

Assessment of anthropogenic pressure on the Volga federal district territory using river basin approach

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Abstract

© 2020, MDPI AG. All rights reserved. The analysis of the geocological state of basin geosystems was carried out by evaluation of the anthropogenic pressure on the basin. As indicators that directly or indirectly reflect the anthropogenic impact, the following were used: Population density in the basin, density of the road network, and agricultural development of the basin territory. The spatial and statistical distributions of indicators were analyzed after the indicators were brought to a unified scale (transformation, normalization). The integral indicator of anthropogenic pressure, calculated as a linear combination of individual variables, was ranked to six categories of anthropogenic pressure: “absent”, “very low”, “low”, “moderate”, “high”, and “very high”. Using the developed methodology and prepared geodata, for the first time at scale of 1:200,000, the territory of the Volga Federal District was zoned according to the anthropogenic pressure on each river basin. Basins with a high and very high pressure are concentrated around large cities. Most of the basins belonging to the categories of low and moderate anthropogenic pressure are located in the forest-steppe and steppe zones with maximal agricultural development. Basins with zero and very low pressure lie in the north of the study area, in the forest zone, and in the southern Ural.

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Keywords

Anthropogenic pressure, Basin geosystems, Geocological state, Volga Federal District

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