HOLOCENE HISTORY OF RIVER DELTAS IN THE ARCTIC ZONE OF SIBERIA

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The Holocene transgression of the World Ocean created ingression embayments in most major river valleys of northern Siberia. There, following a relative stabilization of the sea level 6 000 - 7 000 y. ago, the river deltas began to grow. The study of original topography and its preservation of composition and thickness of deposits, their radiocarbon dating and pollen analyses enable us to distinguish the main stages and phases in delta evolution.

The Yenisey delta which is formed within a narrow and long bay is at the stage of embayment filling. This stage was divided into five phases of delta formation: the first, 7 000-6000 y.ago, is represented by the filling of the Krestovsk-Muksuninsk valley widening; the second and third, 6 000-2 000 y.ago, by the aggradation within the central part of the Tanam-Munguy widening; the fourth by the filling of relict bays with a predominant growth of the eastern part of the delta; during the recent phase the delta plain continued to grow, but the main zone of aggradation shifted onto a mouth bar near Cape Sopochnaya Karga. During the Holocene the runoff was uniformly decreasing and the rate of the delta growth was increasing. The environment morphology, and history of evolution of the Taz and Pur deltas are similar to those of the Yenisey delta.

In the mouth area of the Yana River, 7 000-6 000 y.ago, a wide and shallow lagoon was separated from the sea by a barrier terrace. The stage of lagoon filling ended about 4 000 y.ago by the formation of the delta plain and advance of mouth bars of delta channels into the sea. The main delta channel and associated zone of maximum aggradation migrated first from the western part of the delta to its central part (end of the Subboreal), then its northeastern part (800 y.ago). At present the runoff of eastern delta channels is increasing, thermokarst processes favoring the channel development. The runoff within the delta was higher during the Subatlantic, and the highest rate of deltaic sedimentation was characteristic of the Subboreal.

The Indigirka delta has also passed the stage of the filling of a mouth lagoon, however the runoff migration through delta channels during the advance stage was less pronounced.

The deltas of the ingression bay filling Olenioksk and of the advance into a wide open bay (Tumat-Trofimovsk) existed simultaneously in time of the formation of the Lena delta plain. A phase-by-phase migration of the main delta channel from west to east occurred against the background of the evolution of these deltas: about 4 000 y. ago the runoff concentrated mainly within the Olenioksk and proto-Bulkur channels; not later than 1 500 y. ago the Titaryn valley widening was filled and the Bykovsk channel was formed. At present the runoff through the Trofimovsk and Sardakh channels is increasing. The Olenioksk channel has filled the bay and its stage of the advance into the open sea is beginning.

The morphogenetic type of a river delta, the role of marine and river factors in its formation, and hence a mechanism of this formation depend on a structurally controlled form of a junction of a river mouth and a sea. Landscape and climatic conditions of the cryolithozone determine a high rate of deltaic sedimentation owing to peat and ice incorporation and a slow change of stages of the delta formation due to relatively low activity of channel processes.