Vegetation influence on friction factors of a lowland river. A case study of the Biebrza river.

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Lowland rivers according to their dimension are under impact of less or more intensive processes of overgrowing banks or shallow by aquatic plants. Vegetation is cause of reduction of an active area of cross-section, flow resistance increasing, variation of water velocity and a water slope, finally it generates rising the channel water stage. Seasonal vegetation changes influence significantly on a local hydraulic condition and channel morphology. Calculation methods of discharge capacity in rivers and channels with flexible vegetation are based at the Manning's and Darcy – Weisbach's friction factors to appear local river bed stresses coupled with other fluid dynamic processes.
Seasonal local hydraulic conditions changes have been analyzed for selected segment of the Biebrza River. The Biebrza River, situated in the north-eastern part of Poland, flows through the last extensive, fairly undisturbed river-marginal peatland in Europe. The hydrometrical measurement and recognition of aquatic plants have been surveyed in a selected cross section in the Lower Biebrza basin. A measured data has been collected since June till November. The absolute roughness for the divided parts of cross sections has been calculated by using Collebrook-White's equation. The change of friction factors value in scale of season is strictly related with aquatic plants growing in banks zone. Calculated friction factors and roughness assume maximum values in end of September.