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Anthropogenic influence of small urban watercourses - Case study from the Czech Republic

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Rivers and streams in the urban areas are losing natural environmental values. There is especially small watercourses issue, where there exists the lack of river management and interest of municipalities. The main used methods are based on the field research of river landscape, mapping and inventory of anthropogenic landforms and determination of Channel Capacity Coefficient (CCC). We establish the list of anthropogenic landforms, which we divide to the five categories - industrial, agrarian, urban, transport network, and water management structures. Values of the channel morphologic parameters – width of channel, width of riverbed, and the degree of countersink - are measured for Channel Capacity Coefficient calculation. Pattern of objects shrinking transverse profile and limiting the smooth flow are investigated beside the morphological features.
Resulting from the application of these theoretical methods are several practical outputs. Firstly, we construct thematic grid cell monitoring maps (a) count of anthropogenic landforms in the floodplain; (b) weighted average of landform, whose weight was determined on the basis of their influence on the impact of floods. Secondly, we identify pattern distribution of the watercourses channel capacity in the selected study areas. Thirdly, we confirm existence of the urban stream syndrome which is characterized by consistently observed ecological degradation of brooks. The main symptoms of degradation are the altered channel morphology, occurrence of flashfloods, and the rate of ecological stability.
Above mentioned characteristics were applied in two different catchments in the Czech Republic – the Leskava Brook and the Lacnovsky Brook. Both streams flow through the urban area in the diverse natural conditions and with various historical development. The Leskava Brook is situated in the southern part of Brno in the Southern Moravia, and the Lacnovsky Brook, lies in the northern part of Svitavy town on the border of Moravia and Bohemia. We compared quantitative and qualitative characteristics of both catchments, e.g. relief, area, land use types, state of hydrographic network. Significant contribution of this study is to demonstrate the discussed information needs to improve flood risk management.