

New data on the state and changes of glaciers in mountain and Polar Regions of Russia

*Tatiana Khromova¹, Gennady Nosenko, Andrey Glazovsky, Stanislav Nikitin, Anton Muraviev, Ivan Lavrentiev

1. Institute of Geography Russian Academy of Sciences

The new glacier inventory created recently at the Institute of Geography of the Russian Academy of Sciences is based on Sentinel 2 images obtained mainly in 2016-2019. This data made it possible to study the current state and recent changes of glaciers in Russia, where now there are 22 glacial systems. Glaciers are located on islands and archipelagoes of Russian Arctic and in mountain regions of continental part of the country and currently cover the area of 54,531 km².

The largest glacial systems are located on archipelagoes of Russian Arctic. The next in area

glacial systems are located in the mountains of the temperate zone: the Caucasus, Kamchatka and Altai. The most numerous group is small glacial systems, the area of which does not exceed 100 km². They are located in different glaciological zones. The De Long Islands and the Urals are in polar region. The Putorana Plateau, the Byranga Mountains, the Chersky Ridge, the Chukotka Upland, Northeast of the Koryak highlands are in subpolar area. Kodar Ridge and Eastern Sayan are in the temperate zone. Some glacier systems are very small. Their area is less than 10 km². Despite their small size, these glacial systems are important from indicative point of view, fixing the zone of spatial distribution of glaciation. They indicate the growth points in the event of a change in climatic conditions according to a scenario favorable for glaciers.

The glacier area has decreased since the compilation of the USSR glacier Inventory (1965-1982) by 5603.9 km² or 9.3%. The area of polar glaciers has decreased less than glaciers in mountainous regions. Values range from 5.44% (Novaya Zemlya) to 19.11% (De Long Islands). Small glaciers were not found in the Khibiny. Glaciers in the Urals have reduced their area by 63%. The subpolar glacier systems of the Orulgan (46.6%), Chersky (44.4%), and Suntar-Khayata (34%) ridges reduced the area a little less. Reduction in the area of glacial systems in the temperate zone ranges from 57% (Eastern Sayan) to 13% (Kodar). The largest glacial systems in the Caucasus, Kamchatka and Altai have reduced their areas by 25, 22 and 39 percent, respectively.

The results of our studies confirm the tendencies for the reduction of the glacier area throughout Russia. The exception is the glaciers of the volcanic regions of Kamchatka, which increased their size or remained stationary. The magnitude and rate of changes depend on the local climatic and orographic features. The presentation includes the results obtained in the framework of the following research projects: № 0148-2019-0004 of the Research Plan of the Institute of Geography of RAS, № 18-05-60067 supported by RFBR.

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