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PERMAFROST AREA OF THE MIDDLE ASIA

A. P. Gorbunov

Permafrost Institute, Siberian Branch of the USSR
Academy of Sciences

The largest area of the alpine permafrost distribution in the world is Central Asia. It includes the Tibetan Plateau, Himalayas, Sino-Tibet Mountains, Kun Lun, Nan Shan, Karakorum, Hindukush, Pamir, Tien Shan, Dzhungarskiy Alatau, Saur Tarbagatai and a number of smaller massifs. The area of 2200 km extends from the north to south from 47°N to 27°N and 3500 from the west to east from 67°E to 104°E. It totals 2.061.750 km². Permafrost boundary is at the elevation of 2200 m in the north of it, and 5200-4700 m in the south depending on climate continentality. Thus, the boundary shifts by vertical to 125-150 m for one degree of geographical latitude.

In the lower stage of permafrost belt along with bedrock loose detrital frozen material is abundant, and in the upper stage only bedrock occur. Maximum cryolithozone thickness reaches 130 m in loose detrital deposits; minimum temperatures being -4°C. Maximum recorded thickness of frozen rocks is 400 m, but calculations show that in the highest points of the region the frozen rock thickness reaches 1000-1500 m and temperatures are -25°-30°C.

Frost rocks (without ice) prevail in the region. In contrast to the majority of other massifs, however, vast uplands composed by loose detrital thicknesses are widespread there. They contain considerable amount of ground ice, lacustrine and moraine being particularly ice rich (from 50 to 70% by volume). From all the variety of the ground ice in the region only polygons of ice wedges and buried sea ice are absent.

A set of cryogenic forms of the region includes all similar known formations, excluding polygonal systems of ice wedges and related specific thermokarst forms. Patterned ground, solifluction terraces and flows, hydrolaccoliths, thufurs, peat mounds (palsas), rock glaciers, icings, thermokarst depressions on moraines and in lacustrine sediments, cryogenic landslides, ploughing blocks are typical of the region.