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Study of the urban climatic effect for Budapest on district scale using satellite observations

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About 1.7 million inhabitants are living in the Hungarian capital, Budapest, which consists of 23 districts altogether. The entire city is divided by the river Danube into a hilly, greener Buda side on the west, and the flat, more densely built-up Pest side on the east. Our study aims to analyse the urban effect on both sides.
In case of the Buda side, the analysis focuses on the extended urban vegetation since most of the forested green area is located there. The effects of the past 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. We aim to evaluate the relationship of surface temperature and NDVI in this urban environment with special focus on either increased or decreased vegetation cover, e.g., recently built shopping centers in previously vegetated area or brown industrial area where low quality vegetation appeared in the past decade.
In case of the Pest side, several block rehabilitation programs have been started since the 1980s. Due to these programs functional and structural changes of special subsections of the districts occurred in the past few decades. Their consequent local climatic changes are evaluated in this poster on the basis of satellite measurements, namely, surface temperature fields derived from radiation data of seven different infrared channels measured by sensor MODIS (onboard satellites Terra and Aqua). 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.