



## **The Holocene glaciation of SE Altai (Russia): correlation of climate and tectonic factors**

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The glacial erosion caused by mountain glaciation is one of the most essential surface processes. It depends on climate changes and tectonic evolution. Estimation the glacial erosion rate during the Holocene and comparison this rate with the rates of other exogenous processes allow determining the correlation between climate and tectonic factors of glaciers evolution in Holocene.

We calculated and compared the Holocene rates of glacial, fluvial erosion and erosion due seismically induced landslides for Chagan-Uzun river basin, which is situated on the south-east of Russian Altai. Comparison these erosion rates and the denudation during last 5 million years obtained by FTA dating and thermal history modeling performed on samples from Chuya-Kurai basin and ranges (De Grave et al., 2007) shows the acceleration of denudation in Holocene. Our geomorphological investigations testify to the fact that this acceleration is associated with the modern tectonic reactivation of the region and ongoing ridges uplifting in SE Altai in Holocene.

In spite of global warming and arid climate exactly the ongoing ridges uplifting is the main reason caused the Holocene glaciation of SE Altai. Numerous radiocarbon dates of moraines in valleys of South Chuya and North Chuya ranges testify to the repeated glacier advances, which are most likely associated with the temperature oscillations. The decrease of glacier's length in every following stage in Holocene can witness to aridity intensification in this region. Moreover the thermal minimum of the middle of 19<sup>th</sup> century, the greatest in the last millennium, did not influence positively the mass balance of glaciers, which also argue to this conclusion.

So appearance of Holocene glaciation in SE Altai is connected with ridge's altitudes – the result of modern tectonic reactivation, and the glacier's oscillations is determined by humidity and temperature changes.

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