



## CHANNEL PROCESSES ON THE YAMAL PENINSULA (WESTERN SIBERIA) DURING THE LAST 2300 YEARS

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The floodplain of the rivers Se-Yakha River and Mordy-Yakha (Western Yamal) is 5-6 km wide, and meandering river width is only 100-150 m. According to interpretation of the aerial photographs and radiocarbon dating, several levels of the floodplain have been defined. The convex banks of meanders are outlined by the young grass-shrubs floodplain with the age up to 200 years. This level is characterized by primary fluvial relief with clearly identified natural levees. The next level is mature grass-moss-shrubs floodplain with the age 200-2300 years. Here the fluvial relief is slightly transformed by permafrost polygonal crusting and by thermokarst. The highest floodplain level with the age than 2300 years is completely reworked by thermokarst processes and has relief and vegetation pattern that shows different stages of thermokarst lakes development.

The dendrochronological and radiocarbon dating show very low rates of the vertical growth of the floodplain and river bank erosion. Only the surface of the youngest grass floodplain grows with the average rate up to 50 mm/year due to annual flood sedimentation. The lowest parts of the grass-shrubs floodplain grow with the average rates 3-19 mm/year. The average rate of accumulation is not more than 0.7 mm/year at the mature floodplain. The rates of bank erosion are much less than 1 m/year for the majority of river reaches. The average rates of erosion of the floodplain banks for 200-year period are 0.5-0.7 m/year along the lower River Se-Yakha. The maximum observed rate of erosion of the high terrace bank is 0.9 m/year.

The cut-offs occur at the meanders with the coefficient of sinuosity more than 5-6, that is, when the opposite sides of the bends almost touch each other. The main cause of such short (several meters) cut-offs is frozen surface of the floodplain at the period of spring flood. Three most recent cut-offs here were formed approximately 30-40; 40-50 and 70-80 years ago. The most ancient identified cut-off has age 1400-1800 years.

At the same time relatively recent (200-250 years ago) long (several kilometers) cut-offs of meander series occur on the lower River Se-Yakha. One of the cause of such cut-offs may complicate pattern of ox-bows and numerous linear depressions, which connect thermokarst lakes and their residual depressions on the surface of the floodplain. The other one may be catastrophic flood with the velocities on the floodplain enough to erode its surface. The 2-D hydraulic model was used to estimate the maximum discharge of such proposed flood.