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Natural and transformed geosystems of the Tunkinskaya depression

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The objective of this study is to analyze the spatiotemporal variability in natural and transformed geosystems at different nature management stages.
We investigated the spatiotemporal variability in the geosystems by using, as an example, the key area measuring 890 km2, located in the Tunka district (south part of Eastern Siberia) in the eastern part of the Tunkinskaya depression – the most developed area of the territory under consideration.
Staring in the latter half of the 19th century till the present, the evolution of the derivative geosystems in the structure of natural piedmont taiga and piedmont and intermontane troughs of the subtaiga complexes in the Tunkinskaya depression was promoted by a whole set of economic activities. By virtue of the physical-geographical characteristics of the territory, the most widespread were agricultural activities leading to the absence (within the study area, on the slopes and bottoms of the depressions) of natural larch (with the inclusion of pine) forb swamped, Siberian bog sedge- fescue and small-grass steppizated-meadow cryogenic groups of facies. Throughout the entire 20th century and till the present, agricultural lands have occupied about one third of the study area while, with due regard for the meadows used as hayfields and pastures, the total percentage of the area occupied by these complexes constitutes about 53%.
The forestry-related and recreational, highly fire- hazardous activities resulted in a considerable reduction in natural mountain-taiga Siberian stone pine and larch forests, with coniferous tree species being replaced by deciduous species. Thus, while in the late 19th – early 20th centuries, within the mountain-taiga territories, secondary small-leaved forests occupied slightly more than 4% of the study area, tending to occur in the vicinities to human settlements in places of old felling areas, this figure increased five times to exceed 20% in the mid- and late century.
On the whole, taking into consideration the contemporary tendencies of the region's development, we are led to suggest that within the geosystems occurring in the depressions, the existing package of agricultural activities, with livestock husbandry predominating, will be promoting a further development of hayfields and pastures as well as of lands used as grazing grounds. It is likely that the arable lands will have a tendency to be reducing in area, which will contributed to an increase in the forested area occupied by derivative complexes at different stages of forest regeneration. A considerable contribution to impacts on the natural environment, as before, will come from the recreational activities and forestry-related pursuits (selective pointwise fellings, gathering of wild plants and fruits, and hunting). Notwithstanding the seemingly small-scale character of these activities, they are highly fire-hazardous, which can lead to spatial and structural- dynamical changes in the taiga geosystems.

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