



Hamburg Urban Soil Climate Observatory (HUSCO): A concept to assess the impact of moisture and energy fluxes of urban soils on local climate

Sarah Sandoval (1), Felix Ament (2), and Annette Eschenbach (3)

(1) KlimaCampus, University of Hamburg, Germany (sarah.sandoval@zmaw.de), (2) Meteorological Institute, University of Hamburg, Germany (felix.ament@zmaw.de), (3) Institute of Soil Science, University of Hamburg, Germany (a.eschenbach@ifb.uni-hamburg.de)

The aim of this research project is a more precise understanding of the interactions between pedosphere and atmosphere in urban environments. Soil as a storage and transmitter for water and thermal energy is able to influence and modify the local climate. This effect is to be quantified for three different typical urban structural units, namely green spaces, dense and sparse terraced housing estates, in combination with different soil properties and water table depths. Focus lies on the modified soil hydrology of different housing densities. The impact of soil properties and groundwater table on local climate in urban areas will be assessed. The results should open up opportunities to make more tangible predictions about the impacts of climate change in urban areas and to develop adaptation strategies to climate change for urban planning.

Long-term measurements will start in spring 2010 in the city of Hamburg, Germany. To quantify the climate-controlling processes as fluxes of energy and water, two Eddy covariance systems including soil heat flux measurements are used and various soil measurement stations are mounted to analyze seasonal variations in soil water balance, ground water table and soil thermal properties. To detect the resulting climate effects, namely the heterogeneity of temperature and humidity in urban areas, coupled "Meteo-stations" are set up to analyze core atmospheric parameters. Furthermore, data of existing observational networks throughout Hamburg will be integrated.

We will present objectives of the project, the design of experiments and the selection of investigation sites as well as very first data.

Acknowledgment: The project is founded by DFG as a part of the cluster of excellence "Integrated Climate System Analysis and Prediction (CliSAP)", KlimaCampus, Hamburg