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As A Determining Factor Of Soil Meliorium Status Of Sangzor Basin Flow Geosystem

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Abstract. To assess the salt mix within the Sangzor basin geosystem (Uzbekistan, Mirzachul) is identified and shown on the flow map (according to IN Stepanov), which is a natural elementary spatial-temporal structure of the earth's crust. The currents are separated by geometric variation of the isogypsum lines of the topographic maps. For the first time in the geosystem of the Sangzor basin, the boundary of the flow areas is separated by the area of formation, transit and accumulation of water, salt and fine sand. The map shows geochemically compatible divergent and convergent regions, increasing regions of easily soluble salts and decreasing regions receiving natural salts.

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Introduction.

The article recommends a systematic approach to the study of the laws of spatial differentiation of salt masses in the soil-soil of the Sangzor geosystem (Erofeev, 2012; Ozeldinova, Mukaev, 2016, etc.). The study of the theory of the mechanism of formation and formation of soil salinity Mirzachul (Pankov, 1962; Rafikov, 1976; Kovda, 1984; Shuravilin, Ahmedov, Gafurov, et al., 2019) shows that natural salt accumulation processes with certain relief types, geomorphological and hydrogeological conditions determined.

The highest occurrence of soil salinity is observed in areas where the groundwater level is close to the surface and in areas with difficult or no flow, where the water-salt balance is controlled by evaporation and transpiration. Secondary salinization is observed here, which occurs as a result of soil salinization without irrigation and drainage supply. Materials obtained as a result of field, laboratory and experimental studies are the basis for the development of thematic and soil-reclamation maps, which reflect the spatial differentiation of different levels of salinity of soils in basin geosystems.

Although the soil-reclamation maps created to date have used the same original materials, they differ significantly from each other in terms of configuration, consistency, and mutual placement of contours. For an objective study of the existing natural conditions for the formation of soil-reclamation features of geosystem basins, we used a method of approach to the system, including morphological analysis of the earth's surface. (Method of plastic relief, 1997; Stepanov, 2006). According to this method, at the beginning of the work lies one of the main factors in the differentiation of salts in soils in the form of a contour carcass, the radically different relief elements - convexity and concavity (Fig. 2). These maps are the main basis for field research, remote sensing material interpretation, and stock material analysis. This method is based on the close relationship of soils with relief elements and relief elements and their well-known position on the reclamation status.

At the initial stage of research, there are many methods of analysis and processing of cartographic material (Salishchev, 1976; Berlyand, 1978). As A.M. Berlyand pointed out, at this stage in the development of cartography it is necessary to create not only maps that reflect the elements and structures of geosystems, but also the factors and processes that determine their function and development. That is, soil reclamation maps should be based on a systematic approach. As a result of the analysis of soil-reclamation conditions of Mirzachul, it was found that mapping of streams, as well as demarcation of basin geosystems has not been done yet, and this is a gap that still exists in learning about soil dynamics and spatial differentiation.

Object of research. The study area is the Sangzor basin geosystem, with a length of 198 km and an area (up to irrigation networks) of 2530 km2. (See Figure

1). Within the basin geosystem, the Sangzor River flow itself is formed by groundwater and pressurized water flows on the northern slope of the Turkestan Range and is associated with Quaternary sedimentary rocks composed of fine-gravel and sandstone. The distribution cone of the geosystem basin is represented by a flat, slightly convex, radially sloping proluvial plane from the top of the ridge to the north and northeast.

The flow structures of the distribution cone within the basin geosystem (see Figure 2) are in the same two directions - west and east. The Quaternary formations that make them up have a regular differentiation, and the currents in the west-west direction are composed of small rocks and are observed up to 10 km from the top to the north. To the east, their separate streams extend to 7-8 km. The spreading cone is composed of radially flowing flow structures and is composed of crushed rock at the foot of the mountain, which is covered with a thin layer of cartilaginous sand. Flow structures in the territory of Jizzakh include cartilaginous proluviums. The flow structures towards the edges of the basin geosystem have a flatter, wider profile and have the character of a slightly sloping plain consisting of relief lyoss. The Sangzor distribution cone is connected to the wide basin occupied by Tuzkon salt lake within the basin geosystem.

Discuss research methods and results. For the Sangzor basin geosystem under study at the scales M1: 50,000 and M1: 100,000, a relief plastic map was created by modifying the isocillary lines of topographic maps using the second derivative method (Plastic method..., 1987; Ilina, 1987), in which all carcass relief forms without exception on the topographic map shown, the contour lines are represented by curved lines of bubble and concave relief shapes (see Figure 2).

A card created in this way gives a three-dimensional view of the area. The horizontals, topographic maps, as well as the lines of the transverse and longitudinal profiles are the curves of this space and are used to describe its flatness. The relative flatness of the horizon is indicated by the fact that the relief forms are positive, convex surface and elevated above the surrounding relief, and in the negative case, the topography consists of a concave surface and the ground is low. This is an important condition for future soil-reclamation maps, as the convex and concave shapes of the soil are a key factor in the redistribution of water and solid organic-mineral flows and allow the determination of the path of matter in adjacent geosystems using a set of symbols.

The relief plasticity map separates the flow structures that give a clear idea of the path of salt mass migration (see Figure 2). In the first, the Sangzor basin for the Mirzachul area is shown with flow structures. In the presented map, basins of any order are selected as the main organizational unit of mapping, in which convection-currents form integral images - flow systems. The geometry of streams is related to the curvature of the contour lines of topographic maps of any scale of currents created by the area of gravity of their shape. Currents describe the movement of matter and energy within basin geosystems (Florensov, 1971).

Mapping of flow structures of geosystems is accompanied by the identification of saturation, transit and accumulation zones, i.e. migration path, separation and accumulation of salts in the soil. The constructed map shows the geochemical combination of divergent and convergent regions: from the first (rise) leakage currents along the slopes, along the transit channels, to the second (depressions) these flows merge, swamp and saline the soils. Divergence zone (system of elevations) - autonomous, easily degraded areas, subordinate areas of subsidence (sinking system), easily saline areas, natural salt water reservoirs. In traditional thematic maps, these areas are not highlighted, they are indicated by a single separation, and the frequency of formation of soils at ups and downs is sometimes indicated by alphanumeric or numerical indices (indicators). If we draw the crop fields in terms of separation and convergence from aerospace images, then we can see that they are bounded by desalination and salinity areas, and even indicate the degree of this or that process: lower, middle, upper parts of slopes, their verticality, degree of exposure, the level of flow channels cut at different depths, and so on. Irrigation of fields maintains the geochemical direction of salinization or salinization along depressions and uplifts, but significantly accelerates processes.

The beginning of the saturation area is the distribution area in the formation of saturated water-salt masses, the transit area (zones) is the area of distribution of water-salt masses, the main factor of the hydrochemical process is the flow, and the accumulation area is the accumulation factor.

The contour drawing on the map allows to see the zones of formation of groundwater and surface water, the concentration of salts in the flow structures - this is the area covering the mountain valley and foothills of the Sangzor River Valley and Gallaorol basin.

Previous research shows that the bulk of the salts in the gray soil are carried along the soil depth and slope by the soil and groundwater, which are converted into soil thickness. In this respect, the soils of the foothills, even in the conditions of deep groundwater, are more or less saline due to their passage from the outside.

In the area adjacent to irrigation, active processes of mountain formation are observed in the constant displacement and accumulation in the plane of the soil-forming material, which contains salt. Surface and underground currents formed in the area under study in ancient geological periods continue to operate today. The streams form salts from the rocks that are disturbed in the path of movement, and in the process of their movement are enriched with the salts of ancient salt deposits. Streams from the mountains partially flow into rivers and depressions and carry water to the final accumulation zones within the basin geosystems. As a result, during the halogeochemical periods, the thick sedimentary layers that make up the lower parts of the basin geosystems were subjected to salt accumulation associated with the evaporation processes of the transit streams. The soils of basin geosystems within mountainous areas are not saline from the surface because there is sufficient atmospheric precipitation for the leaching regime and the groundwater has very high water exchange and salinity.

In line with the natural distribution of areas with large salt reserves, the distribution of saline irrigated lands within geosystem basins from the upper reaches to the lower reaches of the river also increases.

In summary, on the map of flow structures in the Sangzor Basin geosystem - the zones of formation, transit and discharge are clearly defined and the conditions of soil regeneration are supposedly motivated and associated with relief forms that determine the spatial distribution of salts in soils. In the future, a detailed and maximally complete picture of the spatial distribution boundaries of soil salinity on the map will provide information on the cause-and-effect relationships of galo geochemical processes.

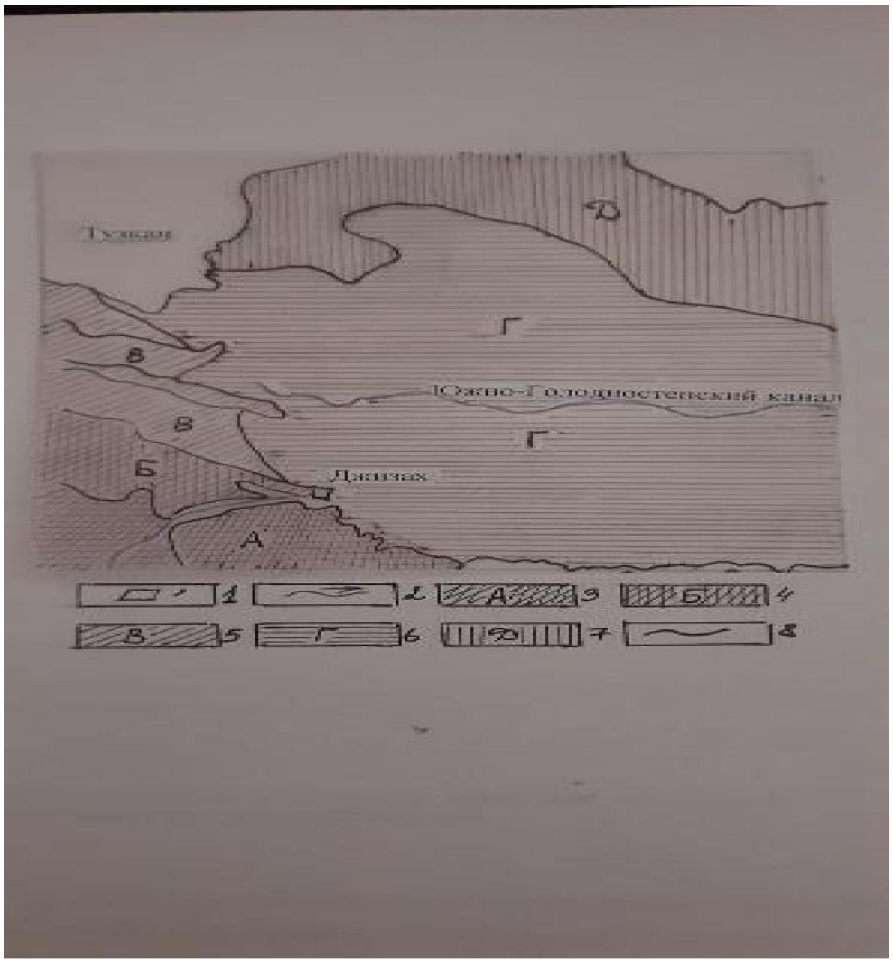

Figure 1 Scheme of natural zoning of Mirzachul (desert)

Symbols. 1. Population points. 2. Water bodies. 3 (A) - Turkestan ridge, low mountains, front ridges; 4 (B) - intermountain and foothill deluvial-proluvial plains separated (divided) by new temporary water flow valleys, 5. (B) - Fish mountains, low mountains, fronts of ridges; 6. (D) - Upper, central and peripheral parts of the Sangzor River; 7. (D) The northern peripheral part of the cone vynosa, which connects with the ancient valley of the Syrdarya.

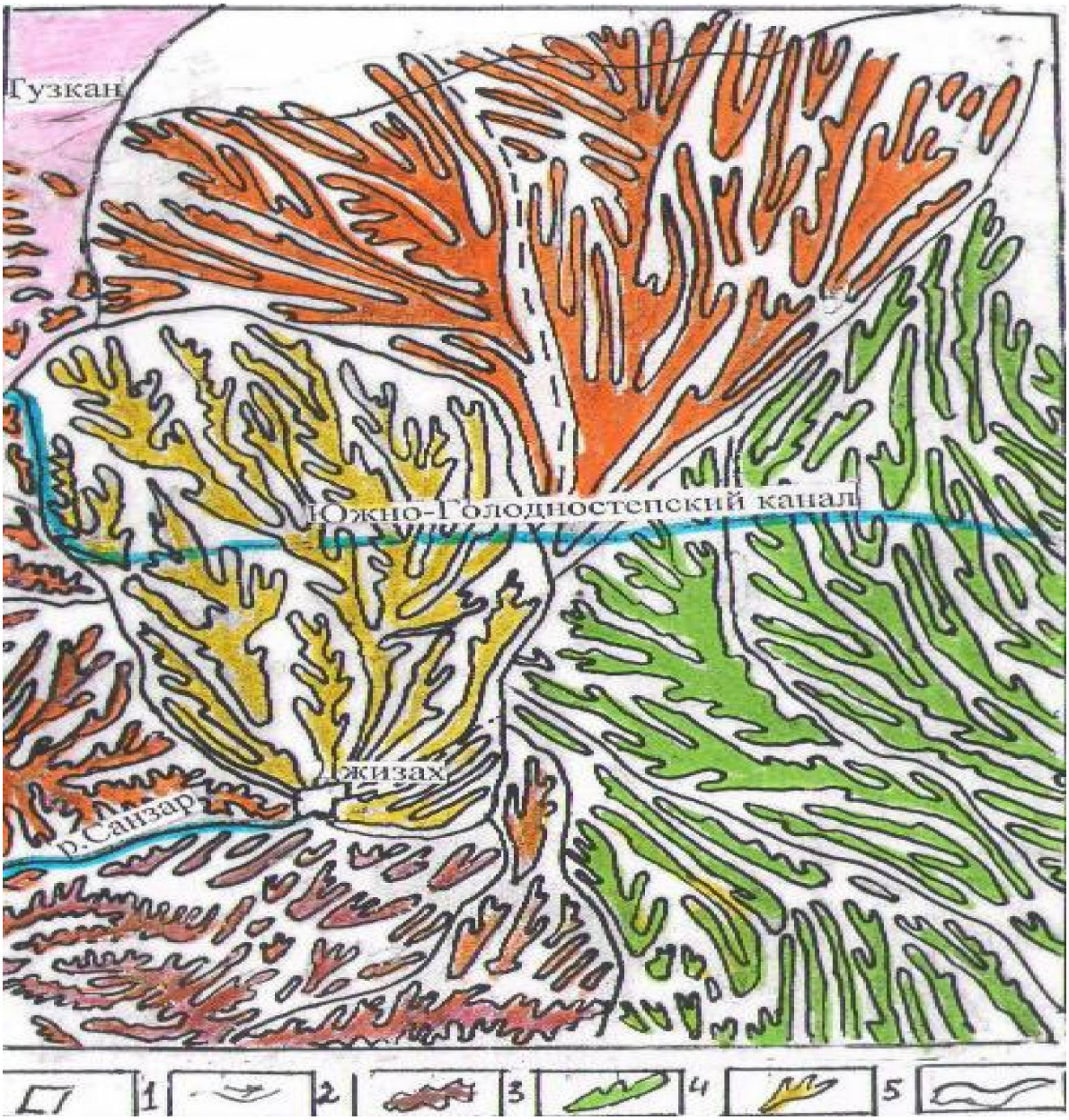

Figure 2 Map of flow structures of the Sangzor Basin geosystem

Symbols. 1. Population points; 2. Water bodies; 3. Mountains - a zone of formation of surface and groundwater; 4. Central part of Sangzor basin geosystem; 5. Central and peripheral part of the Sangzor river (cone vynosa), which is connected with the ancient valley of the Syrdarya; 6. Central and peripheral part of the geosystem of the Zaamin basin

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