



Situational reconstruction of Altai-Sayany glacio-climatic characteristics in Holocene optimum and a review of present state

M. Ananicheva

Institute of Geography, Moscow, Russia

Realization of glacio-climatic approach for reconstruction of main glaciological characteristics of mountain glaciations (in particular, Altai Mtns) for Holocene Optimum, the essence of which is an adaptation of the climatic paleodata related to the lowlands, to the mountain belt conditions involving present-day relationships between climatic and glaciological parameters, resulted in building balance vertical profiles for 17 glacier groups. These profiles are validated by independent data about present values of the averaged for the groups ELA.

The paleo-scenario, based on spore-pollen analysis of vegetation of Tomsk-Ob' River lowland (*Votakh, Klimanov, 1994*) is applied to Altai Mountains with taking into account the differences in thermal & humidity regime of these regions. Two combinations of the scenario were used: 2°Ñ air temperature increase as compared to the present time (mid of 20th century) and precipitation: 1) the same as present; 2) at 15% greater.

As a result, for the chosen glacier groups the following parameters for Holocene Optimum have been calculated: the ablation, accumulation, the ELA and temperature over the ELA, averaged for each group. The spatial distribution of the Holocene ELA deviation from present for both scenario were built, they in smooth way copy the given in (*Krenke, 1982*) maps of Altai ELA, built by the all present data. The similarity is more pronounced for the variant of the unchanged precipitation in Holocene.

The trend analysis of modern temperature and precipitation both for lowlands adjacent to Altai-Sayany region and for high-mountain belt shows the recent warming started in the early 1960-s for the former and in late 1960-s – for the latter region. The tem-

perature trends amount 0.8-1.4 °N/31 years, for the recent 15 years trends were more intensive 1.3° - 1.5°, precipitation grew during last 30 years. These conditions though favorable the glacier retreat however unable causing catastrophic shrinkage of Altai glaciation. More sensible retreat is characteristic for glaciers located on the ranges bordered the hollows in the east and south of Altai mountain part due to more significant positive temperature trends and negative trend of winter precipitation. Thus, both in Holocene Optimum (by our reconstruction) and during warming of the last decades the most impacted by climate change glaciers are located in the periphery of Altai mountain system, in the south-eastern part of it. Intensity of the glacier response of western macro-slope on climate warming is not so intensive.