

## **Monitoring and assessment of the outdoor thermal comfort in Bucharest (Romania)**

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Bucharest is one of the European cities most at risk of being affected by meteorological hazards. Heat or cold waves, extreme temperature events, heavy rains or prolonged precipitation deficits are all-season phenomena, triggering damages, discomfort or even casualties. Temperature hazards may occur annually and challenge equally the public, local business and administration to find adequate solutions for securing the thermal comfort in the outdoor environment of the city. The accurate and fine resolution monitoring of the air temperature pledges for the comprehensive assessment of the thermal comfort in order to capture as much as possible the urban influence. This study uses sub-hourly temperature data (10-min temporal resolution) retrieved over the period November 2014 – November 2016 collected from nine sensors placed either in plain urban conditions or within the three meteorological stations of the national network which are currently monitoring the climate of Bucharest (Băneasa, Filaret, Afumați). The relative humidity was estimated based on the data available at the three stations placed in WMO standard conditions, and the 10-min values of 8 Thermal Comfort Indices were computed, namely: Heat Index, Humidex, Relative Strain Index, Scharlau, Summer Simmer Index, Physiological Equivalent Index, Temperature-Humidity Index, Thom Discomfort Index. The indices were analysed statistically, both individually and combined. Despite the short range of the available data, this study emphasizes clear spatial differentiations of the thermal comfort, in a very good agreement with the land cover and built zones of the city, while important variations were found in the temporal regime, due to large variations of the temperature values (e.g. >4 centigrade between consecutive hours or >15 centigrade between consecutive days). Ultimately, this study has revealed that the continuous monitoring of the urban climate, at fine temporal and spatial resolution, may deliver fundamental information for supporting the immediate measures and the long-term urban planning and the sustainable thermal comfort of the urban inhabitants.

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