities can become more humane. Humane social science research may be understood as a care-centered approach that prioritizes the well-being, reciprocity, dignity, and safety of both researchers and research participants. It also requires respect for Indigenous knowledge systems, cultural awareness and meaningful attention to the needs, priorities, and aspirations of the communities involved. Although substantial progress has been made toward more humanizing and community-engaged Arctic research over recent decades, a significant gap remains between stated commitments and actual research practices. Partner-centered approaches, strong community engagement, transdisciplinarity, and knowledge co-production are increasingly emphasized, yet they often remain constrained by conventional Western scientific methodologies, institutional expectations, funding structures, and research timelines. The same factors often tend to dehumanize researchers themselves by devaluing personal relationships with research partners and ignoring researcher's own personal needs. Participants are invited to share experiences and critically examine the hidden, silenced, or insufficiently explored challenges that continue to shape Arctic research.

S36: Co-producing Arctic Knowledge across Borders, Knowledge Systems, and Disciplines

Keywords:

Arctic science, Indigenous Knowledge, Knowledge co-production, Interdisciplinary research, Circumpolar studies

Conveners:

Claudine Hauri *University of Alaska Fairbanks*
Margaret Rudolf *University of Alaska Fairbanks*
Go Iwahana *University of Alaska Fairbanks*
Emily Lescak *University of Alaska Fairbanks*

Description:

Arctic environmental change does not respect borders. It affects the land, ice, and waters communities depend on as a single, shared reality. Yet we rarely study it that way. Knowledge about the Arctic is produced separately, split across countries, disciplines, and knowledge systems, with little exchange between them. Indigenous Knowledge, academic science, and policymaking largely advance in parallel, not together. This session asks what it would take to actually change that: what circumpolar co-production of Arctic knowledge could look like in practice, and what's stopping us from doing it now. When different forms of expertise and perspective are brought together early, the resulting understanding is not only more complete, but more useful and more just. We welcome both presentations on ongoing collaborative projects and bold proposals for new ones. This is an invitation for people already working in this space, and for people with strong ideas to start. The session could take the form of a few short presentations followed by a working session or discussion round.

S37: Reshaping the Study of Communities amid a Changing

World: Centering Community Well-being through an Ethnographic Approach

Keywords:

Anthropology, Development Studies, Social Work, Public Health; History

Conveners:

Naotaka Hayashi *University of Calgary*

Maho Araki *Kyoto University of the Arts*

Description:

The purpose of this session is to bring together presentations to discuss community well-being amid a world changing environmentally, politically, and economically. Northern communities are increasingly involved in the wider (or global) context, such as climate change, international politics, decolonization, consumer culture, and so forth. Researchers often view these phenomena as 'problems', basing their analytical frameworks on ones often used in the global context, such as 'sustainability' and 'resilience.' However, we want to ask: Can we view the affairs and dynamics of these communities in a way that is appropriate to the local context? This question arises because communities may have views that differ from those of researchers. By shifting our research perspectives, we can view what is happening 'out there' as an entry point into community well-being. What futures do local people imagine, hope for, or want to create? What is it like to live in the area? Therefore, we want to discuss lived experience in the area, bringing an ethnographic perspective back into the research. The session welcomes topics such as, but not limited to, human-environmental relationships, local economies, transportation, community development, local history, cultural heritage, and community health.

S38: Art-Science Collaborations in the Circumpolar North

Keywords:

Circumpolar North, Art-Science, Collaboration, Indigenous Peoples, Research-Creation

Conveners:

Heather Igloliorte *University of Victoria*

Kirsty Robertson *University of Western Ontario*

Description:

Global geopolitical and economic interest in the North is rapidly increasing, even as ice caps and permafrost melt; industrial cross-Arctic shipping rises; contaminants exacerbate oceanic pollution; and a myriad of other alarming signs of climate change are impacting planetary health. How can artistic research-creation processes rooted in Northern Indigenous knowledges help Indigenous communities to be better informed, protected, and proactive? The Taqsiqtuut Indigenous Research-Creation Lab (University of Victoria) and the Centre for Sustainable Curating (University of Western Ontario) invite those working at the intersection of art and science to share their own projects and approaches. This session focuses on how to harness the transformative power of art to raise distinct questions and generate innovative responses that enable artists, researchers, and Indigenous communities to

recognize and address environmental injustices in the North within communities and the broader world.

S39: Education in Rural Communities of the Circumpolar Arctic

Keywords:

Arctic education, Indigenous education, educational equity, Place-based learning, Social and ecological sustainability

Conveners:

Tuija Turunen *University of Lapland*
Mhairi Beaton *Leeds Beckett University*

Description:

Education provision is fundamental to the preparation of present and future generations living in the Arctic and across the Circumpolar North. Nevertheless, for too long, education in the North at all levels from early years to tertiary education has been marked by deficit perspectives, highlighting long distances, geographic isolation, limited resources and challenges in retaining qualified teachers. However, education in the Arctic also offers features that are increasingly relevant beyond this unique geographical context. Small schools, multi-age classrooms and linguistic and cultural diversity including Indigenous perspectives can foster innovative, context-responsive practices that emphasise place-based learning and stewardship of local resources. These elements are closely linked to social cohesion and ecological sustainability. This session invites oral and poster presentations exploring a variety of viewpoints on education in the Arctic, including those of students, teachers and community members. The presentations will contribute novel and inclusive perspectives on current and future education in the Arctic.

S40: Arctic Riverine Systems and Communities: Interdisciplinary Perspectives on Environmental Change, Resilience, and Adaptation

Keywords:

Arctic and sub-Arctic riverine systems, hydrological regimes, social-ecological systems, riverine community-centered adaptation strategies.

Conveners:

Alexander Shiklomanov *University of New Hampshire*
Marya Rozanova-Smith *Columbian College of Arts & Sciences*
Andrey N. Petrov *University of Northern Iowa*

Description:

Across the Circumpolar region, many communities are located along rivers, where riverine social-ecological systems are essential to livelihoods, transportation, food systems, cultural practices, and community well-being. Arctic and sub-Arctic rivers are undergoing rapid transformation as a result of changes in hydrological regimes, cryosphere dynamics, permafrost conditions, erosion patterns, and ecosystem processes. These environmental changes are closely connected to the social, cultural, economic, infrastructural, and governance challenges experienced by Arctic communities, particularly Indigenous communities. The session will examine interactions among hydrology, cryosphere processes, ecosystems, infrastructure, mobility, livelihoods, and community adaptation. Participants are

invited to consider how changing river conditions affect local and regional resilience, how Indigenous knowledge and community priorities can shape research agendas, and how interdisciplinary collaboration can support practical, community-centered adaptation strategies.

S41: Arctic Environmental Observing in Challenging Times: Coordination, Data Systems, Funding, Co-creation and the Path Forward to IPY-5

Keywords:

Arctic Observing System, Co-creation, IPY-5, Arctic data systems, user-needs

Conveners:

Michael Karcher *Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research*

Jeremy Wilkinson *British Antarctic Survey*

Maribeth Murray *Arctic Institute of North America*

Tetsuo Sueyoshi *National Institute of Polar Research*

Gosia Smieszek-Rice *Arctic Monitoring and Assessment Programme*

Description:

The Arctic is undergoing rapid environmental, social, and geopolitical transformations, demanding a resilient, inclusive, multi-national and coordinated approach to environmental observing. As the Fifth International Polar Year (IPY-5, 2032-2033) approaches, the global Arctic community faces critical questions.

This session invites contributions that address the future of Arctic environmental observing, with a focus on:

- How to improve coordination of observations across disciplines, nations, and knowledge systems, including lessons from national and international initiatives?
- Where do we stand with data system advancements and what is needed next - including interoperability, standardization (FAIR/CARE/TRUST principles), data sovereignty, and the role of digital twins, AI, and autonomous technologies?
- Which long-term monitoring strategies bridge gaps in sustainability, spatial coverage, and user-needs?
- Which international and national funding models are in sight to support a sustained Arctic Observing System of Systems, including public-private partnerships and alignment with EU, Canadian, Asian, US and other Arctic stakeholders' priorities?
- How to best prepare for IPY-5, including scientific priorities, Indigenous co-creation, and global collaboration.
- How to arrive at co-creation with Indigenous Peoples and other Arctic residents, ensuring ethical data governance, capacity-building, and equitable participation in observing systems?

Among other programs, we will be motivated by the portfolio of the Horizon Europe project 'Beyond Arctic PASSION' as a case study, looking at governance, data interoperability, community-based monitoring, and policy alignment to spark discussion on scalable solutions. We welcome submissions from scientists, policymakers, Indigenous knowledge holders, funders, and industry representatives to foster a trans-disciplinary dialogue on the path forward.