

Changes in mountain glacier systems and the distribution of main climatic parameters on the territory of Russia (XX -XXI century)

*Tatiana Khromova¹, Gennady Nosenko¹, Valeria Popova¹, Anton Muraviev¹, Stanislav Nikitin¹

1. Institute of Geography Russian Academy of Sciences

Mountain glaciers are vital sources of water worldwide to many densely-populated regions including North Eurasia. Most glaciers are now shrinking, resulting in variable water supplies and sustained sea level rise. Rapid glacier change threatens water, energy and food security. Further glacier mass loss is likely in response to recent climate change, driven by global increases in air temperatures and the production of atmospheric pollutants. However, high altitudes and rugged topography generate regional weather systems that complicate the investigation of the relationship between climate and glacier change. Predictive models need to move beyond the state-of-the-art to couple advanced climate models with accurate representations of glacier processes, and more detailed and reliable data describing the state of mountain glaciers are required to constrain these models, both from monitoring individual glaciers and regional remote-sensing observations.

Glaciation exists on the territory of Russia for thousands of years. Glaciers are located now on islands and archipelagoes of Russian Arctic and in mountain regions of continental part of the country and currently cover the area of about 3,480,000 km². Now there are 18 mountain glacier regions on the territory of continental Russia. We present recent data on glaciers state and changes in these regions based on remote sensing and in situ studies and distribution of main climatic parameters that affect the existence of glaciers: summer air temperature and winter precipitation.

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