



Permafrost distribution and ground temperatures in Iceland - evidence for wide-spread mountain permafrost in a highly oceanic climate

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Permafrost in high-mountain environments is extremely heterogeneous, and its distribution depends on topographic factors in addition to local variations in snow- and vegetation cover. Iceland is characterized by an oceanic climate type, with small annual temperature amplitudes and high precipitation. However, temperature variability is high, so that warm events occur frequently during winter. Simple air temperature modelling and continuous ground temperature measurements in four bore holes (up to 22 m depth) combined with DC resistivity tomography soundings documents for the first time warm (above -1°C), thin, but nevertheless wide-spread mountain permafrost at altitudes above 850 to 900 m a.s.l., at least in wind-blown areas. Numerical modelling of ground temperatures indicates the permafrost being highly sensitive to climatic variations. Modelled permafrost variations based on empirical derived time series back to the 1940ies are presented. This study area is characterised by warm permafrost, and thus will possibly react quickly to changes in environmental conditions in the future. This in turn may influence geomorphological processes and possibly slope stability in high mountain areas.