



Human-biometeorological assessment of the urban heat island in Bucharest (Romania)

Sorin Cheval (1,2,3), Alexandru Dumitrescu (2), Ana-Maria Ciobotaru (3), and Andreas Matzarakis (4)

(1) “Henri Coandă” Air Force Academy, Braşov, Romania (sorincheval@yahoo.com), (2) National Meteorological Administration, Bucharest, Romania, (3) University of Bucharest, Bucharest, Romania, (4) Deutscher Wetterdienst, Research Center Human Biometeorology, Freiburg, Germany

This study examines the spatial differences and the thermal variability of the urban heat island (UHI) in Bucharest (Romania) by applying thermal indices as Physiologically Equivalent Temperature (PET) and Universal Thermal Climate Index (UTCI). Hourly data collected from the three WMO meteorological stations which monitor the climate of Bucharest (Filaret, Băneasa and Afumaţi) were analysed over the period 1961-2015. The main objectives of the study are (1) to evaluate the influence of the urban environment on the human-biometeorology and (2) to compare the UHI characteristics as derived from air temperature and thermal indices. Previous studies performed in other cities (e.g. Stuttgart) already demonstrated that UHI and intra-urban variability were most obvious using thermal indices rather than air temperature. For Bucharest, the nighttime PET-based assessment of the UHI was in average 2.4°C and maximum around 12.2°C, while the air temperature assessment revealed an average difference between urban and peri-urban stations of 1.1°C, and maximum of 8.7°C. Similar patterns and order of difference was computed for daytime UHI. Both PET and air temperature revealed an increased UHI intensity along 1961-2015, very likely due to the intensified urbanisation within the city centre.