



Permafrost landscapes changes after anthropogenic impact in Norilsk region

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Temperature conditions of permafrost are changing in many ways connected with human impact, especially in industry developed regions like Norilsk. We had the series of field works along the gas pipeline “Messoyakha –Norilsk” and in the nearest nature landscapes.

The research territory is located on the surface of Valyok lacustrine-alluvial plane (2nd fluvial terrace above flood-plane of the River Norilskaya) where the epigenetic permafrost was formed after the retreat of Late Pleistocene deep and cold lake during last 8-10 thousand years. This territory is also famous by their inter-ground massive ice sheet. Thermokarst processes activity near the pipeline higher in 30 per cent than in similar natural conditions and in general landscape is almost destroyed and the surface is polluted. In swampy hollows and near thermokarst lakes grass cover (shrub-cereal-grass-moss tundra) is changing to the sedge. The pipeline (550 mm in diameter) was built 35 years ago. High heat conductivity of gas pipe footing is resulting in the increasing of the active layer thickness and frost heave activation. Also, around almost all pipes were formed plump holes with deep from 0,2-0,3 up to 0,7-0,9 m, some of them were filled by water, this is caused thermokarst in the ice-rich ground, in it's turn this could provoke the same destructive processes in the near nature landscapes because all valley is covered system of inter-ground ice sheet.