

EGU24-8061, updated on 20 May 2024

<https://doi.org/10.5194/egusphere-egu24-8061>

EGU General Assembly 2024

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## Urban canopy parameters and local climate zones over Europe using OpenStreetMap data

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*Climate modelling needs to have accurate informations about topography, type of land and land-use, size and type of wind or radiative obstacles such as trees or buildings. Explicit climate models solve heat and mass equations for each individual surface but they cannot be applied at regional scale for long time periods due to computational limitations. Parameterized climate models can overcome this limitation considering that within a given grid cell (being from one to several hundred meters wide), the obstacles and lands follow a given setting (e.g. street canyon for cities, with or without a garden). The heat and mass balances are applied for each of the grid cells using urban canopy parameters summarizing the main relevant parameters describing an area (e.g. mean building height, canyon aspect ratio, building fraction, fraction of road, building type and use, etc.). However, there is currently no datasets over Europe that would accurately describe all these informations.*

*OpenStreetMap (OSM) is a free, open geographic database updated and maintained by a community of volunteers via open collaboration. It contains most of the informations needed by climate models. It can cover any part of the world and is particularly well fulfilled for the European continent. One of its limitations is the lack of building height information. GeoClimate is a tool that calculates urban canopy and land cover parameters as well as Local Climate Zones (LCZ). GeoClimate uses vector data such as the ones available through the OSM project and uses machine learning algorithm to estimate the height of building missing such information. GeoClimate has recently used the OSM data to calculate the needed informations needed by parameterized climate models such as SURFEX-MesoNH or WRF over Europe. The presentation will describe the way GeoClimate works and will show some of the results of the resulting dataset.*