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Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Urban Climate as a Factor for Climate Change Adaptation in City Planning

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Climate change demands a rethinking of urban planning actions and urban design solutions. Cities are of great importance coping with climate change. On the one hand they contribute to high emissions on the other hand they are strongly affected by the caused impacts due to their high densely populated areas.

As we know today climate change will continue and cities have to find specific solution in fighting climate change impacts like flooding, heat waves and so on. Climate change modifies the local climate. In order to find specific adaptation solutions urban climate analysis is of great importance. Current investigations on regional scale show that the impact of climate change is different in each region. To implement climatic aspects in urban planning it is necessary at first to investigate the regional and the urban climate of a city today and in future.

Urban climatologists already have simulation tools on mesoscale and microscale to calculate thermal stress or wind velocity in cities as well as the effect of urban planning projects on the urban climate. It is known that the overheating of cities - the so called urban heat island effect (UHI) - is mainly depending on city size as on density and shape of built up areas. This leads to different zones of overheating in the city which can be identify for example by a surface radiation temperature analysis in combination with urban climate modeling.

This report will give an overview of how urban climate knowledge can be used for a sustainable urban planning and design in responsibility to climate change adaptation strategies. Further it will outline how urban climate analysis can help to identify future city districts of high climate vulnerability. On the background of this knowledge urban adaptation strategies and measurements for specific areas can be developed and implemented in zoning plans and local urban development plans.

Zoning plans and local urban development plans on regional and municipal level serve as important legal instruments which can contribute to implement adaptation measures. Based on examples of the City of Stuttgart and others it will be shown how on different planning levels local climatic information and knowledge (e.g. Climate Atlas) can be used towards a sustainable urban planning and design in responsibility to climate change adaptation strategies. This will be outlined looking at some best practice examples on three different planning levels: Zoning plan/Land use Plan, Informal plans like Framework Plans, Local Development Plans/ Implementation Plans.