



First results of the geophysical research of the lower border of permafrost occurrence in the Abisko area Lappland, Sweden

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Research into mountain permafrost concentrates in particular on determining its distribution and on its evolution due to present climate warming. The evolution seems to be especially significant in the areas where the lower limit of permafrost occurrence runs for it can directly impact on the change of permafrost spatial distribution. No extensive research into permafrost was previously conducted in the Abisko area although it was known for 50 years that permafrost occurs there. Sub-zero, below -3°C MAAT in the mountains of the Abisko area (above 1000 m a.s.l.) and the mean annual air temperature of about -1°C beyond the mountain area at the altitude of round about 400 m allows the assumption that both mountain and arctic high latitudinal permafrost occurs there. A series of geophysical probing, using resistivity tomography and electromagnetic mapping, was carried out in the above mentioned altitude range in varied geological conditions. In the sites where it was possible outcrops were made, which enabled to correlate the results of geophysical research with the actual occurrence of permafrost. The research findings show that permafrost can be present in the mountain areas, especially above 900 m a.s.l. and in lower - lying areas, about 400 m a.s.l., where permafrost can reach the thickness of 20 – 30 meters. Its thickness and distribution are determined to a large extent by various local conditions, especially the medium in which it occurs. The existing latitudinal and altitudinal permafrost probably is discontinuous and sporadic in form and probably it is difficult to separate one from the other. Fossil permafrost is also likely to be found in that area.