



The July Urban Heat Island of Bucharest as Derived from Modis Images

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Regardless of its size, every settlement influences the meteorological elements, and the urban climate is a theme extensively approached over the. The remote sensing investigations of the urban heat island (UHI) are rapidly developing in the recent years, taking advantage of the significant improvements in the accuracy and the cost of the images. Nevertheless, the heat island of Bucharest has been scarcely documented up to date.

This paper aims at investigating some characteristics of the surface urban heat island (SUHI) of Bucharest, in terms of its extension, magnitude, and geometry. This research is conducted on the basis of thermal data provided by the Moderate Resolution Imaging Spectroradiometer (MODIS) sensors aboard the Terra (EOS AM) and Aqua (EOS PM) satellites. The research focusses on both day and night time data, for the months of July 2000-2006.

The extension (a), the magnitude (b), and the geometry (c) of the SUHI were investigated by comparing the land surface temperatures (LST) in the Bucharest urban perimeter with those in the rural surrounding area.

In order to identify the limits of the SUHI, 16 transects, geographically oriented and originating in the center of the city were analyzed. One can assume that the shifting points in the temperatures datasets along each transect might be regarded as possible limits of the SUHI. The shifting points were identified by two tests, Pettit and

Rodionov. The relationships between LST and landuse were also investigated.

The results highlight that the extension and the geometry of the Bucharest SUHI highly depends on the landuse, and it follows the administrative limits of the city. The differences between the average LST in the SUHI and in the 5-km buffer zone varies between 2 and 5°C.

This study may improve significantly the urban planning, triggering a positive societal impact.