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STRUCTURAL ANALYSIS OF GEOSYSTEMS OF THE NURA RIVER BASIN

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The territory of the Nura river basin is located in the central part of Kazakhstan in Karaganda and Akmola regions. The Nura river starts from the western spurs of the Kyzyltas mountains and flows into lake Tengiz.

The studied region is located within the Kazakhstani folded system. Structures of various ages are oriented in different directions. The formation of the studied areas refers to the devonian

period. The sedimentary cover is represented by carbonate saline deposits. In the neogene – quaternary time there was the development of erosion – accumulative processes.

Within the studied area, 5 distinct types of terrains can be distinguished taking into account age and the origin: tectonic-denudation lowlands and hummocky highlands, denudation-erosion upland, basement denudation plains, accumulative relief (lacustrine-alluvial plains, etc.), alluvial plains and river terraces complex. Within the Nura river basin, the most distinctive form of relief are the uplands, they pass from the mountainous parts of central Kazakhstan to the plains and numerous drainage depressions, which were formed as a result of erosion and aeolian processes in semi-desert climate. Modern valleys are represented by three terraces above the floodplain. The third above the floodplain terrace is erosive – accumulative and preserved fragmentarily. The steppe occupies a significant part of the Nura river basin. It is represented by watershed, laboralistas plain, typical small hill with fragments of denudation-hilly and alluvial-proluvial plains. Soil-forming rocks are represented by heavy loam and light clay.

Climatic conditions are characterized by the following indicators: the sum of air temperatures over 10 ° C is 2400 - 2700 ° C, annual precipitation – 230-280 mm, 60% of which falls under the warm period. The average duration of the frost-free period is 140 - 160 days, the coefficient of moisture is 0,3 - 0,45. Distinctive soils are humus, southern carbonate. Common forb – fescue – grass vegetation with a predominance of feather grass and feather grass [1, pp. 78-110;].

Dark-grained soils are confined to denudation – hilly and alluvial – proluvial plains and gentle slopes with deluvial deposits. In river valleys, lake depressions, slopes and hills, rarely in saline watersheds folded rocks formed in different temeculamovie salt licks soils and their complexes with salt licks.

A large part of the hummocky space occupied dark chestnut featuring poorly developed and undeveloped soils. They appeared everywhere on eluvial – deluvial gravelly loam, they are products of weathering of dense rocks. The steppe zone, which is a fescue – feather grass associations.

Hydromorphic soils form in the places of occurrence of groundwater: meadow - marsh, varieties of meadow chestnut vegetation.

In the semidesert zone of the basin rivers Baikozha and Akbastau, zone of the formation and transit of the drainage basin, Sherubainur, the dispersion of runoff of the river basin, Esen, arid geosystems of the reservoirs and lacustrine-alluvial plains in the middle reaches of the left Bank of the Nura river. Winter is very short, moderately cold, little and moderately snowy (in the East). Spring is very short, dry at the beginning and dry at the end. Autumn is very short and dry. Summer is very long, very warm in the North and moderately hot in the South, dry. The temperature of the coldest month is 14-16 °, the warmest-22-25 °. The duration of the main vegetation period is 148-185 days, frost-free - 136-150 days. The sum of temperatures above 10 ° is 2700-3700 °. The amount of precipitation for the year falls 90-250 mm with evaporation 675-925 mm. the Ratio of precipitation of warm and cold semesters is 0.8-1.1. The annual coefficient of moisture is 0.05-0.151 (0.12-0.33). The soil of this zone is chestnut, including underdeveloped, underdeveloped in small hills and mountain chestnuts in the low mountains, and in the West chestnut, carbonate and salt licks, light chestnut underdeveloped and underdeveloped.

Typical semi-desert area association is a sagebrush – fescue–feather-grass vegetation with dry grasses xeromorphic [2, p. 28-36;].

The territory of the Nura river basin has such physical and geographical features as: the dominance of the spring flood in the diet; the lack of constant surface runoff in the summer; high shallow dismemberment areas.

In the conditions of intensive anthropogenic activity, the natural and climatic features of the development of the processes of pollution of geosystems are the following laws:

- water-resistant properties give it the participation of deposits of heavy granulometric composition in the cover thickness, it provides protection of groundwater from contamination from the surface and it contributes to the formation of surface runoff with a high modulus;

- negative consequence of active wind activity during the summer period is the deflation of soils detrimental to soil fertility and polluting the atmosphere by dust particles and armirovanye

them agro-chemicals. Increased wind activity in the region leads to wind erosion of the soil, which occurs at a wind speed of more than 8 m/s and is accompanied by pollution of the atmosphere with dust. It is very significant that dust storms in the southern part of the basin occur 3 times more often than in the northern part. Active wind activity has a negative effect on the soils of the river basin. It leads to soil deflation. But in winter the winds are accompanied by blizzards, from which the watershed areas are exposed to snow and freeze, and this leads to the fact that during the snowmelt of the soil become waterproof.

- deflation and active salt transport, as well as intensive accumulation in heavy loamy soils of toxic substances, salts of heavy metals accumulating in various natural components have a negative impact on the current dynamics of natural complexes. In the basin of the Nura river on many arable and pasture lands observed the process of dehumification.

- instability of atmospheric moisture conditions often create a large moisture deficit, which is accompanied by a sharp loss of productivity of desert ecosystems. Lack of precipitation in the spring hinders the development of many plants, and many do not grow at all, that is, are in a period of "rest". This is an important adaptive feature of desert ecosystems, allowing them to tolerate drought, but at the same time, with their frequent repetition plants die. The zone is insufficiently provided with precipitation, and therefore, the recurrence of drought here is more than 50 years.

- a pronounced pattern of water pollution is the widespread participation in the composition of ingredients-pollutants of petroleum products and chlorine-organic compounds, i.e. pesticides. Of the other most characteristic pollutants exceeding MPC should be noted heavy metals (copper, molybdenum), mainly in the areas of the lower reaches of the Nura river and phenols in the upper part of the basin. The main sources of pollution of the Nura river are wastewater enterprises of Karaganda-Temirtau industrial district

The characteristic features of modern physical and geographical conditions of functioning and development of the Nura geosystem are the following: the connection of the modern nature of the development of geosystems with the genetic type of semi-deserts; widespread sedimentary rocks, a large dependence of the degree of functioning of geosystems from surface runoff.

СПИСОК ИСПОЛЬЗОВАННЫХ ИСТОЧНИКОВ

1. Cassin N. D. Materials on paleogeography of Kazakhstan. – Alma-ATA, 1947. – 215 p.
2. Mukhamedzhanov O. T. Anthropogenic impact on the geosystems of the Nura river basin: autoref...kand.geogr.sciences'. – Almaty,1997.40 PP.
3. G.Ts. Medoev "Geology and tectonics of Karaganda region" Alma-ATA, 1942.365 S. AFR.
4. Kalmenova U. A. Physical geography of Central Kazakhstan. –Zhezkazgan, 2000 – P. 79.
5. Integrated water management and water protection measures // Scheme integrated use and protection of water resources in the Nura river basin / Committee on water resources of Kazakhstan. – Almaty, 2015. – кN. 2. – 63-69 p.
6. The accounting data of the Nura-Sarysu RBO for the years 1990-2015 / GU "Nura Sarysu basin water management." – Karaganda, 2015. – 229 c.
7. Storozhenko D. N. Soils of Karaganda region. Issue.8.-A - A.:Science, 1967. -329 S.
8. Bykov B. A. Biological productivity of vegetation of Kazakhstan. – A-A.: Science, 1974.
9. Ozgeldinova J. O. Anthropogenic impact on geosystems of river Sarysu : author.. on competition of a scientific degree of PhD. – Astana,2015.-15 PP