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Influence of the landscape condition on the thermal state of permafrost on the interior Alaska and Kolyma lowland.

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Since 2005th the global network of boreholes for permafrost temperature observation was established under umbrella of International Permafrost Association (IPY project Thermal state of Permafrost). Global trend to the permafrost temperature increasing was noticed as a result of this monitoring. But, from another side, permafrost temperature dynamic does not reflect climate changes directly. Mean annual ground temperature (i.e. temperature on the bottom of layer of annual temperature oscillation) also strongly depends on the parameters of snow cower and landscape conditions.
Observations, carried out on the several sites, situated on the interior Alaska (Fairbanks area) and Kolyma valley (Chersky area) show what on the some sites, where dynamic landscape changes (modern cracks formation and tussocks growing) take place permafrost temperature stays stable. At the same time, generally, these areas are characterized by the significant (2-5 Celsium degrees) increasing of mean annual ground temperature since 1990th. Such phenomena were observed on the Ambolikha TSP site near the Chersky and College Peat and Smith Lake sites in the Fairbanks.
Ambolikha site situated at the 68.638N 161.391E. It is a part of Kolyma flood plane. It characterized by the grass and shrub vegetation. Micro relief presented by the tussocks up to 0.5 – 0.8 m high divided by the cracks about 1 m width. Comparison of the modern landscape description and data of landscape survey had been done at 80th years of XX century shows what tussocks height increased twice since this time. Mean annual ground temperature here was -5.6 Celsium degrees and -5.67C now.
Faibanks sites situated at the 64.87N 147.75W (College Peat) and 64.87N 147.86W (Smith Lake) are also characterized by the tussocks micro relief (height of tussocks up to 0.5 m). Mean annual ground temperature is –5.1C (College peat) to -2.5C(Smith Lake) and did not change significantly during the last years.
Such process can be explained by the peculiarities of snow cower formation at the beginning of the winter period. At this time snow collect on the top of tussocks and floor of cracks and sides of the tussocks are open to the cold air with low negative temperature. It leads to the fast freezing of the active layer and general cooling of such kinds of landscape (mean annual ground temperature of these sites is about 1.5C than surrounding area).
Additionally shrubs and trees vegetation protect earth surface from the direct sun rays during the summer.
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