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[Short Communication]

Scientific Approaches and Methods in the Investigation of the Formation and Stability of Hydromorphic Natural Complexes of the Irtysh River Valley System (The Kazakhstan Part)

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Abstract

The current geo-environmental situation of the Irtysh River valley system is connected with the high degree of control of the river drainage, which affects the functioning of its entire ecosystem and determines some morphological features of its channel. In the present work, the methodological approaches in the study of formation of the valley's hydromorphic natural complexes are discussed, and the results of studies on the channel processes in the middle course of the Irtysh River are given.

Key words: Valley, floodplain, hydromorphic complex, river Irtysh, Kazakhstan

Introduction

According to the concept of ecological safety of the Republic of Kazakhstan for 2006-2015, "The ecological safety is considered a component of the national safety and is an obligatory condition of the sustainable development, and it acts as a basis for preservation of natural systems and maintenance of the corresponding quality of the environment". The concept also concerns water resources of Kazakhstan, as it refers to the category of countries with a deficiency of water resources. Currently, the valley of the Irtysh River is undergoing significant anthropogenic loading, and consequently the solution of problems concerning the stabilization of hydromorphic landscapes have huge national-economic values, and is one of the serious regional problems of the republic.

The formation of the valley paragenic hydromorphic landscape complex is largely predetermined in many respects by the geologic-geomorphological and hydrological factors, and inherently reflects the features of ancient paragenesis and modern functioning of the basin geo-system.

It is well known that the river channel is considered a stable system under the influence of the stream as the result of washout or rock deposition, and it does not cause any serious change in the river runway. Usually the river itself creates the natural form of the channel, which is characterized by some stability and corresponds to the least resistance of the water stream. So, while creating bends, the river stops their development as soon as the radius of their curvature reaches the optimum size of the given stream. A big congestion of deposits in the channel creates resistance to the current, and the river deviates or breaks into sleeves, losing its stability.

The river Irtysh is one of the largest trans-boundary waterways in Kazakhstan. The sources of the river are locate, in a glacier of the Mongol Altai Mountains in China, whence it flows in a northwesterly direction, crosses the frontier between China and Kazakhstan and flows into Lake Zaisan below Bukhtarma water basin. After Lake Zaisan the Irtysh River proceeds through the western part of the Russian Altai Mountains and the lowland of Western Siberia and flows into the river Ob'.

In the territory of Pavlodar oblast' the section of the middle watercourse is about 720 km long. The water area at the boundaries of the area (N50°36' and E79°30') consists of 276200 square km.

The valley landscape of the river Irtysh is represented by channels, terraces and floodplain. The area of the floodplain occupies 371 square km, and is characterized by high soil and humidifying freshet. The valley of the Irtysh is situated within the limits of a large platform structure – the Irtysh syneclise of the Western Siberian epipalaeozoic plate - and is characterized by a considerable complexity of structural-geomorphological

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