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**STRUCTURAL ORGANIZATION OF ECOSYSTEMS  
AND PATTERNS OF THEIR DISTRIBUTION**

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**SALINE SOILS OF RUSSIA (HISTORY OF STUDY, DISTRIBUTION AND GENESIS)**

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In this article we have summarized the studies on the distribution and genesis of saline soils in Russia from the early 20<sup>th</sup> century to the present. Emphasis is placed on the ones carried out by the V.V. Dokuchaev Soil Science Institute, which will celebrate its 100<sup>th</sup> anniversary in 2027. Maps of the distribution of saline soils of varying chemistry across Russia are analyzed. The factors, sources, and mechanisms of soil salinization in different regions of the country are considered. Brief information is provided on the types of saline and solonchic soils in all administrative units of the country where they occur, their areas, predominant degrees, depths, and chemistry, as well as the genesis of salinization. The largest areas of saline and solonchic soils are found in southern Russia, due to a combination of an arid climate, poor drainage, and the presence of saline rocks. This determines the predominantly chloride salinization of the soils of the Caspian Lowland. Further north in the Volga Federal District, the area of saline soils decreases, with chloride-sulfate salinization becoming predominantly present. Gypsum appears, and, more often in solonchic and irrigated soils, soda also appears. Saline soils form underlain by saline loess-like loams and clays or at close proximity to mineralized unconfined groundwater. In the Central Federal District, saline soils are localized, as the area is better drained, and the soil moisture index is close to 1. They are primarily found in the south and southeast of the district. At higher elevations, sulfate-based saline soils develop on saline rocks and where mineralized unconfined groundwater approaches the surface, while soda-based salinization is more common in the lowlands. Significantly fewer saline soils are found in the Northwestern Federal District, where saline soils are confined to the coast, forming under the influence of the sea and on marine saline sediments. This determines the predominantly sulfate-chloride and chloride types of salinization of coastal soils. Saline soils are found in the steppe and forest-steppe zones of the Ural Federal District. In addition to climate, salinization is facilitated by outcrops of saline, often gypsum-bearing, rocks and a loamy soil texture. The chemistry of salinization is predominantly sulfate. Saline soils of the Siberian Federal District are divided into two sharply distinct regions. The western part of the district, which belongs to the West Siberian Plain, is where solonchic and solonchic soils most often form, with sodic chemistry dominating; the salinization type is continental, associated with climate and poor drainage of the territory. The eastern part of the district is characterized by smaller areas of saline soils; solonchic is extremely rare, and the chemistry is predominantly sulfate. Salinization is determined by gypsum-bearing saline deposits and the waters that erode them, including groundwater. Lake Baikal separates the soils of different salinization types. West of Lake Baikal, sulfate salinization clearly predominates, while to the east, a significant proportion of soils exhibit sodic salinization, which is prevalent in eastern Transbaikalia. The causes of salinization in Transbaikalia are similar to those in Western Siberia. Both regions lack saline rocks, gypsum, and salt deposits; salinization is primarily continental in origin, and soda-based chemistry or soda-based chemistry predominates. The chemistry and causes of salinization in the soils of the Far Eastern Federal District are different. In the Lena Valley, in the absence of saline rocks or deposits, sulfate-chloride and chloride-saline soils form under permafrost conditions. Permafrost prevents chloride salts from leaching from the profile. In northern Yakutia, Chukotka, and on the country's eastern

coast, predominantly chloride salinization is determined by proximity to the sea and the presence of marine sediments. In Kamchatka, in a zone of increased seismic and volcanic activity, the presence of saline soils is determined by hydrothermal systems, leading to the formation of alum-type salinization.

*Keywords:* soil salinization maps of Russia, salt accumulation factors, chemistry, depth, degree of salinization, salt genesis, areas of saline soils, administrative units of the Russian Federation.

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