



Evaluation of the thermal behaviour of different ‘local climate zones’ in Belgium

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Urban areas are one of the most important human habitats; already 50% of the world’s population is living there and this percentage is expected to rise to 70% by 2050. Global warming and the increasing world population will only put more pressure on the living conditions in these habitats.

From a thermal comfort point of view it is clear that there is a need for sustainable urban planning that integrates the thermal behaviour of these new developments. To develop sustainable urban planning it is key to know what the influence of a new development will be on the thermal behaviour of the city. Classifying the city according to the local climate zone (LCZ) scheme can provide insights in the thermal behaviour of a city. The WUDAPT LCZ classification framework makes it possible to do so in a spatially explicit manner.

This study presents an evaluation of the thermal behaviour of LCZ in three different Belgian cities (Brussels, Antwerp, Ghent) based on modelled air and surface temperature. First LCZ maps were delineated for the three cities. The maps were built based on Landsat and high resolution LiDAR images conform to the WUDAPT LCZ classification framework. Meter- resolution LiDAR images provide useful information on building height and were used to improve the LCZ maps. An accuracy assessment stage was added to confirm the validity of the maps. Secondly, the LCZ maps were used as input data for the URBCLIM model to model air and surface temperature. With the modelling results we characterized the thermal behaviour of every LCZ. In a next step the results for the different cities are compared and the generic character of the WUDAPT LCZ classification framework is evaluated. The main incentive for this study is to investigate whether LCZ maps can be used to foresee the influence of future urban growth scenario’s on the thermal comfort in cities in Belgium.