

2. Natural hazards - NH

2.4. Transformation of The Arctic and Subarctic Landscapes under Climate Change and Human Impact

Vegetation and climate changes in the north-western part of Putorana Plateau during the last millennium

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Palaeoecological research were focused on the western part of the Putorana plateau in vicinity of the lake Lama, which belongs to The Pyasina river basin. Multi-proxy studies including pollen, micro- and macrocharcoal, peat humification, plant macrofossils and testate amoebae analyses with AMS radiocarbon dating were carried out for the peatland Gervi is located within the lake terrace of the Lama Lake. The peatland is covered by open Larix woodlands with a dense understorey of Duschekia fruticosa and Betula exilis. The thickness of peat is 57 cm and underlay by silt with clay. The peat accumulation began at 1280 cal yr BP. Obtained results showed that Pinus-Picea-Larix woodlands, occupied study area between 1280 and 960 cal yr BP. Picea obovata is very rare in plateau Putorana and grow in protected habitats in river valleys in the south-western part of the plateau at the north-eastern limit of its natural range. A relatively high amount of Picea pollen and presence of Picea stomata and bark in peat core suggest a northward shift of Picea natural range by climate warming during the Medieval warm period. Conspicuous peaks of microcharcoal and appearance of Onagraceae and Gelasinospora indicated a high fire frequency during this period that encourage to increase in proportion of pine and birch forest in plant cover. Macro-charcoal analysis revealed a relatively high CHAR-index and 6 fire peaks during this period (approximately 1 fire episode per 70 years). During the period from 960 cal. year BP to the present time a proportion of trees (Larix, Picea, Pinus) declined in plant cover while the share of shrubs Betula sect. Nanae and Duschekia fruticosa increase significantly. The proportion of typical arcto-alpine species Selaginella selaginoides noticeably increased while other spores become less frequent. The value of micro-charcoal particles reduced to a few percent. CHAR-index decreased; no fire events were detected between 960 and 100 cal. year BP. The last 100 years were characterized by increase of CHAR-index and high fire frequency that could be a result of human activity in the region.

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