



# Arctic Science Summit Week 2021

19-26 March | Online, Portugal

*Theme D: The Changing Terrestrial  
Environments Dynamics and Impacts*

Detailed session program



## **ID:30 - Permafrost thaw effects to the Arctic nature and society**

The Changing Terrestrial Environments: Dynamics and Impacts

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

### **Conveners:**

Moritz Langer | Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research (AWI), Germany

Lei Cai | NORCE Norwegian Research Centre, Bjerknes Centre for Climate Research, Norway

Yes Anna Liljedahl | Woods Hole Research Center, USA

Permafrost is the only part of cryosphere inhabited by people, thus, permafrost thaw have become a multi-dimensional problem of environmental, economic, and social relevance. Widespread thawing of permafrost is expected in a warmer future and modeling studies suggest large-scale degradation of near-surface permafrost at the end of the 21st century. Concurring evidence from recent studies suggests that permafrost landscapes will undergo significant transformations, with unprecedented consequences for Arctic societies and direct impact on human infrastructure. In this session, we invite research covering a wide range of topics including permafrost thaw impacts to natural resources such as water and food production, human infrastructure such as roads and buildings, and societal challenges such as indigenous groups, herding, and culture. We encourage researchers from various disciplines from natural science, engineering, and social sciences to submit their scientific research findings. This session will focus on scientific findings and additionally we will host a parallel workshop that will focus on discussion of these topics.

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

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	Analysis of the stability of pipelines in Western Siberia in a changing climate	Fedor Iurov
08:20	Basic vs. applied science for effective climate adaptation - narrowing the gap	Soňa Tomašková
08:35	Classification of permafrost-ecosystem dynamics to assess thermokarst susceptibility in Yukon, Canada	Oliver K. Kienzle
08:50	How is your life affected by permafrost thaw?	Justine Ramage
09:05	Meaningful research for meaningful impact: Arctic researchers and indigenous communities working together to combat global climate change	Darcy L. Peter
09:20	Modelling consequences of permafrost degradation for Arctic infrastructure and related risks to the environment and society	Thomas Schneider von Deimling
09:35	Open discussion on orals and posters	

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

	Title	Presenting author
	Browning of northern surface waters: Implication on the microbiological quality of drinking water	Marie-Ange Moisan
	Multi-disciplinary hazard mapping framework for critical infrastructure on permafrost, Ilulissat, West-Greenland	Johanna Scheer
	Permafrost Carbon Feedback Including Terrestrial and Aquatic Dynamics in Long-Term Cycle	Deniz Vural
	Permafrost Thaw in three Arctic Focal Areas: Risks and Responses	Susanna Gartler
	Permafrost vulnerability to climate change and human impact on key site of Eastern Chukotka, Russia.	Alexey Maslakov
	Pocket fluorometers to assess the presence of disinfection by-products and cyanobacteria in northern drinking water	Camilo Herrera
	Project Introduction: Impact of rapid degradation of terrestrial cryosphere on the material cycle and the dynamics of environmental pollutants	Tetsuo Sueyoshi
	Quantification of Ancient Microbes from Permafrost and their potential risk: A Simulation Study	Akhil Prakash E.
	Remote sensing and geophysical techniques to detect and map ice-wedges	Samuel Gagnon

## **ID:34 - Implications of permafrost thaw at multiple scales: effects on hydrology and biogeochemistry**

The Changing Terrestrial Environments: Dynamics and Impacts

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

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

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

### **Conveners:**

Lara Hughes-Allen | Université Paris Saclay

Frédéric Bouchard | Université Paris Saclay

Ylva Sjöberg | University of Copenhagen

Permafrost thaw due to continued climate change and anthropogenic influences has significant impact on local and regional hydrology and biogeochemistry. The release of previously sequestered organic matter via greenhouse gas emissions has implications for global climate projections, and changing permafrost landscape dynamics has wide reaching impacts on water quality and aquatic ecosystem equilibrium. Due to the complex interplay between climate, permafrost, and people, there is strong need for cross-discipline collaboration and input from local populations. We welcome studies which focus on the interactions between climate change and permafrost dynamics and the effects of these interactions on biogeochemical and hydrological systems at different temporal and spatial scales.

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

Time	Title	Presenting author
10:30	Introduction by the conveners	
10:35	Importance of Dissolved Organic Matter (DOM) Characterization From Permafrost Thermokarst Lakes	Diogo Folhas
10:50	Annual ecosystem carbon budgets across an abrupt permafrost thaw gradient in Northern Norway	Inge Althuizen
11:05	Quantifying and characterising organic carbon in newly-developed soils following glacier retreat in northern latitudes	Saule Akhmetkaliyeva
11:20	Degradation of particulate organic carbon in the Kolyma River	Kirsi Keskitalo
11:35	Nitrogen sources and dynamics in high-Arctic streams	Ada Pastor
11:50	A 14,000- year record of permafrost and carbon dynamics from Lake Malaya Chabyda, central Yakutia (eastern Siberia)	Lara Hughes-Allen
12:05	Open discussion on orals and posters	

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

Time	Title	Presenting author
16:30	Introduction by the conveners	
16:35	Long-term hydrometeorological changes in basin underlain by continuous permafrost in the high Arctic (Bratteg river, SW Spitsbergen)	Łukasz Stachnik
16:50	Long-term warming & precipitation experiments in the high Arctic Canada	Ji Young Jung
17:05	Comparing streamflow analysis and remote sensing observations to assess climate change impact on permafrost degradation	Flore Sergeant
17:20	Hydrochemistry of the small streams in Arctic tundra	L.S. Lebedeva
17:45	Lena River biogeochemistry in a wet and a dry year	Pier Paul Overduin
18:00	Open discussion on orals and posters	

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

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	Efficient representation of overwinter freeze-thaw events	Élise Devoie
08:20	Cold and colder: extreme seasonality in thermokarst lake viral communities	Valérie Langlois
08:35	Ultra-high resolution assessment of potential impacts of vegetation shadows on satellite-derived spectral signals from small thermokarst lakes	Pedro Freitas
08:50	Thawing permafrost: an overlooked source of seeds for Arctic cloud formation	Jessie Creamean
09:05	Iron speciation at the permafrost-active layer boundary	Amanda Barker
09:20	Open discussion on orals and posters	



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

	Title	Presenting author
	Source-to-mainstem: geohydrochemical chain from catchment deposits to stream waters, Brøggerdalen, NW Spitsbergen	Zbigniew Zwoliński
	Carbon dioxide and methane fluxes measurement in the high Arctic tundra ecosystems in Cambridge Bay, Canada	Namyi Chae
	Environmental controls on organic carbon stocks stored in different tundra vegetation types in the High Arctic of Svalbard	Anna Zielonka
	Hydrochemical features of thermokarst lakes of southern and central Yamal (Russian Arctic)	Irina Fedorova
	Low-molecular-weight organic acids of peat soils in the tundra zone of European North-East	Olesya Kubik
	Modelling pan-arctic lateral carbon transport from abrupt permafrost thaw	Philip Pika
	Monitoring the optical properties of small thermokarst lakes through synergistic Unmanned Aerial Vehicle and satellite data analysis	Pedro Freitas
	Suprapermafrost taliks in the small river watershed in Eastern Siberia	L.S. Lebedeva
	The extent of Alaskan arctic coastal wetlands in response to changing sea level	Matthias Fuchs
	Transcriptional response of methanogenic communities to permafrost thaw	Nu Ri Myeong

## **ID:53 - Earth surface processes in a warmer and wetter Arctic**

The Changing Terrestrial Environments: Dynamics and Impacts

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

### **Conveners:**

Willem G.M. van der Bilt | Bjerknes Centre for Climate Research  
Jostein Bakke | University of Bergen

The Arctic changes faster than any other region on Earth, and is becoming warmer and wetter at rates that far outpace the planetary average. This amplified response has global climate impacts as Arctic glacier loss spurs sea-level rise, increased meltwater run-off perturbs ocean circulation, while changes in snow and ice cover alter the planet's albedo. In the region, this transformation is manifested by dramatic surface changes: open waters and thawing permafrost erode coastlines, melting glaciers leave tracts of easily re-mobilized sediment in their wake or expose new lakes that may trigger outburst floods, and larger river discharges intensify fluvial processes. This session invites contributions that investigate this "geomorphological sensitivity" of a warmer and wetter Arctic and its global links using (a combination of) observational data (e.g. remote-sensing), reconstructions from past analogues and modelling approaches. Our main goal is to highlight how these changes will impact the environment and society in the near-future. We particularly welcome work that advances the state-of-the-art by presenting method innovations, applications in poorly investigated areas, or cases with societal relevance (e.g. hazard risk assessments).

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

Time	Title	Presenting author
19:00	Introduction by the conveners	
19:05	Changes in the flow regime in the four High Arctic catchments with a different stage of catchment glaciation	Marzena Osuch
19:20	Detecting changes in the high-latitude carbon seasonal cycle with a multi-model approach	Aleya Kaushik
19:35	Groundwater flow in the marginal zone of the Werenkiold Glacier in Southern Svalbard	Katarzyna Stachniak
19:50	Holocene chloroplast genetic variation of shrubs ( <i>Alnus alnobetula</i> , <i>Betula nana</i> , <i>Salix</i> sp.) at the Siberian tundra-taiga ecotone inferred from modern chloroplast genome assembly and sedimentary ancient DNA analyses	Stefano Meucci
20:05	Integrated geomorphological mapping of an Arctic shoreline: The case of Qaanaaq, North Greenland	Thomas Guldborg Petersen
20:20	The impact of precipitation regime on the CO <sub>2</sub> emission rates in pine forests of Central Siberia	Anastasia V. Makhnykina
20:35	Open discussion on orals and posters	

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

	Title	Presenting author
	Detecting spatiotemporal ecosystem change with remote sensing across the Arctic	Woodwell Climate Research Center



## **ID:59 - Permafrost and periglacial processes in cold climatic areas**

The Changing Terrestrial Environments: Dynamics and Impacts

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

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

### **Conveners:**

Hanne H. Christiansen | The University Centre in Svalbard, UNIS, Norway

Michael Krautblatter | Technical University Munich, Germany

Permafrost and periglacial processes are largely affected by climatic changes and are thus being studied by a variety of disciplines using a large diversity of methods continuously undergoing innovation. We invite contributions from all cold climatic areas in both the Arctic and Antarctic, but also from alpine environments, to present new observation or modelling based research, education and/or outreach outputs. Interdisciplinary work will be very welcome with having a very wide focus from engineering to societal implications expected. Just as national, regional or local scale results within specific disciplines studying permafrost and periglacial processes will also be welcome. We also encourage presentation of the new methodological approaches and novel research questions for permafrost and periglacial processes. This way the session will be able to present several good examples of regional changes in permafrost and periglacial processes, hopefully providing input to an improved overall global understanding.

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

Time	Title	Presenting author
08:00	Introduction by the conveners	
08:05	An analysis of near-surface temperature inversion characteristics on permafrost in dissimilar valleys, Yukon Canada	Nick C. Noad
08:20	An aerial inventory of rock glacier distribution and activity level assessment in Banff and Jasper National Parks, Alberta, Canada	Mish�lle A.E. Wehbe
08:35	Does global warming stabilize or destabilize permafrost landforms? Decadal-scale monitoring in Svalbard	Norikazu Matsuoka
08:50	Overview of diversity and ecological functions of biological soil crusts in High Arctic ecosystems (Billefjorden, Central Svalbard)	Ekaterina Pushkareva
09:05	Mountain permafrost in Sismiut, Greenland: an assessment based on temperature monitoring, geophysics and modelling.	Marco Marcer
09:20	"Living Permafrost": Man and the Environment	Irina Chesnokova
09:35	Open discussion on orals and posters	

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

Time	Title	Presenting author
11:30	Introduction by the conveners	
11:35	Environmental controls on permafrost and ground temperature regimes and distribution in Barton Peninsula (King George Island, Antarctic)	Joana Baptista
11:50	Permafrost temperature reconstruction on James Ross Island (Antarctic Peninsula) in the period 2004-2017	Lucia Pastirikova
12:05	Assesment of snow cover effect on active layer thermal regime and thickness, CALM-S JGM, James Ross Island	Filip Hrbacek
12:20	Assessment of the spatial relationship between sorted stone circles and vegetation in Maritime Antarctica	Marta Almeida
12:35	Permafrost and ground ice in the McMurdo Dry Valleys of Antarctica	Marjolaine Verret
12:50	Open discussion on orals and posters	

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

	Title	Presenting author
	Aufeis resources of the North-East of Russia	Natalia Nesterova
	Comparison of Ground Surface Freezing-thawing Conditions in Discontinuous Permafrost Regions between Alaska and the Qinghai-Tibet Plateau	Tonghua Wu
	Growth of permafrost within peatlands during warm climate period	Yana Tikhonravova
	Holocene vegetation of Coles valley, Spitsbergen island	Diana Soloveva
	Paleogeography of the Pleistocene-Holocene environment in Central Yakutia	Anna Kut'
	Satellite based mapping of vegetation in Antarctica guided by UAV surveys based on machine learning	Vasco Miranda