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MEASURE THE CLIMATE, MODEL THE CITY

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Abstract. Modern large cities are characterized by a high building concentration, little aeration and lack of green spaces. Such characteristics create an urban climate which is different from the climate outside of cities. An example of an urban climate effect is the so-called Urban Heat Island: cities tend to be warmer than the surrounding rural areas. The higher temperature results in an increase in energy consumption since people, especially in summer, use artificial means to cool themselves. Although means of mitigating the UHI effect exist, they are difficult to justify, as knowledge about urban climate is limited, and analysis tools are lacking. This paper presents the work carried during the 2010 MSc Geomatics Synthesis Project. A 3D spatial relational database has been implemented which is meant to act as starting point in the development of a 3D climate-enabled geographical information system. To this end, the database stores 3D geometries representing the built environment and its thematic properties. The database is also able to store measurements of climate parameters, in this case temperature, obtained through mobile sensors. Spatial analyses and queries are supported, allowing users to calculate areas, distances, buffers, add and remove geometries and thematic attributes. The database design is based on the *CityGML* information model which has been extended to allow the storage of climate parameters relevant to urban climate research.

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