

“Urban Climate“ – Processes and interactions between urban structures and the atmosphere

Title:	“Urban Climate“ – Processes and interactions between urban structures and the atmosphere
Supervisors:	Daniel Fenner, Achim Holtmann Chair of Climatology (Prof. Dr. Scherer)
Program:	Urban Ecosystem Sciences (M. Sc.)
Module:	Environmental resources in urban regions (15 ECTS)
Term:	Summer term 2016, winter term 2016/17 (SoSe16/WiSe16-17)
Participants:	15
First meeting:	Thursday, April 21, 2016 Rothenburgstraße 12, 12165 Berlin (room and time: cf. ISIS)

Background

Urban structures and humans within urban regions modify the atmosphere through a variety of processes, leading to distinct features that can be summarised under the term “urban climate”. The atmosphere reversely impacts humans and urban structures, leading to interactions between these two spheres, the atmosphere and the anthroposphere. These interactions and processes take place on different spatial scales, from meso-scale atmospheric circulations affecting the whole city, over local-scale processes of a neighbourhood down to the micro-scale of, e.g., a single street canyon. Many of these processes on the local- to micro-scale are due to spatial differences in land cover, building morphology, vegetation types and the type of human activity.

Objectives

The aims of this project are to study, quantify and ultimately understand these different processes; their causes, characteristics and effects. Starting from studying/recapitulating relevant climatological background knowledge, the project aims at giving the participants hands-on experience in all important steps and aspects concerning scientific work and carrying out a research project in a group. This includes project organisation and team-work, reading scientific literature, developing a measurement campaign, carrying out measurements, data handling and analyses, and different forms of presentations of results.

Topics within the project

The concept of Local Climate Zones (LCZ) will be introduced, intra-LCZ variations of, mainly, air temperature, humidity, wind and radiation will be studied. We will learn about the functioning of the processes behind these variations, e.g. local winds, cold-air production and transport or modifications of the energy balance. We will also discuss the influence of urban structures and morphology (courtyards, street canyons, etc.) on the micro-climatic conditions and their consequences for the human body, using tools and concepts of human-biometeorology.