



Late Quaternary river channel migrations of the Kura River in Transcaucasia – tectonic versus climatic causes

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Large-scale river channel migrations either in the form of avulsions or combing, i.e. progressive lateral migrations, are global phenomena during the Late Quaternary. Such channel migrations were triggered by tectonics, climate change, human activity or a combination of those factors. River channel migrations have the potential to cause significant human and economic losses. Thus, a more thorough knowledge about underlying causes and process rates is essential. Furthermore, such studies will elucidate the sensitivity or robustness of rivers to different external and internal forcing-agents, i.e. they help to identify the dominant drivers of regional landscape evolution.

The Caucasus region is part of the active collision zone between the Africa-Arabian and the Eurasian plates, and is characterized by high current tectonic activity. Furthermore, significant environmental changes took place during the Late Quaternary, i.e. the shrinking or even disappearance of glaciers in the Greater and Lesser Caucasus or fundamental changes of the vegetation cover varying between woodland and grassland-dominated vegetation. The Kura River is the main gaining stream of the Transcaucasian Depression located between the Greater Caucasus Mountains in the north and the Lesser Caucasus Mountains in the south, and receives several tributaries from both mountain ranges. This study focusses on the middle course of the Kura River in eastern Georgia, SE of the city of Tbilisi. Integration of fluvial geomorphology, geochronology, heavy mineral analyses and seismo-tectonic analyses demonstrates that this part of the Kura River underwent large-scale channel migrations up to >10 km during Late Pleistocene and Holocene. It is interpreted that these movements followed both tectonic and climatic triggers: Whereas SW-ward migrations were caused by tectonic uplift in and SW-directed advance of the Kura fold and thrust belt as part of the Greater Caucasus, NE-ward migrations occurred during cold glacial periods with intensive sediment supply and strong vertical sedimentation of tributaries originating from a westerly direction. Thus, the middle course of the Kura River shows a dynamic equilibrium between competing tectonic and climatic processes.