EMS Annual Meeting Abstracts
Vol. 9, EMS2012-177-1, 2012
12th EMS / 9th ECAC


# Can local adaptation measures compensate for regional climate change with respect to perceived temperature?

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The perceived temperature (PT) is a measure for quantification of human thermal comfort and was developed by the German Meteorological Service (DWD). In the presentation, the sensitivity of the PT with respect to air temperature, water vapour pressure, wind speed, mean radiant temperature, street canyon width, and building heights is investigated for the city of Hamburg in Northern Germany. To provide meteorological input for PT, the mesoscale atmospheric model METRAS is employed with 2 nests. The outermost grid has a horizontal resolution of 4 km for a domain covering Northern Germany and laterally forced with ECMWF analysis data (T799). These results are downscaled with METRAS to 1 km horizontal resolution for a domain covering the metropolitan area of Hamburg and to an inner grid of 250 m horizontal resolution for a domain covering the city of Hamburg. Using the model results, the modification of shortwave and longwave radiation due to the buildings is calculated off-line with the "Building Effects Parameterization" BEP. From the model results PT is off-line calculated using software provided by the DWD. Sensitivities (partial derivatives) of the PT on different input parameters (e.g. building height, wind speed, temperature) are determined by automatic differentiation of the DWD software and the radiation modification routines from BEP using the "Transformation of Algorithms in FORTRAN" software TAF. On one side, this allows to estimate at low computational costs how local adaptation measures can influence the target PT. On the other side, the sensitivities show how accurate different input variables need to be known in order to achieve a certain desired accuracy in the target PT. Results are discussed in detail for the 10.06.2007, a summer day with advection of warm air masses from the south-east. A comparison with results obtained for other synoptic situations during the summer is made.