PERMAFROST MONITORING NETWORK IN BARENTSBURG AS PART OF AN EURASIAN ARCTIC HIGH-LATITUDE PERMAFROST MONITORING TRANSECT

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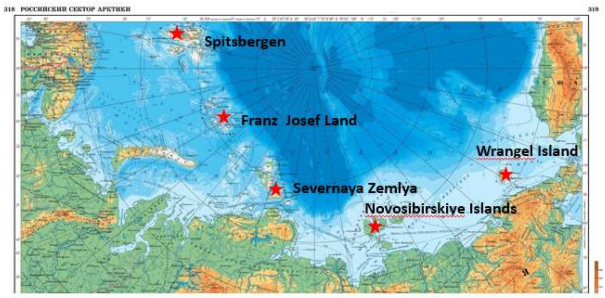
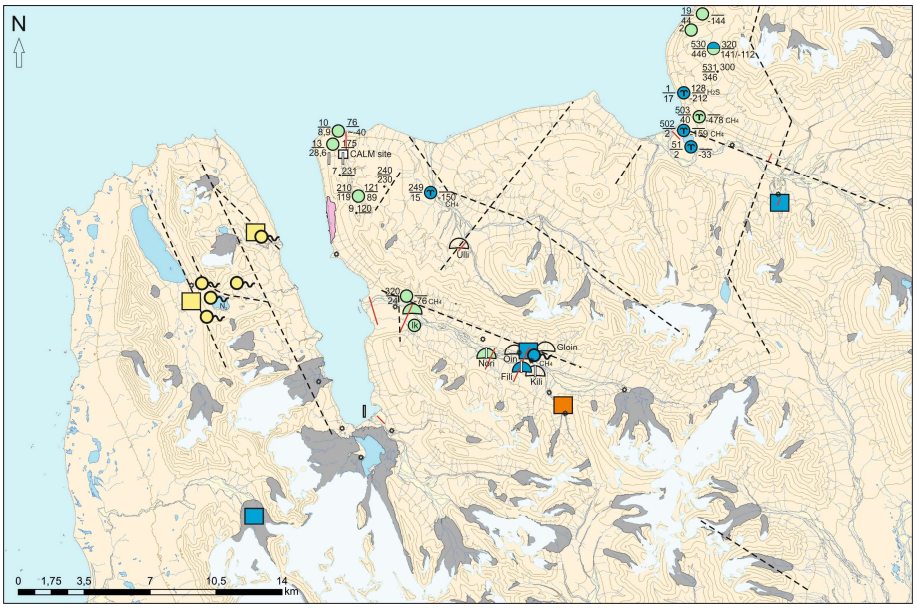
A cooperative effort seeks future research on the Eurasian High Arctic islands. Fieldwork will include permafrost drilling and ground temperature monitoring for the Global Terrestrial Network for Permafrost (GTN-P) and the Circumarctic Active Layer Monitoring (CALM) programs along a west-to-east transect including locations on Spitsbergen, Franz Josef Land, Severnaya Zemlya, the New Siberian Archipelago and on Wrangel Island. The activities focus (i) on current cryosphere response to climate change and (ii) on the late Pleistocene-Holocene paleopermafrost history of High Arctic islands. These include modern studies of permafrost with instrumental data and monitoring in bore holes, paleoenvironmental studies of the core material in terms of cryolithology, geochronology and biogeochemistry. First results were obtained since 2016 on Spitsbergen. Permafrost observations are concurrently published on the G-TNP and CALM websites while research on permafrost deposits, pingo ice and ground water near Barentsburg is currently in progress. We are open for extended partnerships and aim on attracting your research interest.

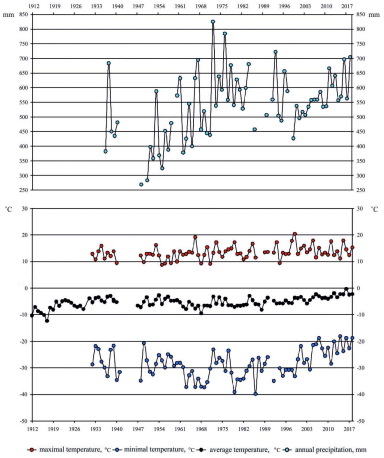


West-to-East High Arctic permafrost monitoring transect

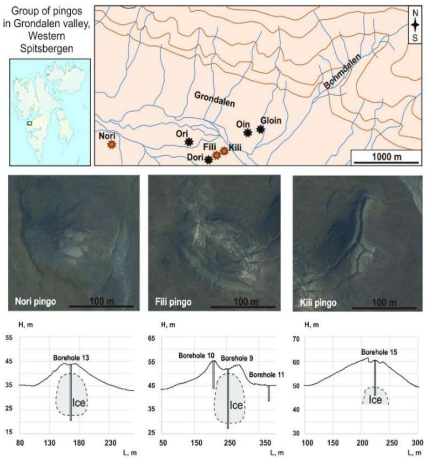
Main objects of permafrost-hydrogeological investigation and monitoring in Barentsburg area



- icings with low mineralization (<4 g/l) HCO_3/Na (data 2019)
- icings with low mineralization (<4 g/l) SO_4/Ca (data 2019)
- icings with high mineralization (~8 g/l) SO_4/Mg (data 2019)
- year-round springs with low mineralization (<4 g/l) HCO_3/Na (data 2019)
- year-round springs with low mineralization (<4 g/l) SO_4/Ca (data 2019)
- boreholes with low mineralization aquifers (<4 g/l) HCO_3/Na (data 1935-1986)
- boreholes with high mineralization aquifers (~35 g/l) Cl/Na (data 1935-1986)
- boreholes with overflow pressurized aquifers (data 1935-1986)
- lake waters getting increase of Cl/Na mineralization after pumping out (1959)
- pingo ice cores with low mineralization (<4 g/l) Cl/Na (2017-2019)
- pingo ice cores with low mineralization (<4 g/l) HCO_3/Na (2018-2019)
- ice blisters drilled and sampled (2019)
- CALM site (first measurement sept. 2016)
- thermistor equipped boreholes (2016-2019)
- thermistor monitoring site at the sea bed (2019)
- electrical resistivity sounding profiles (2019)
- borehole with unavailable aquifer data (1935-1986)
- confirmed fault (data 1935-2019)
- borehole index
- permafrost thickness m
- gas emission
- depth of upper/lower aquifers (abs. m)
- borehole positioning (m.a.s.l)

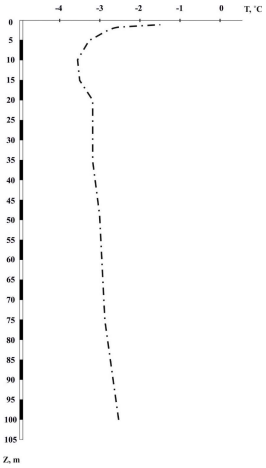


Temperature and precipitation in Barentsburg since 1912

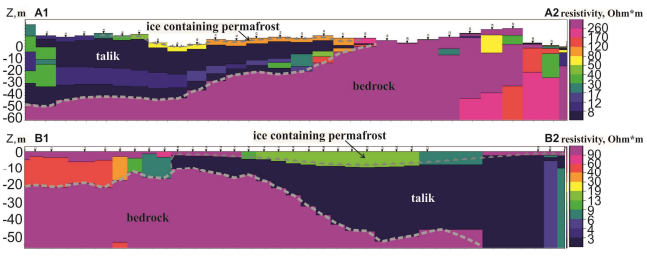


Location, space images and crossections of pingos in Grondalen

Cores of massive ice, overlying and underlying permafrost of Fili pingo

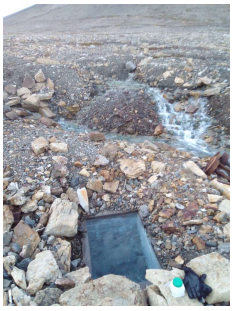


Temperature profile of borehole 240 taken 28.10.1952



Geoelectrical profiles through the lower part of Grondalen valley showing talik under thin permafrost

Oin spring near Oin pingo in winter and summer 2019



Spring Kongress-1 in summer 2019

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