



## **Use of remote sensing imagery for characterization of urban heat radiation flux**

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Rapid urbanization transforms the natural landscape to anthropogenic urban land and changes surface physical characteristics. By covering the urban areas with specific infrastructure (buildings, roads, parking lots, and other paved surfaces), urban zones usually experience higher solar radiation absorption and a greater thermal conductivity and capacity for releasing heat stored during the day at night. Based on the scale and height of their appearance, atmospheric heat island phenomenon can be classified into two types, the canopy urban heat island effect and the boundary-layer urban heat island effect. Satellite remote sensing imagery of various spatial and temporal resolutions have been used to investigate the urban heat island phenomenon, because the spatial pattern of the thermal emission from the land surface can be obtained over a wide area when using remote sensing data. However, thermal-infrared remote sensors observe thermal radiation from the land surface. Therefore, the surface urban heat island, which can be determined by the surface temperature pattern and its remotely sensed heat island intensity, differs from both the canopy urban heat island and the boundary-layer urban heat island. Remote sensing is a key application in global-change science and urban climatology. Urbanization, the conversion of other types of land to uses associated with growth of populations and economy has a great impact on both micro-climate as well as macro-climate. Urban areas tend to experience a relatively higher temperature compared with the surrounding rural areas. This thermal difference, in conjunction with waste heat released from urban houses, transportation and industry, contribute to the development of urban heat island (UHI). The aim of

this study is to examine the changes in land use/cover pattern in a rapidly changing area of Bucharest metropolitan area in Romania in relation to urbanization since the 1989 till 2007 and then to investigate the impact of such changes on the intensity and spatial pattern of the UHI effect in the region. Investigation of radiation properties, energy balance and heat fluxes is based on time series satellite data from various sensors Landsat TM, ETM+, ASTER and IKONOS. So called effect of “urban heat island” must be considered mostly for summer periods conditions and large scale heat waves like Europe experienced in 2003 and 2007 years.