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Systematization of river valleys in different morphostructural areas

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The aim of our research was to identify the features of development of river valleys within the south of Eastern Siberia. One of the objectives to achieve this aim was the typing of river valleys, which was based on the principle of the location of a river valley or its part within different morphostructural areas, determining the morphology and individual (general or specific) development features that make it possible to specify the pattern of development of river valleys at different topological levels. Within the study area the following major morphostructures are distinguished: Altai-Sayan and Baikal mountain-folded regions, the Baikal rift zone, and the Siberian platform, within which morphostructures of the lower order are identified. Thus, a large variability in types of interaction and interpenetration of different areas provides for the development of various types of river valleys, depending on their location in the morphostructural areas. This approach was the basis for the typing of river valleys, i.e. idenifying their typological characteristics, depending on their location within a particular morphostructural area, geological and geomorphological conditions, and the history of development. The basic principles for the typing of river valleys are: 1) their location with respect to morphostructural areas, and 2) a set of characteristics of valleys of different morphostructural areas. Based on the above mentioned approach, and using GIS (MapInfo software), a map of river valleys typing was compiled, which included the database of the hydrographic network with space-time characteristics, tabulated for each streamflow. The procedure for determining the types of river valleys within each morphostructure was as follows. Boundaries of morphostructures of different orders were identified according to cartographic and literature data and allocated in the GIS space (MapInfo software). In the database, each distinguished morphostructure has the following characteristics: 1) name, 2) orographic location, 3) topological order, 4) belonging to a morphostructure of the higher order, 5) belonging to a morphostructural area, and 6) morphostructural characteristics. Then, the location of river valleys towards morphostructures is identified. For this purpose, the layer of the hydrographic network was divided according to obtained polygons of morphostructures. Thus, each streamflow appeared to be either within one morphostructural area or within few ones. In the database every streamflow (valley) or its part also have the following characteristics: 1) name of the river, 2) morphodynamic channel type, 3) direction of the current state of the processes of erosion or accumulation, 4) morphology of terraces, and 5) characteristics of the alluvium. The final research result is preliminary correlation of river terraces of the rivers, crossing several morphostructures of different orders, selection of local, cyclic terraces, and analysis of longitudinal profiles of terraces, focusing on their behavior in the transition zones from one morphostructural area to another one. This approach helps to systematize the forms of fluvial relief formation, formed under different conditions.
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