



Urban Impact Assessment and Adaptation Strategies to Climate Change in Europe: A Case Study for Antwerp, Berlin and Almada

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Climate change is driven by global processes such as the global ocean circulation and its variability over time leading to changing weather patterns on regional scales as well as changes in the severity and occurrence of extreme events such as heat waves. For example, the summer 2003 European heat wave caused up to 70.000 excess deaths over four months in Central and Western Europe. As around 75% of Europe's population resides in urban areas, it is of particular relevance to examine the impact of seasonal to decadal-scale climate variability on urban areas and their populations. This study aims at downscaling the spatially coarse resolution CMIP5 climate predictions to the local urban scale and investigating the relation between heat waves and the urban-rural temperature increment (urban heat island effect). The resulting heat stress effect is not only driven by climatic variables but also impacted by urban morphology. Moreover, the exposure varies significantly with the geographical location. All this information is coupled with relevant socio-economic datasets such as population density, age structure, etc. focussing on human health. The analyses are conducted in the framework of the NAACLIM FP7 project funded by the European Commission involving local stakeholders such as the cities of Antwerp (BE), Berlin (DE) and Almada (PT) represented by different climate and urban characteristics. The end-user needs have been consolidated in a climate services plan including the production of heat risk exposure maps and the analysis of various scenarios considering e.g. the uncertainty of the global climate predictions, urban expansion over time and the impact of mitigation measures such as green roofs. The results of this study will allow urban planners and policy makers facing the challenges of climate change and develop sound strategies for the design and management of climate resilient cities.