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# Substantial flows transformation processes in the Lena River delta

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The main purpose of our work is study of geochemical processes on the basis of matter flow transformation regularity from the head of delta to its sea border.
The study is based on data on flow in the head of the Lena Delta and in the main branches and results of expeditions. Satellite images are given by Research and development center Scanex.
The main regularity of geochemical processes in the Lena Delta is connected with transformation of channels structure and corresponding water flow, sediment yield, living material and heat changes, and branch development trend. Characteristics of channels structure were determined for the first time in the Lena delta. The basis of this structure is main branches of the delta. About 42% of all channels are concentrated in Trophimovskaya channel, 29% of them are in Tumatskaya channel, 18% - in Olenekskaya channel, and 11% of them are in Bykovskaya channel. In the Lena delta there are 714 relatively large channels. They are characterized by space instability because of channel bifurcation or confluence (there are 231 division points and 121 merge points in the Lena Delta). Its maximum number is formed in Trophimovskaya channel (106 and 50 correspondingly); the minimum (81 and 25) is formed in system of Bykovskaya channel.
Hydrographic orders were calculated and appropriate dependencies were drawn for studied channels. These dependencies were used for reference orders definition (by reverse calculation) and water content estimation for unstudied channels.
River order also allows us to carry out gradation of channels by the flow division degree.
The conception of reference orders allows us to characterize conditions of flow division in deltas branches. Water content and reference order change synchronously. The dependence is more complicated for Olenekskaya channel, it's connected with its geographic features.
Division of water flow influence on sediment yield. This process is rather complicated because of morphometric and hydraulic characteristics change in torrent – riverbed system. Some of channels disappear and it leads to decrease of sediment yield and deposition; growth of water flow leads to increase of carrying capacity and erosion.
In the Lena Delta accumulation of sediments occurs. About 87% of sediments, which inflow to the head of delta, are caught in branches and on flood-plane and don't reach the sea border.
According to data on relative turbidity change in Olenekskaya and Trophimovskaya channels turbidity changes irregular to the sea border, there is no pointed trend. The reason is alteration of division and merge zones which leads to alteration of erosion and accumulation zones.
Change in content of chemical substances, which are divided into nonconservative and conservative ones, is also complicated.
Conservative change is characterized for content of main ions and trace elements (on the way from the head of delta to its sea border).
Transformation of nonconservative substances (biogenic elements) is connected with division of water flow and sediment yield and also water temperature, flow velocity, and biochemical processes.