EMS Annual Meeting Abstracts
Vol. 14, EMS2017-800, 2017

Analysing the relationship between the surface urban heat island intensity and the local climatic zones in Budapest

Csenge Dian (1), Rita Pongrácz (1,2), Zsuzsanna Dezső (1), Judit Bartholy (1,2)

(1) Eötvös Loránd University, Department of Meteorology, Budapest, Hungary, (2) Eötvös Loránd University, Faculty of Science, Excellence Center, Martonvásár, Hungary

Artificial surface covers and buildings fundamentally determine the urban environment. Because of this complex relationship the city structure can be characterised by different local climate zones (LCZ) based on the ratio of built-in areas, general building height, and surface cover. From the internationally defined 17 different LCZ classes 7 types (i.e. compact midrise, open midrise, open low-rise, large low-rise, dense trees, low plants, water) were identified in Budapest, which is the target area of this study.
Budapest is the capital and the largest city of Hungary both in terms of the total population (with about 1.7 million inhabitants from the total 9.8 million inhabitants in Hungary) and the spatial extent (about 525 km2 from the total 93,000 km2 area of the country). The city is divided by the river Danube – flowing from north to south within the city – into a hilly, greener Buda side with forests on the west, and the flat, more densely built-up Pest side on the east. The finer scale city structure is reflected in the urban heat island intensity fields with special focus on the building density and land cover types, which are also addressed by LCZ classes. To analyse the differences between LCZ classes within the city, we used surface temperature derived from the radiation data of 7 infrared channels measured by the sensor MODIS onboard satellites Terra and Aqua. The results can be used in urban planning to identify the hot spots within the city where the increase of vegetation cover might reduce the urban heat island intensity.