Development of a Permafrost Observing Network in Alaska and Russia

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USGS
science for a changing world

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Permafrost Distribution in Alaska and Permafrost Observatories Location

Permafrost Characteristics of Alaska (Jorgensson et al., 2008)
Global Terrestrial Network-Permafrost (GTN-P):
Thermal State of Permafrost (TSP)

~ 850 stations

TSP Countries
- Canada
- China
- Denmark
- Germany
- Iceland
- Italy
- Kazakhstan
- Mongolia
- Norway
- Poland
- Russia
- Sweden
- Switzerland
- USA

~ 760 stations

Southern Hemisphere
- Italy
- New Zealand
- Portugal-Spain
- Russia
- USA

~ 90 stations
Click on the sites on the map to find the site you are interested in or use the site list to search for a particular site.

Russian Sites | Alaskan Sites | Canadian Arctic and Greenland Sites

The U.S. Geological Survey Real-Time Permafrost and Climate Monitoring Network in Arctic Alaska is a collaborative effort with The Bureau of Land Management, U.S. Fish and Wildlife Service, private organizations and universities. Primary network operations are managed by members of the U.S. Geological Survey, Geology and Environmental Change Science Center. The network was established to provide high quality real-time environmental data to aid in land management decision making. The information is also used extensively in logistics and aircraft operations.

This real-time network is a subset of a larger U.S. Geological Survey permafrost and climate monitoring research network. Many of the stations are co-located with deep boreholes, thus forming the basis for comprehensive permafrost monitoring observatories. The objectives of the larger network include climate change detection, monitoring how permafrost and vegetation respond to climate change, and acquiring improved data for current permafrost characterization and impact assessment models. Data from this network contributes to several international networks as well, primarily GTN-P (Global Terrestrial Network for Permafrost), part of the WMO (World Meteorological Organization) sponsored effort GCOS (Global Climate Observing System).

BARROW, 1924 - 2014

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Barrow snow depth and mean annual air temperatures
FAIRBANKS, ALASKA, 1930-2014

Mean annual ground temperatures

Depth:
- 0.08 m
- 0.3 m
- 0.5 m
- 1 m

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Changes of permafrost temperature during 2010-2015
CORRELATION OF MEAN ANNUAL GROUND TEMPERATURE VALUES AND TRENDS IN ALASKA
Changes of permafrost temperature during 2010-2015
Societal Impacts of Permafrost Degradation
Impact on Infrastructure
Changes in the ground surface
Photo provided by the Fairbanks DOT office
A Mysterious Holes on Yamal Peninsula in Russia