

EGU2020-11705

<https://doi.org/10.5194/egusphere-egu2020-11705>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Anthropogenic Transformation of Russian Arctic: dividing the area into zones based on cluster analysis

Ekaterina Eremenko, Andrei Bredikhin, Sergei Kharchenko, Yury Belyaev, **Ekaterina Matlakhova**, Fedor Romanenko, Sergei Bolysov, and Yulia Fuzeina

Lomonosov Moscow State University, Faculty of Geography, Department of Geomorphology and Paleogeography, Moscow, Russian Federation (eremenkoeaig@gmail.com)

In this study we analyzed the information about the presence of different types of anthropogenic objects (settlements, transport infrastructure, mining areas, etc.) in the Arctic zone of Russia. This information was taken from open Internet-sources: maps, cartographic projects, databases, schemes of regional development of the Russian Federation. Data analysis shows that only about 20% of Russian Arctic's area is affected by economic development, meanwhile on the other 80% of the area there are practically no anthropogenic objects.

The economic development of the Arctic region decreases from West to East of Russia. The Republic of Karelia is characterized by the highest economic development level (only 13,1% of the area are not affected by any economic activities), the lowest levels have Krasnoyarskiy krai (95,2%) and the Republic of Sakha (Yakutia) (87,2%). Data on the presence, position, and types of anthropogenic objects were subjected to the k-means method of cluster analysis in order to identify characteristic combinations of objects corresponding to different types of development. Within the Arctic zone of Russia six main types of economical use of the territory were identified. Each of these types was characterized by the dominance of a certain type of anthropogenic objects (settlements, roads, mining industry objects, oil and gas transport infrastructure, wood industry objects).

Each type of the economical use of the territory is characterized by specific anthropogenic transformation of the topography of the area. The greatest transformation of the topography and geomorphological processes was found within the open mining areas. The least influence on the topography is connected with some of the linear transport structures (unpaved roads and underground gas pipelines). In general, economic activity in Russian Arctic is relatively low. Anthropogenic transformation of topography and geomorphic processes is typical for the area about 667 thousand square km, that is about 18% of the total area of the Russian Arctic.

This study is supported by Russian Foundation for Basic Research (RFBR) Project № 18-05-60200 "Anthropogenic transformation of Arctic Landscapes for the last 100 years".