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Geomorphic response of gravel-bed Carpathian rivers to human impact (Czech Republic)

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The poster summarizes existing knowledge of factors of morphodynamic changes in channels and alluvia of Carpathian streams. The study focuses on particle size analysis by the photogrammetrical equipment and the statistical evaluation of sediment changes in gravel beds. The transformation of streams is presented on the example of several typical gravel carrying streams in the area of the Czech Carpathians – Kopytná, Morávka, Tyra and Mohelnice Rivers and their tributaries (with typical "step-pool" and "pool-riffle" patterns). The river pattern of larger rivers was analysed by means of historical maps and aerial photographs. Detailed geomorphologic mapping concentrated on the overall analysis of fluvial landforms adverting to changes in the general development of the streams. Several fundamental geomorpic trends were identified in studied segments of the selected Carpathian streams. The first trend is related to the change in land use in the historic period when deforestation of mountain areas caused the increase in the amount of bed-load in the streams and influenced the course of flood waves on the streams. A significant source of sediments came from the activation of debris flows in the upper parts of the basins. Another type of anthropogenous impact consisted in stream regulations that culminated in the second half of the 20th century totally transforming the geomorphologic regime of the streams. This resulted in the occurrence of new conditions to which the streams react by more intensive displays. All these interferences often caused non-reversible changes in channel morphology. The most distinct type of the changes is transformation from gravel carrying braiding streams into streams with accelerated deep erosion and bedrock channel development.
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