



# Arctic Science Summit Week 2021

19-26 March | Online, Portugal

*Theme E: Unravelling Arctic  
Ecosystem Dynamics*

Detailed session program



## **ID:06 - Arctic ecosystem changes, pollutant issues and their impact on wildlife and northern communities**

Unravelling Arctic Ecosystem Dynamics

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

### **Conveners:**

Martin Pilote | Environment and Climate Change Canada, Aquatic Contaminants Research Division, Montreal, Canada & Centre for Northern Studies

Martin Jusek | Centro de Química Estrutural, Instituto Superior Técnico, University of Lisbon, Lisbon, Portugal

João Canário | Centro de Química Estrutural, Instituto Superior Técnico, University of Lisbon, Lisbon, Portugal

The Arctic and subarctic regions are experiencing the influence of regional and global anthropogenic activities, and unprecedented warming has been causing significant changes in the structure and functioning of both terrestrial and aquatic ecosystems. These changes have major implications on the remobilization of contaminants, biogeochemical transformations, transport and deposition, and the consequent bioaccumulation in the food chains with direct impacts not only on wildlife, but also on the northern communities who live in close connection with their own environment. This session aims to present and discuss new crucial scientific knowledge related with the interaction between contaminants, microbes and nutrients in the atmosphere, biosphere, cryosphere and the hydrosphere and to debate their impact on the arctic and sub-arctic ecosystems, native communities, and public health. This session is also included on the T-MOSAIC, Northern Community Issues Action Group activities.

### **24 March 2021 | 08:00 - 10:00 GMT | Room D | Oral Presentations**

| Time  | Title  | Presenting author  |
|-------|--|--------------------|
| 08:00 | Introduction by the conveners  |                    |
| 08:05 | Advancing models to link changes in dissolved organic carbon with PAR and UV light attenuation and the ecosystem responses in browning lakes | Rachel M. Pilla    |
| 08:20 | Who is methylating Mercury in Permafrost Thaw Lakes?   | Martin Jusek       |
| 08:35 | Influence of thawing permafrost on the fate of Hg and trace metals in thermokarst ponds, eastern Canadian subarctic region (Nunavik)         | Martin Pilote      |
| 08:50 | Microplastic pollution estimation in the surface water of the Barents and Norwegian Seas in Norwegian and Russian marine expeditions         | Svetlana Pakhomova |
| 09:05 | Distribution of floating marine macro-litter in relation to oceanographic characteristics in the Russian Arctic Seas in October 2020         | Maria Pogojeva     |
| 09:20 | Anti-biotic resistance genes in arctic aquatic environments  | Mary Thaler        |
| 09:35 | Open discussion on orals and posters   |                    |

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

|  | Title  | Presenting author |
|--|--|-------------------|
|  | Comparison of ion runoff during the ice-covered period and summer according to actual data and long-term change in ion runoff of Lena river delta. | Natalia Alekseeva |
|  | Modeling the influence of biogeochemical and ecosystem processes on microplastic transport in the Arctic seas on the example of Oslofjord          | Anfisa Berezina   |

## **ID:12 - Microbiomes and biogeochemical processes along geographic and environmental gradients in the circumpolar North**

Unravelling Arctic Ecosystem Dynamics

25 March 2021 | 11:30 - 13:30 GMT | Room E

25 March 2021 | 15:30 - 17:30 GMT | Room E

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

### **Conveners:**

Anne D. Jungblut | Natural History Museum, London, United Kingdom

Jérôme Comte | Institut national de la recherche scientifique, Quebec city, Canada

Klemens Weisleitner | University of Innsbruck, Innsbruck, Austria

Arctic ecosystems are underpinned by communities of diverse microscopic lifeforms, collectively referred to as microbiomes. These occur as interacting networks that control biogeochemical processes such as greenhouse gas production and nutrient cycling, and they contribute to the base of food webs and affect populations changes at higher trophic levels. Genomic analysis has shown that microbiomes contain assemblages of viruses, archaea, bacteria and microbial eukaryotes that are metabolically as well as taxonomically diverse with new emerging taxa, but still little is known about the extent of that diversity, network relationships, spatial and temporal variation, and coupling to biogeochemical and ecosystem processes. The session organized by T-MOSAiC Arctic Microbiome Action Group invites contributions on bacteria, archaea, viruses, fungi and other microbial eukaryotes from any Arctic environments. The aim of this session is to encourage broad and comparative research across spatial and environmental gradients as well as connectivity between terrestrial and marine habitats in the circumpolar North using omics and other approaches. This may include studies on microbiomes along geographic and environmental gradients, seasonal and temporal drivers of diversity patterns, responses to environmental stress, as well as metabolic and physiological responses to environmental change with implications to biogeochemical and ecosystem processes.

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

| Time  | Title  | Presenting author    |
|-------|--|----------------------|
| 11:30 | Introduction by the conveners  |                      |
| 11:35 | A 20-year record that links the planktonic microbiome of Toolik Lake to seasonal cycles of stratification                                | Natasha R. Christman |
| 11:50 | Microbial monitoring of a three-year permafrost collapse in Greenland  | Maria Scheel         |
| 12:05 | Microbial iron cycling detection, ecology, and role in the Arctic tundra   | Alexander B. Michaud |
| 12:20 | Species diversity of fungi in peat plateaus in mountainous landscapes of the Arctic.   | Kovaleva Vera A.     |
| 12:35 | Hydroecological and biogeochemical assessments of rainfall washoff on retrogressive thaw slump scars along the soil-slump-lake continuum | Thomas Reid          |
| 12:50 | Terrestrial Inputs Shape Coastal Microbial Communities in a High Arctic Fjord (Isfjorden, Svalbard)                                      | Lisa-Marie Delpech   |
| 13:05 | Open discussion on orals and posters   |                      |

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

| Time  | Title   | Presenting author    |
|-------|---|----------------------|
| 15:30 | Introduction by the conveners   |                      |
| 15:35 | The biogeochemical variability of Arctic thermokarst ponds is reflected by stochastic and niche-driven microbial community assembly processes | Alizée Le Moigne     |
| 15:50 | Dissolved organic matter composition and energetic shifts in Arctic stream waters with landcover change                                       | Dr Samuel Cottingham |
| 16:05 | Functional vs. taxonomic microbial diversity along lake glacier chronosequences: what is the better predictor for greenhouse gas production?  | Jing Wei             |
| 16:20 | Variations in cryoconite holes and phototrophs across an outlet glacier in southwest Greenland  | Nozomu Takeuchi      |
| 16:35 | Salinity and dissolved organic carbon drive microbial community structure in a subarctic river system and its transition zone to the sea      | Marie-Amélie Blais   |
| 16:50 | Insights into metal tolerant bacterial diversity associated with a glacio-marine system in Ny-Ålesund, Arctic                                 | Femi Anna Thomas     |
| 17:05 | Open discussion on orals and posters  |                      |

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

| Time  | Title   | Presenting author        |
|-------|---|--------------------------|
| 15:30 | Introduction by the conveners   |                          |
| 15:35 | Rare bacterial taxa shape the bacterioplankton community structure in the fjords of west and northern Svalbard, Arctic                                      | Siddarthan Venkatachalam |
| 15:50 | Degradation of terrigenous dissolved organic matter in Arctic coastal waters: importance of the priming effect and identification of microbial actors       | Lucas Tisserand          |
| 16:05 | Seasonal shifts in microbial dormancy and activity in Beaufort Sea coastal lagoons  | Natasha A. Griffin       |
| 16:20 | Antibiotic resistance in cryosheric habitats  | Daniel Gattinger         |
| 16:35 | Repertoire of membrane transporters encoded in the Arctic picophytoplankton <i>Micromonas Polar</i> ( <i>Mamiellophyceae</i> , <i>Chlorophyta</i> ) genomes | Margot Tragin            |
| 16:50 | Open discussion on orals and posters  |                          |

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

| Time | Title  | Presenting author |
|------|--|-------------------|
|      | Diversity and metabolic profiles of prokaryotic communities in extra-terrestrial analogues on Earth: perennially ice-covered Antarctic lake brines | Papale Maria      |
|      | In-silico analysis of functional annotations in cold active BgalEL from an Arctic psychrotrophic bacterium <i>Enterobacter ludwigii</i>            | Aneesa P A        |
|      | Arctic tundra microbiomes in relation to relative humidity and soil properties   | Lotte De Maeyer   |
|      | Changes in microbial diversity and ecology in Arctic freshwater biofilms across a broad latitudinal gradient (56-83 °N)                            | Patrick M. Hooper |

## ID:23 - The forgotten season – Arctic Winter Microbiology

### Unravelling Arctic Ecosystem Dynamics

24 March 2021 | 19:00 - 21:00 GMT | Room E

#### Conveners:

Riitta Nissinen | Department of Biological and Environmental Science, University of Jyväskylä, Finland

Shawn Brown | Department of Biological Sciences, The University of Memphis

Pernille Bronken Eidesen | The University Centre in Svalbard, Norway

Winter conditions fundamentally shape arctic ecosystems. The Arctic is warming rapidly, and changes in temperature, precipitation and extreme weather are more pronounced in winter than summer. Bacteria, fungi, and small eukaryotes maintain substantial activity year around. The winter nutrient cycling and gas exchange are keys to understand the arctic ecosystem ecology and productivity across the snow-free season. Yet, research on microbes is largely done during the short arctic summer. Season length, research activity and anticipated climatic impact are grossly mismatched. To assess and understand climate change, and predict ecosystem responses, we need knowledge of biological winter processes across terrestrial, freshwater, and marine ecosystems, coupled with abiotic factors and arctic critical zone dynamics. We invite contributions related to arctic winter microbiology aiming at 1) gauging the state of research in this emerging field, 2) identify research needs and best approaches, 3) cooperation across fields (biology, geology, geophysics) to share current knowledge and identify key research questions to understand the system as a whole.

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

| Time  | Title   | Presenting author        |
|-------|---|--------------------------|
| 19:00 | Introduction by the conveners   |                          |
| 19:05 | Annual cycle of filamentous alga <i>tribonema</i> cf. <i>Minus</i> in hydro-terrestrial habitats in the high arctic   | Matouš Jimel             |
| 19:20 | Arctic spring awakening – reinitiation of photosynthetic activity at the winter-spring transition   | Clara J M Hoppe          |
| 19:35 | Season strongly shapes bacterial but not fungal communities of subarctic plants   | Suni Mathew              |
| 19:50 | Ectomycorrhizal fungi: resilient to increased snow depth or a matter of experimental design?  | Pernille Bronken Eidesen |
| 20:05 | Nutrient cycles and gas exchange coupled to Microbial community diversity in Arctic permafrost  | Lise Øvreås              |
| 20:20 | Isolation and characterization of psychrotolerant arsenic-metabolizing microorganisms from a subarctic peatland used in treatment of mining-affected waters | Katharina Kujala         |
| 20:35 | Open discussion on orals and posters  |                          |

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

|  | Title  | Presenting author |
|--|--|-------------------|
|  | Capturing the unknown microbial players and genes involved in the cycling of arsenic and antimony in Northern peatland soils | Tiina Laamanen    |



## **ID:26 - The Arctic Underground: Exploring root and rhizosphere processes in cold ecosystems**

Unravelling Arctic Ecosystem Dynamics

24 March 2021 | 10:30 - 12:30 GMT | Room D

### **Conveners:**

Rebecca Hewitt | Center for Ecosystem Science and Society, Northern Arizona University

Michelle Mack | Center for Ecosystem Science and Society, Northern Arizona University

Quantifying belowground properties in response to climate warming is critical to accurately forecasting terrestrial Arctic ecosystem dynamics. While field and modeling studies point to the importance of belowground processes in driving ecosystem change and feedbacks to the climate system, studying belowground dynamics has been challenging historically. Novel molecular ecology and chemistry applications are enabling new insights into the connections between the visible surface and the Arctic underground. This session will explore research focused on root traits and rhizosphere processes in “cold” ecosystems – Arctic and alpine tundra, boreal forest, and peatlands. We welcome abstracts ranging from molecular biologists investigating rhizosphere processes, to plant ecologists using a trait framework to understand vegetation patterns and function, to ecosystem ecologists measuring the interplay between terrestrial ecosystem function and the climate system, to social scientists exploring the human dimension of belowground change.

### **24 March 2021 | 10:30 - 12:30 GMT | Room D | Oral Presentations**

| Time  | Title   | Presenting author   |
|-------|---|---------------------|
| 10:30 | Introduction by the conveners   |                     |
| 10:35 | Can root-associated fungi mediate the impact of abiotic conditions on the growth of a High Arctic herb?                         | Magdalena Wutkowska |
| 10:50 | Fungi and plant co-variation in Arctic Siberia inferred from sedimentary ancient DNA metabarcoding during the last 50.000 years | Barbara von Hippel  |
| 11:05 | Impact of short-term warming on nitrogen uptake and allocation by an arctic grass   | Verity Salmon       |
| 11:20 | Reliance of subarctic fungal communities on recent photosynthate delivery revealed by a stem girdling experiment                | Thomas C. Parker    |
| 11:35 | Rhizosphere and non-rhizosphere priming effects in the Arctic   | Sylvain Monteux     |
| 11:50 | Rooting depth distribution of arctic vegetation on permafrost   | Gesche Blume-Werry  |
| 12:05 | Open discussion on orals and posters  |                     |

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

|  | Title  | Presenting author  |
|--|--|--------------------|
|  | Contrasting plant root responses across vegetation types to snow addition in the High Arctic   | Ludovica D'Imperio |
|  | Fine-root functional trait responses to experimental warming: A global meta-analysis   | Jinsong Wang       |
|  | Impact of Increased Seasonal Snowpack on the Fine Root Dynamics of Treeline White Spruce ( <i>Picea glauca</i> ) in the Western Brooks Range, AK | Christina Minions  |
|  | Litter decomposition is moderated by below-ground micro-environmental variation in tundra ecosystems   | Elise Gallois      |
|  | Plant-Microbiome Interactions in Contaminated Soil in a Subarctic Mine Environment   | Qinhong Cai        |

## **ID:27 - Biodiversity and ecosystem functions in the New Arctic**

### Unravelling Arctic Ecosystem Dynamics

25 March 2021 | 08:00 - 10:00 GMT | Room D

25 March 2021 | 11:30 - 13:30 GMT | Room D

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

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

#### **Conveners:**

Gabriela Schaepman-Strub | University of Zurich

Cinzia Verde | National Research Council of Italy

Toke Thomas Høye | Aarhus University

Global change is affecting biodiversity and ecosystem functions in many ways, altering the complex balance of biogeochemical and -physical cycles and climate feedbacks. The fast rate of climate change in Arctic systems may challenge organisms. Ecosystems may approach tipping points, where irreversible shifts in biodiversity and ecosystem functions could occur. The ability to cope with this change will depend on physiological and behavioral plasticity of current populations and their evolutionary potential. In this session, we are interested in integrating latest results on the biodiversity of Arctic marine, freshwater, and terrestrial ecosystems, their functioning and the provisioning of ecosystem services under current conditions and in the New Arctic. We solicit contributions based on experiments, models, and observations; from gene to ecosystem level; from microbes to lichens, vascular plants, large mammals, fish, and birds; integrated across temporal and spatial scales; and across natural science, social science and humanities, citizen science and indigenous knowledge systems. Contributions relating to impacts and interactions of Arctic ecosystems to and with the lower latitudes are specifically encouraged. Our goal is to highlight existing research, propose new avenues, identify knowledge gaps, and outline international research opportunities.

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

| Time  | Title   | Presenting author   |
|-------|---|---------------------|
| 08:00 | Introduction by the conveners   |                     |
| 08:05 | A metagenomic view of microbial community, functional potential, and fishes in the central arctic ocean   | Moritz Buck         |
| 08:20 | Adaptive mechanisms of phytoplankton in a changing Arctic: The hidden dynamics of intraspecific selection                                       | Klara Wolf          |
| 08:35 | Arctic Jellies: Investigating the impact of gelatinous zooplankton communities on changing Arctic ecosystems                                    | Charlotte Havermans |
| 08:50 | Range-wide ecological niche model of <i>Calanus finmarchicus</i> reveals possible drivers of Arctic 'Atlantification' by sub-Arctic zooplankton | Jennifer J. Freer   |
| 09:05 | Do interannual variations in environmental conditions affect the recruitment of adult Arctic cod  | Jennifer Herbig     |
| 09:20 | Competition among Arctic cephalopods: how do diet and life history traits in three sympatric Arctic <i>Rossia</i> spp. may reduce it?           | Alexey V. Golikov   |
| 09:35 | Open discussion on orals and posters  |                     |

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

| Sequence | Title   | Presenting author  |
|----------|---|--------------------|
| 1        | Modelling of Arctic Gelatinous Zooplankton  | Dmitrii Pantiukhin |
| 2        | Arctic vs sub-Arctic pelagic amphipods: DNA reveals a different history and a different future in the face of climate change  | Ayla Murray        |
| 3        | Should we expect shift in beluga habitat use in the context of climate change – Case of inshore Mackenzie Estuary and Tarium Niryutait Marine Protected Area in Western Arctic Canada | Aurelie Noel       |
| 4        | Sympagic fauna in seasonal land fast ice in the White Sea   | Anna I. Timchenko  |

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

| Time  | Title  | Presenting author              |
|-------|--|--------------------------------|
| 11:30 | Introduction by the conveners  |                                |
| 11:35 | Changing sea ice ecosystems and associated ecosystem services  | Nadja Steiner                  |
| 11:50 | Environmental status of Svalbard coastscapes and focal ecosystem components  | Janne E. Søreide               |
| 12:05 | Sympagic meiofaunal abundance and diversity with emphasis on the phenology of ice nematodes, in Van Mijenfjorden (Svalbard)  | Vanessa Pitusi                 |
| 12:20 | Sympagic carbon: an important food source for benthos in a warming Arctic?   | Ivan Cautain                   |
| 12:35 | High Arctic ecosystem change over the last 50,000 years revealed by paleo-metagenomics analyses on a lake sediment core from Far Eastern Russia  | Kathleen R. Stoof-Leichsenring |
| 12:50 | Investigation of East Siberian Pleistocene glacial and interglacial paleodiversity based on ancient DNA analyses of sediments from the Batagay Megaslump exposure – Providing picture of past ecosystems | Jérémy Courtin                 |
| 13:05 | Open discussion on orals and posters   |                                |

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

| Sequence | Title  | Presenting author     |
|----------|--|-----------------------|
| 1        | On the interannual variability of sea ice in the Bering Sea and related changes in primary production and Cold Pool distribution | Jaclyn Clement Kinney |
| 2        | Investigating the prey spectrum of two co-occurring <i>Themisto</i> amphipod species in the Fram Strait using DNA metabarcoding  | Annkathrin Dischereit |
| 3        | On the phylogeny of Nematoda in coastal sea ice on Svalbard (European Arctic)  | Vanessa Pitusi        |

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

| Time  | Title   | Presenting author     |
|-------|---|-----------------------|
| 08:00 | Introduction by the conveners   |                       |
| 08:05 | Litter decomposition in the High-Arctic: plant communities and edaphic factors influence the fate of Tea Bags   | Vincent Maire         |
| 08:20 | Unique genetic origin of an old biodiversity hot spot in Svalbard   | Viktorie Brožová      |
| 08:35 | Flora of mosses of the Franz Josef Land   | Irina V. Czernyadjeva |
| 08:50 | Integrating metabolomics and ecological niche modelling to predict plant climate change resilience at a permafrost anomaly on Cornwallis Island, Nunavut. | Lauren Erland         |
| 09:05 | Modelling reindeer adaptability in a changing landscape and climate   | Ilona Kater           |
| 09:20 | Food web approach to manage arctic wildlife populations in an era of rapid environmental change   | Jarad Pope Mellard    |
| 09:35 | Open discussion on orals and posters  |                       |

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

| Sequence | Title   | Presenting author        |
|----------|---|--------------------------|
| 1        | Cold Mountain (Goltzy) Deserts in European Arctic: an Inventory of Flora, Vegetation, and Soils                             | Koroleva, Natalia        |
| 2        | Effects of warmer and rainier arctic winters on a widespread herb: <i>Bistorta vivipara</i>                                 | Jan Detampel             |
| 3        | Polyploidy in <i>Saxifraga oppositifolia</i> : A shift in reproductive parameters as a result of environmental adaptations? | Ingrid Vesterdal Tjessem |
| 4        | <i>Saxifraga oppositifolia</i> : Conquering new niches in the High Arctic in a successful polyploidization event            | Simen Salomonsen Hjelle  |

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

| Time  | Title   | Presenting author     |
|-------|---|-----------------------|
| 11:30 | Introduction by the conveners   |                       |
| 11:35 | Dark diversity in the tundra: the source of future plant biodiversity change?   | Gergana N Daskalova   |
| 11:50 | Do traits explain tundra plant species range size and projected expansion with warming?   | Mariana García Criado |
| 12:05 | Drivers of Spatial and Temporal Variability in Ecosystem Functional Diversity on the Yamal Peninsula, Siberia, Russia                       | Morgan Tassone        |
| 12:20 | Macro versus microenvironmental controls on tundra vegetation change  | Isla Myers-Smith      |
| 12:35 | Vegetation phenology and microclimate in a changing Arctic  | Geerte E. de Jong     |
| 12:50 | Not all flowers are equal: The importance of microclimate for reproductive success in the arctic-alpine cushion plant <i>Silene acaulis</i> | Rebekka Eriksen Ween  |
| 13:05 | Open discussion on orals and posters  |                       |

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

| Sequence | Title  | Presenting author |
|----------|--|-------------------|
| 1        | Biodiversity in the Old and the New Arctic - toward completion of the Arctic Vegetation Archive  | Amy Breen         |
| 2        | Will Current Protected Areas Harbour Refugia for Threatened Arctic Vegetation Types until 2050?  | Merin R. Chacko   |
| 3        | Monitoring and modelling of the critical balance of biomass vs biodiversity in the development of the northern treeline using drone monitoring and earth observation in Siberia (BioS) | Stefan Kruse      |
| 4        | The hidden world: how plants shape belowground development of active layer depth in a high arctic environment  | Sil Schuurig      |

## **ID:44 - Effect of environmental parameters on polar terrestrial microbial communities**

Unravelling Arctic Ecosystem Dynamics

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

### **Conveners:**

Laura Zucconi | University of Tuscia

Fabiana Canini | University of Tuscia

In recent years Arctic regions have been experiencing the highest rates of warming worldwide, resulted in an extension of ice-free periods and an overall greening of terrestrial areas. Given the role of microbes on biogeochemical cycles, the effects of warming on decomposition of permafrost carbon pools have the potential to cause significant feedbacks at global scale. These phenomena are recently interesting also Antarctica, where they are firstly feared to result in the loss of unique and highly adapted species. Therefore, understanding the diversity of soil microbes, their role in the ecosystems functioning and the ecological drivers of their composition is fundamental. The session encourages the submission of abstracts about both Arctic and Antarctic communities aiming to disentangle environmental factors associated with their diversity and composition. Comparisons between the two environments are not mandatory and works dealing with specific taxonomical groups are also accepted.

### **24 March 2021 | 08:00 - 10:00 GMT | Room E | Oral Presentations**

| Time  | Title   | Presenting author |
|-------|---|-------------------|
| 08:00 | Introduction by the conveners   |                   |
| 08:05 | Glacier retreat in the High Arctic: Opportunity or threat for ectomycorrhizal diversity?  | Sunil Mundra      |
| 08:20 | Tundra type drives distinct trajectories of functional and taxonomic composition of arctic fungal communities in response to climate change – results from long-term experimental summer warming and increased snow depth | József Geml       |
| 08:35 | Spatial scale structure soil bacterial communities across an Arctic landscape   | Lucie A. Malard   |
| 08:50 | Structural and functional characteristics of high alpine soil communities   | Federica D'Alò    |
| 09:05 | Antarctic Dry Valley Refugia  | Abigail Jackson   |
| 09:20 | Finding Snowball Earth: a multidisciplinary study of Arctic and Antarctic Cryogenian analogues  | Jaz Millar        |
| 09:35 | Open discussion on orals and posters  |                   |



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

|  | Title  | Presenting author  |
|--|--|--------------------|
|  | Cooperative communities at both poles: From explorative studies to comprehensive theory                                      | Jesse Jorna        |
|  | Influence of climate change on microclimate and biodeterioration of cultural heritage in soil contact at Spitsbergen, Norway | Dr. Johan Mattsson |
|  | Interplay between fungal and bacterial communities in soils with different vegetation coverage in Western Greenland          | Fabiana Canini     |
|  | Microbial response to anthropogenic pollutants in Polar lakes  | Papale Maria       |

## **ID:54 - Fjords ecosystems in a global perspective – similarities and special features**

Unravelling Arctic Ecosystem Dynamics

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

24 March 2021 | 19:00 - 21:00 GMT | Room D

### **Conveners:**

Ingrid Wiedmann | UiT The Arctic University of Norway

Angelika H. H. Renner | Institute of Marine Research, Norway

Maeve McGovern | Norwegian Institute for Water Research, UiT The Arctic University of Norway

Fjords are a rare type of coastal marine ecosystem, yet as a hotspot of primary production and carbon burial, they play an important role in global climate regulation. While Arctic and Antarctic fjords are frequently studied, a bipolar, cross-disciplinary understanding of fjord ecosystems is lacking. Thus, we invite presentations detailing recent fjord research, including, but not limited to, field and model studies of fjord oceanography, investigations of the effects of freshwater run-off on fjord ecosystems, as well as ecological studies on all trophic levels. Further, research addressing the effects of climatic change and other anthropogenic activities (e.g., aquaculture, effects of contaminants) in fjord ecosystems are welcome. The overarching goal of this session is to gain a bipolar, multidisciplinary understanding of fjord ecosystems and of how future regional changes in fjords may have global impacts. Thus, a comprehensive perspective will be provided by highlighting special features and global similarities among fjord systems in the Arctic and Antarctic.

### **24 March 2021 | 16:30 - 18:30 GMT | Room D | Oral Presentations**

| Time  | Title   | Presenting author |
|-------|---|-------------------|
| 16:30 | Introduction by the conveners   |                   |
| 16:35 | Perspective on fjord dynamics in a changing Arctic  | Karley Campbell   |
| 16:50 | Seasonal plankton trends in Kongsfjorden, Svalbard, during 2019   | Philipp Assmy     |
| 17:05 | Biogeochemistry of an Arctic fjord under high-resolution lens   | Archana Singh     |
| 17:20 | 15 years of observatory data from two Arctic fjords as open access  | Jørgen Berge      |
| 17:45 | Biogeochemical regime of Templefjord (Spitsbergen) influenced by coastal runoff and glacial melting           | M. Pogojeva       |
| 18:00 | Glacial meltwater determines the balance between autotrophic and heterotrophic processes in a Greenland fjord | Mikael Sejr       |
| 18:15 | Open discussion on orals and posters  |                   |

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

| Time  | Title   | Presenting author |
|-------|---|-------------------|
| 19:00 | Introduction by the conveners   |                   |
| 19:05 | Contrasting patterns of benthic biomass and response to climate warming in Antarctic versus Arctic subpolar fjords  | Craig R. Smith    |
| 19:20 | Rapid phytodetritus accumulation and consumption in a glaciomarine fjord of the West Antarctic Peninsula  | Mattias Cape      |
| 19:35 | Ability of sediment bound heterotrophic bacteria from Kongsfjorden and Krossfjorden, Arctic to degrade structurally stable polysaccharides                | Vishnupriya. S    |
| 19:50 | Sustainable Aquaculture in the North; Spatial response of hard and mixed-bottom epifauna to organic enrichment from salmon aquaculture in northern Norway | Katherine Dunlop  |
| 20:05 | Macrobenthic communities of deep sub-Arctic fjords  | Valentin Kokarev  |
| 20:20 | Effect of temperature and depth on ecosystem structure and properties of Arctic Norwegian fjords  | Torstein Pedersen |
| 20:35 | Open discussion on orals and posters  |                   |

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

|  | Title  | Presenting author   |
|--|--|---------------------|
|  | Environmental and anthropological drivers of seasonal and diurnal material load patterns in north Norwegian fjords | Menno Blom          |
|  | Glacial streams of the Novaya Zemlya as a source of nutrients for the Kara Sea fjords                              | Borisenko Gennady   |
|  | Mixed layer depth and its control on spring bloom dynamics in Kongsfjorden, Svalbard                               | Clara J M Hoppe     |
|  | Modeling the impact of glacier run-off on plankton composition in West Spitsbergen fjord (Svalbard)                | Marlena Szeligowska |
|  | Seasonality and variability of the circulation in a high-latitude fjord  | Anna Nikolopoulos   |
|  | The Fate of Ice sheet Derived Organic Matter in Greenland Fjords   | Johnna M. Holding   |
|  | Ocean temperature during summer in Kongsfjorden, an eastern Arctic fjord   | Divya David T       |

## **ID:56 - Climate change and its impact on ecosystems in subarctic Eurasia**

### Unravelling Arctic Ecosystem Dynamics

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

#### **Conveners:**

Dr Gareth Marshall | British Antarctic Survey

Dr Olga Tutubalina | MV Lomonosov Moscow State University

Polina Mikhaylyukova | MV Lomonosov Moscow State University

The ecotone between northern tundra and forest (or taiga) is an especially sensitive indicator of climate change. Moreover, both biomes make important contributions to global biosystems and biodiversity, and support traditional land management, while the northern forest is also a major economic resource. Therefore, a clear need exists to accurately monitor changes in subarctic Eurasian ecosystems and to better understand their response to the significant regional changes in climate across a range of spatial and temporal scales. We invite submissions on the following subject areas:

- Observational and modelling studies of climate change in subarctic Eurasia
- New methods for mapping northern ecosystems at a range of spatial scales, from ground measurements, through UAV survey to satellite imagery
- New methods for monitoring intra-seasonal and long-term variations in forest and tundra biomass using remotely-sensed data
- Determination of the key climatic variables that govern the dynamics of northern ecosystems, including their response to human disturbance
- Future projections of northern forest development and migration of the tundra-forest ecotone

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

| Time  | Title  | Presenting author              |
|-------|--|--------------------------------|
| 18:00 | Introduction by the conveners  |                                |
| 18:05 | Climate-driven phenological changes in the Russian Arctic derived from MODIS LAI time series 2000-2019   | Nikolay Shabanov               |
| 18:20 | How well do current climate reanalyses reproduce climate change across northern Russia?  | Jack Tomaney                   |
| 18:35 | Regional biogeographic effects of climate changes in the Russian Arctic in the 21st century  | Arkadiy Tishkov                |
| 18:50 | A multi-scale approach to studying disturbance dynamics in the tundra-forest ecotone: a decade of experience   | Ole Petter Laksforsmo Vindstad |
| 19:05 | Estimation of Russian boreal forest biomass from high-resolution satellite imagery   | Gareth Rees                    |
| 19:20 | Coupling the individual based, spatially-explicit treeline model LAVESI with the permafrost land-surface model CryoGrid to assess the impact of permafrost-vegetation interaction on tundra-taiga dynamics of Far-east Siberia | Stefan Kruse                   |
| 19:35 | Open discussion on orals and posters   |                                |

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

|  | Title   | Presenting author |
|--|---|-------------------|
|  | Assessing and predicting spatially explicit larch above-ground biomass change in the treeline ecotone of central Chukotka                   | Iuliia Shevtsova  |
|  | Climate-induced vegetation change around Noril'sk, north-central Siberia  | Oleg Zheleznyy    |
|  | Decadal variability in the impact of atmospheric circulation patterns on the winter climate of northern Russia                              | Gareth Marshall   |
|  | Modeling the distribution of <i>Betula nana</i> as a key indicator of changes in subzonal tundra boundaries in the North of Western Siberia | Ivleva T. Y.      |
|  | Small Arctic islands and their seasonal and long-term dynamics according to optical and radar data  | Elena Baldina     |
|  | Subarctic Eurasia in flames: A new perspective on wildfire impacts from an individual-based fire-vegetation model for eastern Siberia       | Ramesh Glückler   |

## **ID:57 - Light as a structuring mechanism in the Arctic – from physics to biology**

Unravelling Arctic Ecosystem Dynamics

24 March 2021 | 10:30 - 12:30 GMT | Room E

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

### **Conveners:**

Dr. Nicholas Per Huffeldt | Greenland Institute of Natural Resources & Aarhus University, Denmark

Professor Finlo Cottier | The Scottish Association of Marine Science, United Kingdom & UiT The Arctic University of Norway

Dr. Laura Hobbs | The Scottish Association of Marine Science, United Kingdom & The University of Strathclyde, United Kingdom

Light is a key mechanism shaping almost every aspect of the natural world – from geophysical systems to ecosystems to individual behavior and physiology. Phases of continuous light and dark during the annual cycle define high latitude systems, which contrast the persistent and prominent diel cycle between light and dark at lower latitude. In polar environments, however, we have an incomplete and fragmented understanding of how these photic extremes structure natural events, and multiple disciplines investigate how light organizes atmospheric, ecological, and organismal processes. The aim of this session is to consolidate our knowledge of the role that light plays in the Arctic by bringing together colleagues working on marine, terrestrial, and atmospheric systems. This interdisciplinary session will be a foundational event for producing a cross-cutting synthesis, from which we can build a better understanding of the role of light in a warming Arctic.

### **24 March 2021 | 10:30 - 12:30 GMT | Room E | Oral Presentations**

| Time  | Title   | Presenting author    |
|-------|---|----------------------|
| 10:30 | Introduction by the conveners   |                      |
| 10:35 | Light and energetics at seasonal extremes limit poleward range shifts   | Tom Langbehn         |
| 10:50 | Environmental conditions alter behavioural organization and rhythmicity of a large Arctic ruminant across the annual cycle                | Floris M van Beest   |
| 11:05 | Oscillating circadian clock genes and widely rhythmic transcriptome in <i>Calanus finmarchicus</i> during the high Arctic summer solstice | Laura Payton         |
| 11:20 | High latitude photoperiodism in the copepod <i>Calanus finmarchicus</i>   | Kim S. Last          |
| 11:35 | Do physiology and behavior track time of day under the continuous light of polar summer in a seabird?                                     | Nicholas P. Huffeldt |
| 11:50 | Does climate change lead to timelapse versions of spring bloom scenarios in Arctic fjords?  | Eva Leu              |
| 12:05 | Open discussion on orals and posters  |                      |

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

| Time  | Title   | Presenting author |
|-------|---|-------------------|
| 16:30 | Introduction by the conveners   |                   |
| 16:35 | Arctic twilight entrains visual sensitivity and behavioral rhythms in krill                                     | Jonathan H. Cohen |
| 16:50 | Behavioral response of marine fish and zooplankton exposed to artificial light during the Arctic polar night    | Maxime Geoffroy   |
| 17:05 | Changes in the solar partitioning of the sea ice cover during summer in the Arctic Ocean                        | Gaëlle Veyssière  |
| 17:20 | Arctic Ocean mid-winter phytoplankton growth revealed by autonomous profilers                                   | Achim Randelhoff  |
| 17:45 | Light permits continued near-bottom chlorophyll fluorescence on a shallow Arctic shelf, the eastern Chukchi Sea | Michael F. Sigler |
| 18:00 | Large scale sea-ice ecosystem response to changes in under-ice light field                                      | Giulia Castellani |
| 18:15 | Open discussion on orals and posters  |                   |

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

|  | Title   | Presenting author |
|--|---|-------------------|
|  | Arctic zooplankton and the Lightscape of Fear: Behavioural Responses to Light Buffer Diel and Seasonal Changes in Visual Predation Risk | Laura Hobbs       |
|  | Different responses to photoperiod in boreal and sub-Arctic Calanus population: a seasonal study of individual cyclic activity.         | Estelle Coguie    |

## **ID:71 - Biodiversity at Northern Latitudes: a Focus on Wetland and Freshwater Ecological Connectivity**

Unravelling Arctic Ecosystem Dynamics

25 March 2021 | 15:30 - 17:30 GMT | Room D

### **Conveners:**

Dr. Skúli Skúlason | Hólar University, Iceland

Dr. Jennifer Lento | University of New Brunswick, Canada

Camille Leblanc | Hólar University, Iceland

The Northern latitudes contain abundant and diverse freshwater ecosystems, which encompass streams, lakes, ponds and wetlands. They harbour a great diversity of plants and animals. These diverse ecosystems contain a wide range of habitats of varying ecological complexity and support a variety of permanent and transitory organisms adapted to living in often highly variable and extreme environments. The session will focus on the importance of community and within-species diversity, illustrating studies on aquatic species in the Arctic and subarctic areas. We will also consider how focusing on one level of diversity, i.e. species, can lead to detrimental conservation strategies. Bridging the gap between scientific knowledge about biodiversity and conservation practices is still a challenge we are faced with. We aim to discuss and raise questions regarding how wetland and freshwater ecosystems may be affected by global warming and how those changes may affect these ecosystems, local human populations and utilization. We particularly encourage submissions from Early Career Scientists and Traditional and Indigenous Knowledge holders focusing on gathering and collecting data on Arctic biodiversity finalized to Arctic biodiversity conservation.

### **25 March 2021 | 15:30 - 17:30 GMT | Room D | Oral Presentations**

| Time  | Title   | Presenting author      |
|-------|---|------------------------|
| 15:30 | Introduction by the conveners   |                        |
| 15:35 | Exploring biological diversity of Arctic freshwater organisms: Do conservation goals change when looking at structural versus functional diversity?             | Brianna Levenstein     |
| 15:50 | Indigenous partnered research to address biodiversity knowledge gaps and community ecological concerns: a case study from the lower Mackenzie Watershed, Canada | Jordan Musetta-Lambert |
| 16:05 | Recent Trends in Nest Densities of Arctic Birds in Chaun Delta, Chukotka, Russia, as Related to the Climate Change  | Diana V Solovyeva      |
| 16:20 | Temperature and spatial connectivity limit benthic macroinvertebrate biodiversity across Arctic lakes and rivers  | Jennifer Lento         |
| 16:35 | Using bacterial diversity to predict greenhouse gas emissions from boreal lakes   | Nicolas Valiente       |
| 16:50 | Open discussion on orals and posters  |                        |



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

|  | Title  | Presenting author        |
|--|--|--------------------------|
|  | Climate-change induced landscape alterations causes severe lake oligotrophication in Northern Scandinavia  | Willem Goedkoop          |
|  | Freshwater zoobenthos of the Severnaya Zemlya Archipelago  | Andrey B. Krasheninnikov |
|  | The structure and the main patterns of benthic and planktonic copepod associations formation in the arctic lakes (the Lena River Delta, Eastern Siberia) | Anna A Novichkova        |