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Climate change impacts on air quality in Germany

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Many European countries experienced large improvements in air quality over the past decades due to successful implementation of emission control measures and robust air quality monitoring programs. Yet, the concentration levels of some pollutants (PM2.5, NO_2, O_3) still exceed regulatory values and the emission reductions have not always resulted in the expected concentration decreases. At the current threshold levels of air pollution regulations, chemical processes that inter-convert for example NO, NO_2, and O_3 become important factors influencing the impacts of further reduction strategies. Local air pollution is linked to large scale changes in longer-lived pollutants, and extreme weather situations such as the heatwave of 2003 indicate a potentially significant impact of climate change on air quality in central Europe. There is, however, very little research investigating the impact of climatic changes on pollution concentrations on smaller regional scales as most studies up to now focused solely on future emission changes. In this presentation we review the existing information on emission trends, concentration trends and emission projections for Germany and relate the process knowledge from detailed field and modelling studies to the potential implications of climate change for air quality at rural, suburban, and urban sites in Germany.