

EGU21-10236

<https://doi.org/10.5194/egusphere-egu21-10236>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Current state and recent changes in glacial systems in Russia

Tatiana Khromova, Gennady Nosenko, Andrey Glazovsky, Anton Muraviev, Stanislav Nikitin, and Ivan Lavrentiev

Institute of Geography RAS, Glaciology, Moscow, Russian Federation (tkhromova@igras.ru)

The new glacier inventory created recently at the Institute of Geography of the Russian Academy of Sciences made it possible to study the current state and recent changes of glacial systems in Russia, where now there are 22 glacial systems. The total area of glaciation on this territory is 54,531 km² based on Sentinel 2 images obtained mainly in 2016-2019. This area is occupied by 7478 glaciers. The largest glacial system in area is located on the Novaya Zemlya archipelago (22,241.37 km²). It is followed by Severnaya Zemlya (16491.81 km²) and Franz Josef Land (12530.03 km²). The next largest glacial systems are located on the Caucasus Mountains (1067.13 km²), Kamchatka (682.8 km²) and Altai (523.14 km²). The area of glaciers on the Arctic island of Ushakov (283, 09 km²), in the Suntar Khayata mountains (132, 97 km²) and the Koryak Upland (254.1 km²) occupies a range from 100 to 300 km².

The largest 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 (65, 2 km²), the Urals (10.45 km²), the Putorana Plateau (11.36 km²), the Byranga Mountains (29.94 km²), the Chersky Ridge (86.37 km²), the Chukotka Upland (15.98 km²). Northeast of the Koryak highlands (42.19 km²), Kodar Ridge (16.22 km²), Eastern Sayan (12.88 km²).

The remaining four regions are characterized by the smallest glacial systems. These are the Orulgan ridge (9.82 km²) and the Kolyma Upland (6.62 km²), the Kuznetsk Alatau (3.42 km²), the Barguzinsky (0.09) and Baikalsky (0.65 km²) ridges. Despite their small size, these glacial systems are important from an 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 belt 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.