



Urban heat island under various synoptic scale atmospheric circulation in the central and south-eastern Europe – comparison of Prague and Bucharest

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Urban heat island (UHI) development is greatly influenced by the synoptic scale atmospheric circulation. Anticyclonic conditions presumably are more advantageous for the formation of the heat island because of the undisturbed radiation and because they are usually connected with calm or weak wind conditions and clear or only partly cloudy sky. However, there is only limited meteorological observation in urban-to-rural networks resulting in a lack of information addressing how synoptic weather types influence intra-urban and rural variations in air temperature. The effect of synoptic weather types on human health has been well-documented, yet the strength of the UHI formation under different weather types is not as well documented in Central and Eastern Europe. Usually, such studies focus on distinct urban areas, while comparison of more distant cities are less approached. In this paper we use an objective classification, based on “Grosswetterlagen” approach, for Prague, Czech Republic, and Bucharest, Romania available for period of 35 years (1981-2016). We analyse the UHI intensity based on daily maximum and minimum temperatures at seasonal scale, in correlation with various synoptic types. Our results provide more deep knowledge about UHI features under different weather conditions including temporal evolution during last decades. This temporal evolution is discussed with respect to city development – increase in built up areas, growth of population, traffic intensity etc. One can assume that the findings can be useful also for weather forecasters in order to prepare and warn the urban population in potentially dangerous situations, in order to minimize the mortality or health problems).