

*Project:*  
***“Effects of urbanization and urban aerosol emissions on  
precipitation in Europe”***

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**Objectives**

This study will address two key questions:

- How sensitive is precipitation in Central Europe to urban land use and urban aerosol emissions?
- What are synergistic effects of urban land use and the urban aerosol emissions on the climate of Central Europe?

**Summary**

Changes of precipitation play a crucial role for the agricultural planning and management in Central Europe and require not only monitoring but a detailed understanding of underlying processes. Aerosol particles play an important role in the cloud and precipitation physics. Land cover modifications lead to changes of surface radiative properties that, in turn, influence formation of convective clouds and precipitation.

Within this project I will investigate sensitivities of the precipitation to two major anthropogenic disturbances: urbanization and urban aerosol pollution of the atmosphere. The main goal of this work is to analyse the synergistic effects of urbanization and urban aerosol pollution on the precipitation, and their feedbacks.

The importance of these synergistic effects on precipitation will be addressed with multi-seasonal simulations of the weather predicting model COSMO. This model will be further developed to resolve specific properties of urban land. The model simulations will be compared with the existing meteorological measurements over Central Europe.

Quantitative assessments of the role of urban land use and pollution for precipitation formation and related feedbacks will be utilized to better constrain regional climate models, which are used for future climate projections and allow developing adaptive strategies for the agricultural management.