



The summer urban heat island of Bucharest (Romania) as retrieved from satellite imagery

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The summer Urban Heat Island (UHI) of the city of Bucharest (Romania) has been investigated in terms of its shape, intensity, extension, and links to land cover. The study integrates land surface temperature (LST) data retrieved by the MODIS sensors aboard the Terra and Aqua NASA satellites, and SEVIRI sensors on board of the geostationary platform MSG, along 2000-2012. Based on the Rodionov Regime Shift Index, the significant changing points in the land surface temperature values along transverse profiles crossing the city's centre were considered as UHI's limits. The study shows that the intensity calculated as the difference between the LST within the UHI limits and several surrounding buffers is an objective and flexible tool for describing the average thermal state of the urban-rural transition. The method secures the weight of comparing the UHI's intensity of different urban areas. There are little variations from one month to another, but UHI's shapes and intensities under clear-sky conditions are very specific to nighttime (more regular and 2-3°C less in the 7-km width buffer), and daytime (more twisted and more steep temperature decrease). For both cases, strong relationships with the land cover can be assumed. The nighttime UHI's geometry is more regular, and the intensity lower than the day situation, while the land cover exerts a strong influence on the Bucharest LST. After all, the study promotes an objective manner to delimitate and quantify the UHI based on satellite imagery. The study was performed within the STAR project 92/2013 (Urban Heat Island Monitoring under Present and Future Climate - UCLIMESA).