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Climate change adaptation potentials in Budapest – the roles of block rehabilitation and urban vegetation

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The Hungarian capital, Budapest is divided by the river Danube into the hilly, greener Buda side on the west, and the flat, more densely built-up Pest side on the east. Our study aims (i) to analyse the urban climatological effect on both sides, and (ii) to evaluate the recent climate change adaptation-oriented local programs from a climatological point of view. For these purposes two special districts are selected among the total 23 districts of the city. At the Buda side, the analysis focuses on the extended urban vegetation since most of the forested green area is located here. The effects of the recent changing of these green areas are analyzed using surface temperature data calculated from satellite measurements in the infrared channels, and NDVI (Normalized Difference Vegetation Index) derived from visible and near-infrared satellite measurements. At the Pest side, several block rehabilitation programs were completed in the recent decades, which resulted in functional and structural changes of special subsections of the districts. Their consequent local climatic changes are evaluated for the district Ferencváros on the basis of (i) satellite measurements, namely, surface temperature fields derived from radiation data of infrared channels measured by sensors MODIS (onboard satellites Terra and Aqua) and ASTER (onboard satellite Terra), and (ii) in-situ temperature and relative humidity measurements within the rehabilitated sections. Our main goal is to analyze whether the generally positive changes of the built environment can also be recognized in the urban heat island effect of this area.