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Future projections for Southern West Africa: Air pollution

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Southern West Africa is currently experiencing an unprecedented population growth, which is predicted to continue until the middle of the century. This will have an impact on land use and anthropogenic emissions. How these changes will appear depends on political and economic decisions. To account for the uncertainties in future decisions, different scenarios were developed for the 5th Phase of the Climate Model Intercomparison Project (CMIP5).
To investigate the impact of the changes in land cover and anthropogenic aerosol emissions on regional air pollution we performed a set of simulations with our aerosol-climate model ECHAM6-HAM2. The anthropogenic emissions are prescribed by the ACCMIP (Atmospheric Chemistry and Climate Model Intercomparison Project) emission inventory (Lamarque et al., 2010). Present day simulations refer to the year 2010 (rcp4.5) and future projections to 2050 (rcp4.5 and rcp8.5).
In our presentation, we focus on changes in PM2.5 (particles with diameter less than 2.5 μm) concentrations. Epidemiological studies have indicated that PM2.5 can increase morbidity and mortality, it can damage the respiratory and cardiovascular system, and affect the immune function of humans. We discuss the range of changes in natural and anthropogenic PM2.5 concentrations and how the changes depend on the applied scenarios.